VOLUME II
Appendices

COLORADO RIVER VALLEY FIELD OFFICE
ROAN PLATEAU PLANNING AREA

Including Naval Oil Shale Reserves Numbers 1 & 3

Proposed Resource Management Plan Amendment and Final Supplemental Environmental Impact Statement

BLM/CO/PL-16/010

United States Department of the Interior
Bureau of Land Management
Colorado State Office

JULY 2016

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United States Department of the Interior
Bureau of Land Management
Colorado State Office
Colorado River Valley Field Office

Proposed Roan Plateau Planning Area Resource Management Plan Amendment and Final Supplemental Environmental Impact Statement

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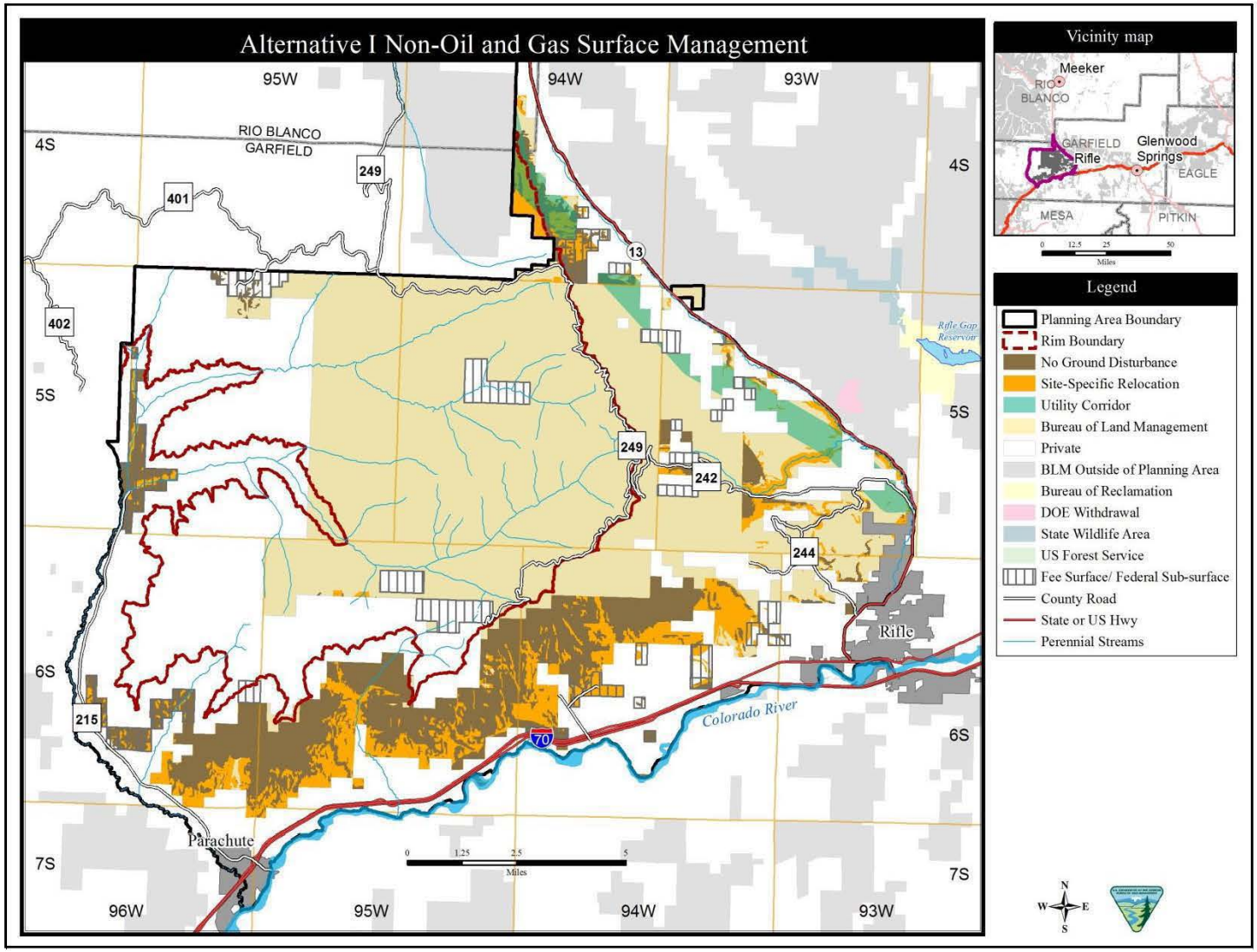

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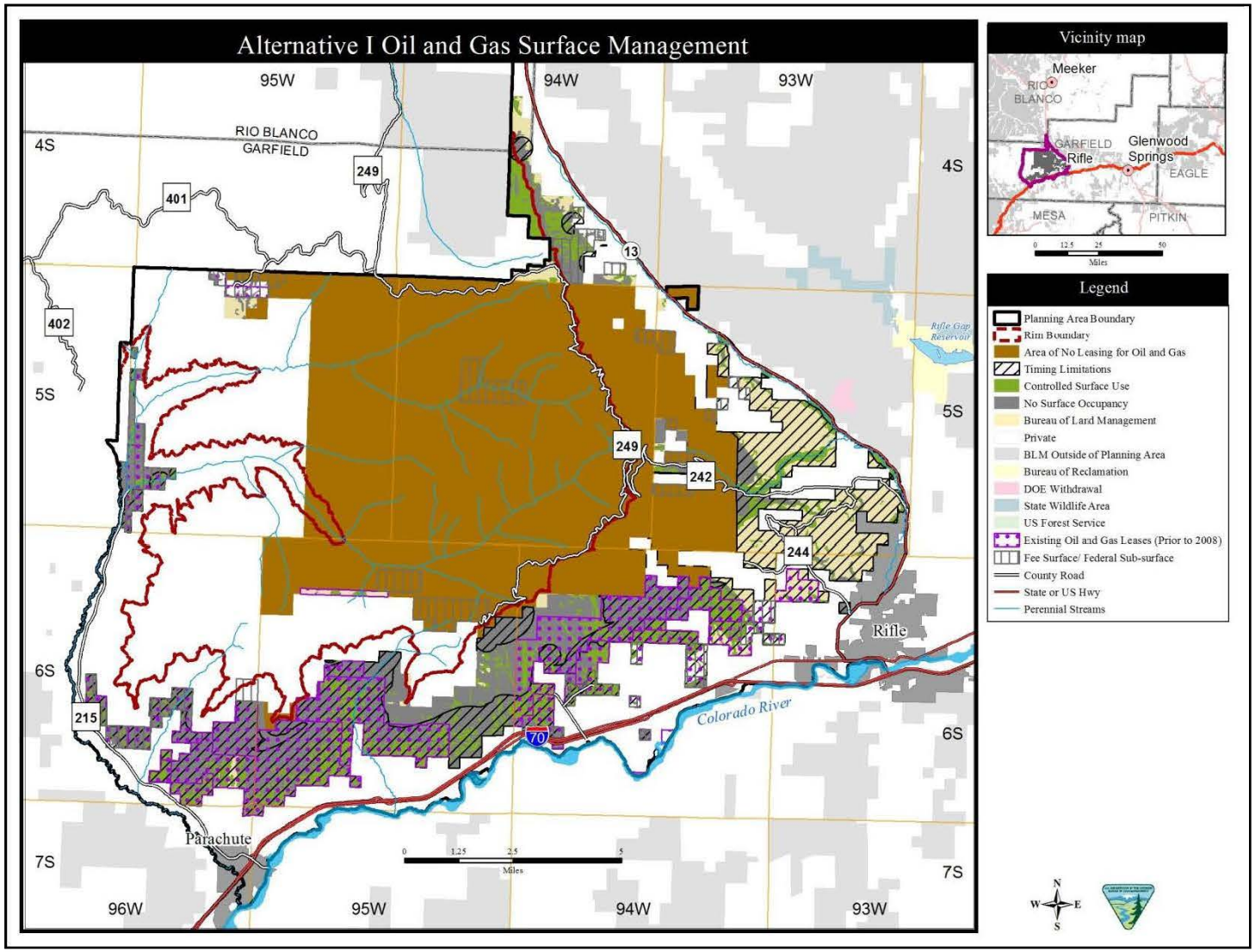

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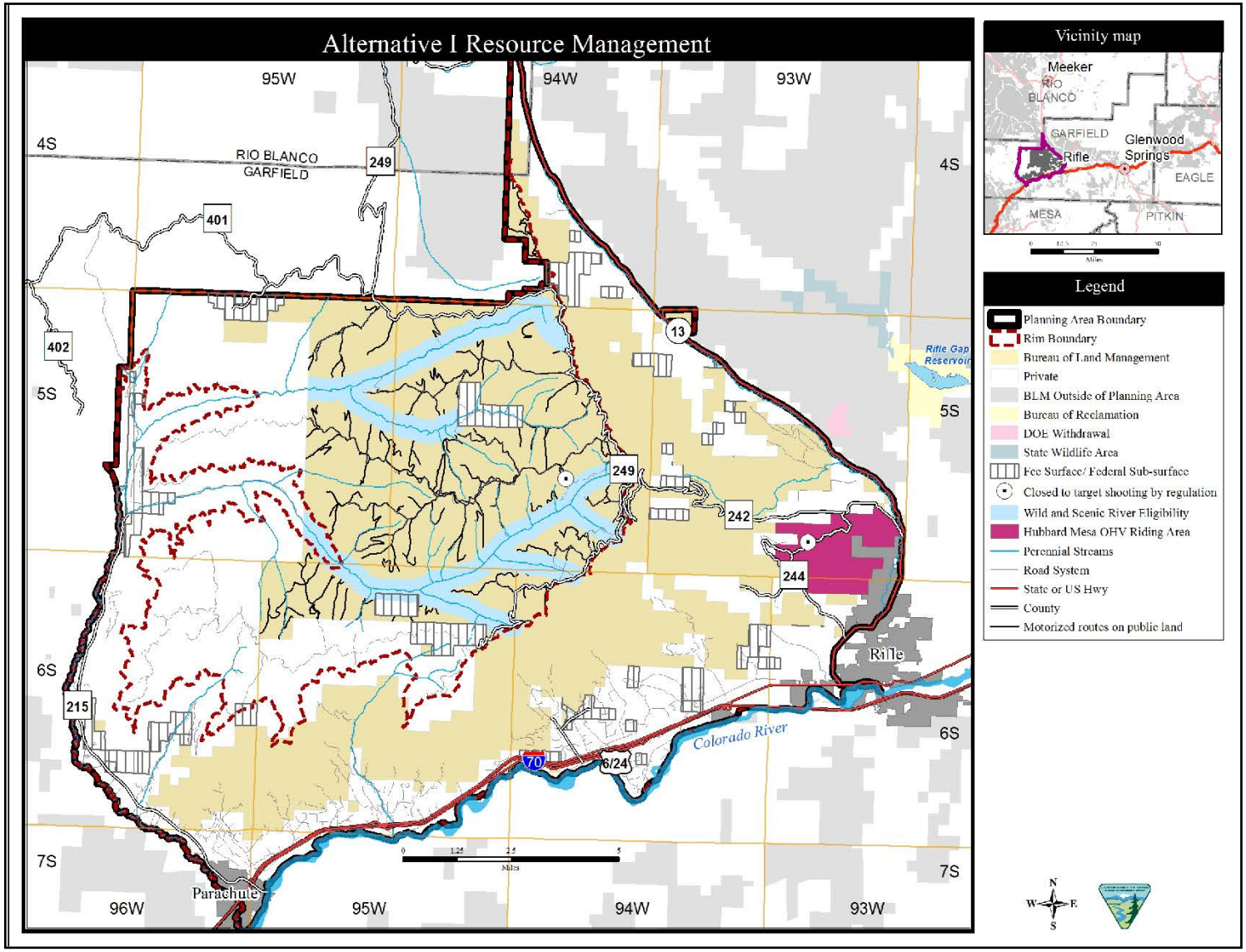

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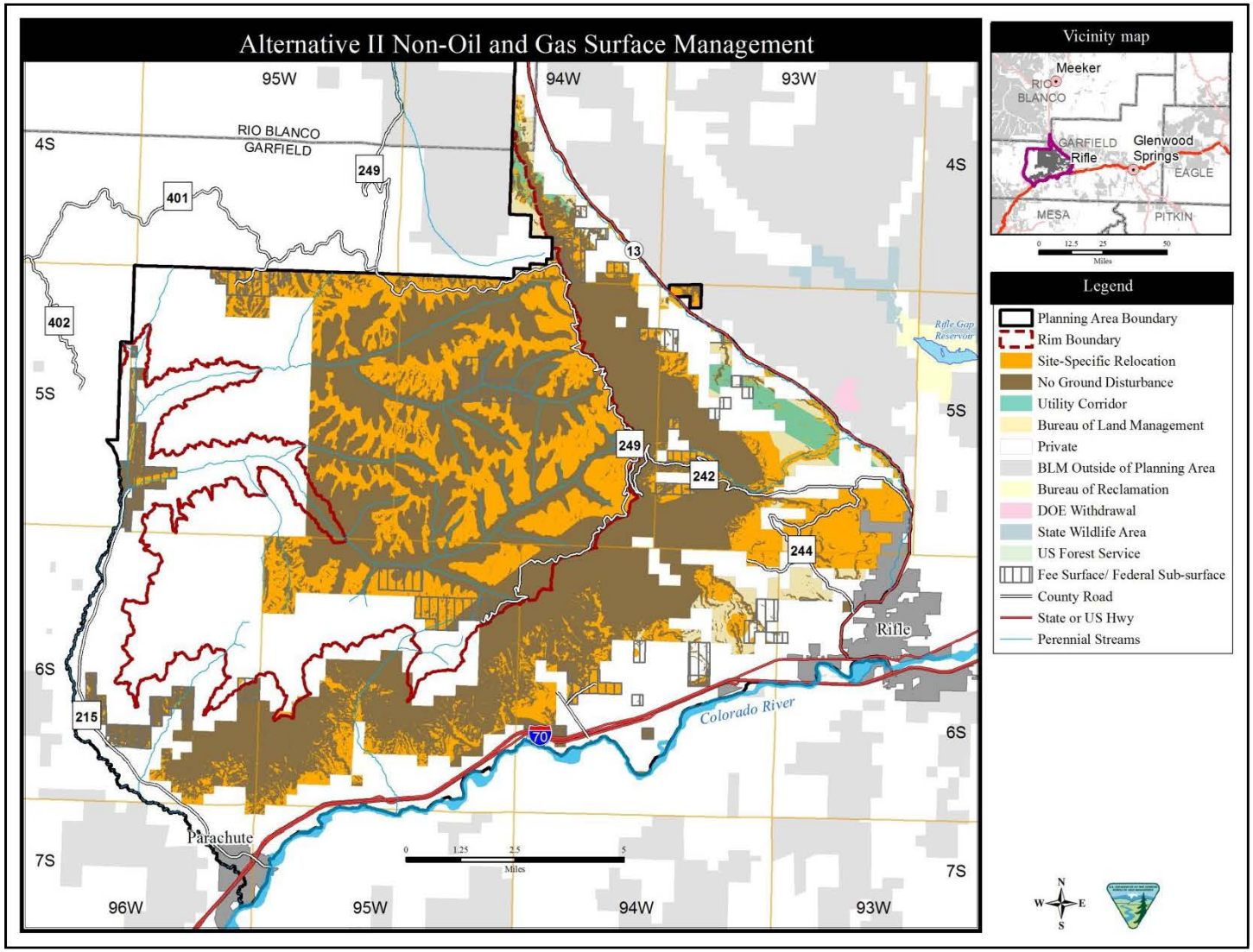

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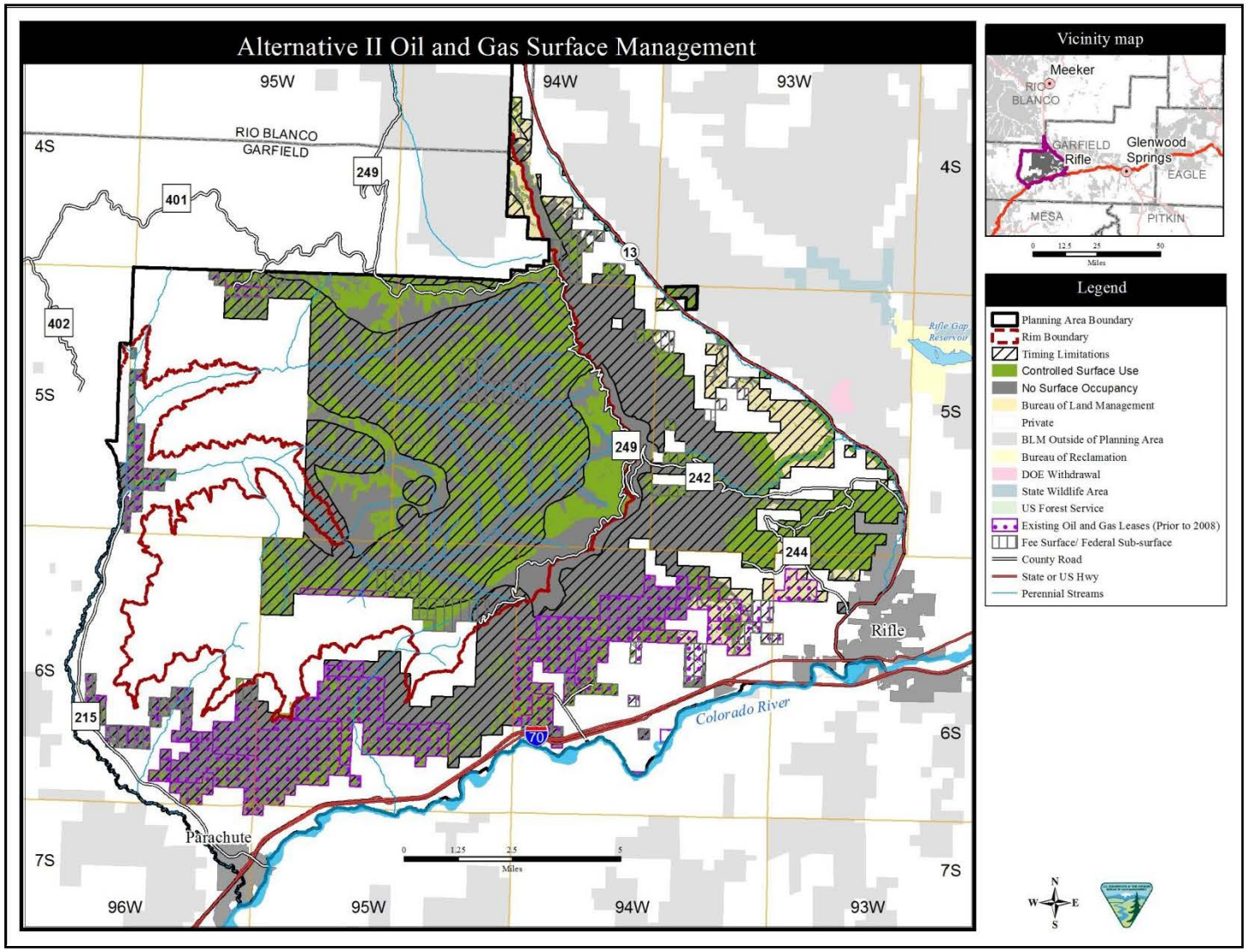

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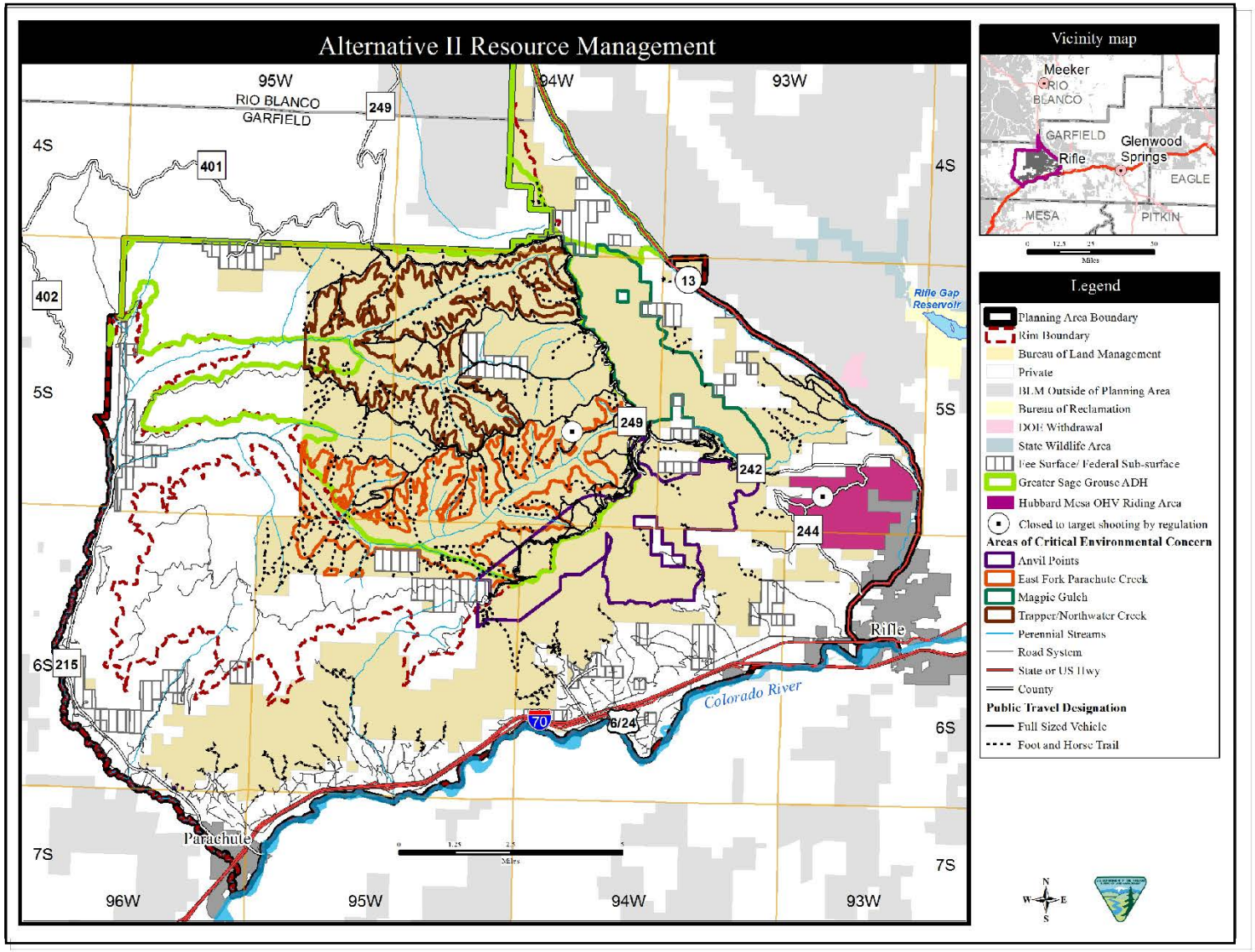

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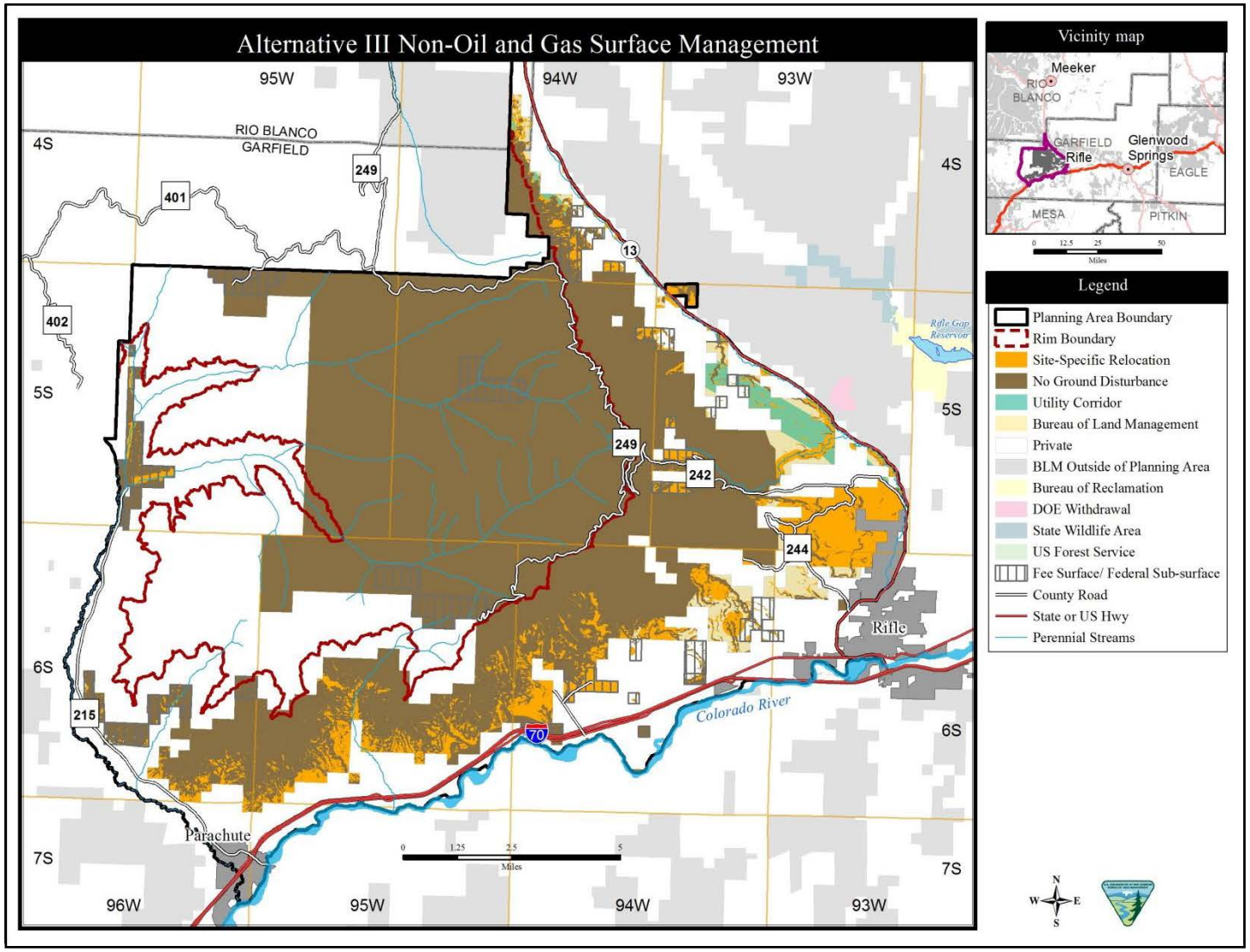

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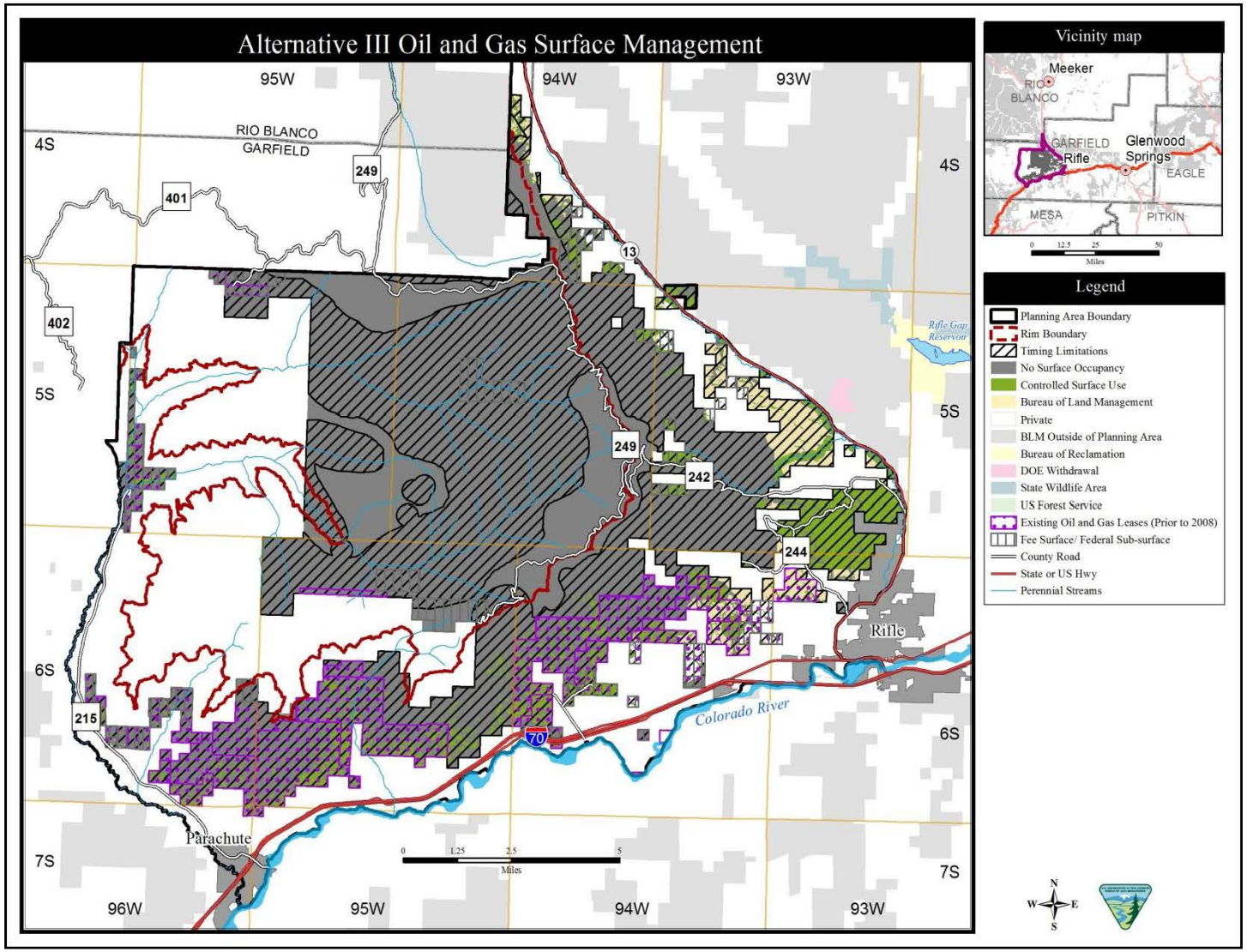

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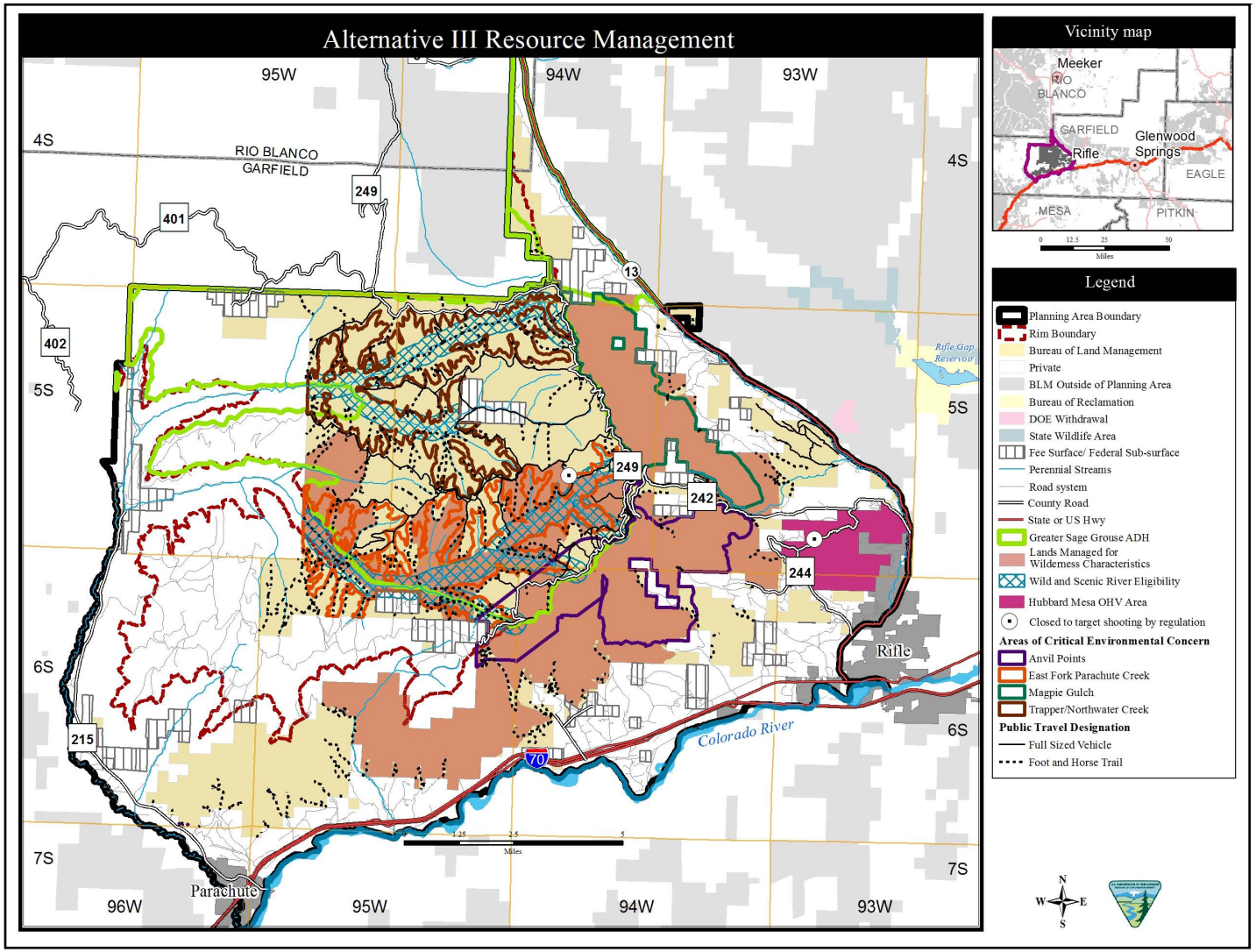

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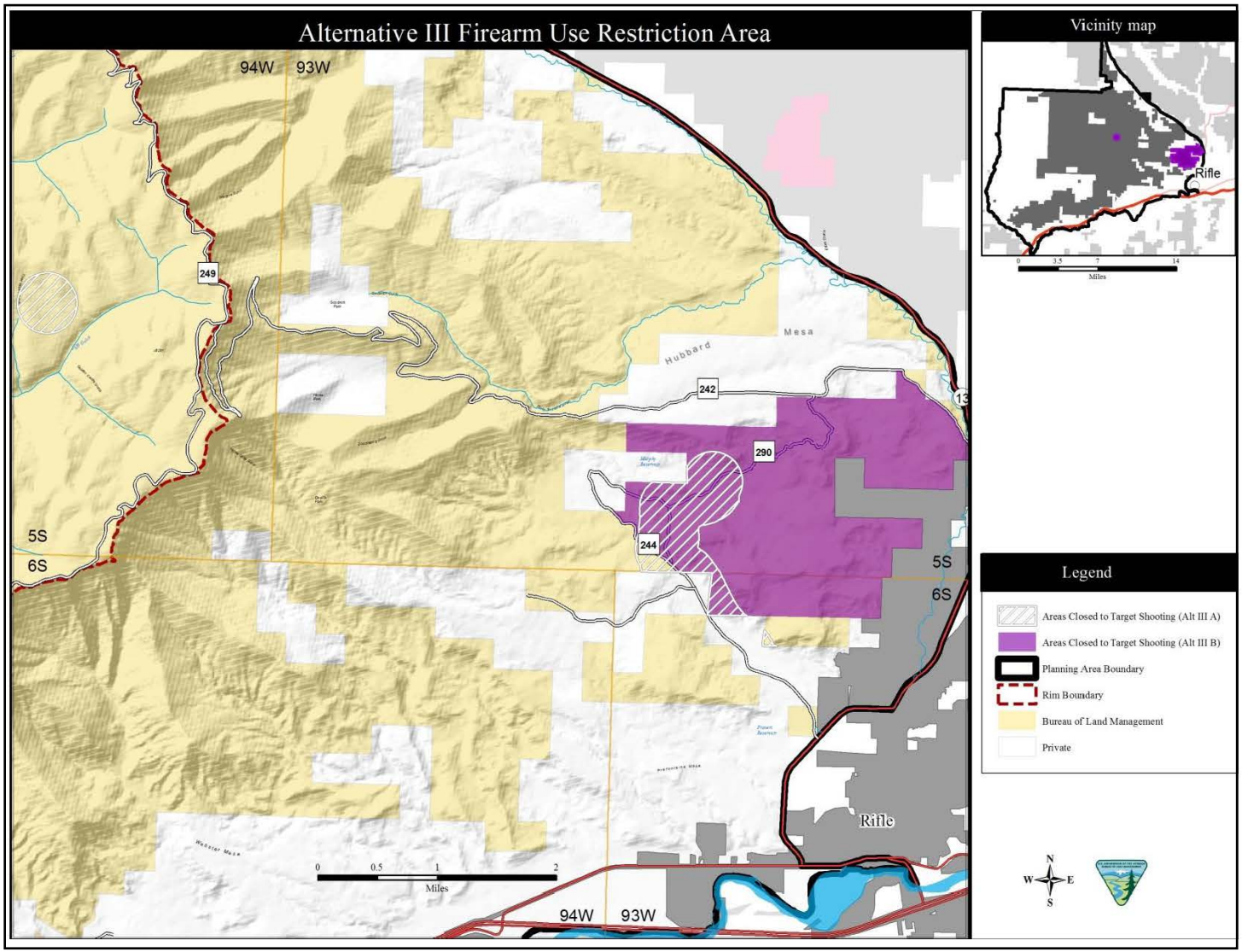

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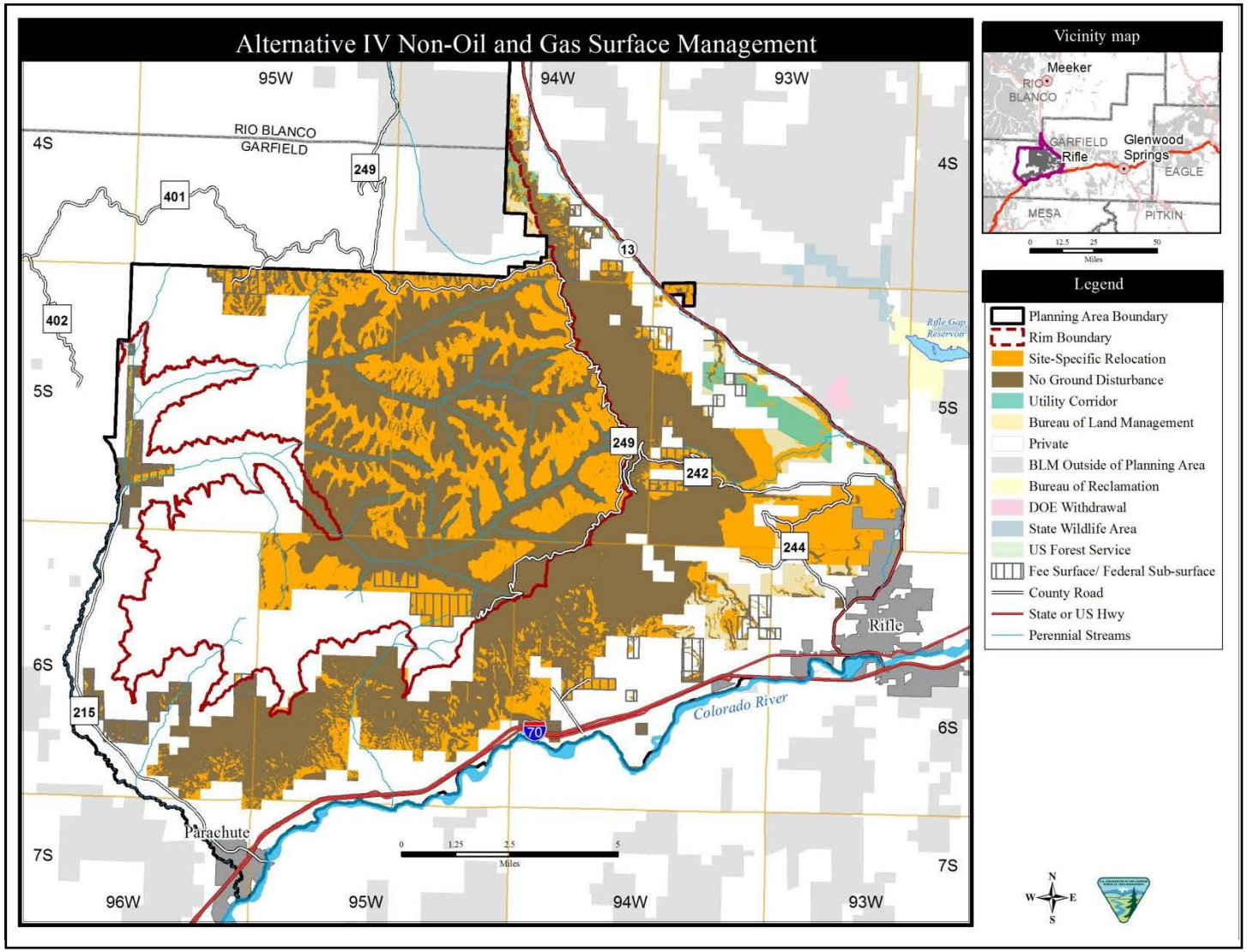

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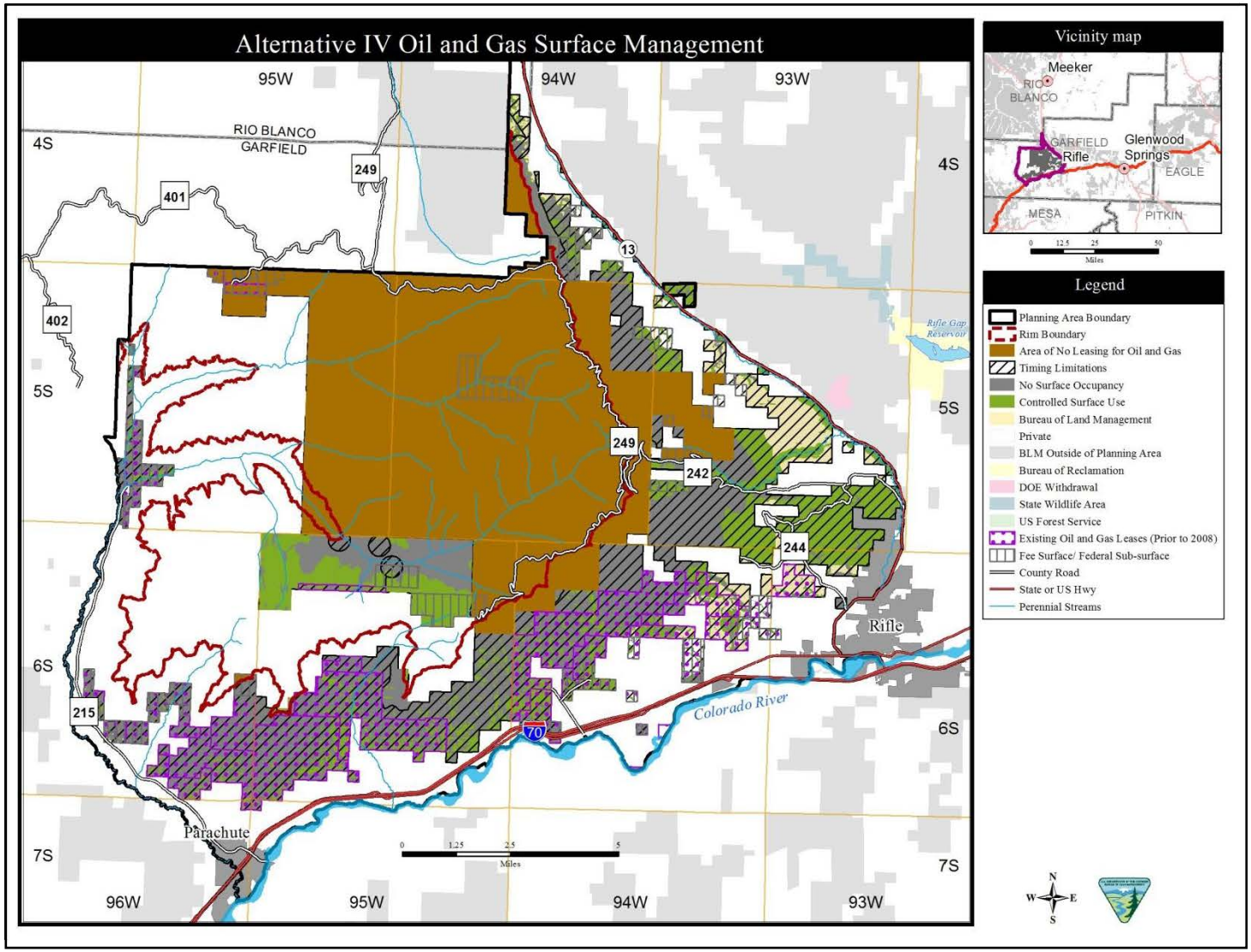

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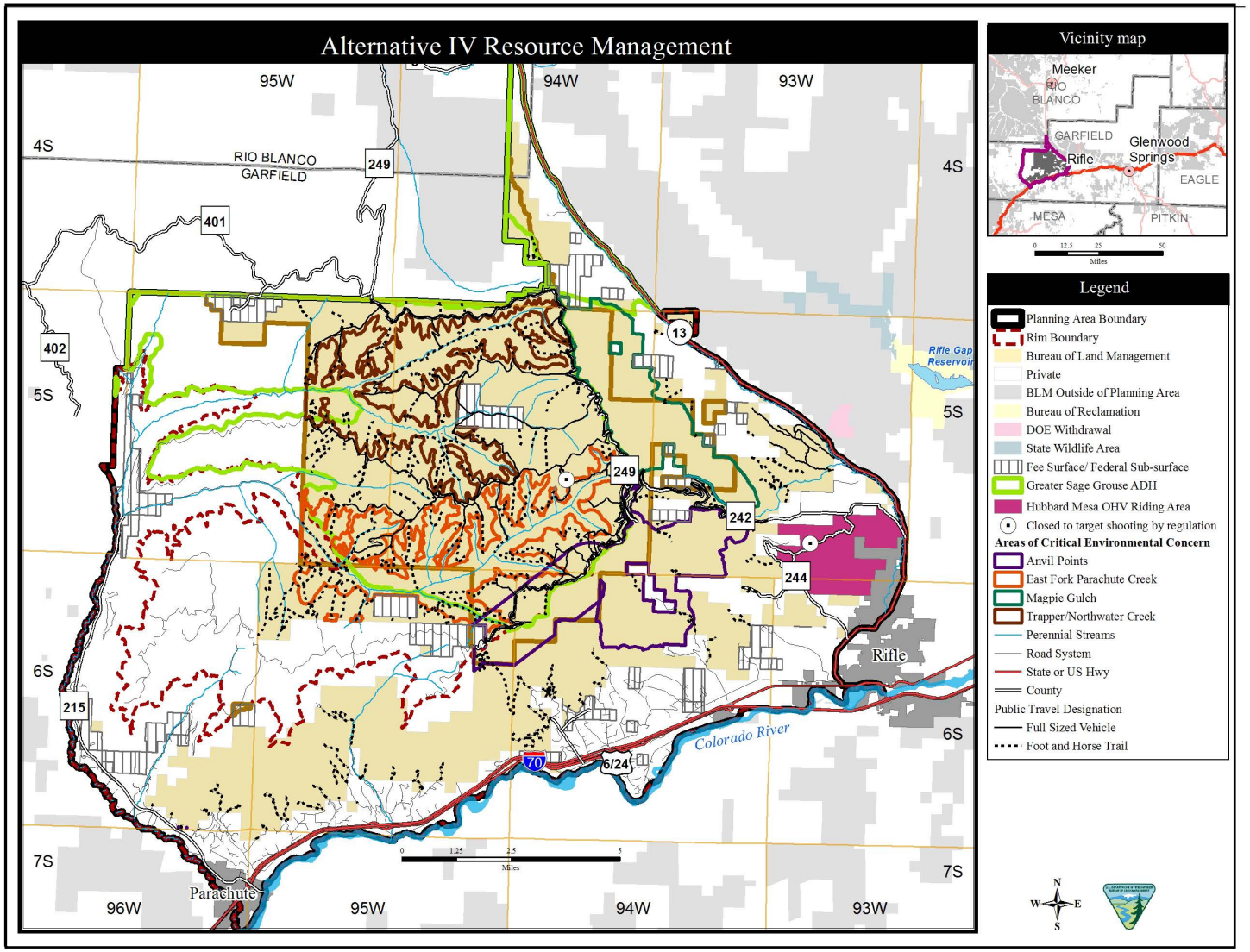

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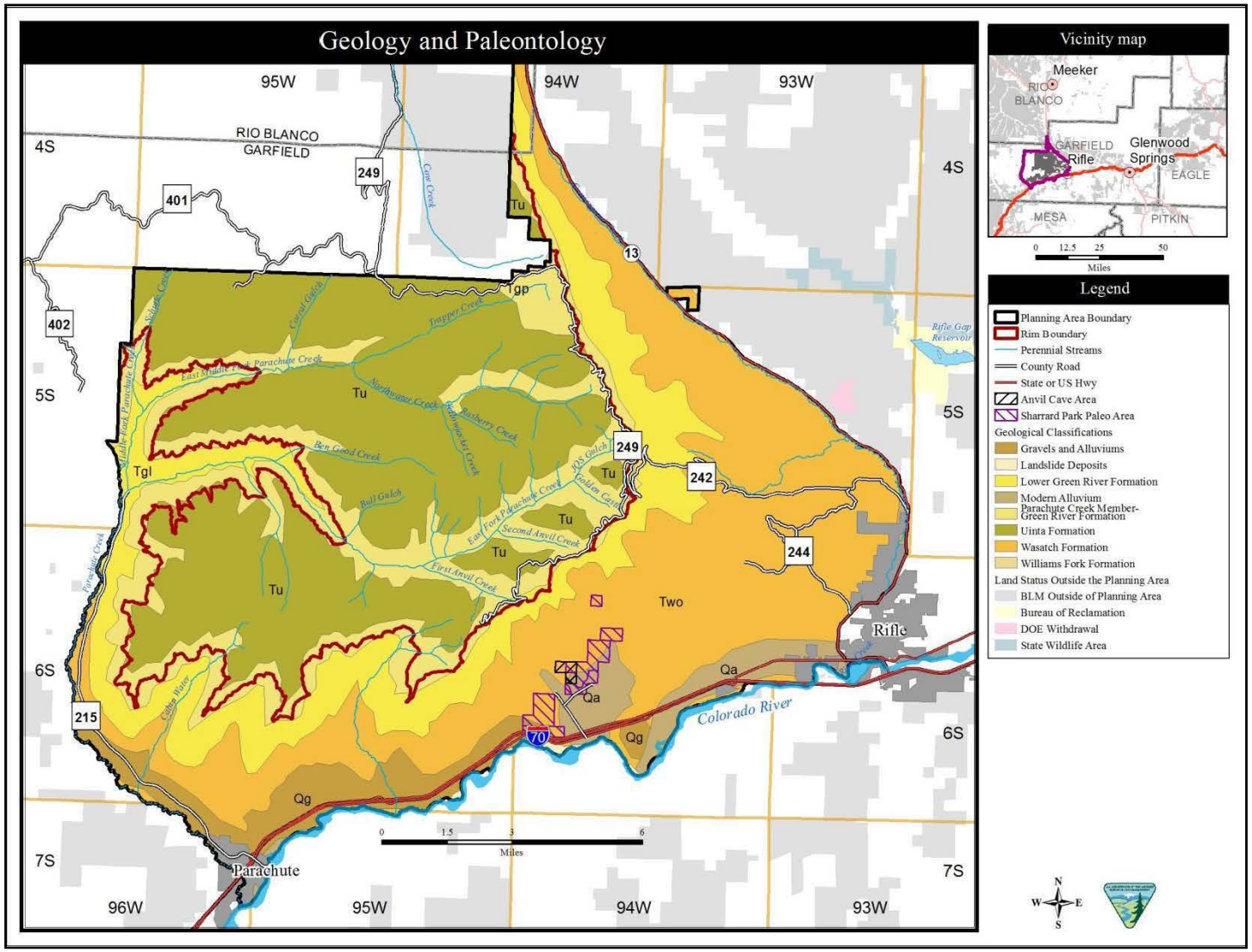

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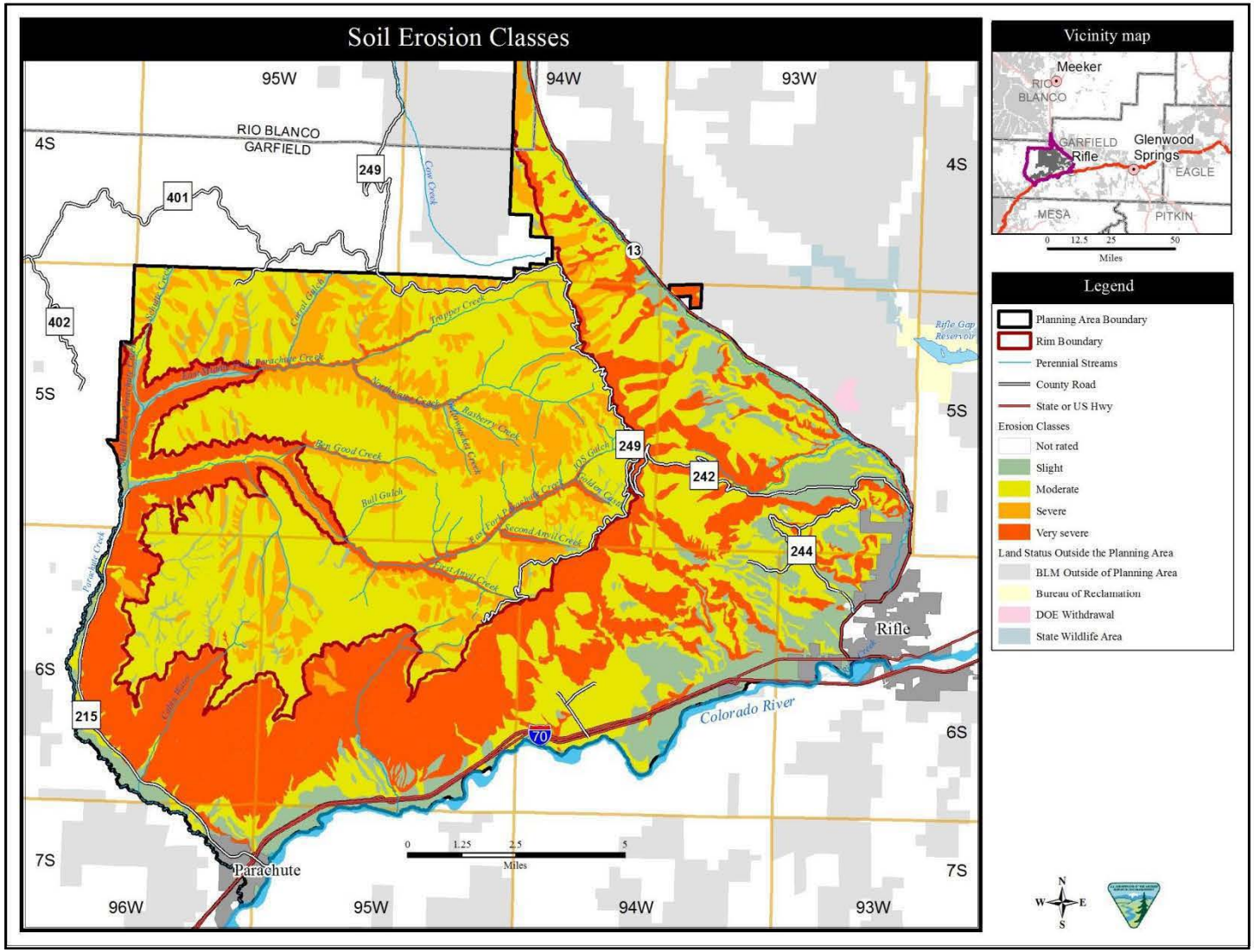

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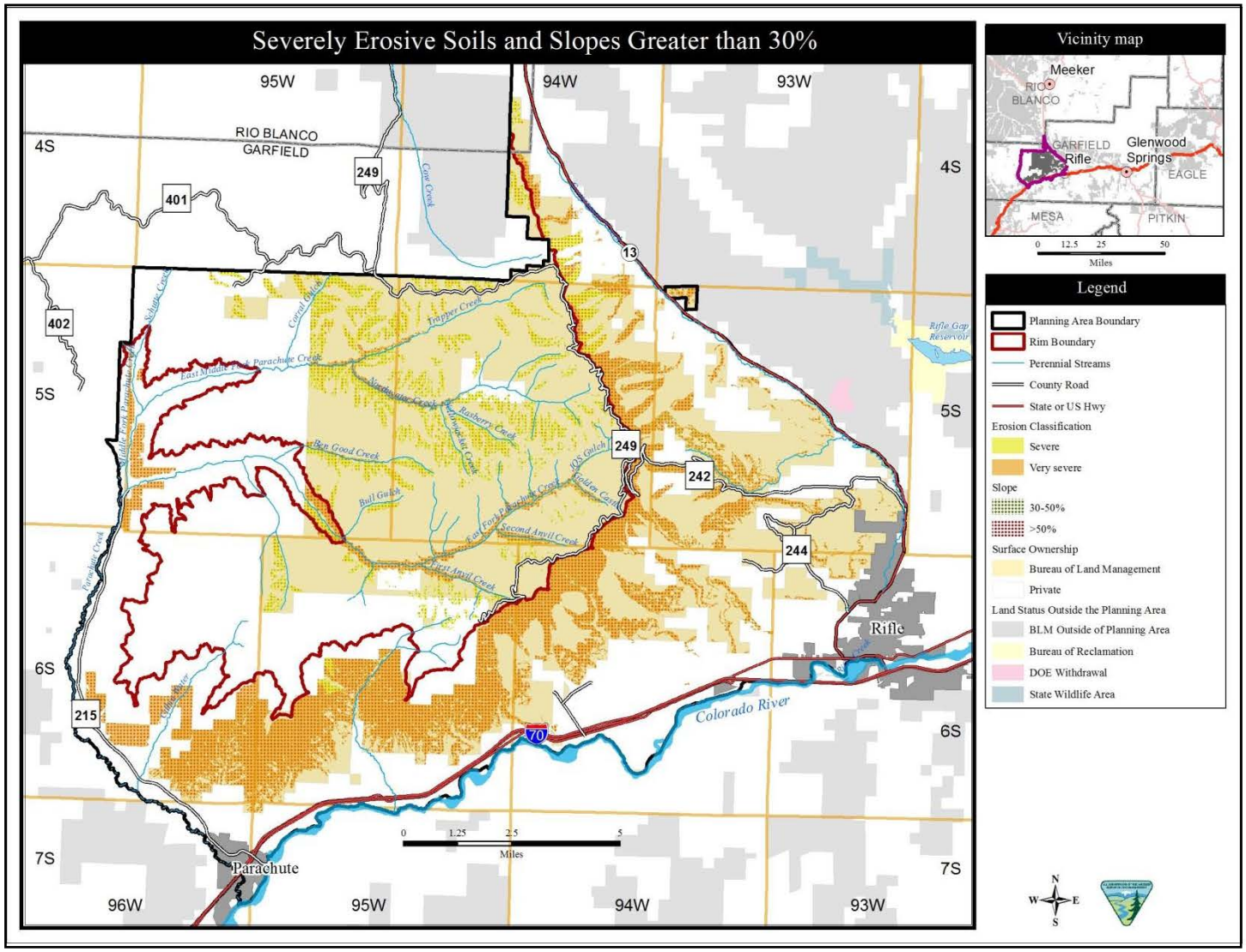

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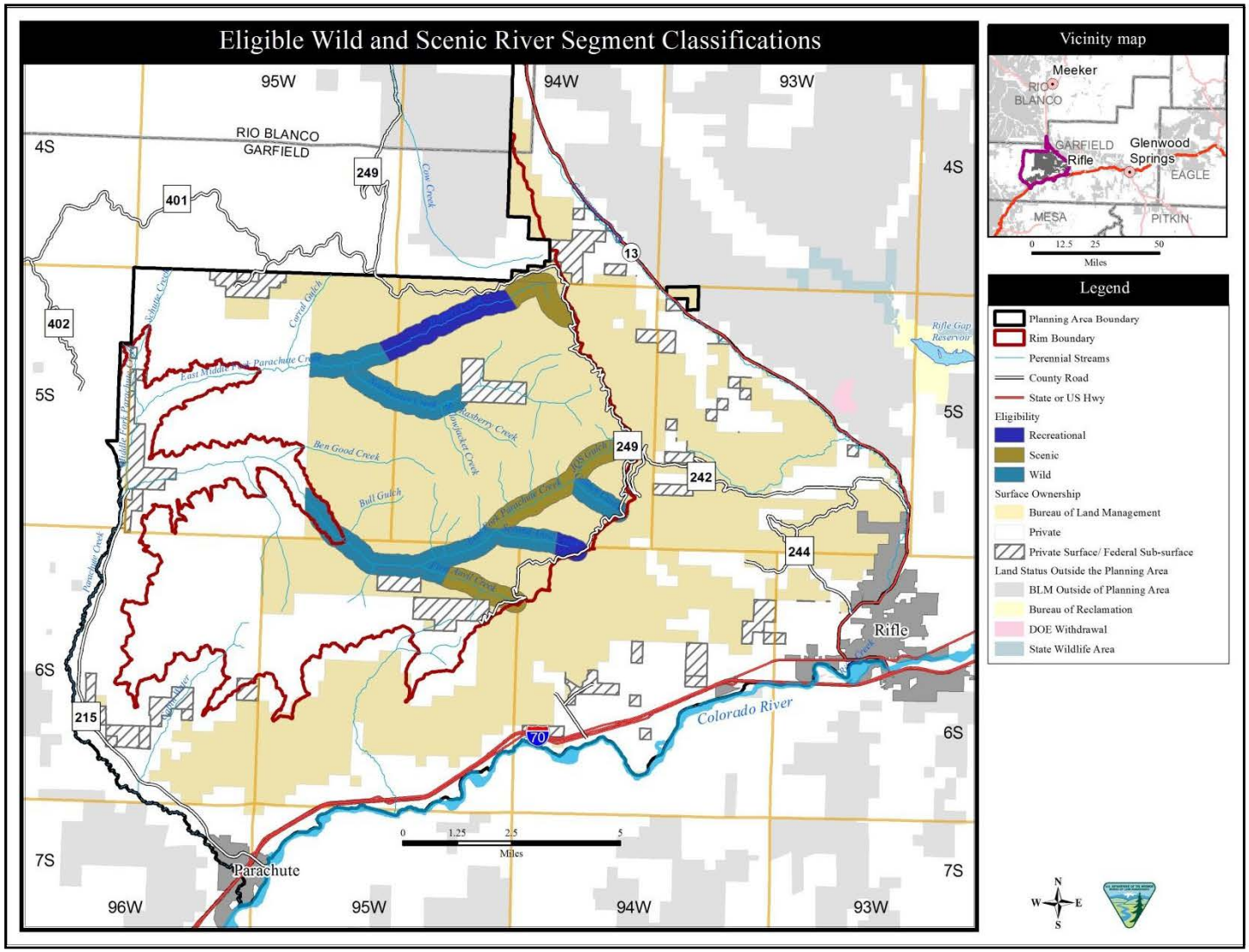

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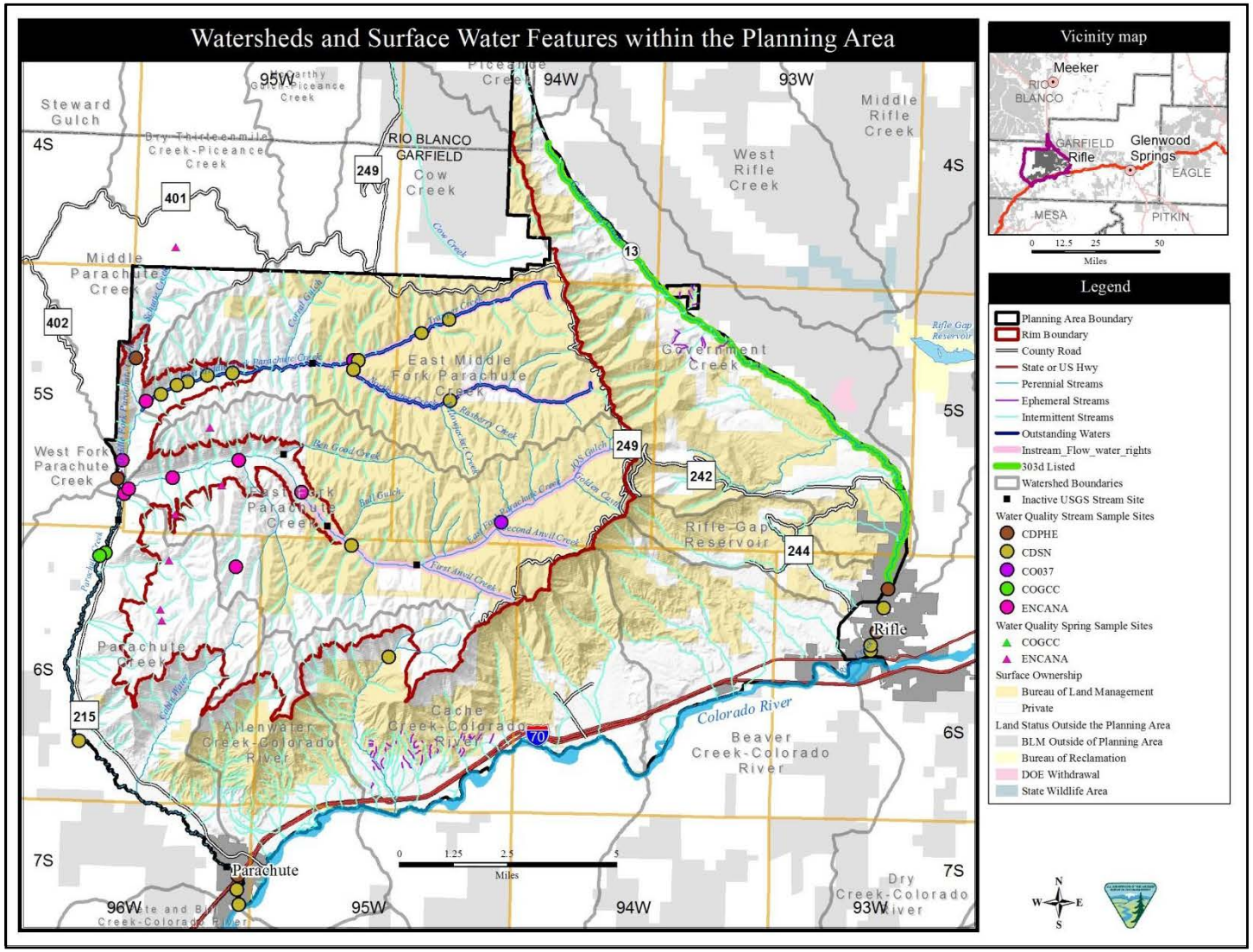

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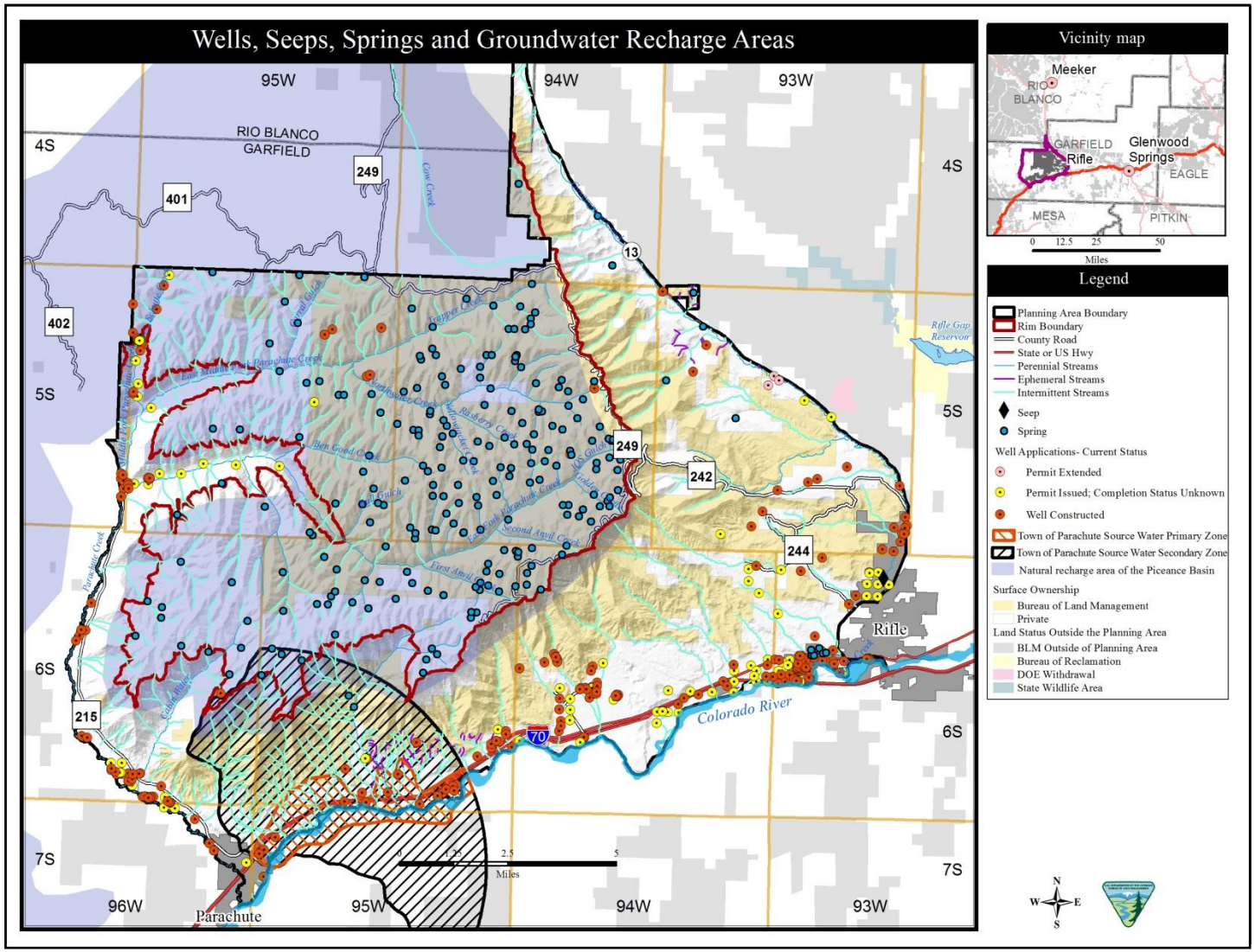

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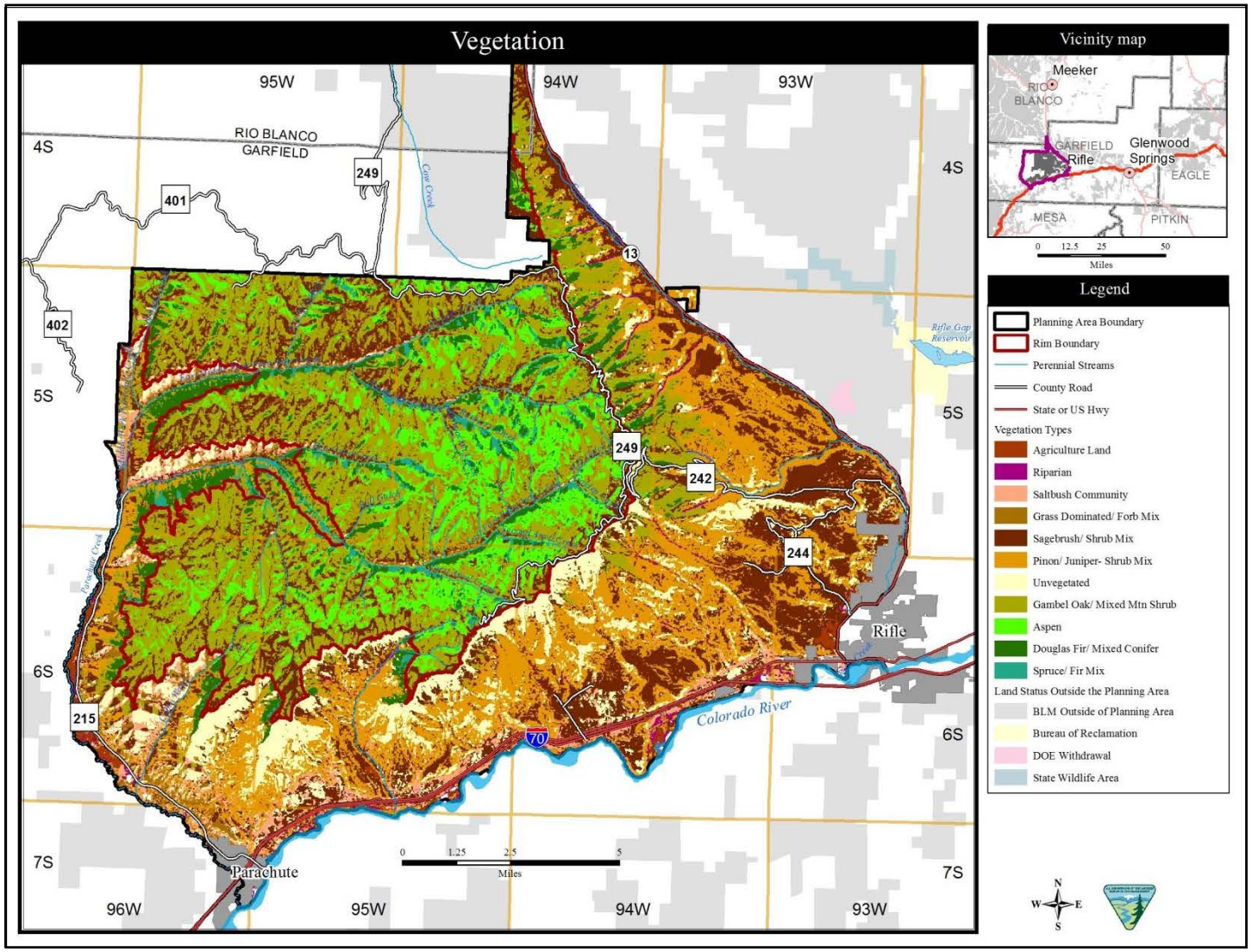

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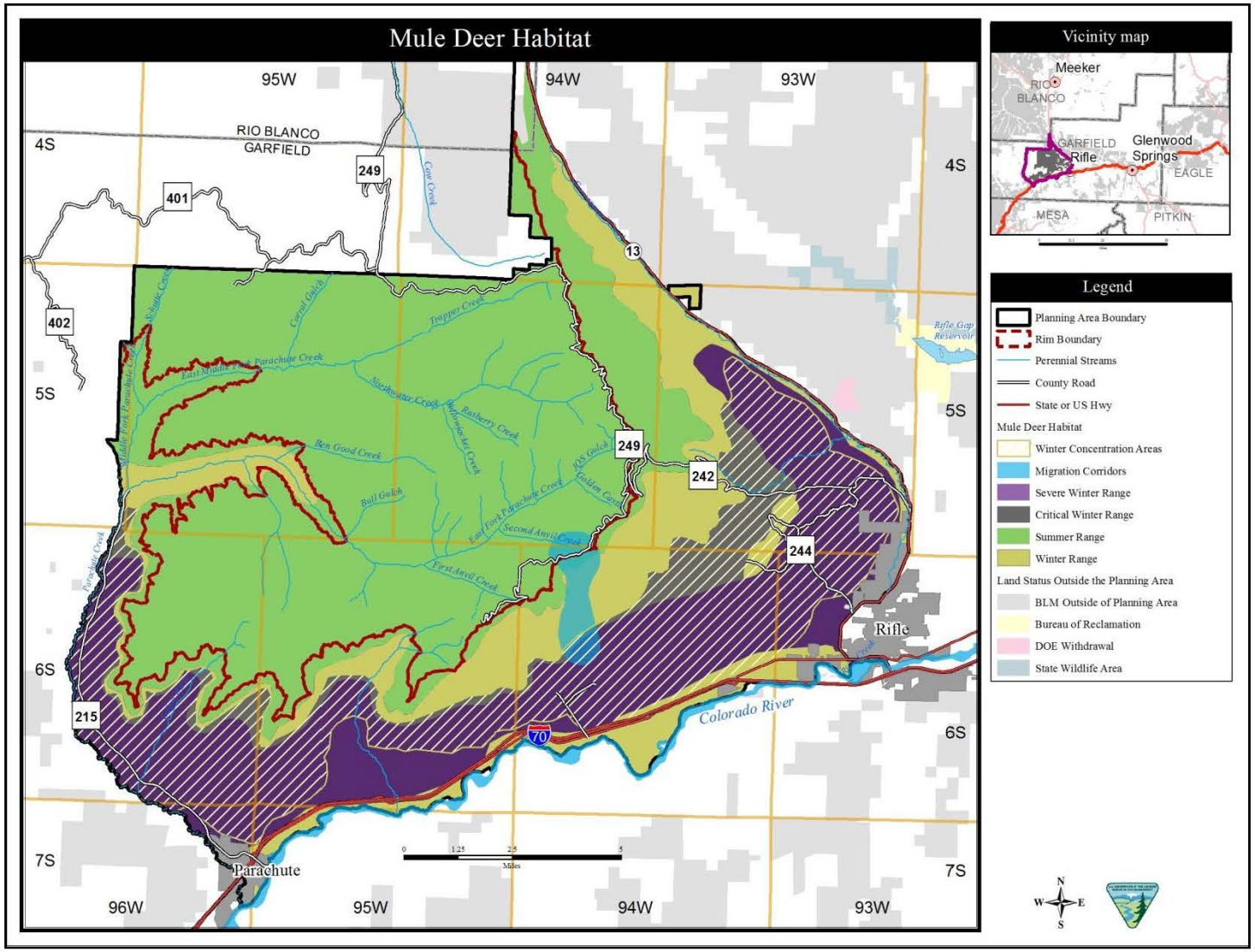

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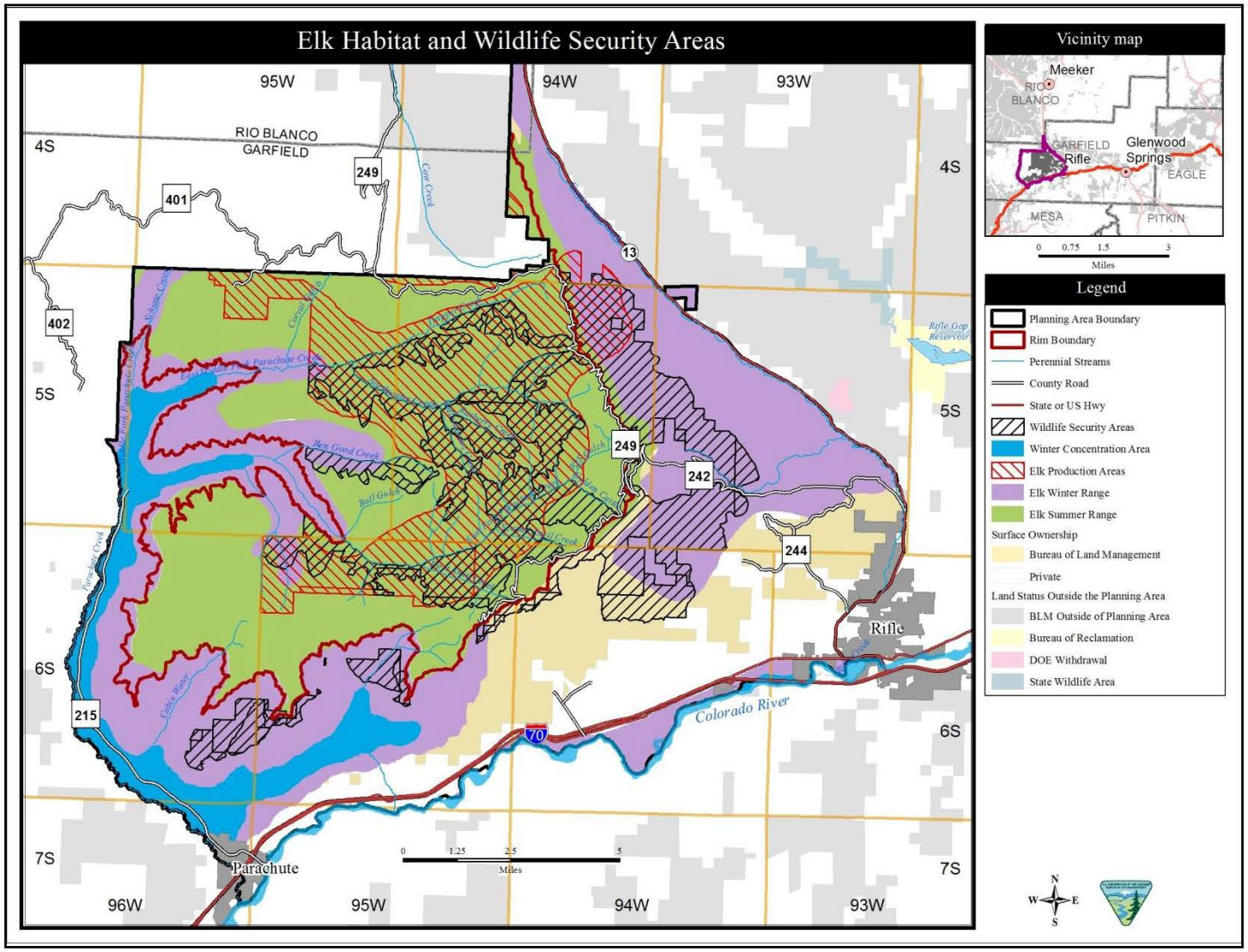

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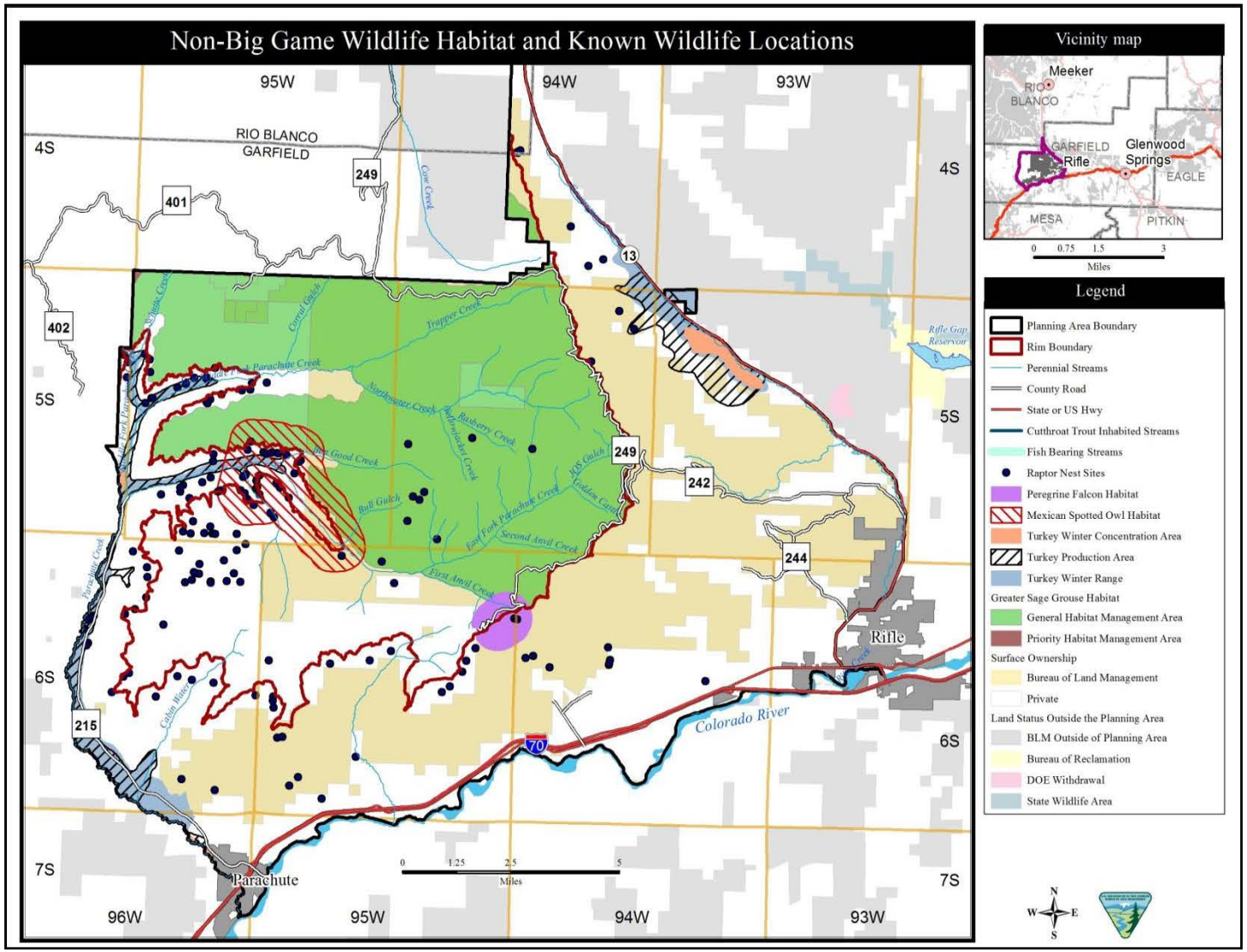

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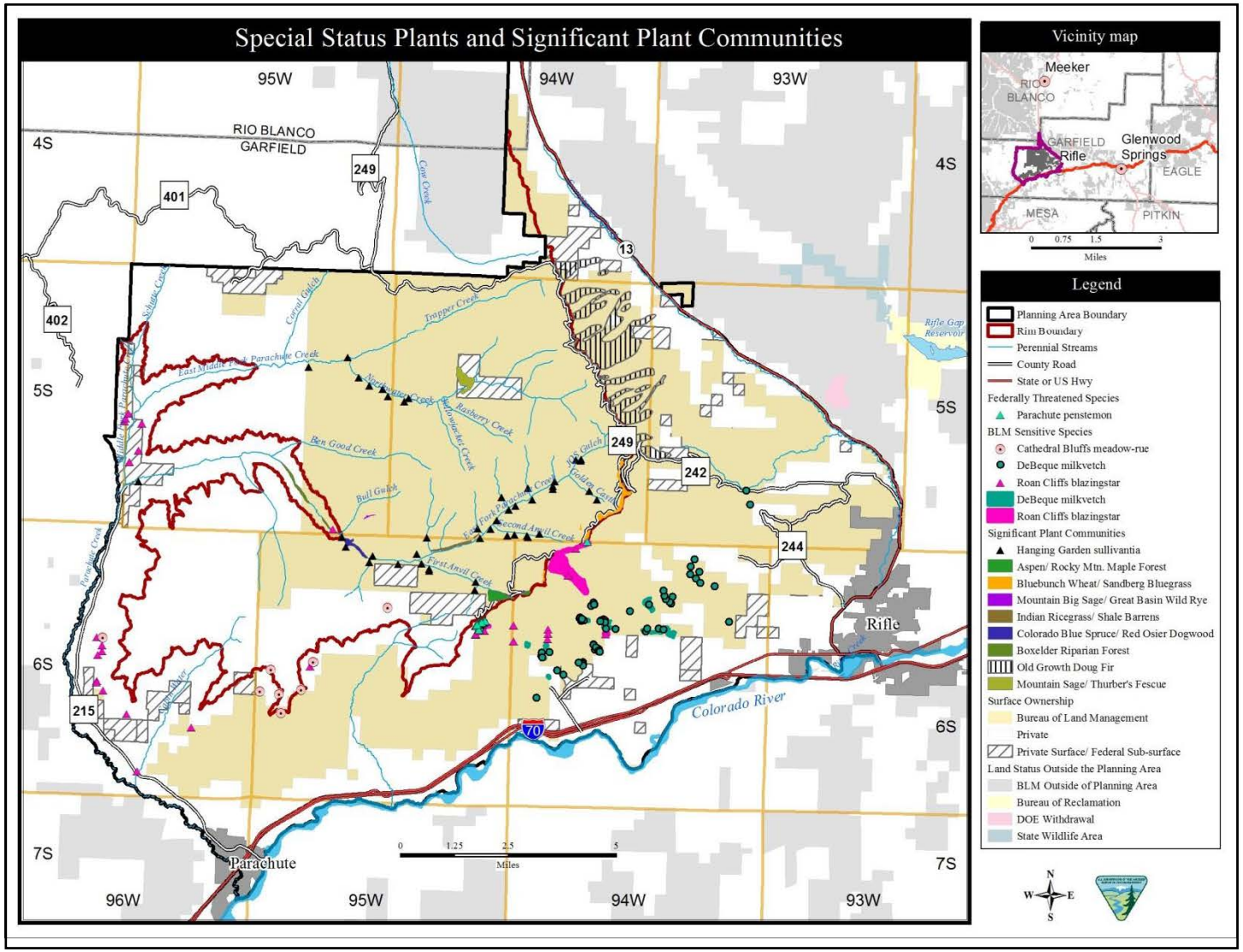

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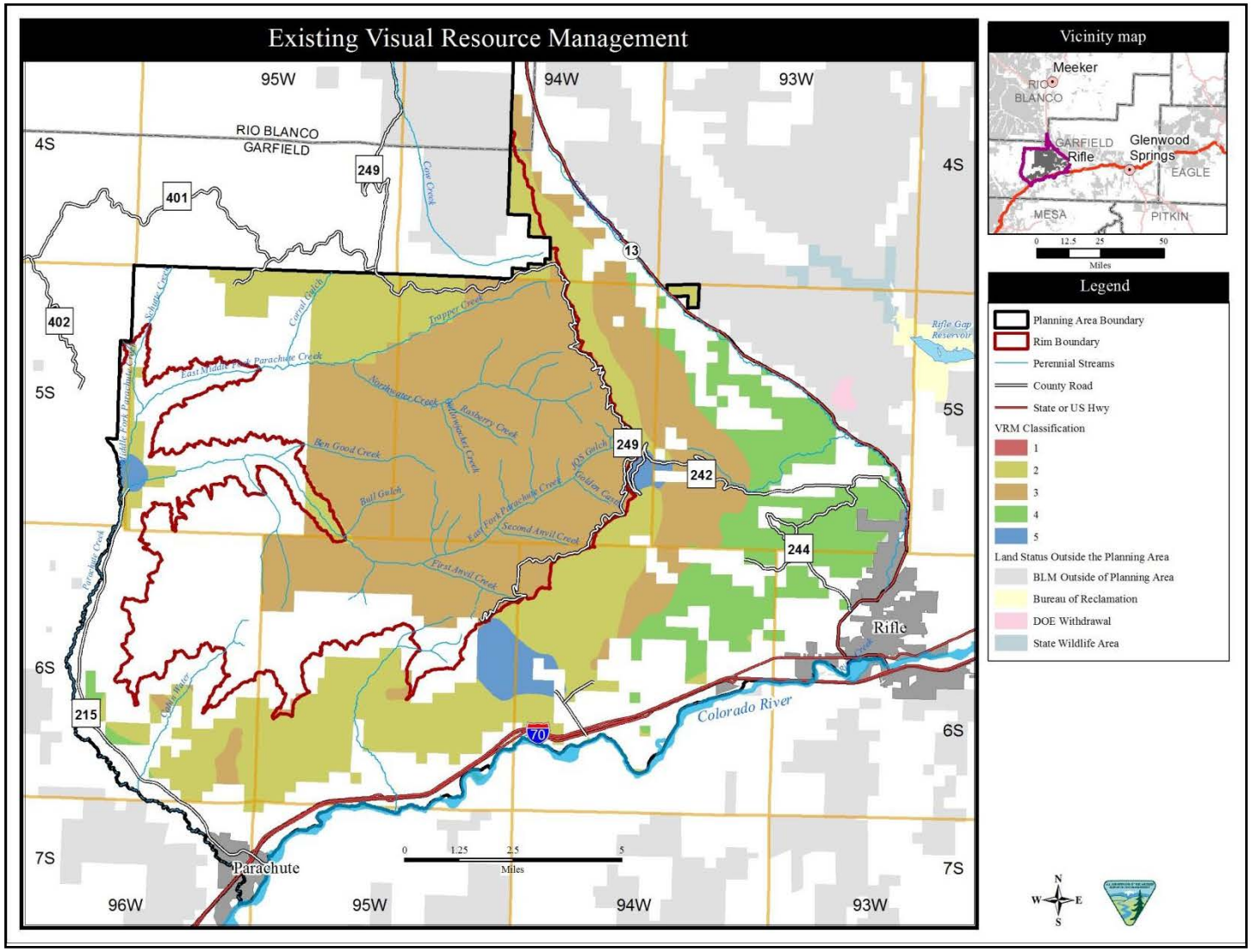

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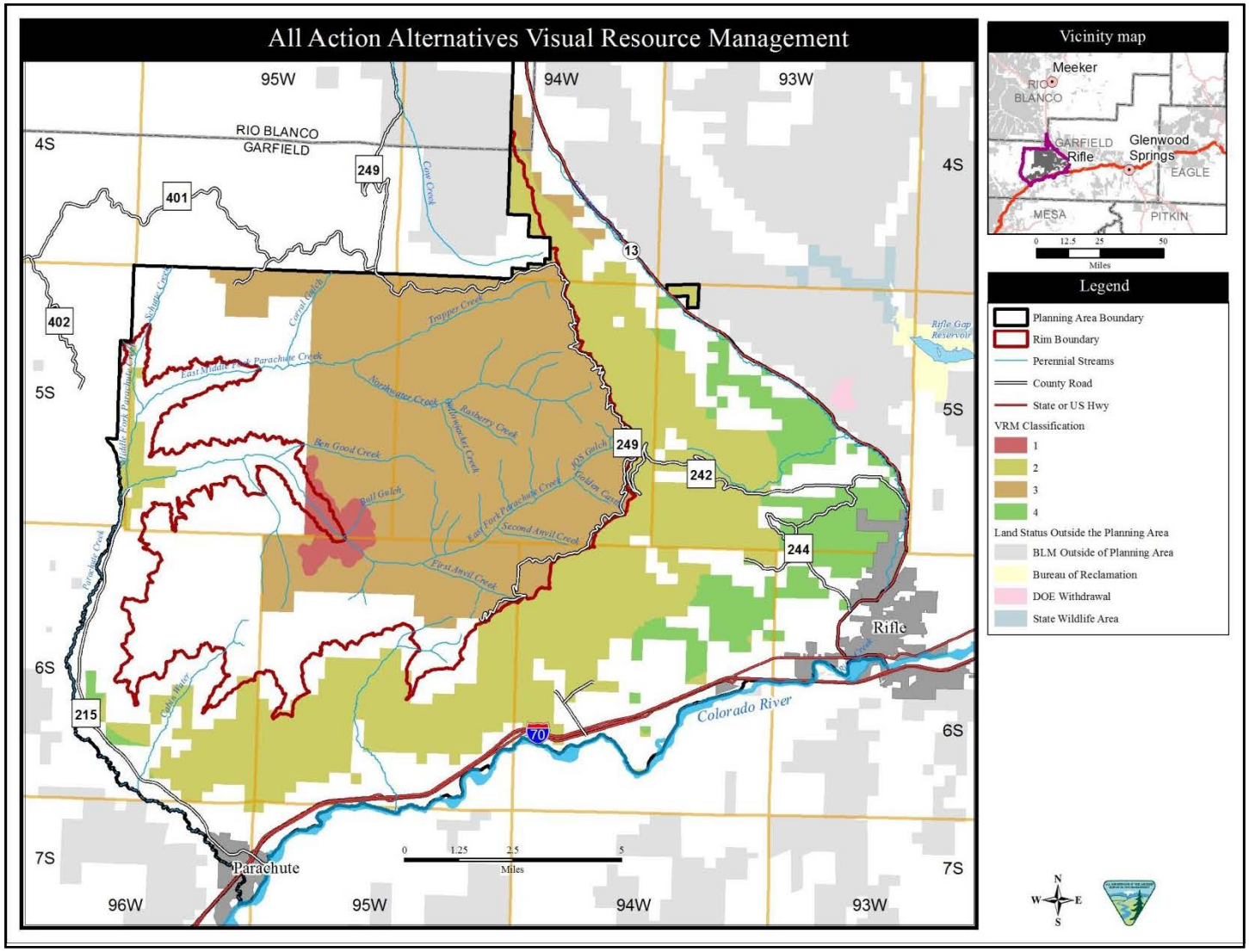

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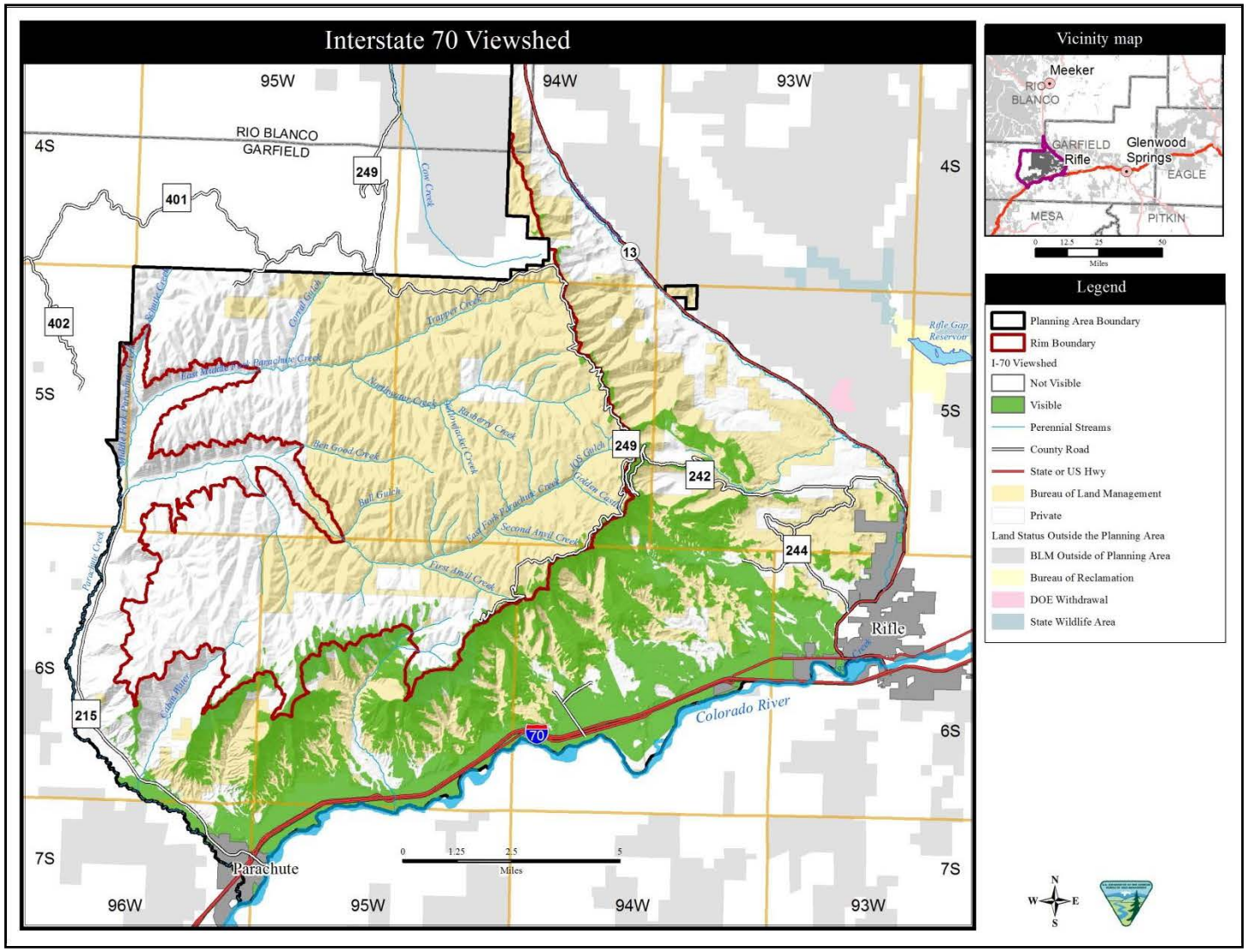

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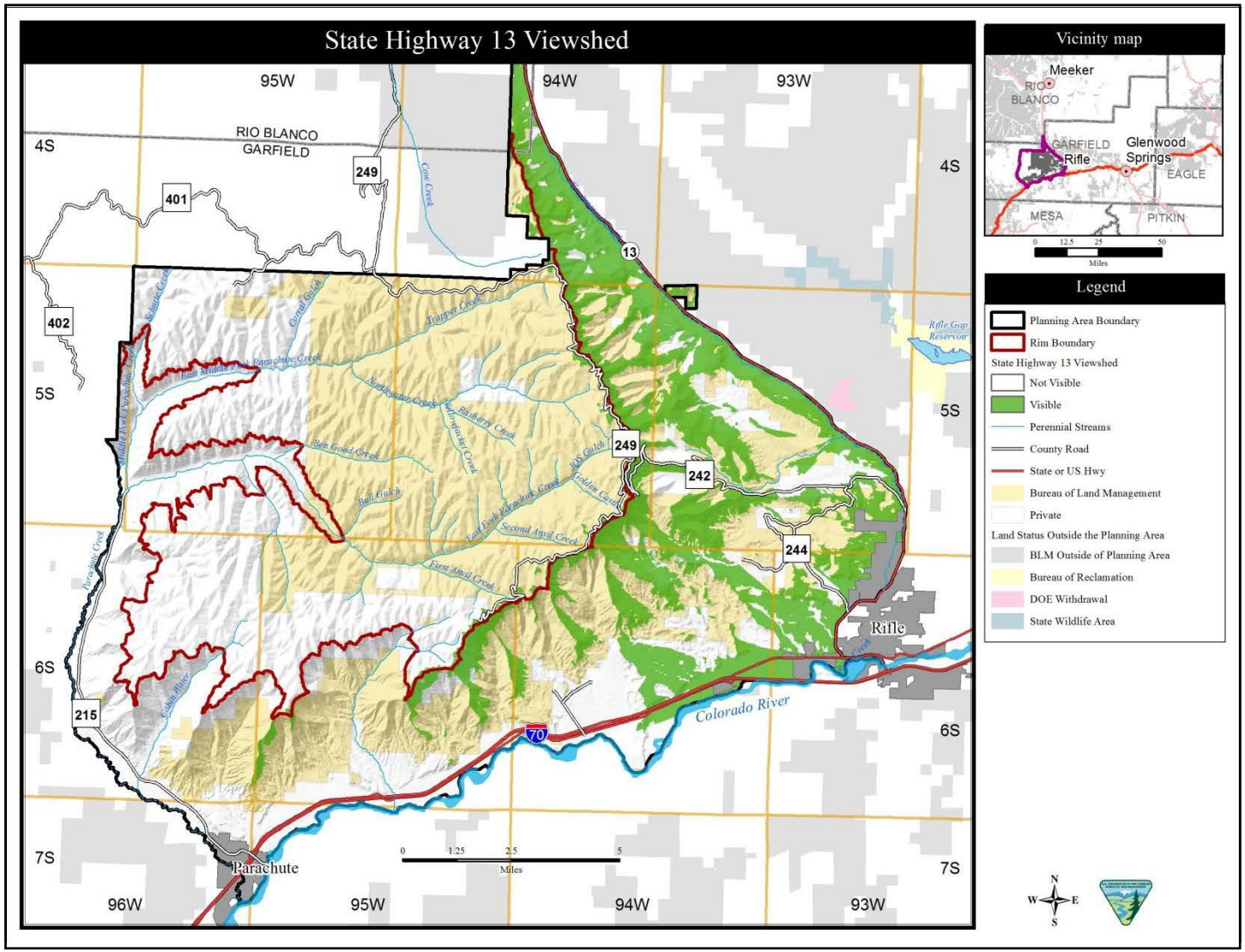

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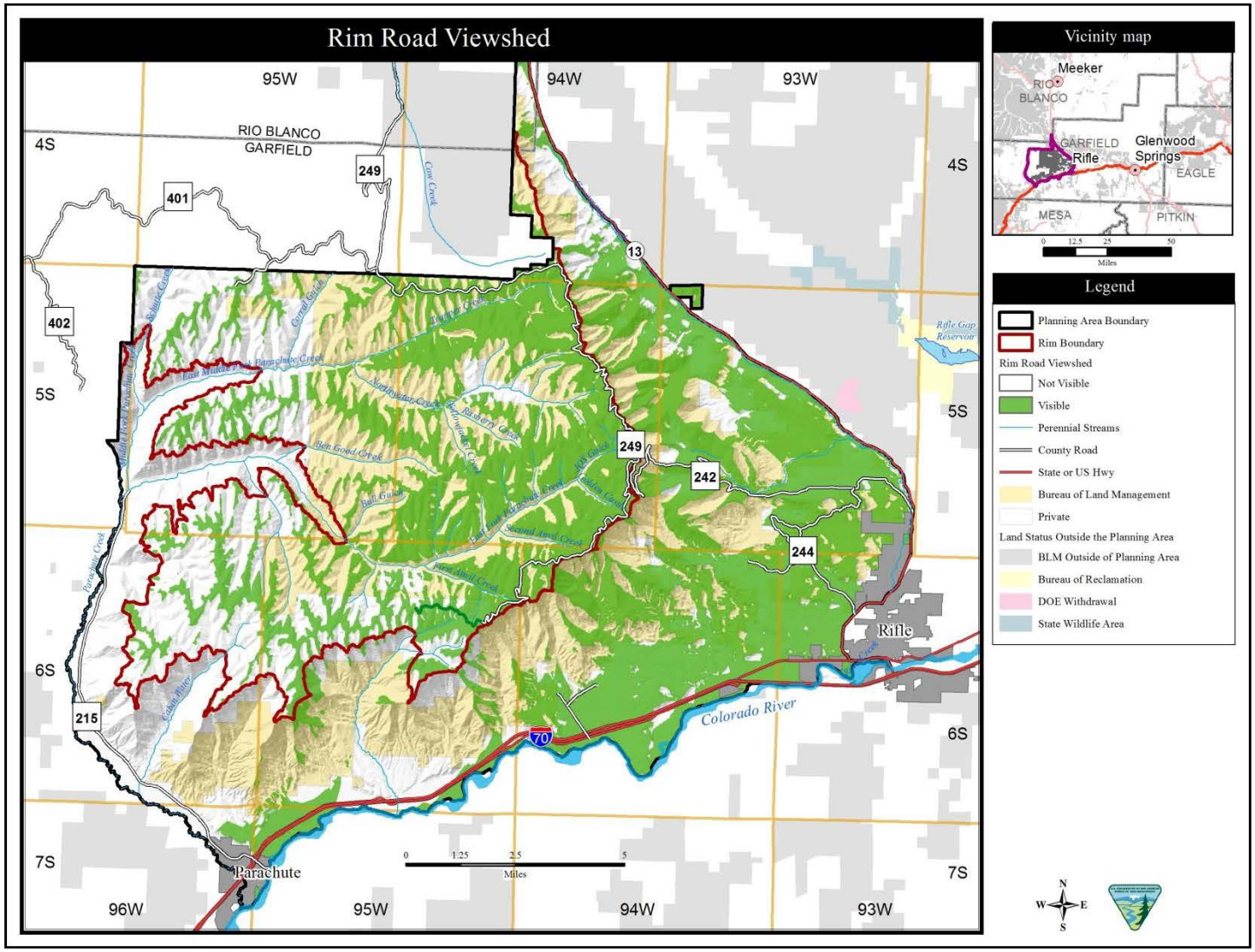

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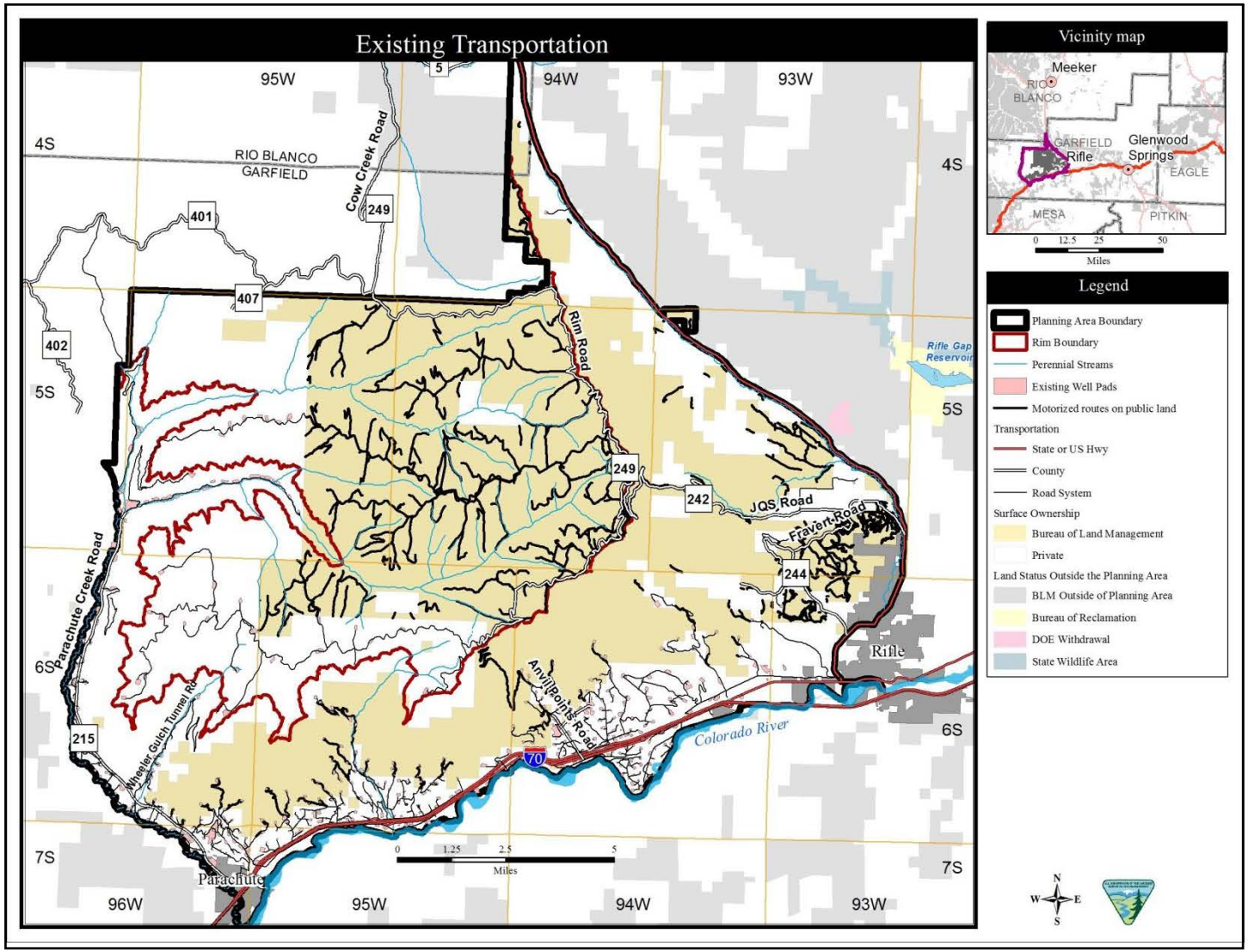

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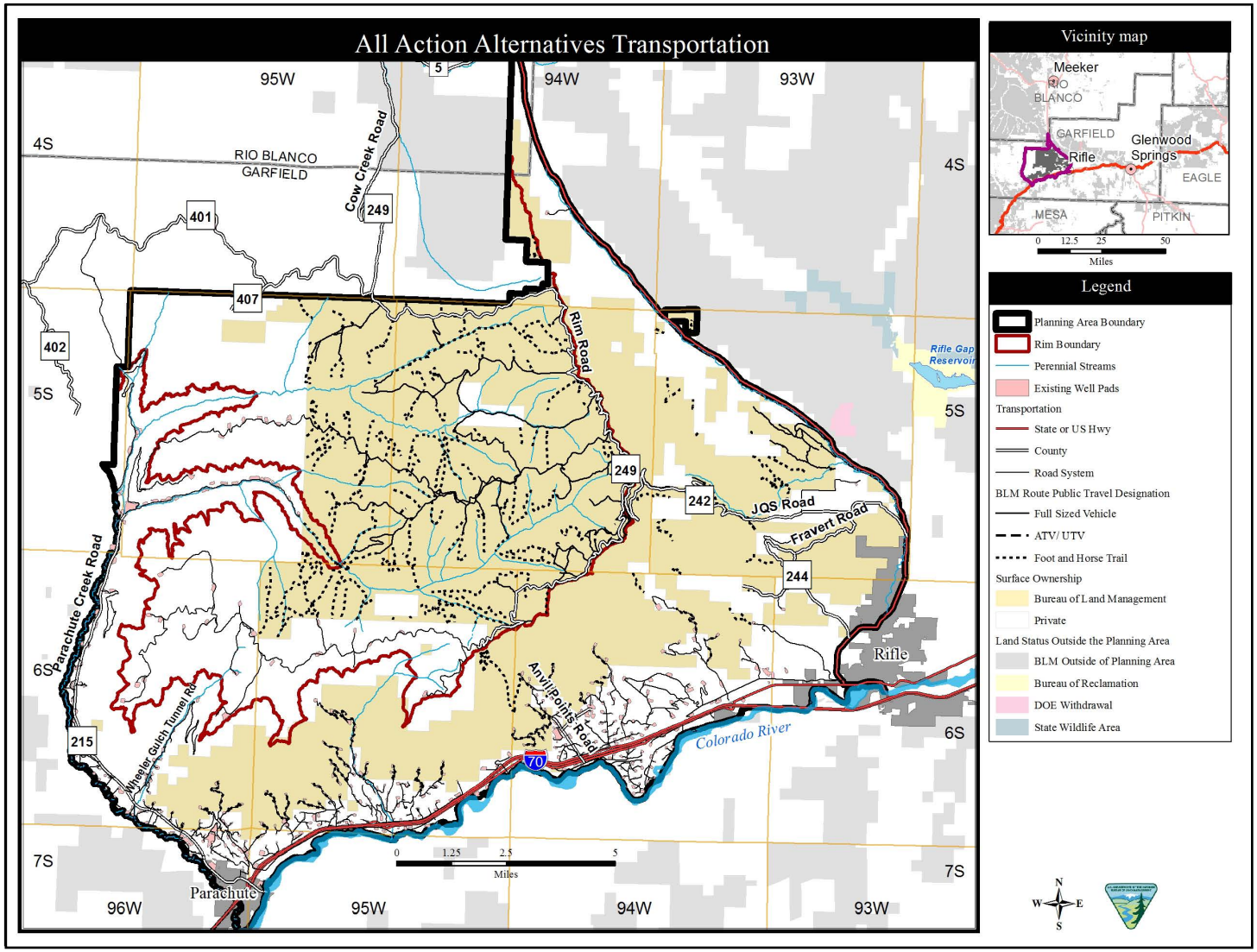

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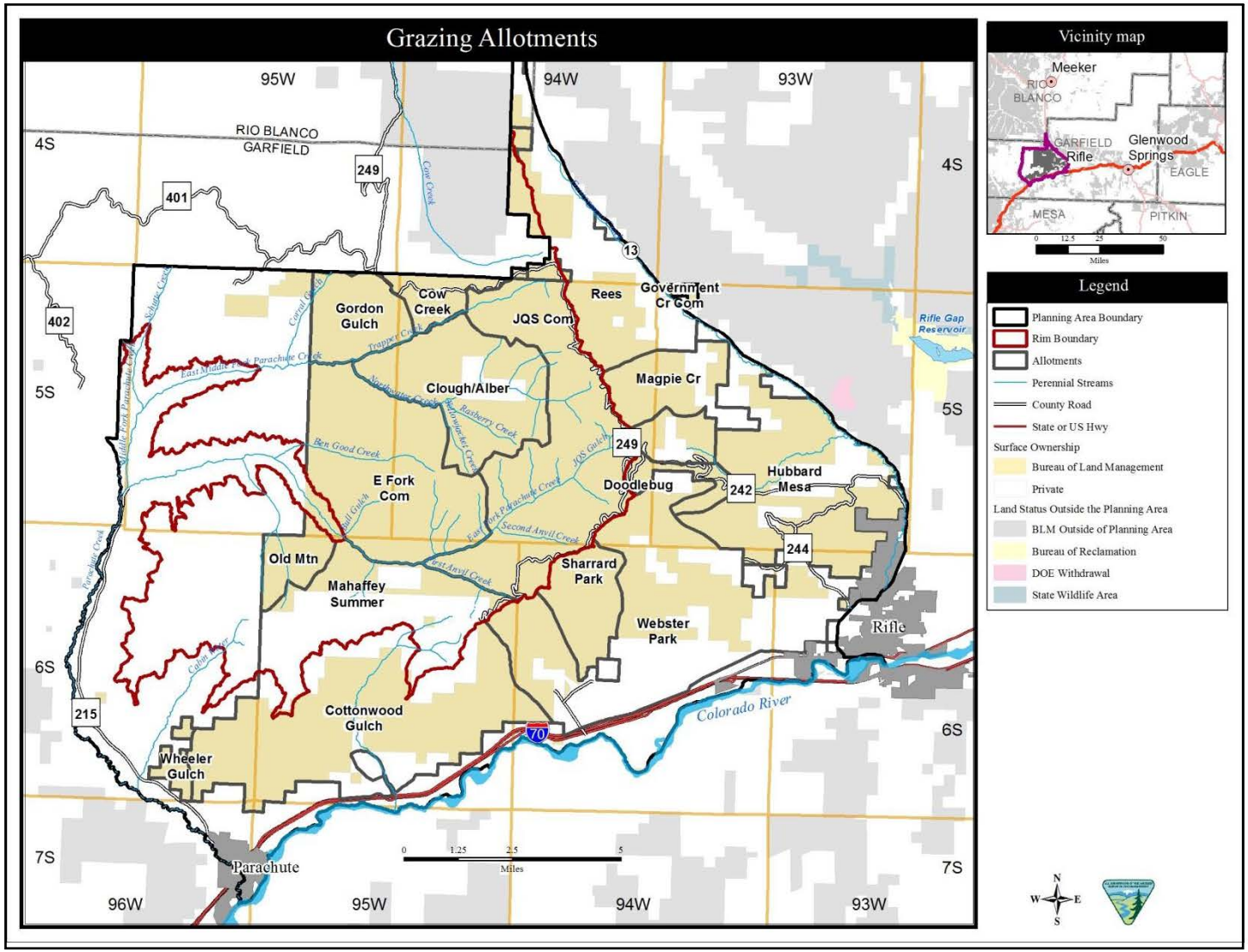

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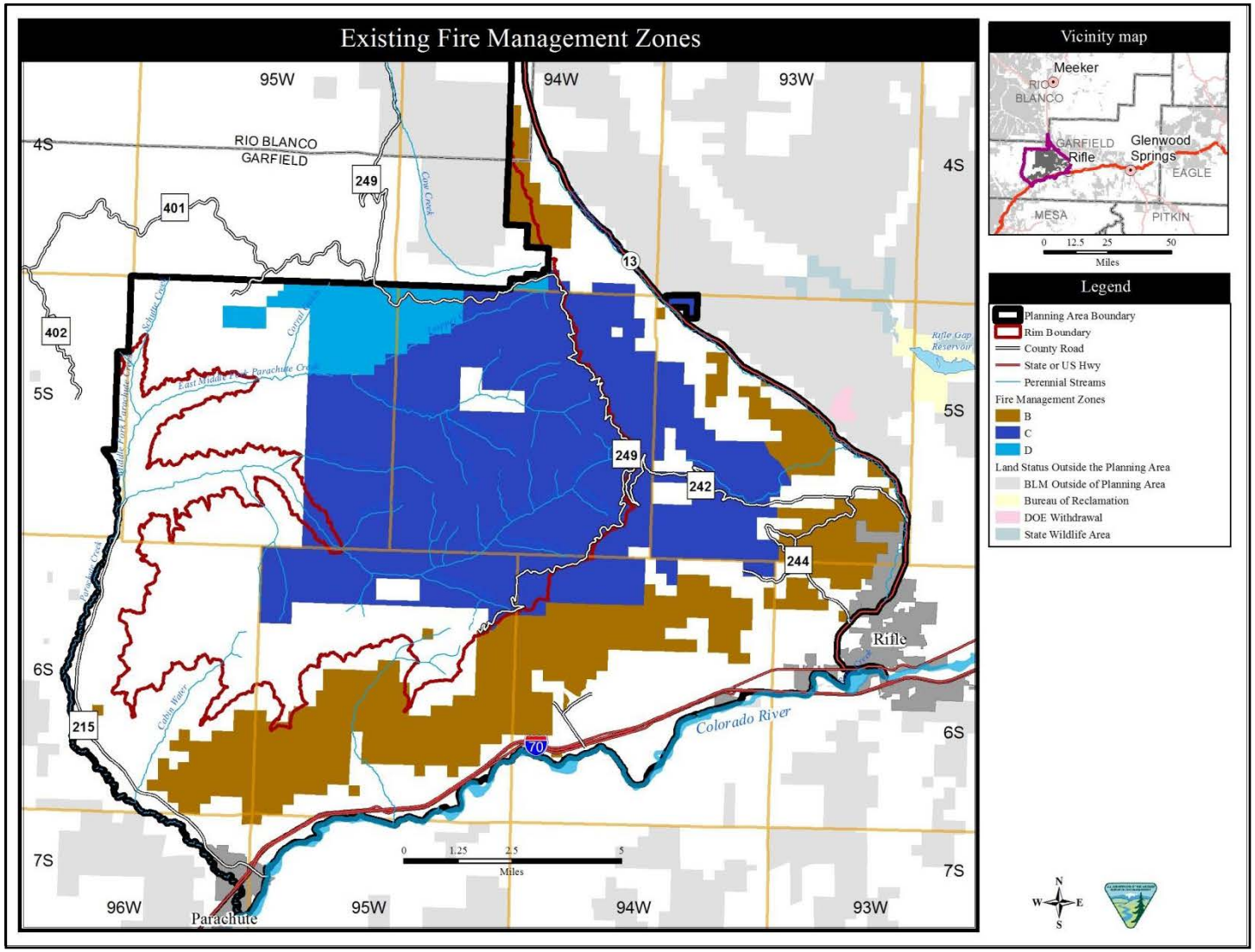

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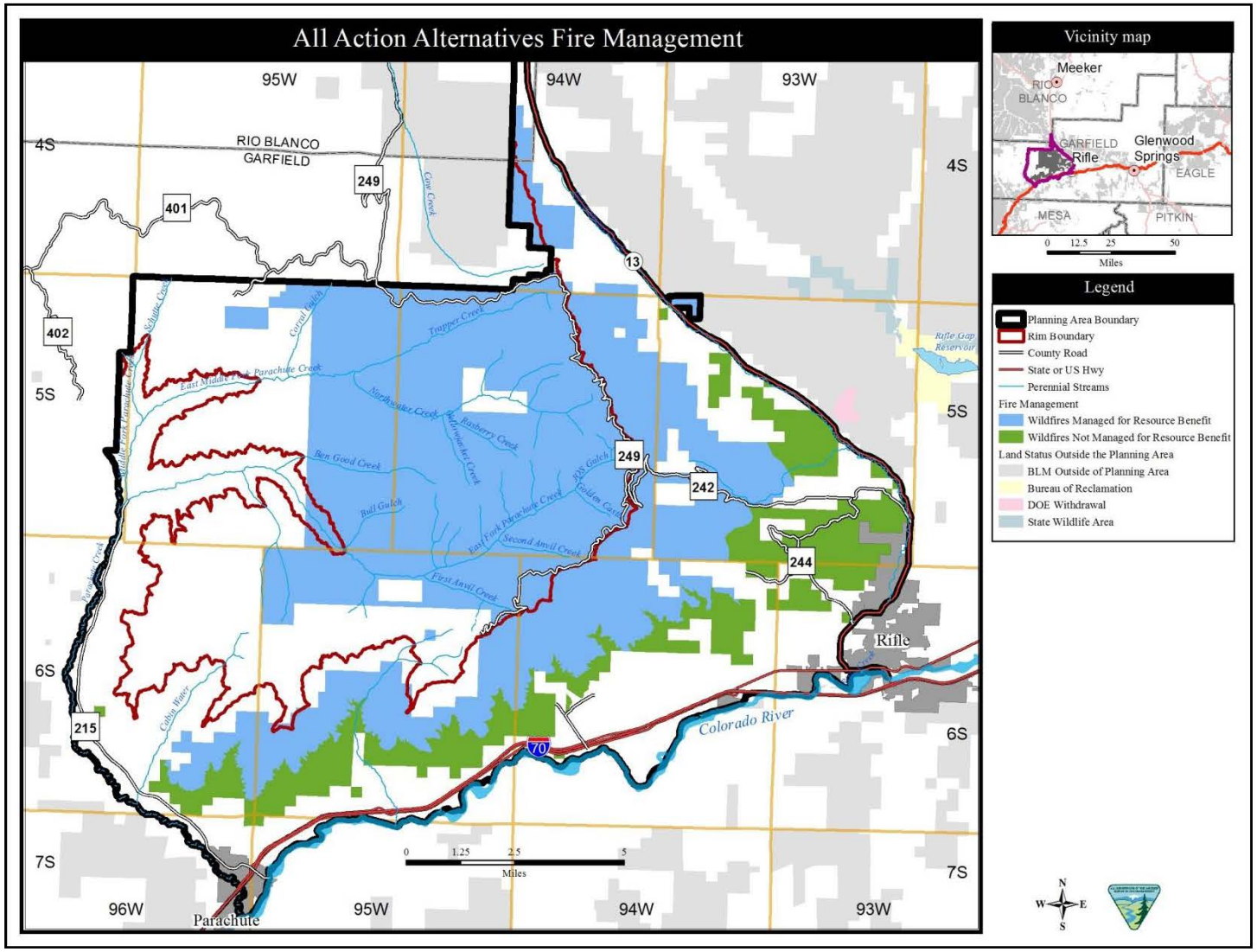

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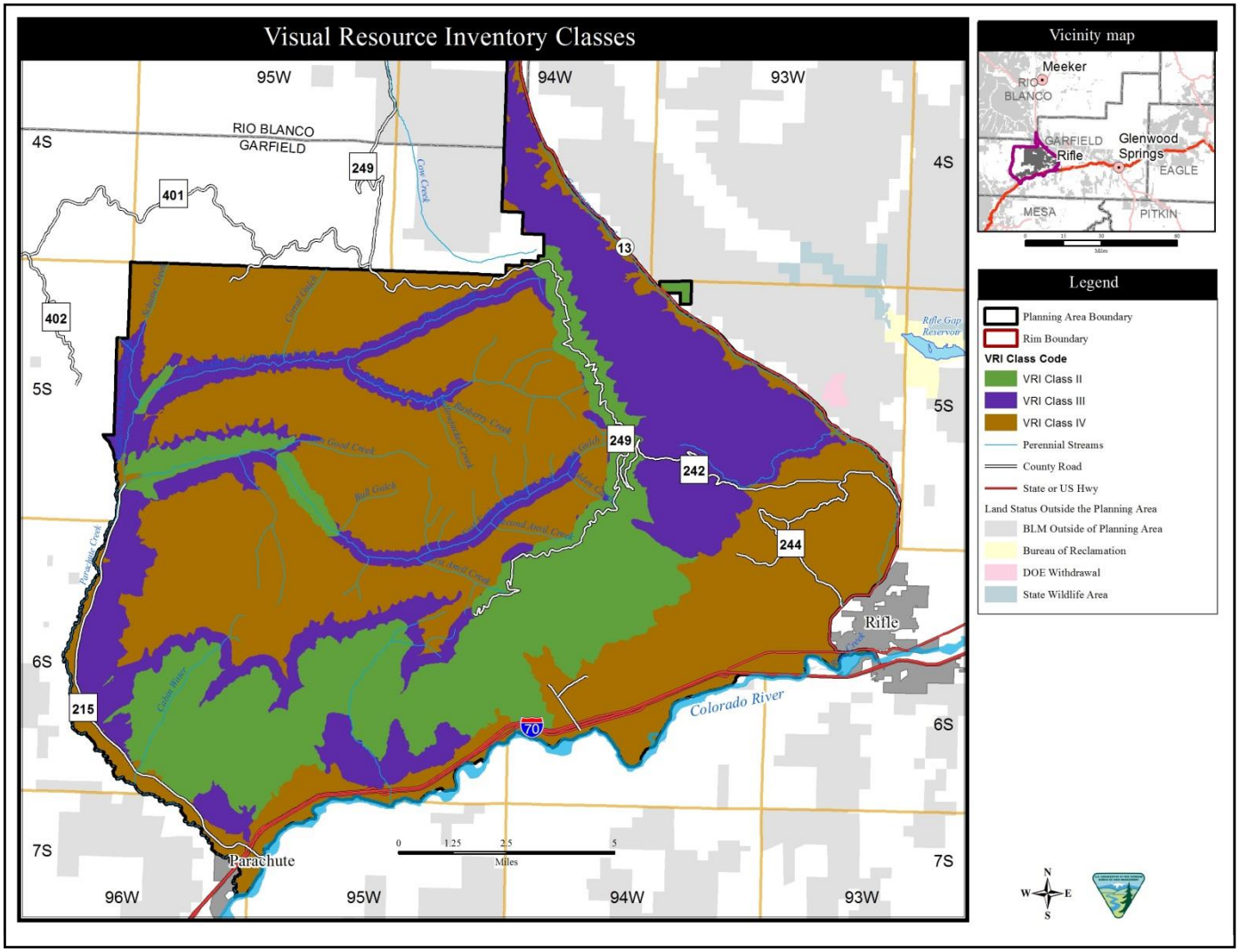

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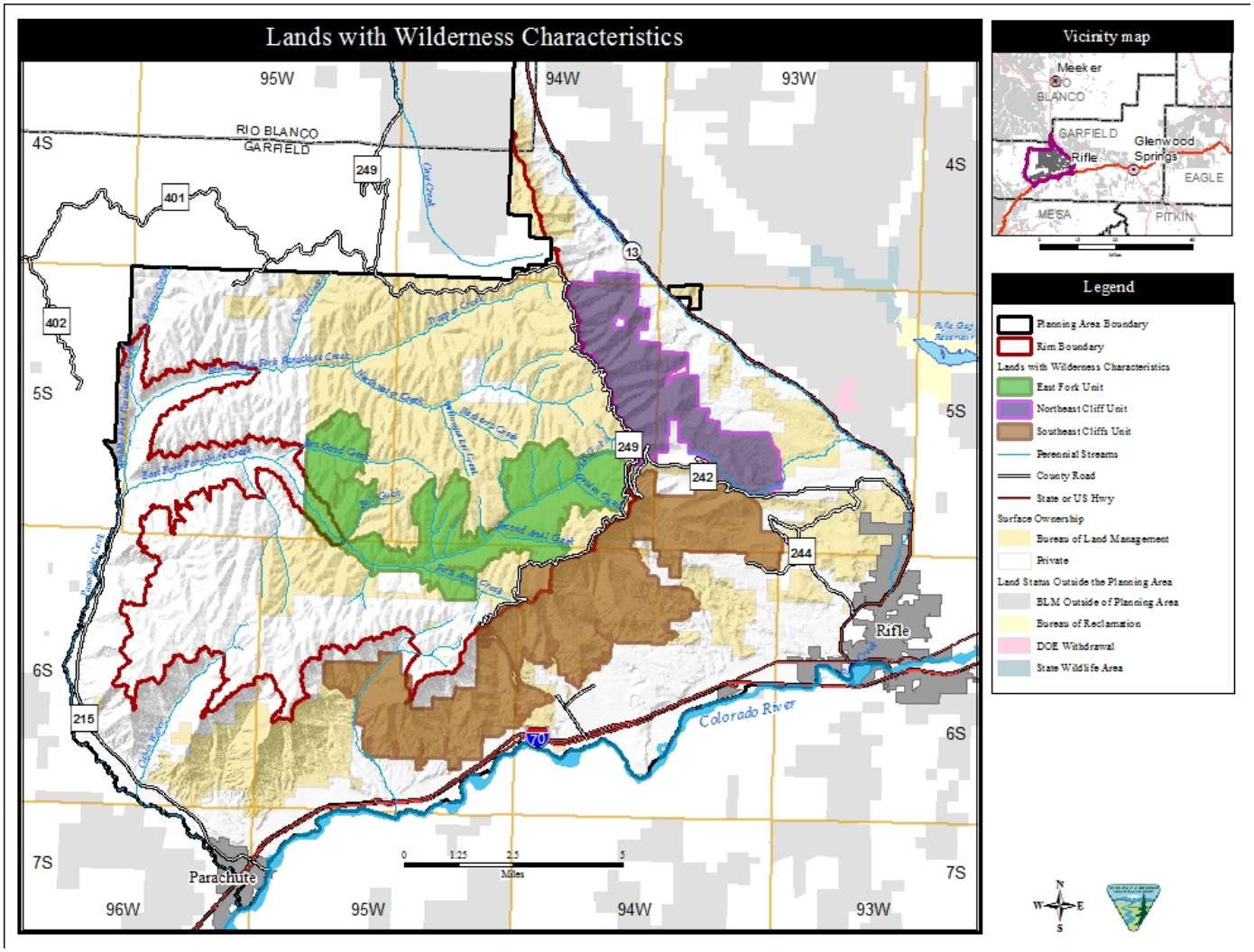

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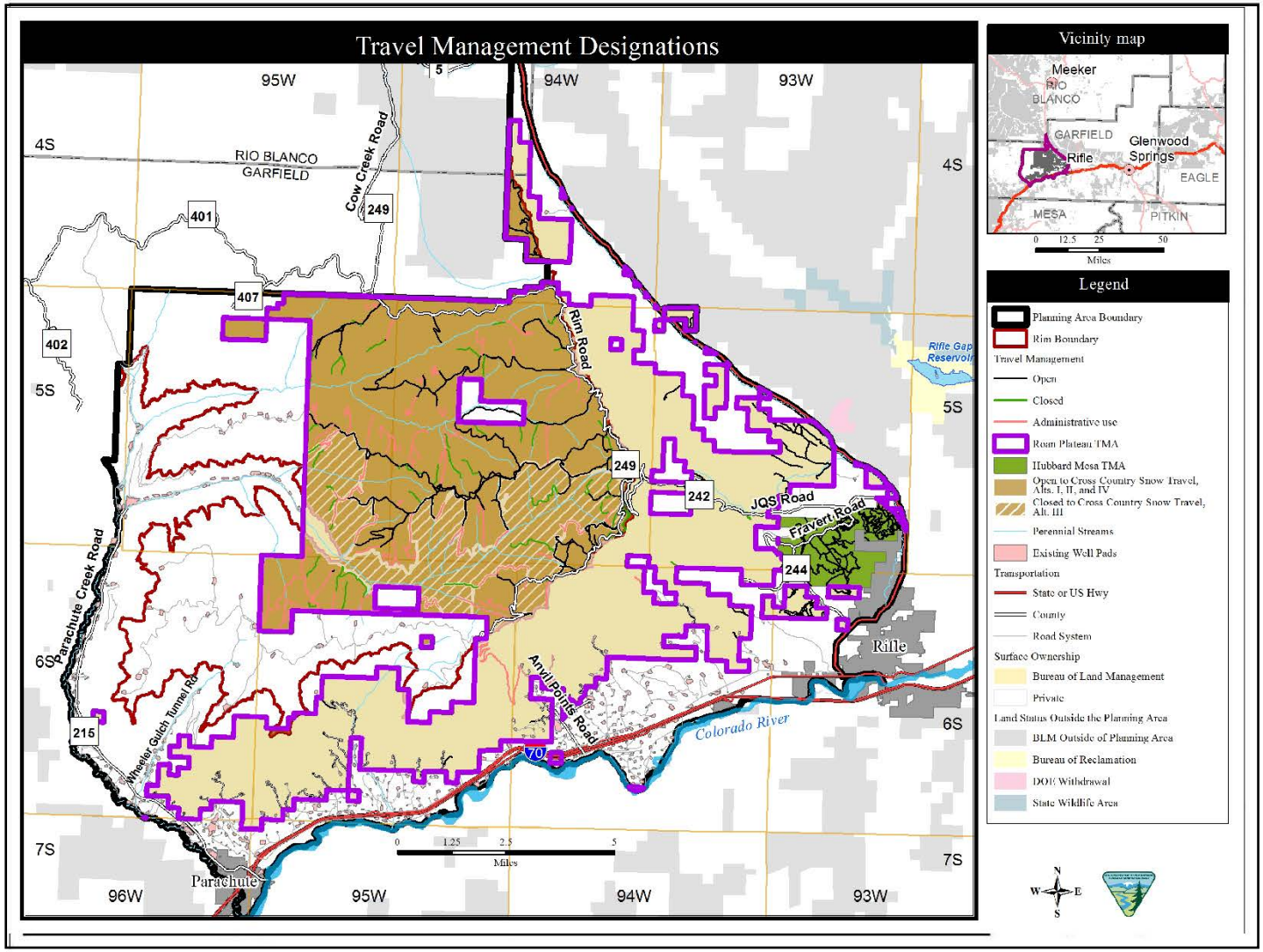

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Appendix B

Information Related to Oil and Gas Leasing, Permitting, and Development

Description of Typical Oil and Gas Operations

Sample Oil and Gas Lease

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Appendix B

B-1. Information Related to Oil and Gas Leasing, Permitting, and Development
Typical Oil and Gas Operations

BLM Authority and Responsibilities for Oil and Gas Operations

The BLM has responsibility for environmental protection, public health, and safety related to oil and gas operations on public lands. There are three laws which give the BLM its primary direction for oil and gas operations: the Mineral Leasing Act of 1920 (MLA) as amended, the National Environmental Policy Act of 1969 (NEPA), and the Federal Land Policy and Management Act of 1976 (FLPMA). However, other laws also affect the various stages of oil and gas operations, including the National Historic Preservation Act (NHPA), Endangered Species Act (ESA), Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), Clean Water Act (CSW), Clean Air Act (CAA), and others.

Under MLA, BLM is responsible for mineral leasing, including onshore oil and gas leasing, for all Federal lands, including lands with a Federal mineral estate but private surface ownership (43 CFR 3100). The MLA and other laws specify types of Federal lands that are not available for oil and gas leasing.

Under NEPA, BLM's responsibilities are triggered by a Federal action or undertaking. This legislation directs the BLM to analyze and disclose to the public the impacts of Federal actions. Oil and gas leasing, permitting and development are all Federal actions which require varying degrees of NEPA analysis.

Under FLPMA, BLM's responsibilities are tied to the use of Federal lands. This legislation directs the BLM to prepare and disclose to the public its plans for the public lands under its jurisdiction.

Since leasing for oil and gas under MLA, impact analysis under NEPA, and management under FLPMA apply to the same lands during the leasing process, the three laws are tied together in a workable process to accomplish Congressional intent. The vehicle by which the process occurs on BLM lands begins with a Resource Management Plan (RMP) and accompanying Environmental Impact Statement (EIS). The RMP/EIS determines if the public land is available and suitable for leasing and establishes the appropriate lease stipulations.

OIL AND GAS LEASING

The decision to lease for the development of fluid minerals is a discretionary action that is made through BLMs' land use planning process. The RMP identifies lands open to oil and gas leasing. All leases are subject to a standard set of terms and conditions that are found in section 6 of the lease form. The lease grants the lessee a right to use and develop the leased lands as is necessary to explore for, extract, and dispose of all the leased resources subject to (a) stipulations attached to the lease, (b) restrictions derived from non-discretionary statutes (i.e., ESA, NHPA), and (c) Conditions of Approval (COAs) used in the permitting process to minimize adverse impacts to other resource values, uses and users not addressed in the lease stipulations at the time operations are proposed.

The MLA provides that all public lands designated "open to oil and gas leasing" in BLM's land use planning shall be made available for lease sale. Based on the Federal Onshore Oil and Gas Leasing Reform Act of 1987, all leasable Federal minerals must be made available for competitive lease sales. Lands for which bids are not received at the lease sale will be available for noncompetitive leasing for a period not to exceed two years. Competitive sales will be held at least quarterly and by oral auction. Competitive and noncompetitive leases are issued for a 10-year term or ~~for~~ as long as oil and/or gas are produced on the lease. The Federal Government receives yearly rental fees on non-producing leases.

Royalty payments are received at the rate of 12.5 percent of the total saleable production, approximately one-half of which is returned to the State of Colorado.

In the preparation of parcels offered in competitive lease sales, stipulations may be attached to each lease parcel. Initially, stipulations are attached to a parcel by the state office leasing section from various databases. The parcel list is segregated and sent to the field office that has the majority of the parcel lands in its area. In the field office, the lease parcel(s) is reviewed by resource and National Environmental Policy Act (NEPA) specialists to ensure that lands are in conformance with the applicable land use plan (RMP), the stipulations are correct, and that any missing stipulations are included.

Instructional Memorandum No. 2010-117 has added a requirement of preparation of a NEPA Environmental Assessment as a basis for a decision to offer the lease for sale, and for determining whether the stipulations identified in the land use plan as applicable to the lease area would be sufficient or whether other available stipulations identified in the land use plan should be applied. This decision is typically based on more site-specific information, including site surveys, that may have been available at the time the RMP was finalized. The leasing EA process also ensures updated resource information and concerns are adequately considered in attaching stipulations and making a leasing decision. After the lease sale packages are finalized, a NEPA leasing decision, documenting the environmental impacts of the leasing the various parcels, is rendered at the state office.

Lease stipulations are conditions of lease issuance that provide protection for other resource values or land uses by establishing authority for delay, site changes, or the denial of operations within the terms of the lease contract. The stipulations are specified for each applicable parcel in the Notice of Competitive Oil and Gas Lease Sale and are intended to inform interested parties (potential lessees, operators) that certain activities will be regulated or prohibited unless the operator and the surface owner and/or surface management agency (SMA) arrive at an acceptable plan for mitigation of anticipated impacts. The authorized officer has the authority to relocate, control timing, and impose other mitigation measures under Section 6 of the Standard Lease Form. This authority is generally invoked when lease stipulations are not attached to the lease, or new resources are discovered on a lease.

New science, comprehensive documentation of resource requirements, land pattern interference, and ongoing monitoring of the effectiveness of a stipulation may allow granting of a waiver, exception, or modification to a stipulation. A lease stipulation “waiver” is a permanent exemption to a lease stipulation. An “exception” is a onetime exemption to a lease stipulation and is determined on a case-by-case basis. A “modification” is a change to the provisions of a lease stipulation, either temporarily, or for the term of the lease.

EXPLORATION

Seismic Reflection Surveys

The potential of oil and gas resources can be detected by direct or indirect exploration methods, such as borehole data from existing wells and seismic or other geophysical surveys conducted at the surface increases the chances of drilling a successful well by identifying the presence, thickness, and depth specific geologic formations present beneath an area. This information sheds light on the presence of potential hydrocarbon source rocks and the presence of potential stratigraphic or structural traps that may have led to the concentration of hydrocarbons.

The most widely used geophysical exploration tool consists of seismic reflection surveys. These include either two-dimensional (2D) or three-dimensional (3D) surveys. Seismic surveys generally use truck-

mounted vibrators or detonation of small explosive charges on or just beneath the surface to generate shock waves that propagate through the subsurface. The waves are reflected back to the surface, depicting the subsurface bedrock topography at a given point (2D), or differentially by different rock layers (3D), giving a more detailed picture of the vertical stacking of various rock types as well as faults and folds at varying depths. With either process, the information is useful in locating the downhole targets for oil and gas wells.

In rugged or remote terrain, and especially in 3D seismic surveys, helicopters supporting ground crews are used to lay out source lines and perpendicular receiver or receptor lines. In the past, the source points along a line were connected by wires, as were the receiver points along a line. Wireless equipment is now commonly used, which is both simpler logistically and reduces the amount of potential surface disturbance. The resolution of the resultant seismic picture of subsurface geology is related to the spacing of the source points and receiver points.

With truck-mounted vibration ("vibroseis") sources, travel is limited to relatively gentle terrain and, for resource protection reasons, may be restricted to existing roads. Where terrain, the type of plant cover, and other resource considerations permit, the trucks—equipped with oversized rubber tires, four-wheel drive, and often center articulation—may be allowed to drive cross-country, which allows a more regular (perpendicular) source-receiver pattern. Where trucks are limited to existing roads, receiver lines are typically laid outward from the road, on foot or, if permitted, all-terrain vehicles to establish the grid.

Geophysical operations within federal lease(s) are reviewed by the appropriate federal surface management agency (SMA) (e.g., Bureau of Land Management [BLM], Bureau of Reclamation, or U.S. Forest Service [USFS]). The NOI includes map showing the location of the proposed source and receiver lines, all access routes, and ancillary facilities. Upon completion of operations, including required rehabilitation, the operator is required to file a "Notice of Completion of Oil and Gas Exploration Operations."

Geophysical surveys are typically evaluated and authorized using a NEPA Categorical Exclusion (CX) is available to the BLM for approving NOIs. However, approving the CX requires that a series of questions standard be asked and responded to appropriately to ensure that the surveys would be consistent with the relevant land use plan and would avoid significant adverse impacts to a variety of other resources and resource uses. For geophysical operation methods involving surface disturbance, a cultural resources survey is also required. Similarly, surveys are required for methods involving surface disturbance potentially causing direct or indirect impacts on a federally listed or proposed threatened or endangered species. An effects determination other than "No Effect" requires consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

Other resource surveys may be required to ensure adequate protection of wetlands and other waters of the U.S., nesting raptors or other migratory birds, and big game or other wildlife species of special concern. If the requirements for approving a CX cannot be met, either as the project as initially proposed or with required mitigation measures applied by the BLM as Conditions of Approval (COAs), or if the proponent wishes to continue with the request, the BLM would prepare a NEPA Environmental Assessment.

Because the Roan Plateau planning area is already partially developed, including some private wells atop the plateau, it is unclear if geophysical surveys would be sought. If so, they probably would be limited to the top of the plateau and limited to truck-mounted vehicles travelling on the existing road system that follows the major east-west ridges and are linked at the eastern end by the Rim Road.

Exploratory Drilling

Either preceding or following geophysical exploration, one or more exploratory wells are sometimes drilled to provide a more detailed picture of not only the rock types at depth but of the type and volume of hydrocarbons and water they contain. In areas that have not already been developed, the relatively remote and isolated "wildcat" wells help the operator decide whether further exploration is warranted and, if so, help to design the type of development. In areas near existing fields, exploratory drilling consists of "step-out" wells to confirm that the geologic conditions remain favorable for oil and gas development.

Successful wildcat wells in areas remote from other facilities may be temporarily shut in until further drilling is sufficient to support the cost of establishing infrastructure (access road and pipelines) to support long-term production. Gas flowing to the surface during the exploratory phase is typically flared. Unsuccessful wildcat wells are plugged and abandoned. In any area drilled outside an existing field, the first well is normally considered exploratory, because the quantity of the resource has not been proven. However, the likelihood of success is typically high.

Because the Roan Plateau planning area already supports a substantial amount of development, it is unclear to what extent exploratory drilling would be conducted. Depending on the alternative selected from the SEIS process, exploratory drilling could range from confirming an appropriate location for additional wells within a limited number of leases or determining which development area (ridge) is most appropriate for the initial development before moving to other ridges.

Any future leasing would be as described in section B.2. Any exploratory drilling would require approval of an Application for Permit to Drill (APD), as described in Section B.4.

DRILLING PERMIT PROCESS

A federal lessee or the operator of record is governed by procedures set forth by the Onshore Oil and Gas Order No. 1, "Approval of Operations on Onshore Federal and Indian Oil and Gas Leases," issued under 43 CFR 3164. These procedures cover the full gamut of operations on federal minerals, from initial permitting of the well to subsequent operations and final abandonment. In the initial permitting process, the operator selects the location of a proposed drill site. This selection is based on COGCC spacing requirements, the subsurface geology, the topography, and the avoidance of known protected surface resource values.

Spacing requirements are established by the COGCC to protect the correlative rights of offsetting mineral owners and efficiently recover the resource. This applies to all mineral ownership (i.e., fee, State, and federal minerals). The Roan Plateau planning area is subject to State spacing COGCC Rule 318, which for wells deeper than 2,500 feet would be about 40 acres. This does not mean that all wells can be approved at 40-acre spacing. For wells shallower than 2,500 feet, the wells must be spaced at least 300 feet from the nearest well and a distance of at least 200 feet from the lease boundary. However, the majority of wells drilled target the Mesa Verde formation, in which 10 acre equivalency spacing is typically approved by the COGCC. This allows wells to target the equivalency of 10 acres per drilling and spacing unit, so that efficient drainage of isolated tight sand lenses may take place.

Ten-acre spacing requires that every well be set back 100 feet away from adjacent lease or drilling and spacing units with the same spacing. Wells that abut leases or drilling and spacing units that do not have 10-acre equivalency, require 200-foot setbacks. New spacing regulations may be necessary to accommodate new drilling and production techniques in the planning area. Future production from previously undeveloped plays such as the Niobrara play and in the Mancos Formation may also require

spacing changes. Surface density of wells would be a variable based on the surface resource conflicts, economics of directional drilling, accessibility within the checkerboard (surface locations on fee land to access federal minerals within resource conflict areas), and the subsurface density. Occasionally, BLM could require that a lessee drill a directional well on a lease if it is determined that federally owned minerals are being drained by an adjacent well on private or State-owned lands. The BLM could also require compensatory royalty be paid, or require a communization agreement be formed, any of which may be utilized to mitigate surface impacts and prevent drainage of federal mineral.

Well permitting begins with submittal of either a Notice of Staking (NOS), followed by the submittal of an Application for a Permit to Drill (APD), or directly through submittal of an APD. The lessee or operator for the lease has the option of which route to use. The APD must include both a drilling plan and a Surface use Plan of Operations (SUPO).

Notice of Staking (NOS)

The NOS is an abbreviated notice that consists of an NOS form, a staked location map, and sketched site plan. This notice is posted for a 30-day public review, which provides the time frame for processing the approval of the APD. The NOS triggers the onsite inspection of the well, which determines whether there are any conflicts with critical resources, as well as provides the preliminary data to assess what additional items are necessary to complete the APD. The NOS informs the BLM of the well location, the access road, any ancillary facilities, and the need to conduct an onsite inspection. If the well location needs to be moved or reoriented, then the necessary re-surveying and re-staking can be performed before all subsequent documents are submitted.

Application for Permit to Drill (APD)

Before drilling a well, the lessee or operator for the lease, must file an APD. The operator must file an application with the BLM Field Office having jurisdiction over the lands described in the application. The application must include a plan for the drilling of the well and a plan for the protection of the surface and environment. The drilling plan (as per the requirements set forth in Onshore Oil and Gas Order No. 1) contains information as to the depth of the well, how it will be constructed, how groundwater and other mineral resources will be protected, and how blowouts and other emergencies will be prevented or dealt with. The surface use plan (as per the requirements set forth in Onshore Oil and Gas Order No. 1) covers such concerns as the location and amount of surface disturbance and how that disturbance will be reduced or eliminated. It covers mitigation of impacts to wildlife, cultural resources, vegetation, soils, surface water and other resource values. The operator is responsible for incorporating all RMP decisions in the proposed APD. If the APD does not have the appropriate information and mitigation incorporated, the application may be modified or rejected. Any RMP decisions not incorporated by the operator are attached to the approved application by the BLM as COAs.

Regardless of the permitting option selected by the lessee, no surface disturbing activity can be conducted in conjunction with the drilling operations until the APD is approved by the Field Manager.

Onshore Oil and Gas Order No. 1 requires an onsite inspection as part of the review of an APD. The inspection is a meeting between the parties to explain and clarify the proposed action. If the onsite inspection is conducted with the NOS option (before filing the APD), the applicant is more likely to submit a complete surface use plan without the need for amendments. The onsite inspection is held with the operator, surface landowner, COGCC and County oil and gas liaison and other interested parties. The purpose of the onsite inspection is to evaluate the operator's plan, to assess the situation for possible impacts (surface and subsurface), and to formulate resource protection stipulations. To lessen

environmental impacts, a pad, road or pipeline can be moved, reoriented, or resized, within certain limits, at the onsite inspection.

The administrative review of the APD is usually led by the field office natural resource specialist (NRS), who is responsible for evaluating the surface plan, checking the proposal against the RMP and other guidance, conducting the onsite inspection (with other appropriate specialists), and leading the preparation of the NEPA document (usually an EA) and its associated impact analysis and proposed mitigation. The various BLM staff resource specialists provide input into project design and mitigation measures based on the onsite field visit.

The field office is responsible for preparing appropriate environmental documentation necessary to satisfy the NEPA requirements, issuing a Record of Decision (ROD) authorizing the project components and identifying the mitigation measures (COAs) attached to the APD to protect any affected resource values.

Another component of the review process is the technical review of the drilling plan portion of the APD. The APD review by the field office geologist includes the following items: geological markers and formation tops, oil, gas, and mineral bearing zones, potential hazards such as abnormal pressure, casing set points, and cement tops. A geologic review report documents the review and is incorporated in the APD case file. The APD review by the field office petroleum engineer includes the following items: casing and cement program, drilling fluid program, pressure control system, and testing, coring, and logging.

Consideration is also given to the protection of subsurface water resources. When processing an APD, the BLM geologist is required to identify the maximum depth of usable water as defined in Onshore Oil and Gas Order No. 2. Usable water is defined as water containing 10,000 parts per million or less of total dissolved solids. Water of this quality is to be protected usually by surface casing and cement. Determining the depth of fresh water requires geophysical log determination of water quality. The field office requires that the first well on every pad have an open hole log run for both the surface hole and production hole. The open hole log is required to be submitted within 24 hours of running so that a field office geologist has the opportunity to timely analyze the log. If usable fresh water is found to be present below the surface casing, then the operator will be required remediate and change the casing setting depths for future wells. The depth of the casing is specified to be below a depth reasonably anticipated for future useable water recovery. When final approval is given by BLM, the operator can commence construction and drilling operations. Approval of an APD is valid for two years. If drilling does not begin within two years, the conditions of approval can be revised before extending the APD for a maximum of two additional years.

Economic conditions, regionally and nationally, have a dramatic effect on oil and gas exploration and development activities. Currently, oil and gas markets are depressed nationwide, and an upturn in the oil and gas commodities pricing would be expected to increase the number of wells sought and drilled in the planning area. Changes in technology that improve resource recovery in relation to development costs or changes in geopolitical situations also have the potential to affect drilling rates, the latter through potentially higher prices associated with reduced production in other regions or countries.

NEPA Compliance

The NEPA process provides a written documentation of the environmental review for an APD and the development of mitigation (COAs). The NEPA process also serves as the vehicle to check for conformance with the applicable land use plan, consisting of the Resource Management Plan (RMP). In some instances, multiple layers of NEPA are conducted during in the oil and gas process. The RMP/EIS

determines if the public land is available for leasing and the appropriate stipulations for leasing. The leasing EA as a basis for a decision to offer the lease for sale, and for determining whether the stipulations identified in the land use plan as applicable to the lease area would be sufficient or whether other available stipulations identified in the land use plan should be applied. At the site-specific level, EAs are prepared for a majority of APDs in Colorado. In cases where the proposed well is obviously part of a larger field development, and such development has not already been analyzed by a NEPA document other than the RMP, a Field Development EA or Master Development Plan EA can be prepared.

A Documentation of Land Use Plan Conformance and NEPA Adequacy (DNA) can then be prepared for future APDs within the oil and gas field, as long as the Field Development EA provides the site-specific analysis and the APD meets the DNA criteria and the criteria identified in the RMP/EIS. Where applicable, Statutory Categorical Exclusions (SCX) as authorized under Section 390 of the Energy Policy Act of 2005 is another NEPA compliance tool available under certain statutory conditions.

WELL DEVELOPMENT

Issuance of Rights-of-Way

Operations by a lessee or operator for the lease do not require issuance by the BLM of a right-of-way (ROW) grant for activities overlying the federal oil and gas lease being developed, or when the lease is part of a federal unit or communitization agreement (see later). However, ROW grants from the BLM are required for any and all well pads, tank batteries, pipelines, powerlines, and access roads that occupy federally owned land outside the lease or unit boundary associated with the particular oil and gas well. A ROW grant is also required when occupying federal surface for the purpose of developing private (non-federal) oil and gas leases, even if the surface facilities for the private well would be on a well pad also containing federal wells.

Access Road and Well Pad Construction

Upon receiving approval to drill a proposed well, the operator moves construction equipment over existing roads to the point where the access road will begin. Generally, the types of equipment include dozers (track mounted and rubber-tired), scrapers, and motor-graders. Moving equipment to the construction site requires moving several loads (some overweight and over width) over public and private roads. Existing roads and vehicle routes are improved in places and occasionally, culverts and cattle guards are installed as specified in the approved APD.

The length of the access road varies. Generally the shortest feasible route is selected to reduce the haul distance and construction costs. Environmental factors or the landowner's preference might dictate a longer route. In rough terrain, the type of construction is side casting (using the material taken from the cut portion of the road to construct the fill portion), slightly less than one-half of the road-bed is on a cut area, and the rest is on a fill area. Roads used for oil and gas operations require an average 35-foot-wide right-of-way. Roads are usually constructed with a l6-foot (single lane) or 25-foot (double lane) driving surface (in relatively level terrain). The total acreage disturbed for each mile of access road constructed varies significantly with the steepness of the slope. New roads to be developed for well pads on the plateau are assumed to need an average 75-foot right-of-way disturbance corridor, which accounts for road construction and pipeline installations.

When construction activities are initiated, vegetation is typically cleared and grubbed and set along the outside edge of the project, or removed with a brush clearing machine. Organic soil material or topsoil suitable for plant growth is then removed and typically windrowed around the perimeter of the pad

disturbance area, windrowed along the edge of a road or pipeline corridor, or, in areas with limited space, stockpiled in designated area(s). Afterward, the site is excavated with dozers and trackhoes to move the excavated or "cut" material to typically flatter terrain that supports the machine-compacted fill material. In optimal instances, the pad would be constructed with little or no excess material resulting in a project with "balanced" earthwork quantities.

The average disturbance footprint for 20-well pad as outlined in the Roan RFD, is 5 acres. Instances occur where balanced earthwork is not possible and excess material piles are created in proximity to the pad readily allowing the piled material to be later recovered for interim work on the pad. Earthwork related to interim reclamation would include reducing the pad to an average 2.5-acre footprint while reshaping the reclaimed pad its natural topography.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig and the number of wells that will share the same pad. The surface area required for a typical pad is about 5 acres and should be constructed so that the drill rig can be placed on the cut surface instead of fill material to prevent the derrick from leaning or toppling as a result of the settling of uncompacted soil.

Depending on the relationship of the location to natural drainages, it might be necessary to construct water bars or divert a short drainage segment with a constructed channel.. The area disturbed for pad construction depends largely on the steepness of the slope.

Drilling

Drilling activities usually begin within a week or two after the location and access road have been constructed. The drilling rig and associated equipment are moved to the location and erected. Moving a drilling rig might require moving 10 to 25 truckloads of equipment over public highways and private roads. The derrick, when erected, is roughly 160 feet high.

Water for drilling is hauled to storage tanks. Water sources are usually wells or commercial water sources permitted with the Colorado State Engineer for the use of surface or subsurface water for drilling. When drilling commences, and as long as it progresses, water is continually transported to the rig location. Roughly 2,000 barrels or 84,000 gallons of water are required to drill a natural gas well to the depth of 8,000 feet. More water would be required if circulation is lost.

Within 24-hours after commencing drilling of a federal oil and gas well, the operator must notify the BLM jurisdictional office. This is culled the "Spud Notice." If the well will be completed as a producer, the drilling rig is moved off after production casing is cemented and a smaller rig, called a completion or work over rig, is moved in and utilized for running casing identification logs, perforating and for running down hole pumps, if necessary, running production tubing in the well bore and setting the wellhead valves and controls. The rest of the fluid treating and handling systems are also installed at this time, such as production and storage tanks, dehydrators, separators, measuring systems, sales meters, and flow lines.

Drilling is accomplished by rotating the drill string and putting variable weights on the bit located at the bottom of the string. While drilling, the derrick and associated hoisting equipment bear a majority of the drill string's weight. The combination of rotary motion and weight on the bit causes rock to be gouged away at the bottom of the hole. The rotary motion is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table sits on the drilling rig floor and as the bit advances, the kelly slides down through it. When the kelly has

gone as deep as it can, it is raised, and a new piece of drill pipe, about 30 feet in length, is attached in its place. The drill pipe is then lowered, the kelly is reattached, and drilling recommences. When the bit becomes dull, it is necessary to "trip" the drill string and replace the bit. This is a time-consuming process of withdrawing 90-foot sections of the drill pipe until the bit is out of the hole. However, many operators utilize flex drilling rigs and fit-for-purpose drilling rigs, which have the capability of moving themselves without rigging down, and top drives which eliminates the need of a rotary and kelly. This technology reduces drilling time from 28 days to eight days to drill a well on a typical Mesa Verde well below the rim.

New bits constructed with modern metals and manufactured polycrystalline diamonds along with down hole mud motors have revolutionized drilling operations, whereby thousands of feet of hole can be drilled with one bit run. The mud motor is a turbine driven by high-pressure mud and is placed at the top of the bit to enable more rotational power to be transmitted to the bit and thus increase penetration rates. Drilling fluid (mud) is circulated through the drill pipe to the bottom of the hole, through the bit, up the annulus (i.e., the space around a pipe in a well bore) of the well, across a screen that separates the rock chips, and into holding tanks from which finer sediments settle from the mud before it is pumped back into the well. The mud is maintained at a required weight and viscosity to cool the bit, reduce the drag of the drill pipe on the sides of the hole, seal off any porous zones, contain formation fluids to prevent a blowout, and bring the rock chips to the surface for disposal. Various additives are used in maintaining the mud at the appropriate viscosity and weight. Most of the mud consists of bentonite. Some of the additives are caustic, toxic, or acidic, but these hazardous additives are used in small amounts during the drilling operations and later contained within the cuttings pit.

Within the planning area, drilling is usually accomplished with water or light mud to depths within about 1,000 feet of the prospective formation. Water and natural clays recovered during the drilling operation or light drilling mud, allow fast drilling rates and the attendant reduction in mud chemicals. Once the bit reaches the target depth, the mud system is gradually made more sophisticated by addition of bentonite, chemicals, and natural weight materials to reduce water loss to the potential producing zones and to control the subsurface pressure. In almost all cases, the subsurface pressure is higher than an equivalent water column, and it is necessary to increase the mud weights to control the pressure and prevent a blowout or uncontrolled flow of formation fluids. Wells are at balance or slightly overbalanced, which increases penetration rate and reduces the time on the well, or in the formations of interest. The wells are always overbalanced for safety requirements when a bit trip is made, the well is logged, or the casing is installed.

Drilling operations are continuous, 24 hours a day, 7 days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. Pickup trucks or cars are used for workers' transportation to and from the site. On remote isolated sites, a camp might be established to house the crews, which will reduce the travel requirements. Other operations, such as cementing, running casing, and rig maintenance will require road travel, sometimes with heavy equipment.

Upon completion of drilling, a determination is made regarding the productive potential of the well by the operator. If oil or gas is not discovered in commercial quantities, the well is considered dry. The operator is then required to follow BLM procedures to properly plug the dry hole. The drill site and access road are then rehabilitated in accordance with the stipulations attached to the APD and the plugging approval. If the well is a producer, drilling rig operations continue until the production casing is cemented into the well before removing the drilling equipment from the location.

Logging

Geophysical logs are obtained by running various instruments into the hole on a wire cable. Logs are usually run at a depth point where casing will be installed. A log is not usually run before surface casing is set, but in most instances a log recording natural gamma radiation is run through the surface casing to determine the geology of that section. The logs can determine water resistivity, hydrocarbon saturations, natural gamma radiations, porosity of the rock by density, nuclear receptivity and sonic measurements, permeability, pressure, temperature, hole geometry, and subsurface track. Logs are used to evaluate whether the well is dry or has the potential for a satisfactory completion. Logs also delineate the various geologic horizons; hydrocarbon zones; fresh, usable, and unusable water; and sands, shales, limestones, coals, and other minerals.

The hydrocarbon intervals are usually randomly situated in each well, and logs are required to specify these intervals so that they can be perforated and stimulated during the completion program. Normally in the planning area, logs recording resistivity and a combined porosity log of density and nuclear receptivity are run in the well. Neutron and density porosity logs are indicators of natural gas by crossing over.

Casing

Various types of casing are placed in the drilled hole to provide a conduit for completion operations and production, hang subsequent strings, to nipple the BOP up on, keep hole stability, and for zonal isolation. Casing is a string of steel pipe composed of approximately 40-foot lengths of pipe that are threaded together. Casing is cemented into the well to protect against migration of fluids within the hole and to isolate the productive zones so they can be completed and produced without interference from other zones containing hydrocarbons or water. Hole deviation, depth, bore hole environment, placement of centralizers, and myriad other factors affect the integrity of the casing and cement job, and must be considered in the original design.

Surface casing that is properly set and cemented also protects surface aquifers from contamination by drilling and production operations. Surface casing should be set to a depth greater than the deepest fresh water aquifer that could be reasonably developed. Usable water could exist at great depths but these aquifers are not normally considered to be important water sources. Surface casing is designed to be large enough to allow subsequent strings of smaller casing to be set as the well is drilled deeper. Cement is placed in the annulus of the surface casing from casing shoe to ground level. The surface casing is the first string on which blowout prevention (BOP) equipment is installed. The BOP equipment allows the well to be shut in at any time that conditions warrant, protecting against unanticipated formation pressures and allowing safe control of the well. BOP equipment is tested and inspected regularly by both the rig personnel and the inspection and enforcement branch of BLM. Minimum standards and enforcement provisions are part of Onshore Order No. 2.

Usually, only the bottom few thousand feet of intermediate or production casing is cemented, which often leaves several thousand feet of open hole behind some casing strings. In the planning area, the annulus (i.e., the space around a pipe in a well bore) is required to be filled with sufficient cement to provide adequate protection from interzonal migration of unsuitable water and hydrocarbons. Production casing or production liner is designed to provide isolation of oil and gas formations, and a high-pressure conduit to the hydrocarbon zones that allows stimulation of these intervals to improve the productivity.

Completions

After drilling and casing of the well, a completion program is typically initiated to stimulate production of natural gas and to determine gas and water production characteristics. A mobile completion rig (also called a workover rig) similar to the drill rig may be used to complete each well. The well completion process typically includes perforating the well's steel casing and cement, hydraulically fracturing the producing formation(s), and installing a series of valves and fittings on the wellhead. Hydraulic fracturing does not always require the presence of a workover rig.

Wells are often treated during completion to improve resource recovery by increasing the rate and volume of hydrocarbons moving from the natural gas reservoir into the wellbore. These processes are known as well-stimulation treatments and include hydraulic fracturing, acidizing, and other mechanical and chemical treatments, often used in combination.

In the planning area, the low permeability character of the productive formations generally requires these zones to be hydraulically fractured or "fraced," which consists of using high pressure to force treated produced water, various chemical additives, and large quantities of sand (which serves to keep the fractures open). Hydraulic fracturing greatly improves the productivity to oil and gas wells, particularly when—as in the planning area—wells are very deep and completed in geologically tight formations.

Hydraulic fracturing is a 60-year-old process used to maximize the extraction of underground resources by allowing natural gas to move more freely from the rock pores to production wells that bring the gas to the surface. Fluids, commonly made up of water and chemical additives (e.g. recycled or fresh water, liquid carbon dioxide, sand, and chemical additives), are pumped into a geologic formation at high pressure during hydraulic fracturing. When the pressure exceeds the rock strength, the fluids open or enlarge fractures. After the fractures are created, a propping agent is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracturing is completed, approximately 60 to 80 percent of the injected fracturing fluid returns to the wellbore (BLM 2014). The specific type and components of the fracturing fluid chemical vary based on geologic formation and by company, but may include constituents such as hydrochloric acid, anti-bacterial agents, corrosion inhibitors, and surfactants. Operators are required to post their disclosure of chemicals intentionally added to hydraulic fracturing fluids on FracFocus per COGCC Order No. 1R-114.

Hydraulic fracturing is now being used more commonly due to advances in technology. Groundwater is protected during the fracturing process by a combination of the casing and cement that is installed when the well is drilled and by the depth of the rock between fracture zone and any fresh-water bearing zones or aquifers (BLM 2014).

Generally, for a typical Mesa Verde well, approximately eight frac stages are done on each well to free up gas in multiple tight sand lenses. Roughly 50 percent of the stimulation fluid returns to the surface within a couple of days, and the rest over an extended period at low rates.Radioactive tracers show the fracs stay within the zone, which is important to maximize the effectiveness of the frac because fracture length and height are the primary factor in successfully stimulating a producing interval. After completion operations are finished, wellhead equipment, consisting of various valves and pressure regulators, is installed to control the oil or gas flow to the production facilities and to safely shut-in the well under any conditions.

FEDERAL UNITS

Surface use in an oil or gas field could be affected by the creation and approval of a Federal Unit or unitization of the leaseholds. In areas of federal and mixed mineral ownership, an exploratory unit can be formed before a wildcat exploratory well is drilled. The boundary of the unit is based on geologic data and attempts to consolidate the interests in an entire structure or geologic play. The developers of the unit enter into an agreement to develop and operate as a single entity, regardless of separate lease ownerships. Costs and benefits are allocated according to agreed-upon terms.

Development in a unitized field can proceed more efficiently than in a field composed of individual leases because competition between lease operators and drainage considerations is not a primary concern. Unitization also can reduce surface use requirements because all wells are operated as though under a single lease, and operations can be planned for more efficiency. Duplication of field processing facilities is eliminated, and consolidation of facilities into more efficient systems is probable. Unitization can also involve wider spacing than usual, or spacing based on reservoir factor rather than a set rule, which could result in fewer wells and higher recovery efficiency. Through planning, access roads are usually shorter and better organized, facilities are usually consolidated, and well efficiency is maximized to a degree not seen in individual lease operations.

PRODUCTION

Gas, oil, and produced water (water occurring naturally in the hydrocarbon-bearing formations) are being produced in the planning area by means of natural flow and artificial lift (plunger lift or poor boy gas lift).

During production, field operations are inspected by the BLM to assure accountability of royalties and compliance with the lease and permit safety and environmental requirements. Usually, the last evolution in the life of an oil or gas well is when it is depleted and cannot produce in paying quantities any longer. At this stage, the operator submits a plug and abandonment plan and it is reviewed, and if necessary, modified by the BLM petroleum engineer and approved. When the downhole plugging is completed, the operator submits a Subsequent Report of Abandonment which is review by the BLM. When surface reclamation is completed and the vegetation has had a chance to establish itself, usually in two to three growing seasons, the operator will submit another subsequent report of a Final Abandonment Notice (FAN). The BLM will inspect the location to determine if it was reclaimed properly, and if so, approve the FAN.

Natural Gas

A typical gas well facility may consists of methanol injection equipment (to keep production and surface lines from freezing), separator (which separates gas, oil, and water), dehydrator (uses glycol or calcium chloride to extract entrained water in the gas), and an orifice meter. An intermitter is sometimes used to either shut-in the well to build up pressure, or to aid conveying liquids to surface if the well bore is accumulating excessive quantities of liquids. If the gas well is producing some oil or condensate, oil tanks are used to store the oil or condensate until it is sold by truck or pipeline. Pipeline quality gas at the wellhead requires a minimum of processing equipment. As the quality of gas decreases with the increased presence of water, solids, or liquid hydrocarbons, the amount of processing equipment increases. Water or liquid hydrocarbons in the gas are removed before the gas is sold, usually in the separation equipment near the wellhead. If liquid hydrocarbons are present, storage facilities (tank batteries) are required to store the liquids until they accumulate in sufficient quantities to be hauled out by large trucks. Gas dehydration equipment might also be onsite to remove water entrained in the gas to a water content

defined by pipeline specifications. Gas production data can be found in the RFD scenario for oil and gas that was developed for the revised RMP.

Lighter ends of NGLs (C_{6+}) tend to go into a gaseous state when naturally heated in a stock tank and vent to atmosphere once enough pressure builds in the tank (typically 0.2 psi) , or it may be collected into feeder lines leading to a flare stack where it is thermally destroyed.

Natural Gas Liquids (NGLs)

In the planning area, condensate is associated with natural gas production. The production equipment, such as separator, tank battery, and holding facility for production water, are either placed on a portion of the location (on cut rather than fill) and located a safe distance from the wellhead, or placed offsite as a centralized facility. Tanks are surrounded by earthen dikes or lined corrugated barriers to contain accidental spills. Production facility colors are required to be from the standard color chart and are specified in the APD COAs.

Each well on location produces a mix of fluids, which is separated at the separators. A single separator is designated for each well and is usually located on the same pad as the well. Two types of separators are utilized in the field office area: three phase separators and two phase separators. Three phase separators separate the condensate, water, and gas into three different lines. Two phase separators separate the natural gas and combined liquid into two different lines. Gas is measured immediately after separation and the condensate and water is stored in stock tanks either on the pad or at a different location, where the condensate is sold and the produced water is hauled to a treatment facility. The produced water is typically treated with bleach and aerated to kill bacteria, evaporated to some extent, used for frac operations, or injected into permitted disposal wells.

Produced Water

Associated water produced with the natural gas and liquid condensate is disposed of by trucking or piping the water to an authorized disposal pit, placing the water into lined pits, where the water is treated with biocides, aerated, condensate skimmed, and utilized in frac operations or disposed of in an authorized disposal well. The COGCC has been granted primacy over class II injection wells by the Environmental Protection Agency (EPA); therefore, they control all aspects of disposal wells. The BLM authorizes produced water, from federal wells, to be disposed of in an authorized disposal facility.

PLUGGING AND ABANDONMENT OF WELLS

The purpose of plugging and abandoning a well is to prevent fluid migration between zones, to protect minerals from damage, and to restore the surface area. Each well must be handled individually because of a combination of factors, including geology, subsurface well design, and specific rehabilitation concerns; therefore, only minimum requirements can be established, and these must be modified for individual wells.

The first step in the plugging process is the filing of the Notice of Intent to Abandon. This notice is reviewed by both the SMA and planning area petroleum engineer and geologist. The notice must be filed and approved before plugging a previously producing well. Verbal plugging instructions can be given for plugging current drilling operations, but a notice must be filed after the work is completed. If usable fresh water was encountered while the well was being drilled, the SMA may be allowed, if interested, to assume future responsibility for the well, and the operator will be reimbursed for the attendant costs. This assumption of responsibility becomes effective after the deeper zones are plugged back to the usable

water zone. Usually the operator is more than satisfied to remove the surface reclamation liability and will not charge for the remaining well equipment.

The operator's plan for securing the hole is reviewed. The minimum requirements, as stated in Onshore Order No. 2, are as follows: In open hole situations, cement plugs must extend at least 50 feet above and below zones that have fluid with the potential to migrate, zones of lost circulation (this type of zone could require an alternate method to isolate it), and zones of potentially valuable minerals. Thick zones may be isolated using cement plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with cement plugs placed every 3,000 feet. In cased holes, cement plugs must be placed opposite perforations and extending 50 feet above and below, except where limited by plug back depth. The length of the plug is 100 feet plus 10 percent per 1,000 feet (i.e., at 10,000 feet). The plug will be at a minimum 200 feet long.

Cement plugs could be replaced with a cement retainer, if the retainer is set 50 feet above the open perforations and the perforations are squeezed with cement. A bridge plug could also be used to isolate a producing zone and must be capped, if placed through tubing, with a minimum of 50 feet of cement. If the cap is placed using a dump bailer, a minimum of 35 feet of cement is required. A dump bailer is an apparatus run on wire line to convey the cement to the bottom of the hole. In the event that the casing has been cut and recovered, a plug is placed 50 feet within the casing stub, and the 100 feet plus 10 percent per 1,000 feet rule is used for the space above the cutoff point. In all cases, a plug is set at the bottom of the surface casing that has a volume of cement using the 100 feet plus 10 percent per 1,000 feet rule. This could require perforating the casing and circulating or squeezing cement behind the production casing if that casing is not removed. Annular space at the surface will be plugged with 50 feet of cement using small-diameter tubing or by perforating and circulating cement.

If the integrity of a plug is questionable, or the position is extremely vital, it can be tested with pressure or by tagging the plug with the tubing or drill string. Tagging the plug involves running a pipe into the hole until the plug is encountered, and placing a specified amount of weight on the plug to verify its placement and competency. The surface plug within the casing must be a minimum of 50 feet. The interval between plugs must be filled with mud that will balance the subsurface pressures, and if this balance point is unknown, a minimum of 9 pounds per gallon is specified. After the casing has been cut off below the ground level, any void at the top of the casing must be filled with cement. A metal marker plate is welded over the top of the casing, 3' below surface. A permanent abandonment marker is required on all wells.

The SMA is responsible for establishing and approving methods for surface rehabilitation, and determining when this rehabilitation has been satisfactorily accomplished. With satisfactorily rehabilitation, a Subsequent Report of Abandonment is approved, and the well bond released.

Form 3100-11
(October 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number

OFFER TO LEASE AND LEASE FOR OIL AND GAS

The undersigned (page 2) offers to lease all or any of the lands in Item 2 that are available for lease pursuant to the Mineral Lands Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351-359), or _____(other).

READ INSTRUCTIONS BEFORE COMPLETING

1. Name
   Street
   City, State, Zip Code

2. This application/offer/lease is for: *(Check Only One)* ☐ PUBLIC DOMAIN LANDS ☐ ACQUIRED LANDS (percent U.S. interest _____)

Surface managing agency if other than Bureau of Land Management (BLM): _____ Unit/Project _____

Legal description of land requested: *Parcel No.: _____ *Sale Date (mm/dd/yyyy): _____

***See Item 2 in Instructions below prior to completing Parcel Number and Sale Date.**

T.	R.	Meridian	State	County

Total acres applied for_____

Amount remitted: Filing fee $ _____ Rental fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease:

T.	R.	Meridian	State	County

Total acres in lease _____

Rental retained $ _____

This lease is issued granting the exclusive right to drill for, mine, extract, remove and dispose of all the oil and gas (except helium) in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon for the term indicated below, subject to renewal or extension in accordance with the appropriate leasing authority. Rights granted are subject to applicable laws, the terms, conditions, and attached stipulations of this lease, the Secretary of the Interior's regulations and formal orders in effect as of lease issuance, and to regulations and formal orders hereafter promulgated when not inconsistent with lease rights granted or specific provisions of this lease.

NOTE: This lease is issued to the high bidder pursuant to his/her duly executed bid form submitted under 43 CFR 3120 and is subject to the provisions of that bid and those specified on this form.

Type and primary term:

☐ Noncompetitive lease (ten years)

☐ Competitive lease (ten years)

☐ Other _____

THE UNITED STATES OF AMERICA

by _____
(BLM)

_____
(Title) (Date)

EFFECTIVE DATE OF LEASE _____

(Continued on page 2)

4. (a) Undersigned certifies that (1) offeror is a citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or Territory thereof, (2) all parties holding an interest in the offer are in compliance with 43 CFR 3100 and the leasing authorities; (3) offeror's chargeable interests, direct and indirect, in each public domain and acquired lands separately in the same State, do not exceed 246,080 acres in oil and gas leases (of which up to 200,000 acres may be in oil and gas options or 300,000 acres in leases in each leasing District in Alaska of which up to 200,000 acres may be in options, (4) offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located; (5) offeror is in compliance with qualifications concerning Federal coal lease holdings provided in sec. 2(a)2(A) of the Mineral Leasing Act; (6) offeror is in compliance with reclamation requirements for all Federal oil and gas lease holdings as required by sec. 17(g) of the Mineral Leasing Act; and (7) offeror is not in violation of sec. 41 of the Act. (b) Undersigned agrees that signature to this offer constitutes acceptance of this lease, including all terms conditions, and stipulations of which offeror has been given notice, and any amendment or separate lease that may include any land described in this offer open to leasing at the time this offer was filed but omitted for any reason from this lease. The offeror further agrees that this offer cannot be withdrawn, either in whole or in part unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States.

This offer will be rejected and will afford offeror no priority if it is not properly completed and executed in accordance with the regulations, or if it is not accompanied by the required payments.

Duly executed this _____ day of _____ , 20 ____ _____

(Signature of Lessee or Attorney-in-fact)

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212 make it a crime for any person knowingly and willfully to make to any department or Agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

LEASE TERMS

Sec. 1. Rentals--Rentals must be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

(a) Noncompetitive lease, $1.50 for the first 5 years; thereafter $2.00;

(b) Competitive lease, $1.50; for the first 5 years; thereafter $2.00;

(c) Other, see attachment, or

as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources, and the plan contains a provision for allocation of production, royalties must be paid on the production allocated to this lease. However, annual rentals must continue to be due at the rate specified in (a), (b), or (c) rentals for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) must automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

See. 2. Royalties--Royalties must be paid to proper office of lessor. Royalties must be computed in accordance with regulations on production removed or sold. Royalty rates are:

(a) Noncompetitive lease, 12 1/2%;

(b) Competitive lease, 12 1/2 %;

(c) Other, see attachment; or

as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties must be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production must be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee must not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor must lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year must be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge will be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee must be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

(Continued on page 3)

Sec. 3. Bonds - A bond must be filed and maintained for lease operations as required under regulations.

Sec. 4. Diligence, rate of development, unitization, and drainage - Lessee must exercise reasonable diligence in developing and producing, and must prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if deemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Sec. 5. Documents, evidence, and inspection - Lessee must file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee must furnish detailed statements showing amounts and quality of all products removed and sold, proceeds therefrom, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee must keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee must keep open at all reasonable times for inspection by any representative of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee must maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports costs claimed as manufacturing, preparation, and/or transportation costs. All such records must be maintained in lessee's accounting offices for future audit by lessor. Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section will be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. Conduct of operations - Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses must be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor. Lessee must cease any operations that would result in the destruction of such species or objects.

Sec. 7. Mining operations - To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Sec. 8. Extraction of helium - Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee must include in any contract of sale of gas the provisions of this section.

Sec. 9. Damages to property - Lessee must pay lessor for damage to lessor's improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 10. Protection of diverse interests and equal opportunity - Lessee must pay, when due, all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee must comply with section 28 of the Mineral Leasing Act of 1920.

Lessee must comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractors must maintain segregated facilities.

Sec. 11. Transfer of lease interests and relinquishment of lease - As required by regulations, lessee must file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Sec. 12. Delivery of premises - At such time as all or portions of this lease are returned to lessor, lessee must place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Sec. 13. Proceedings in case of default - If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver will not prevent later cancellation for the same default occurring at any other time. Lessee will be subject to applicable provisions and penalties of FOGRMA (30 U.S.C. 1701).

Sec. 14. Heirs and successors-in-interest - Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

(Continued on page 4)

A. General:

1. Page 1 of this form is to be completed only by parties filing for a noncompetitive lease. The BLM will complete page 1 of the form for all other types of leases.

2. Entries must be typed or printed plainly in ink. Offeror must sign Item 4 in ink.

3. An original and two copies of this offer must be prepared and filed in the proper BLM State Office. See regulations at 43 CFR 1821.2-1 for office locations.

4. If more space is needed, additional sheets must be attached to each copy of the form submitted.

B. Special:

Item 1 - Enter offeror's name and billing address.

Item 2 - Identify the mineral status and, if acquired lands, percentage of Federal ownership of applied for minerals. Indicate the agency controlling the surface of the land and the name of the unit or project which the land is a part. The same offer may not include both Public Domain and Acquired lands. Offeror also may provide other information that will assist in establishing title for minerals. The description of land must conform to 43 CFR 3110. A single parcel number and Sale Date will be the only acceptable description during the period from the first day following the end of a competitive process until the end of that same month, using the parcel number on the List of Lands Available for Competitive Nominations or the Notice of Competitive Lease Sale, whichever is appropriate.

Payments: The amount remitted must include the filing fee and the first year's rental at the rate of $1.50 per acre or fraction thereof. The full rental based on the total acreage applied for must accompany an offer even if the mineral interest of the United States is less than 100 percent. The filing fee will be retained as a service charge even if the offer is completely rejected or withdrawn. To protect priority, it is important that the rental submitted be sufficient to cover all the land requested. If the land requested includes lots or irregular quarter-quarter sections, the exact area of which is not known to the offeror, rental should be submitted on the basis of each such lot or quarter-quarter section containing 40 acres. If the offer is withdrawn or rejected in whole or in part before a lease issues, the rental remitted for the parts withdrawn or rejected will be returned.

Item 3 - This space will be completed by the United States.

NOTICES

The Privacy Act of 1974 and the regulations in 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this oil and gas lease offer.

AUTHORITY: 30 U.S.C. 181 et seq.; 30 U.S.C 351-359.

PRINCIPAL PURPOSE: The information is to be used to process oil and gas offers and leases.

ROUTINE USES: (1) The adjudication of the lessee's rights to the land or resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when consent or concurrence is required prior to granting a right in public lands or resources. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION: If all the information is not provided, the offer may be rejected. See regulations at 43 CFR 3100.

Appendix C

Stipulations

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Resource Management Decision Stipulations for New Oil and Gas Leases and Other Lands Uses and Management Actions for the Roan Plateau Planning Area Proposed RMPA/FSEIS

Introduction

Oil and gas leases issued pursuant to approval and implementation of any of the alternatives analyzed under this RMPA/EIS grant the lessee the right to extract the oil and gas resource on affected BLM lands within the Planning Area. Section 6 of the lease document terms (see Appendix B) restricts the lease rights granted by requiring that the lessee conduct operations in a manner that minimizes adverse [environmental] impacts and take reasonable measures deemed necessary by the lessor (BLM) to accomplish this intent. These prudent measures are applied through a Condition of Approval (COA) during the permit process for oil and gas development.

If BLM deems it necessary to place additional restrictions on the rights of lessees in order to protect environmental resources, stipulations are appended to the lease. Stipulations clarify BLM's intent to protect known resources or resource values. Stipulations that would be applied to new oil and gas leases under the four alternatives are listed and described in Tables C-1, C-2, C-3, and C-4, respectively. Areas included within the various stipulations under each alternative are shown on Maps 1 to 8 (Appendix A) to this Draft RMPA/SEIS. The location and areas of specific stipulations under each alternative are shown in figures appended to Tables C-1 through C-4, respectively.

Due to the supplemental nature of this process, the four alternatives to be analyzed are either based upon alternatives developed and analyzed for the now-remanded FEIS (Alternative I, No Action, and Alternative II, FEIS Proposed Plan), or have their basis in direction from the Judicial Order and Settlement Agreement (Alternative III, Community Alternative, and Alternative IV, Settlement Alternative, respectively). The stipulations associated with each alternative were developed for the protection of resources, as managed by the specifics of that alternative. Therefore, the names and definitions of stipulations associated with each alternative are derived from different sources, as summarized below:

- Alternative I, No Action – stipulations taken from the 1999 FSEIS (BLM 1999b). These are listed in Table C-1, below, followed by figures illustrating the spatial extent and location of each stipulation.
- Alternative II, FEIS Proposed Plan – stipulations from the FEIS ROD (BLM 2007), spatial allocations updated to integrate new and significant information and resource mapping. These are listed in Table C-2, below, followed by figures illustrating the spatial extent and location of each stipulation.
- Alternative III, Community Alternative – stipulations from the CRVFO Proposed Plan/Final EIS (BLM 2014) when available and applicable, otherwise from the FEIS ROD (BLM 2007). These are listed in Table C-3, below, followed by figures illustrating the spatial extent and location of each stipulation.
- Alternative IV, Proposed RMPA – stipulations from the FEIS ROD (BLM 2007), but not updated for new information and resource data, where overlapped with potential leasing areas under this alternative. These are listed in Table C-4, below, followed by figures illustrating the spatial extent and location of each stipulation. Additional conditions of the Settlement Agreement are a limit on the number of well pads atop the plateau, colocation of pipelines,

restrictions on road use, and a requirement for developing a master development plan (MDP) for BLM approval.

In prior planning efforts, BLM has explicitly stated the criteria for which exceptions, modifications, or waivers to a specific stipulation would apply. For the Roan Plateau RMPA/FEIS, BLM no longer planned for exception to stipulations. Instead the conditions under which each stipulation would apply, and standards that must be met for their application, were explicitly stated in the stipulation. Exceptions may still be applied should unforeseen circumstances arise or new information become available. Likewise, these standards may be modified, as necessary, to provide the protections to resources for which they were intended. A waiver may still be applied, but only after following the rigorous testing process described below. Stipulation descriptions from other sources than the FEIS ROD do contain additional descriptions for exceptions, modifications, and waivers. Regulations covering exceptions, modifications, and waivers are found in 43 CFR 3101.1-4. The terms included in this discussion are defined in greater detail in the following:

- **Stipulation** – A condition of lease issuance (or other land use approval) that provides protection for other resource values or land uses by establishing authority for substantial delay or site changes or the denial of operations within the terms of the lease contract.
- **Standard Exception** – An exception is a one-time exemption for a particular site within the leasehold or within a land use authorization. Exceptions are determined on a case-by-case basis, and if granted, suspend the restrictions of a stipulation for a specified period, location, or activity. The stipulation continues to apply to all other sites within the leasehold or authorized use area. In situations where a land use activity is excepted, the activity could be subject to additional conditions of approval, reclamation measures, or BMPs. Measures applied would be based on the nature, extent, and values potentially affected by the surface-disturbing activity. Excepted surface disturbing activities/lease stipulations are given on a one-time, case-by-case basis and will not necessarily constitute subsequent approvals. Exceptions that conform to an RMP do not require public notice. Non-conforming exceptions are granted only upon RMP amendment and following public notice.

  Hypothetical Example: During a mild winter, mule deer have not moved into some low-elevation, low-quality winter range because adequate and higher quality winter range is available at higher elevations. BLM may grant an exception to the seasonal restriction (Timing Limitation) for all or part mule deer winter range if it determines that *de facto* loss of that habitat in that year would not adversely affect the population. Even if an exception to the 5-month Timing Limitation is granted, BLM could still require a 2-month seasonal avoidance during the coldest months, and the stipulation would be reapplied the following winter unless data indicated a similar situation.

- **Standard Modification** – A fundamental change to the provisions of a lease/land use authorization stipulation, either temporarily or for the term of the lease/land use authorization. Modifications may be temporary or permanent and apply to a specific site or to all sites within the stipulation areas. Depending on the specific modification, the stipulation may or may not apply to other sites within the leasehold /land use authorization to which the stipulation applies. Modifications are made if it is determined that the stipulation is no longer required as written, such as based on the results of monitoring data. While the underlying purpose of the stipulation continues, it can be met with less restrictive means. Modifications require an environmental assessment to determine potential impacts and evaluate whether an RMP amendment is needed. If deemed substantial, a modification requires a 30-day public notice period prior to implementation.

  Hypothetical Example: Monitoring data and an area analysis indicate that the No Surface Occupancy stipulation excluding long-term ground-disturbing activities within 0.5 mile of the Colorado River is unnecessarily stringent. This conclusion is based (hypothetically) on a

determination that intervening vegetation, topography, and other land uses are such that a narrower buffer would adequately protect the hydrologic, aquatic, riparian, visual, and other resource values. BLM may modify the stipulation, either temporarily or permanently, to reduce the buffer width to 0.25 miles and rely on other stipulations to provide the necessary protection.

- **Standard Waiver** – A waiver permanently exempts a leasehold/land use authorization from a stipulation attached to the lease/authorization; that is, the stipulation no longer applies to that leasehold/authorization. No waivers are authorized unless BLM staff has verified that the areas mapped as possessing the attributes to which the stipulation applies do not possess those attributes. Waivers apply to an entire stipulation area and are applied only after preparation of an environmental assessment and subsequent decision that a stipulation is no longer required to protect a specific resource. The decision to waive a substantial stipulation requires a plan amendment and a 30-day public notice period prior to waiver.

  Hypothetical Example: Monitoring data indicate that a particular Controlled Surface Use (CSU) stipulation for the protection of sensitive plant species and significant plant communities associated with drainages is not needed. Because of other stipulations that provide the same or higher level of protection along the actual stream corridor, standard stipulations are adequate to protect the specific vegetation resources. BLM could, after preparing an environmental assessment and plan amendment involving a 30-day public comment period, waive that stipulation throughout the area where it previously applied.

For the purposes of this RMPA/SEIS, the stipulations and associated bases for granting exceptions, modifications, and waivers apply to all land uses and management actions for which BLM has approval responsibility, and not only to oil and gas development. Restrictions on these other lands uses or management activities would be imposed at the time of issuance of a specific permit or other approval, while stipulations for oil and gas activities are attached to the lease document.

- **No Surface Occupancy (NSO) –** The NSO stipulation is intended for application only when other stipulations are deemed insufficient to achieve the level of resource protection necessary to protect the public interest. An NSO stipulation is not needed if the desired level of protection can be accomplished by relocating a proposed facility or activity or avoiding that activity for a specified period.

  The equivalent of an NSO for land uses and activities other than oil and gas development is NGD (No Ground Disturbance).

- **Controlled Surface Use (CSU) –** The CSU stipulation is intended for application where standard lease terms and permit-level decisions are deemed insufficient to achieve the level of resource protection necessary to protect the public interest, but where an NSO is deemed overly restrictive.

  A CSU stipulation allows BLM to require that a proposed facility or activity be relocated by more than 200 meters from the proposed location if necessary to achieve the desired level of protection. A CSU is not needed if relocating the proposed facility or activity by up to 200 meters would be sufficient.

  The equivalent of a CSU for land uses and activities other than oil and gas development is SSR (Site Specific Relocation).

- **Timing Limitation (TL) –** This stipulation limits activity during a specified period of the year. A TL stipulation is intended for application where standard lease terms are deemed insufficient to achieve the level of resource protection necessary to protect the public interest, but where an NSO is deemed overly restrictive. The scope of the TL stipulation goes beyond ground-disturbing activities to

encompass any source of protracted or high-intensity disturbance that could interfere with normal wildlife behavior and adversely affect habitat use. The limitation is applied annually for a specified period lasting more than 60 days.

Under the Action Alternatives, TLs may also be applied to land uses and activities other than oil and gas development. Similarly, note also that equivalent levels of protection would be applied to other land uses and management actions as a condition of their approval. Other protective measures such as special mitigation requirements could also be applied to land uses and management actions other than oil and gas (as described above, they could be required for oil and gas as a COA during the permitting process).

Throughout the text of the Proposed RMPA/FSEIS, reference is made to existing stipulations that would be applied, extended, retained, or dropped with regard to new leases. While leases issued prior to 2007 will remain subject to their existing terms, leases issued under this plan will be subject to whatever stipulations are directed by the selected alternative. However, many of the leases are based on, and vary only slightly or not at all from, some of the existing stipulations for current leases.

In the following tables and in Chapter 4 of the Proposed RMPA/FSEIS, new stipulations are designated as to which type they are (NSO, CSU, or TL) and described by the specific resource to which they apply.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
No Surface Occupancy (NSO) Stipulations		
NSO-15: Steep Slopes (>50%), 8,720 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Maintain soil stability and productivity and minimize impacts of soil erosion on other resources.	No ground-disturbing activities on slopes steeper than 50%. [Note: This differs from the existing condition in that pipeline construction is no longer exempted.]	An exception or modification may be granted on areas with slopes less than 50% that are entirely or partially surrounded by slopes steeper than 50% if the less steep area (a) is at least 10 acres in size and (b) can be reached by road, pipeline, powerline, or other required access without crossing any slope steeper than 50%. No exceptions will be granted in areas of steep slopes that also are designated as wildlife movement corridors
NSO-12: Threatened or Endangered Species, 440 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect occupied habitat, or other habitat crucial for the maintenance or recovery, of species listed at the Federal or State levels as threatened or endangered, and proposed or candidate species at the Federal level.	No ground-disturbing activities within occupied habitat or habitat necessary for maintenance or recovery of the species.	An exception or modification may be granted, following Section 7 consultation with USFWS or consultation with CPW for State-listed species, and after considering the behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance, relative extent of available habitat; relationship to topography and vegetation screening; and other factors that may affect maintenance or recovery of the species. If a species affected by this stipulation is removed from the Federal listed (”delisted”), this stipulation would be modified to exclude that species.
NSO-11: Wildlife Seclusion Areas, 3,440 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect important seclusion (security) for wildlife, especially deer and elk.	No ground-disturbing activities in areas that provide high-value habitats along and below the base of the Roan Cliffs.	An exception or modification may be granted if: (a) BLM determines, following consultation with CPW, that the specific activity or requested change would not impair habitat quality due to habitat loss or fragmentation or disturbance from human activity; or (b) the activity would have a duration within the seclusion area of less than one day. The

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
		BLM's determination would consider the vegetation, topography, existing habitat impacts, and other site specific or activity-specific factors and the amount, type, and exact location of the surface disturbance.
NSO-7: Raptor Nesting Areas, 220 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting of raptors not protected by the Endangered Species Act or other species specific stipulation.	No ground-disturbing activities within 0.125 mile of an active nest (i.e., containing eggs or young or being attended by adults in preparation for nesting).	An exception or modification may be granted if: (a) the BLM determines, following consultation with CPW, that the specific activity or requested change would not impair behaviors, habitat use and quality, and reproductive success of raptor species present within the specific NSO area; (b) the activity would have a duration within the buffer zone of an active nest of less than one day; and (c) no suitable alternative is available. The BLM's determination would consider the vegetation, topography, existing habitat impacts, and other site-specific or activity-specific factors and the amount, type, and exact location of the surface disturbance in relation to the nest and vegetation or topographic screening.
NSO-8: Bald Eagle Nest Areas, 380 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting or winter roosting for bald eagle.	No ground-disturbing activities within 0.25 mile of designated bald eagle nesting or roosting habitat.	An exception or modification (e.g., reduced buffer zone width) may be granted depending on the status of the nest or roost (active or inactive); the location of the activity in relation to the nest and areas of topographic or vegetation screening; conservation measures if required by USFWS; and the amount, type, and duration of surface disturbance. An exception or modification granted in one year would not necessarily be granted in subsequent years.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
NSO-9: Peregrine Falcon Cliff Nesting Complex, 120 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting of this State-listed threatened species.	No ground-disturbing activities within 0.25 mile of the cliff-nesting complex along the Roan Cliffs from March 15 through July 31.	An exception or modification (e.g., reduced buffer zone width) may be granted following consultation with CPW and after considering the status of the nest (active or inactive), its relationship to areas of topographic or vegetational screening, and the type, amount, and duration of the surface disturbance. No exception would be granted for an activity with a duration longer than one when the cliff-nesting complex is occupied by breeding by peregrine falcons. An exception or modification granted in one year would not necessarily be granted in subsequent years.
NSO-18: 1-70 Viewshed, 8,300 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect areas with high visual sensitivity within 5 miles of I-70.	No ground-disturbing activities on slopes steeper than 30% with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.	An exception or modification may be granted if protective measures can be designed to accomplish VRM Class II objectives, viz., that the overall landscape character is retained on a site-specific and cumulative basis. Such measures would be designed to blend the disturbance with the natural landscape.
NSO-19: Anvil Points Claystone Cave, 120 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect the scientific and wildlife values of these caves.	No ground-disturbing activities in the area encompassing the cave opening, subsurface features, and watersheds overlying the caves.	An exception or modification would require that the proponent demonstrate by monitoring or other method, and with a high degree of scientific reliability, that the activity would not impair the cave values being protected. Any exception or modification would be approved only after consultation with CPW and considering the type, amount, duration, and timing of the activity.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
NSO-2: Riparian and Wetland Zones, 80 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Maintain proper hydrologic function and protect adjacent riparian and wetland areas that provide habitat for fish and wildlife species, waterfowl and shorebird production, and amphibian breeding/feeding or that provide important water quality, scenic, or recreation values.	Ground-disturbing activities, roads, electric transmission lines, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.	An exception or modification may be granted if (a) the activity will cause no loss of riparian vegetation or, if riparian is lost, that the loss is limited to no more than 0.1 acre, and 100 linear feet, per mile of stream; (b) any temporarily disturbed areas are revegetated with the same or similar species, including use of "nursery stock" rather than seeds to replace woody plants on a one-to-one basis (trees) or area-for-area basis (shrubs); (c) revegetation success can be achieved within 2 years; (d) the activity will not impair water quality, flow regime, aquatic habitat quality, and channel and bank stability; and (e) no suitable alternative is available.
NSO-3: Colorado River Corridor, 440 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect high-quality habitats and wildlife areas, water quality benefits, and scenic qualities along the Colorado River.	No ground-disturbing activities within 0.5 mile of high water mark on either side of river.	An exception or modification (e.g., reduced buffer zone width) may be granted if the BLM determines that (a) the specific activity or requested change would not impair water quality, high-quality habitats, and scenic qualities after considering the vegetation, topography, existing habitat impacts, and other site-specific or activity-specific factors and the amount, type, and duration of surface disturbance proposed; and (b) any lost vegetation would be replaced with the same or similar species within 3 to 5 years.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
Controlled Surface Use (CSU) Stipulations		
CSU-3: Sensitive Species Populations and Significant Plant Communities, 8,930 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect plant species, significant plant communities, and fish and wildlife species listed by BLM as sensitive, including protection of occupied habitat or of other areas needed to support the species.	The BLM may require special design, construction, operation, mitigation, or reclamation measures, relocation by more than 200 meters to protect specified species, plant communities, or associated ecological functions. Measures required will be based on the nature, extent, and value of the area potentially affected.	The BLM may determine that the level of protection available under a CSU stipulation is not required to ensure the values associated with occupied habitat or ecological functioning needed to support BLM sensitive species are adequately protected. The BLM's determination would be based on site-specific conditions, species-specific behaviors and habitat requirements, and the type, amount, and duration of the associated impacts.
CSU-4: Erosive Soils on Slopes Steeper than 30%, 6,690 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Maintain soil stability and productivity and minimize impacts of soil erosion on other resources.	The BLM may require special design, construction, operation, mitigation, or reclamation measures, relocation by more than 200 meters to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in areas of highly erosive soils on slopes steeper than 30% Highly erosive soils are those in the "severe" and "very severe" erosion classes based on NRCS mapping. This stipulation also applies to the Trapper Creek Watershed Management Area.	The BLM may determine that the level of protection available under a CSU stipulation is not required to preserve soil stability and productivity and minimize adverse impacts from soil erosion. The BLM's determination would be based on site-specific conditions and the type, amount, and duration of the associated impacts.
CSU-5: VRM Class II Areas, 14,670 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Preserve the existing character of the landscape to meet VRM Class II objectives in all areas designated at this class.	The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters to retain the existing landscape character and allow only limited changes.	The BLM may determine that the level of protection available under a CSU stipulation is not required to meet VRM Class II objectives based on preserve soil stability and productivity and on site-specific conditions, visibility of the site; the type, amount, and duration of the associated impacts; and the effectiveness of standard stipulations in a given situation.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
CSU-6: Sharrard Park Paleontological Area, 1,020 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect, preserve, or recover the scientifically fossil resources in this area.	The BLM may require special survey, design, construction, operation, and reclamation measures, or relocation by more than 200 meters in identified portions of Wasatch Formation outcrops in Sharrard Park. Prior to any ground-disturbing activity, the operator shall have the paleontological resources surveyed within 200 feet of the proposed disturbance, to be performed by a BLM-approved paleontologist. Other special measures will include a requirement that onsite personnel are informed about the potential for fossils and instructed to notify the BLM if any fossils are found and to leave any vertebrate fossils in place.	The BLM may determine that the level of protection available under a CSU stipulation is not required to protect, preserve, or recover the fossil resources at specific sites or for specific activities within this area. The BLM's determination would be based on site-specific conditions and the type, amount, and duration of the associated impacts.
CSU-2: Riparian and Wetland Habitat Below the Rim, 2,620 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Maintain proper hydrologic function and protect adjacent riparian and wetland areas that provide habitat for special- status fish and wildlife species, waterfowl and shorebird production, and amphibian breeding/feeding or that provide important water quality, scenic, or recreation values.	The BLM may require special design, construction, operation, mitigation, or reclamation measures, relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.	The BLM may determine that the level of protection available under a CSU stipulation is not needed to ensure that values associated with proper hydrological and ecological functioning are not impaired, and that adjacent riparian and wetland areas that support the specified fish and wildlife resources are adequately protected. The BLM's determination would be based on site-specific conditions and on the type, amount, and duration of the associated impacts.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
Timing Limitations (TL) Stipulations		
TL-1: Big Game Winter Habitat, 20,230 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect winter habitat for deer and elk, including severe winter range, winter concentration areas, and critical habitat/winter range,	No activities or other sources of disturbance. Applied annually from December 1 through April 30.	The BLM may grant an exception for a winter season (typically following consultation with CPW) if (a) monitoring studies indicate that, due to mild weather or other natural conditions, deer/elk are not occupying the winter range; (b) (b) deer/elk are occupying the winter range, but the proposed activity would be transitory (duration of one day or less per month), and unlikely to significantly affect behavior or habitat quality in more than 1% of the winter range. The BLM will also consider the exact location, nature, and timing of the proposed activity and availability of a suitable alternative. A modification may be granted if monitoring data indicate that the TL is not needed to maintain appropriate populations of deer and elk.
TL-6: Raptor Nesting, 970 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting and fledging habitat for raptors not protected by species-specific measures. Includes owls, northern harrier, accipiters, buteos, golden eagle, osprey, and falcons except the American kestrel.	Within a 0.125-mile radius of a nest, no activities or other sources of disturbance with the potential to cause the nest not to be used or lead to nest failure, abandonment, or mortality of fledglings. Applied annually from February 1 through August 15.	An exception or modification may be granted (a) if the BLM determines, in consultation with CPW, that the requested activity could be performed during the period of the TL without impairing behavior, nesting, or fledging success, and (b) the permitted disturbance would have a duration within the buffer zone of less than one day. BLM's determination would be based on based on species-specific behaviors, sensitivities, and habitat needs and on meteorological, ecological, or hydrological conditions during that period.

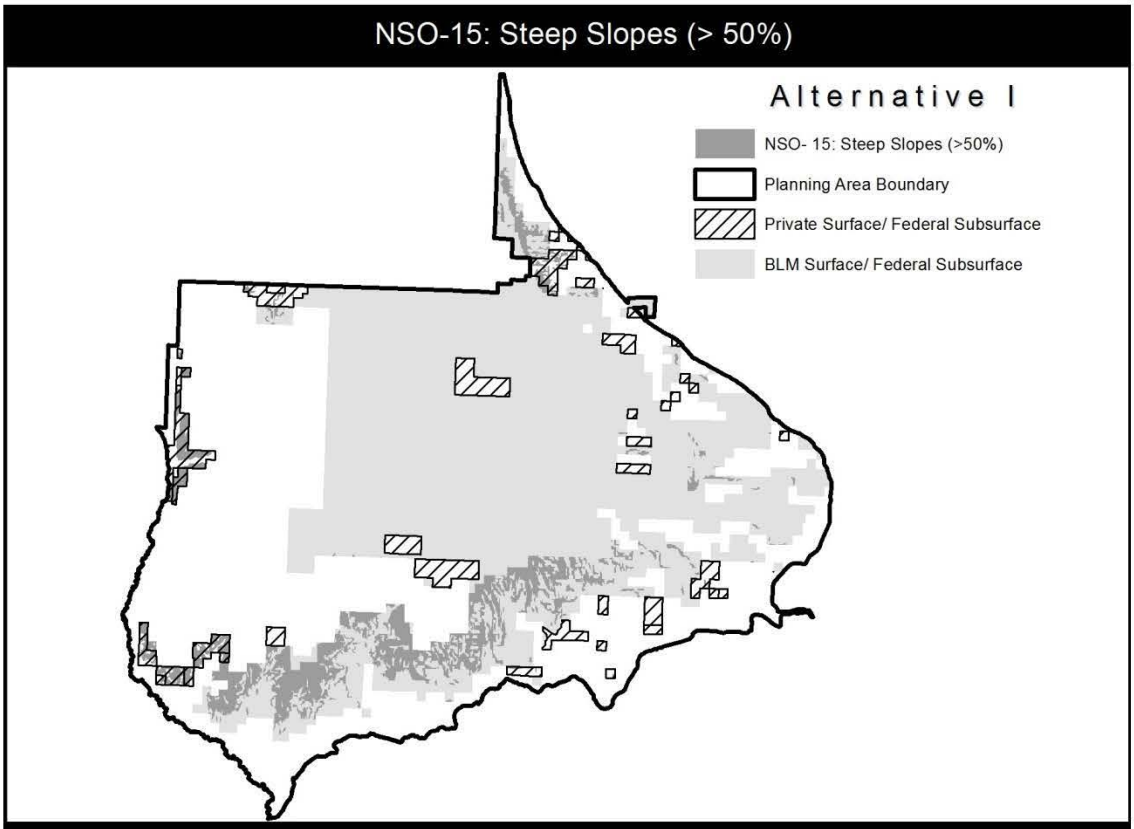
[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

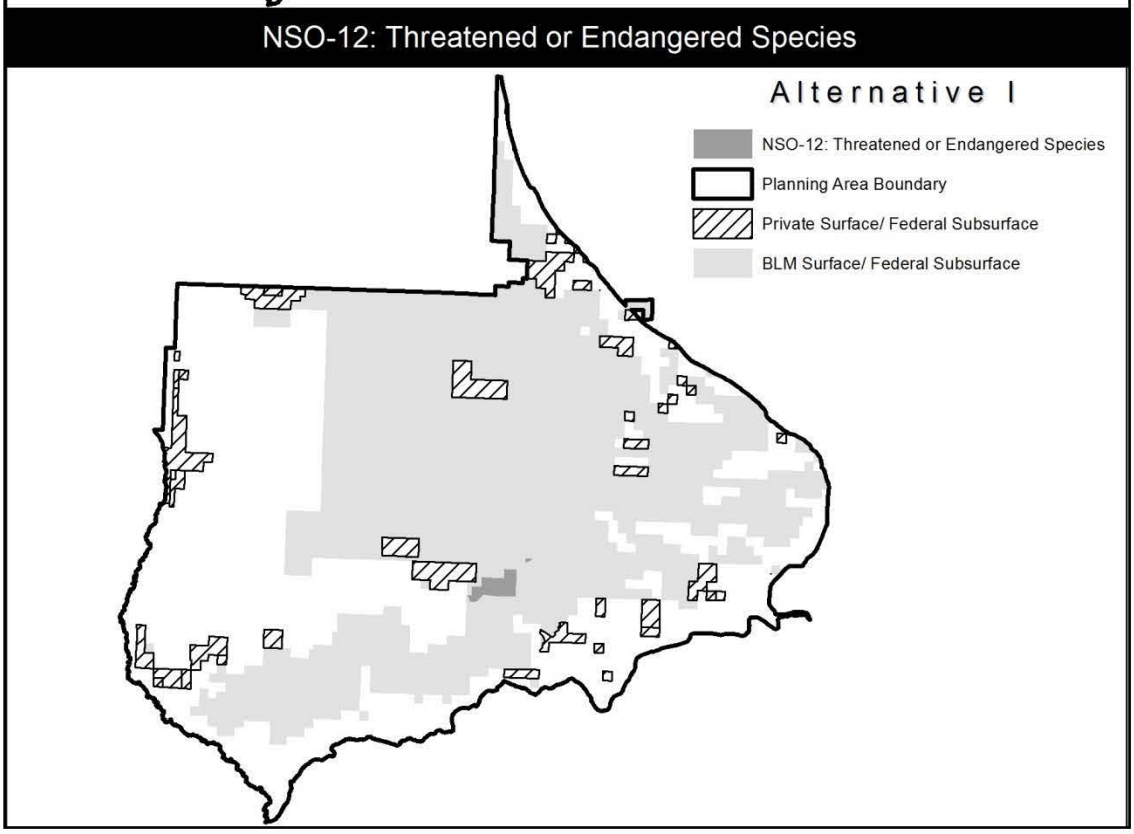
Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
TL-10: Bald Eagle Nesting, 510 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect winter roosts of this species.	Within a 0.5-mile radius of a winter roost, no activities or other sources of disturbance that could cause the roost not to be used or to be abandoned after roosting has begun. Applied annually, November 15 through April 15.	An exception or modification may be granted if the BLM determines that the requested activity could be performed during the period of the TL in a manner that would not impair behavior, habitat use, or winter survival. The BLM's determination would be based on specific meteorological or ecological conditions during the period requested; the status of the roost (active or inactive); the exact location of the activity relative to the roost site and any vegetation or topographic screening; the type, intensity, and duration of disturbance; and measures required by USFWS.
TL-12: Peregrine Falcon Cliff Nesting Complex, 360 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting and fledging habitat of this State-listed threatened species.	Within a 0.5-mile radius of the cliff-nesting complex on the Roan Cliffs, no activities or other sources of disturbance that could cause abandonment of a nest or established territory. Applied annually, March 15 through July 31.	An exception or modification may be granted if BLM determines, in consultation with CPW, that the requested activity could be performed during the period of the TL without impairing behavior, nesting, or fledging success. The BLM's determination would be based on specific meteorological or ecological conditions during the period requested; the status of the roost (active or inactive); the exact location of the activity relative to the roost site and any vegetation or topographic screening; the type, intensity, and duration of disturbance; and availability of suitable options.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

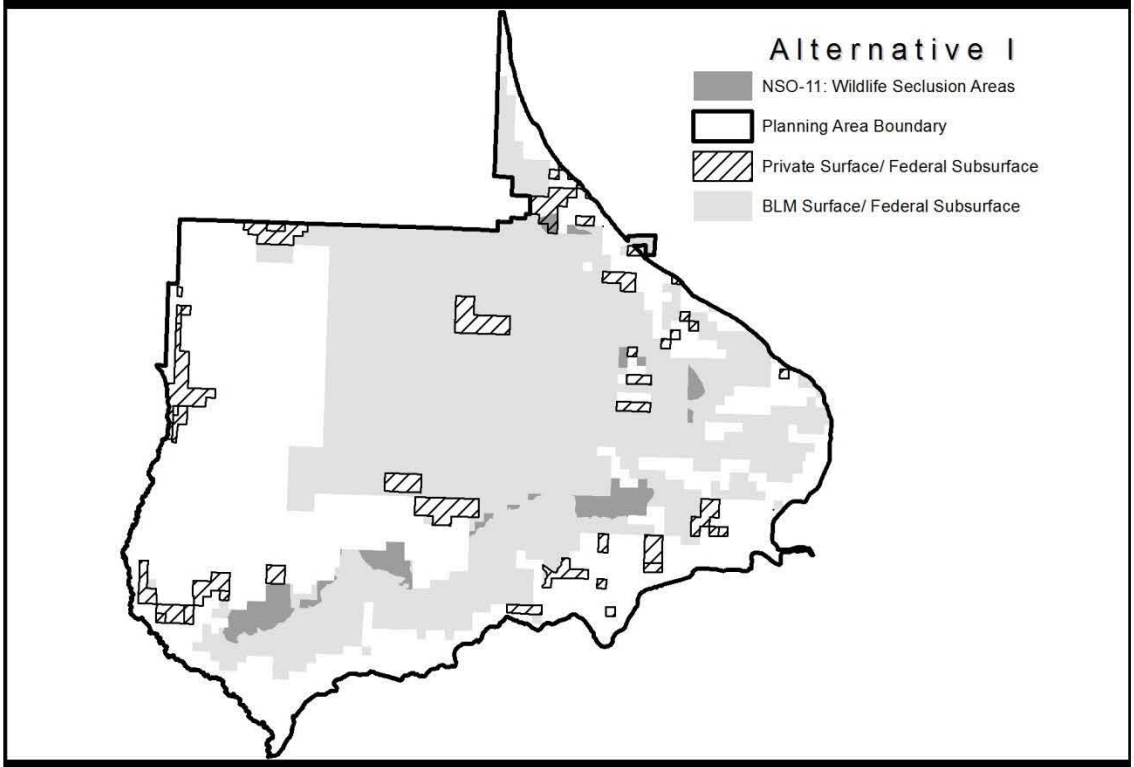
Appendix Table C-1. Descriptions of Surface-Use Stipulations Applicable to No Action Alternative[1]		
TL 13: Waterfowl and Shorebird Nesting Areas, 40 acres		
Objective	**Measures and Areas Applied**	**Exception or Modification Criteria**
Protect nesting and brood-rearing habitats at the Fravert Reservoir Watchable Wildlife Area.	Within 0.25-mile of the nesting and production area of Fravert Reservoir, no activities or other sources of disturbance that could cause waterfowl and shorebirds not to nest or lead to nest failure or abandonment. Applied annually, April 15 through July 15 or until all young have hatched and dispersed from the production area.	An exception may be granted if BLM determines, in consultation with CPW, that the requested activity could be performed during the period of the TL without impairing behavior, nesting, or fledging success. An exception could be based on species-specific behaviors, sensitivities, and habitat needs and on meteorological, ecological, or hydrological conditions during that period.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

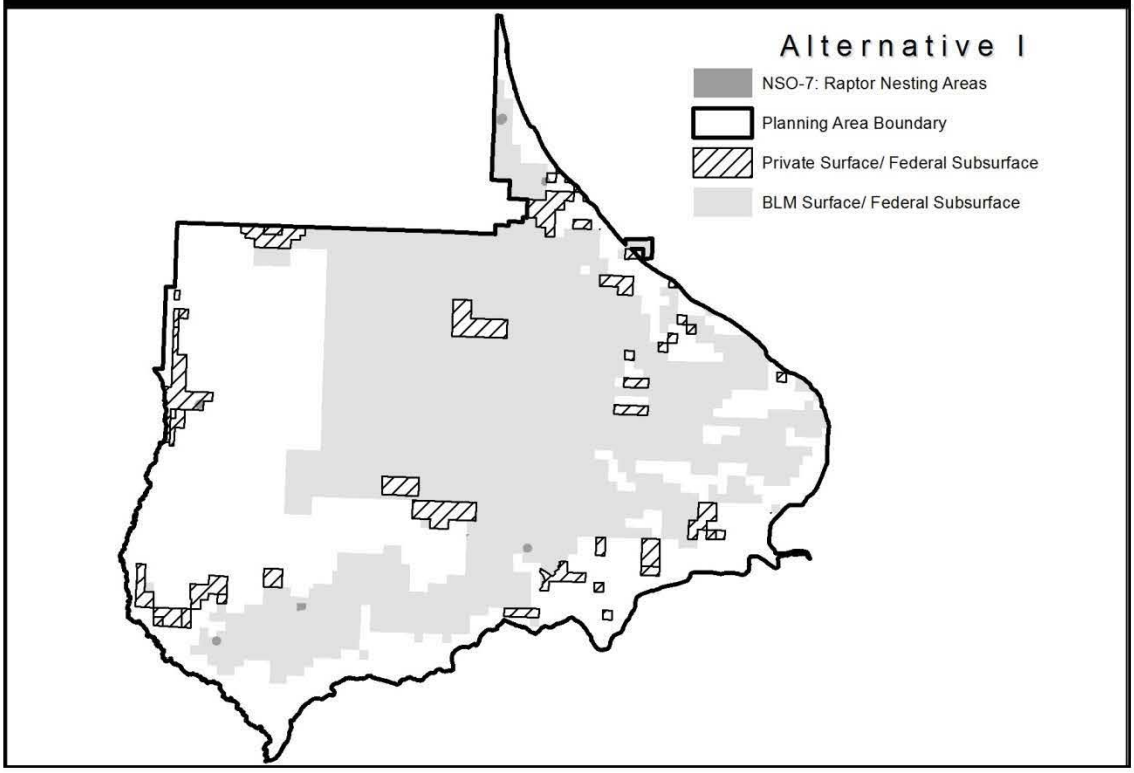

NSO-15: Steep Slopes (> 50%)
Alternative I
NSO- 15: Steep Slopes (>50%)
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


NSO-12: Threatened or Endangered Species
Alternative I
NSO-12: Threatened or Endangered Species
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

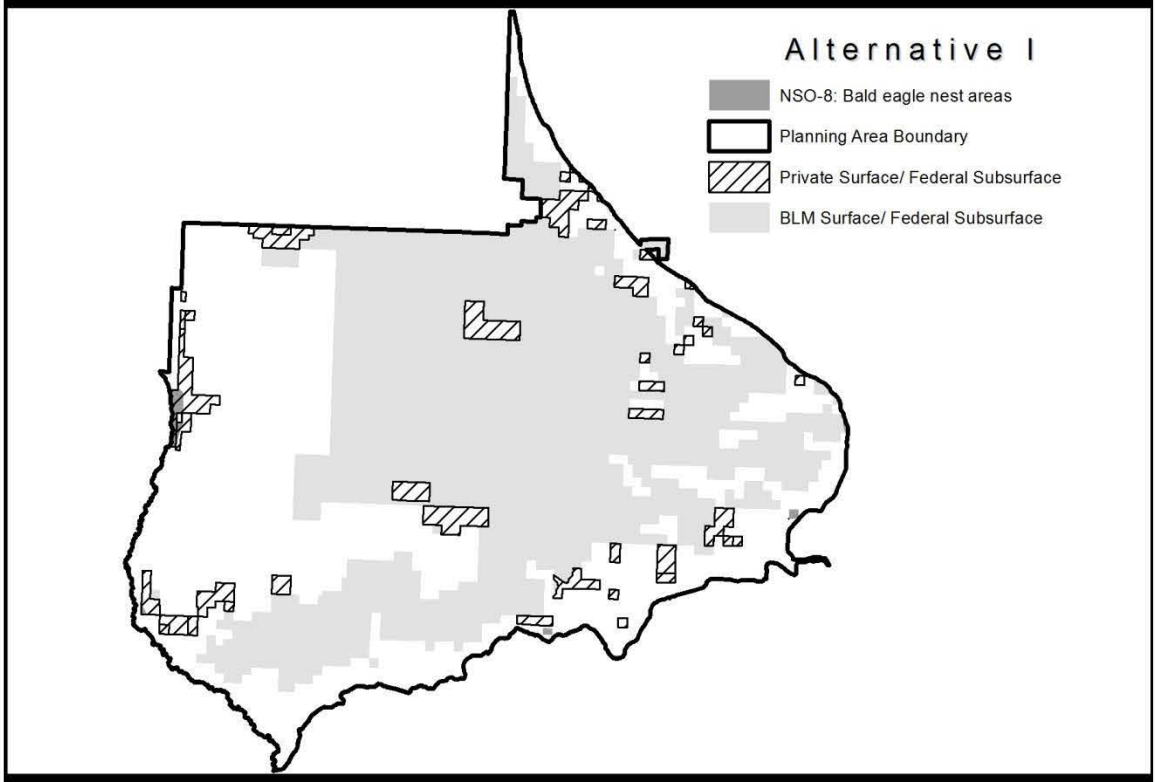
NSO-11: Wildlife Seclusion Areas



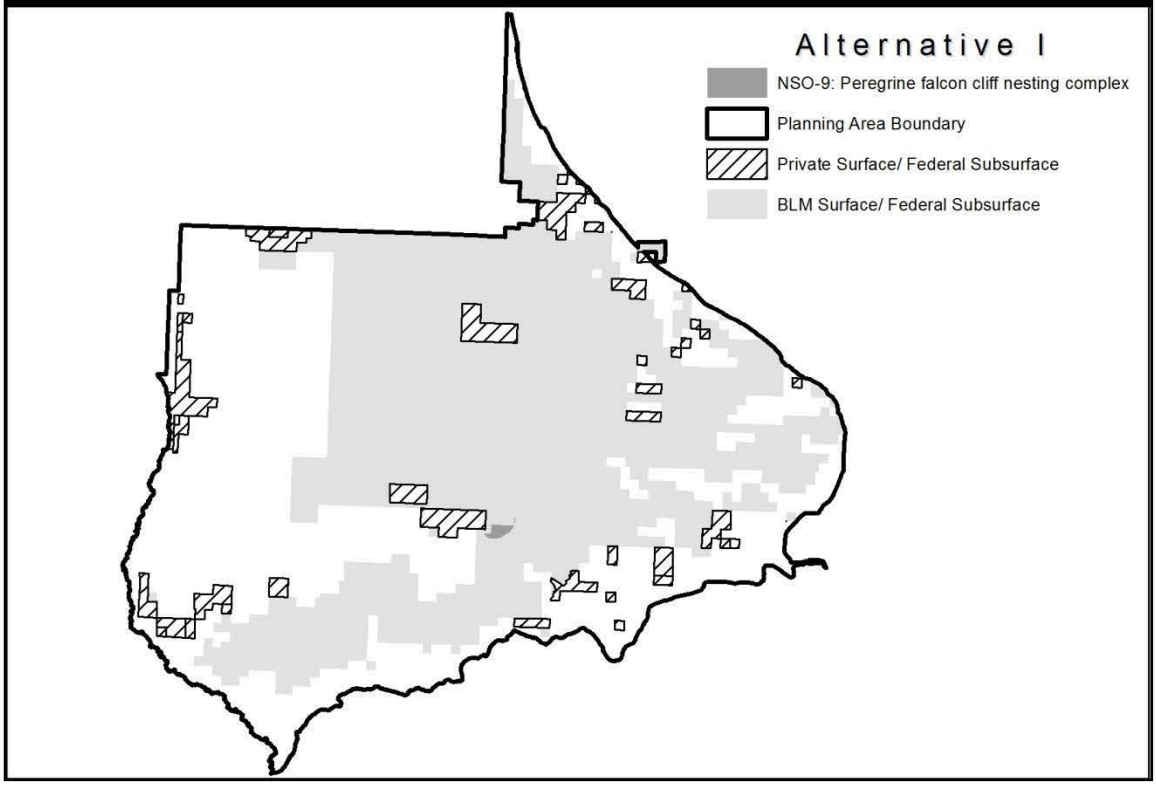
NSO-7: Raptor Nesting Areas



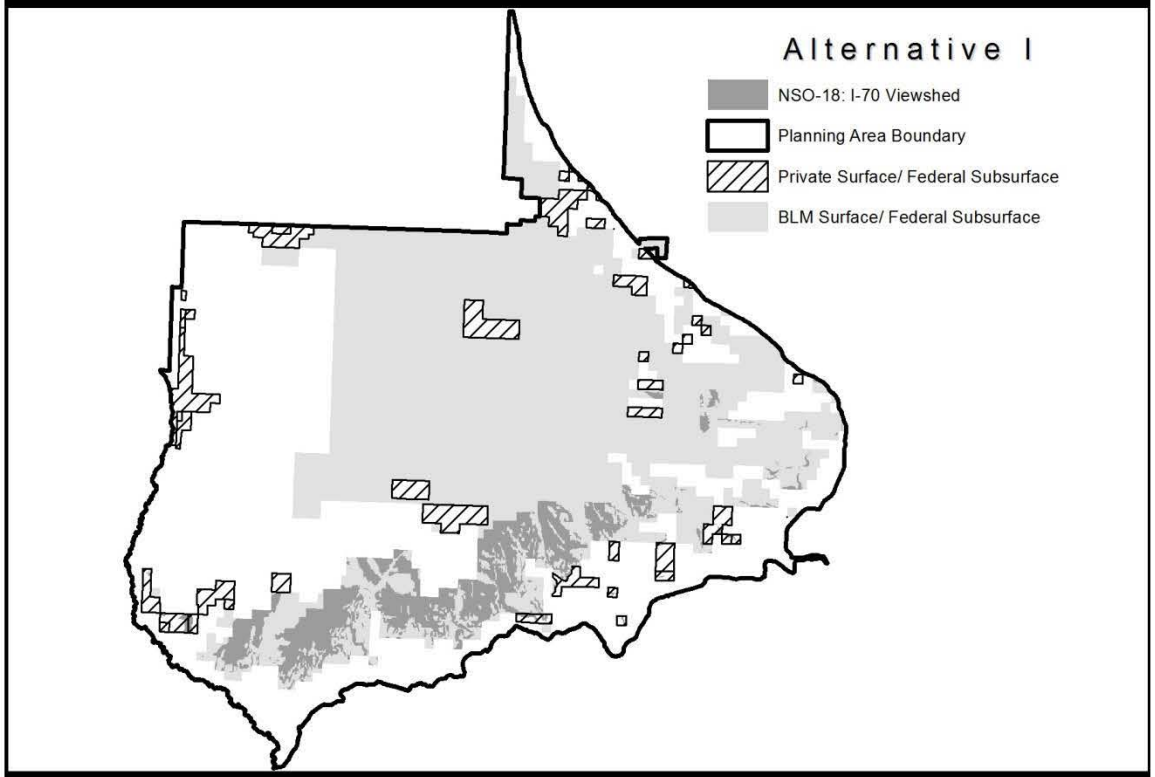
NSO-8: Bald Eagle Nest Areas



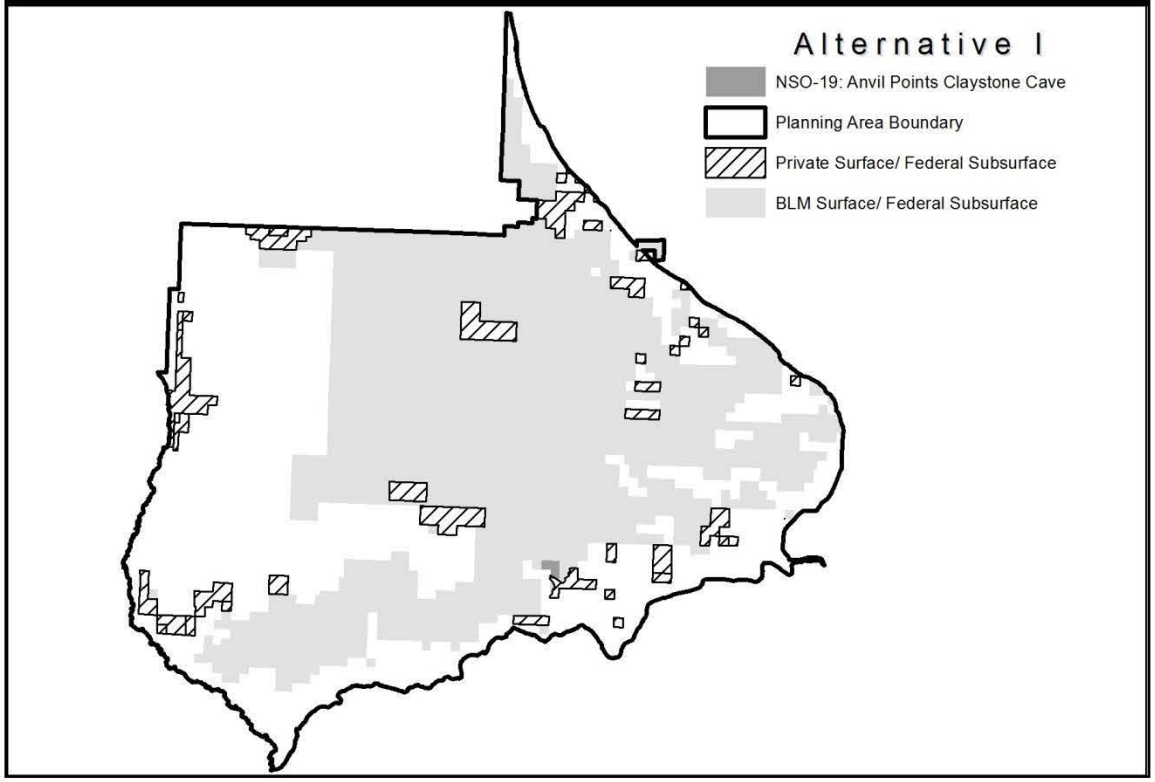
NSO-9: Peregrine Falcon Cliff Nesting Complex



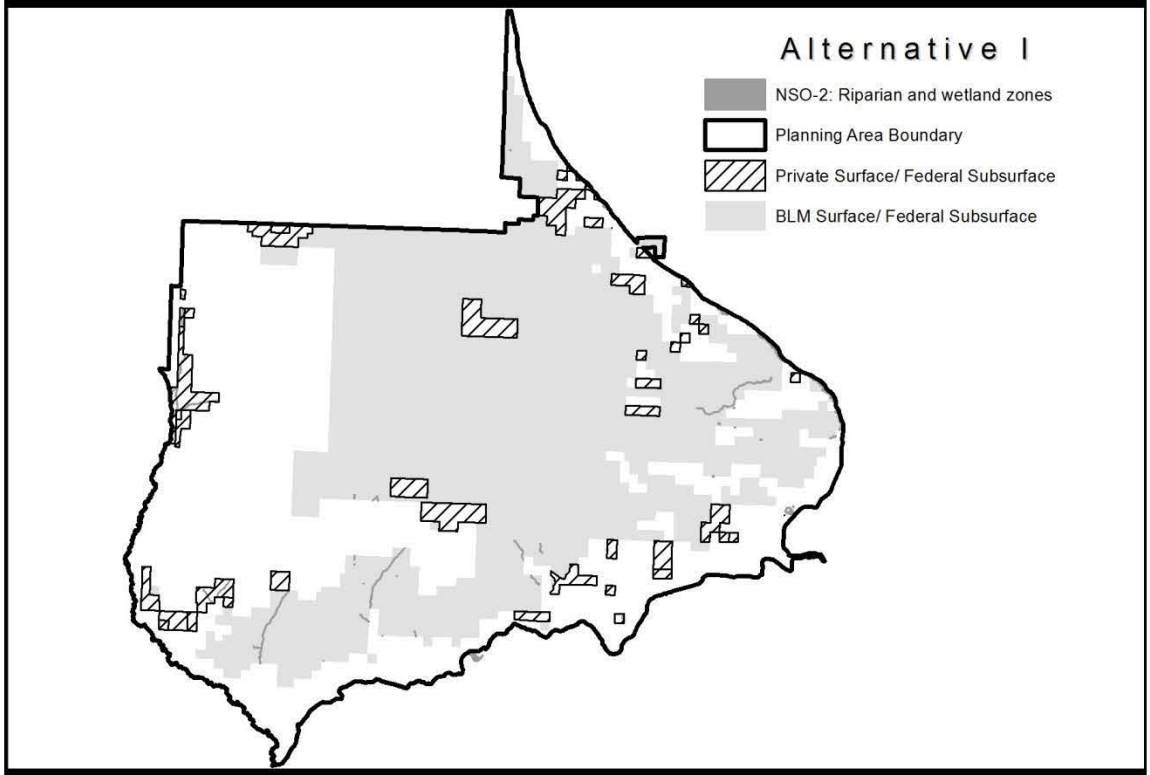
NSO-18: I-70 Viewshed



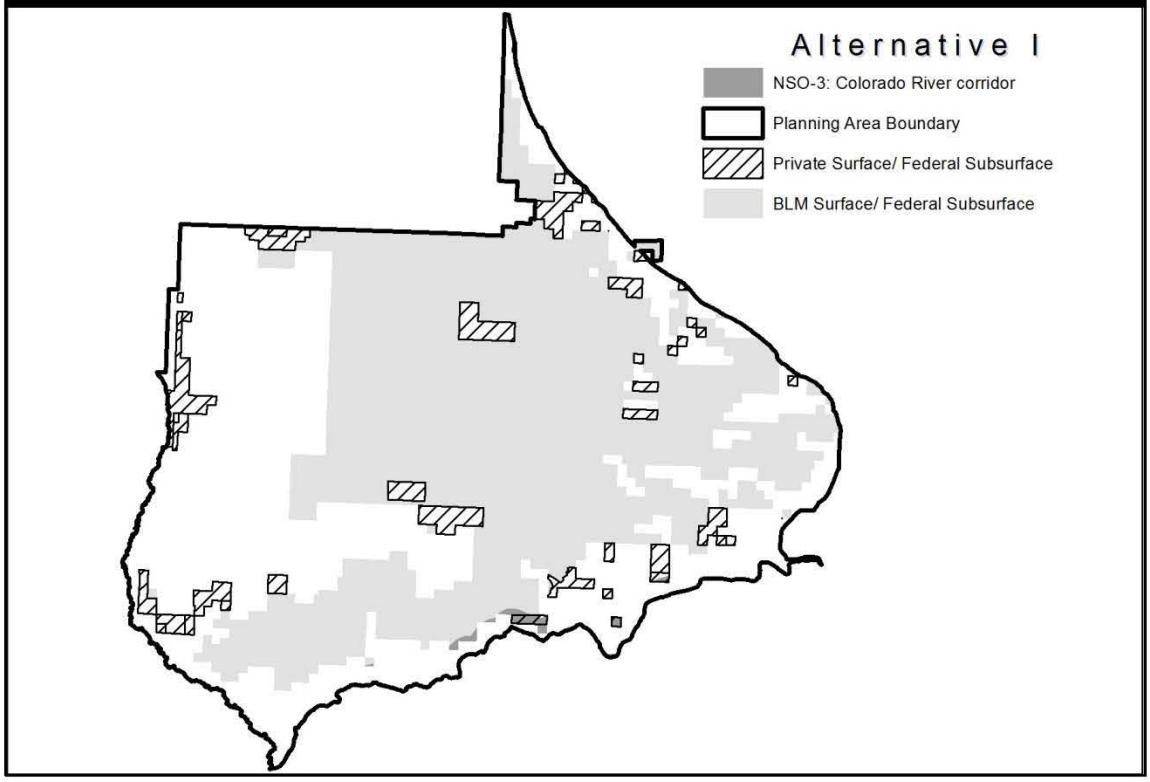
NSO-19: Anvil Points Claystone Cave



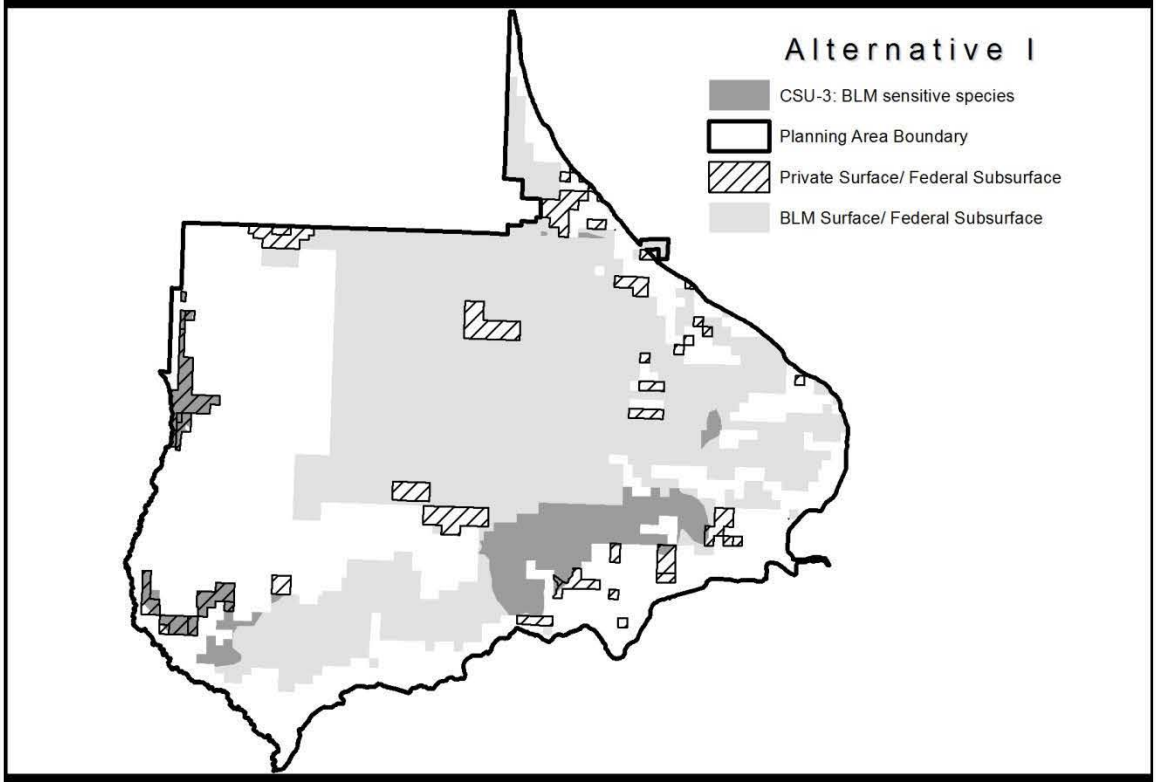
NSO-2: Riparian and Wetland Zones



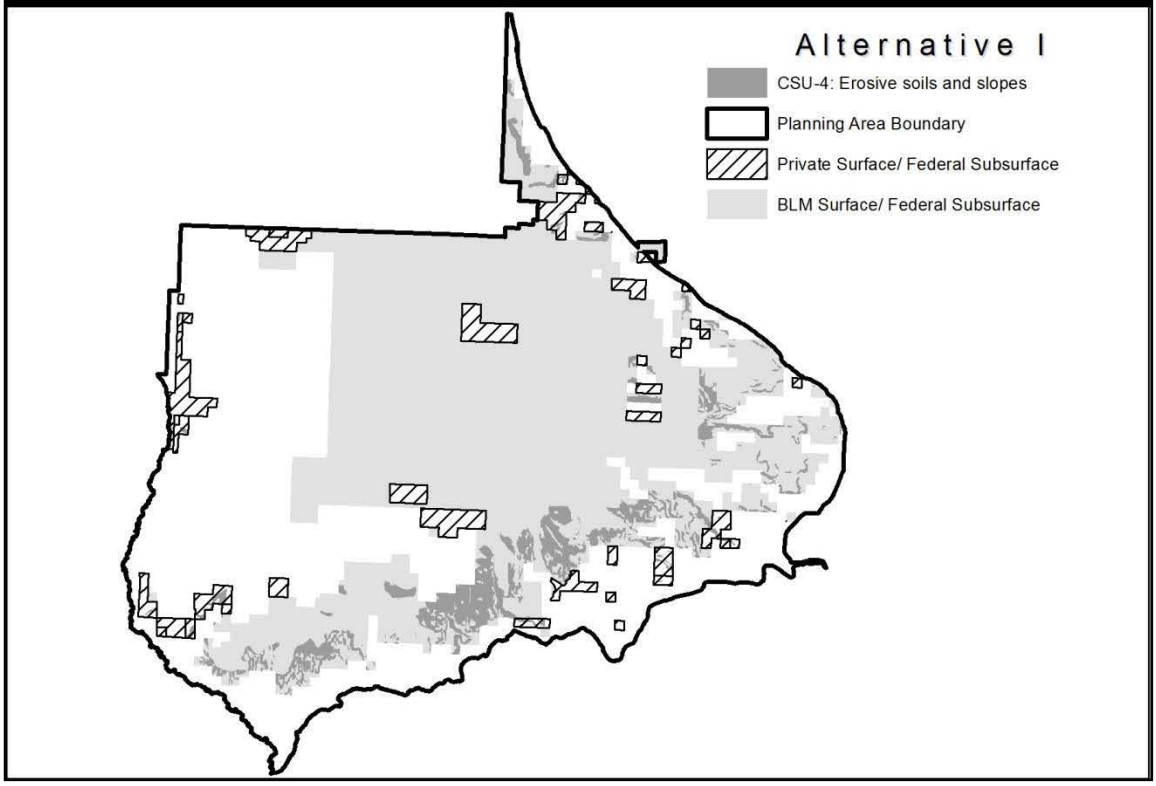
NSO-3: Colorado River Corridor



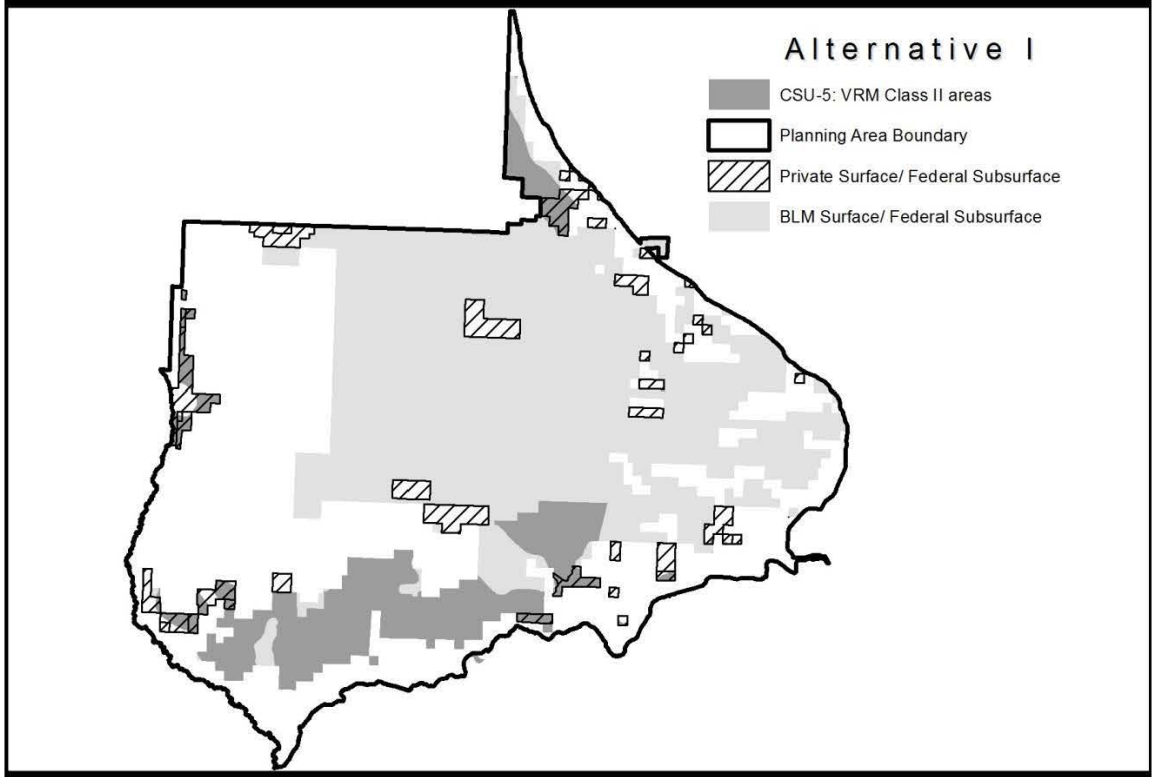
CSU-3: Sensitive Species Populations and Significant Plant Communities



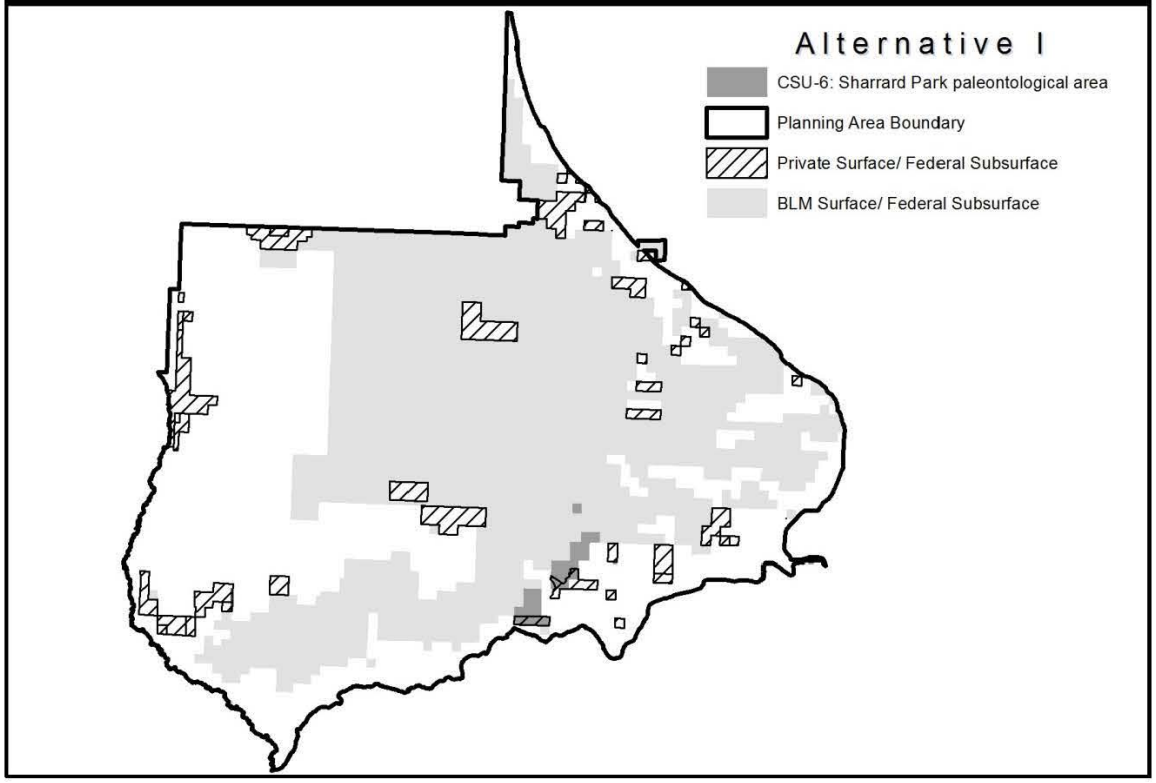
CSU-4: Erosive Soils on Slopes Steeper than 30%



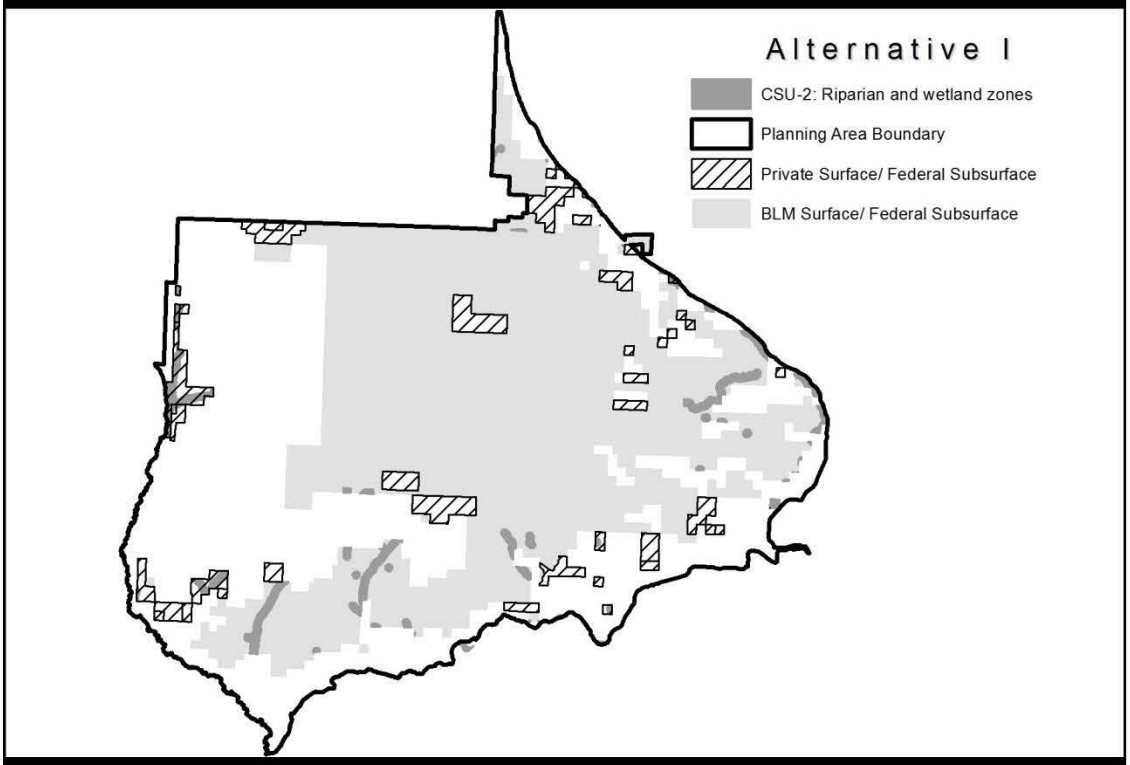
CSU-5: VRM Class II Areas



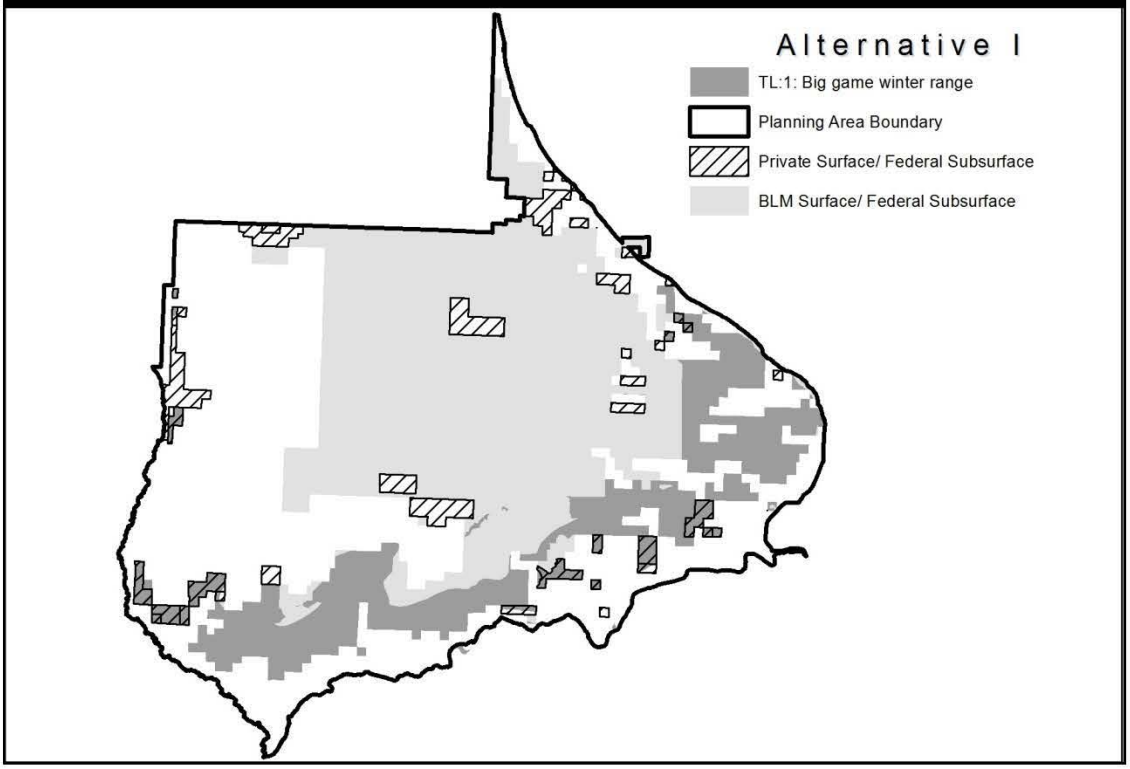
CSU-6: Sharrard Park Paleontological Area



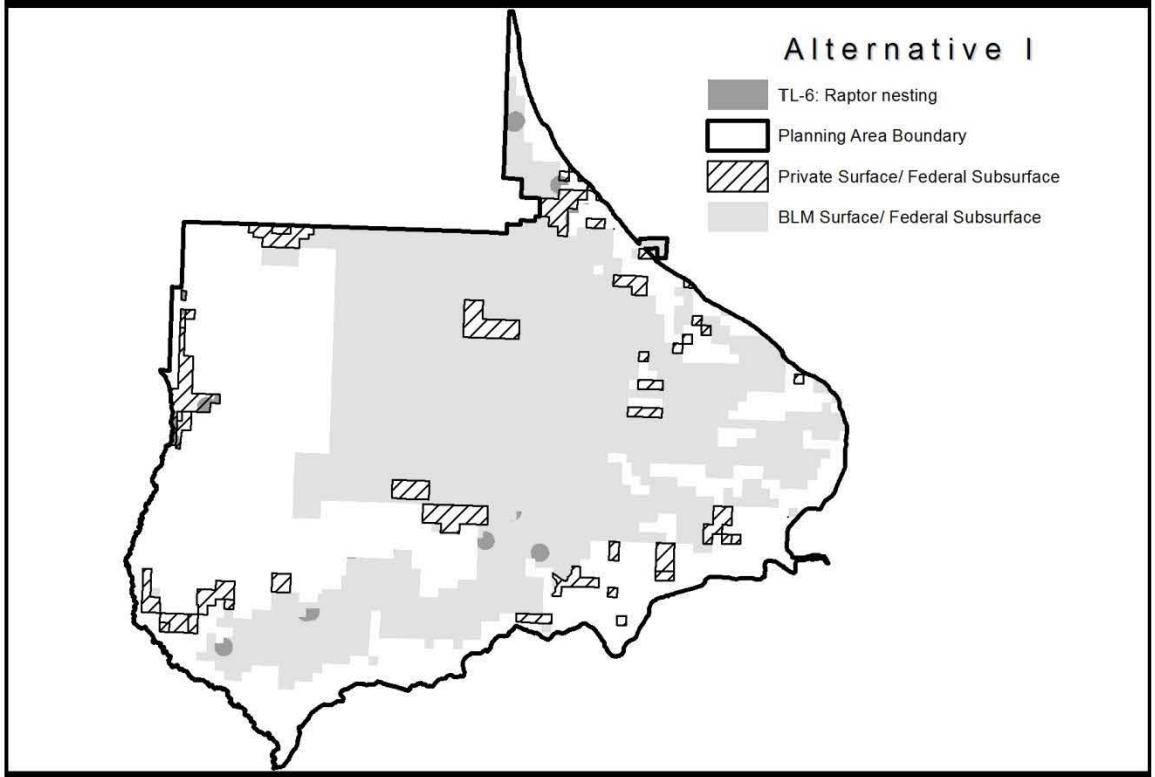
CSU-2: Riparian and Wetland Habitat Below the Rim



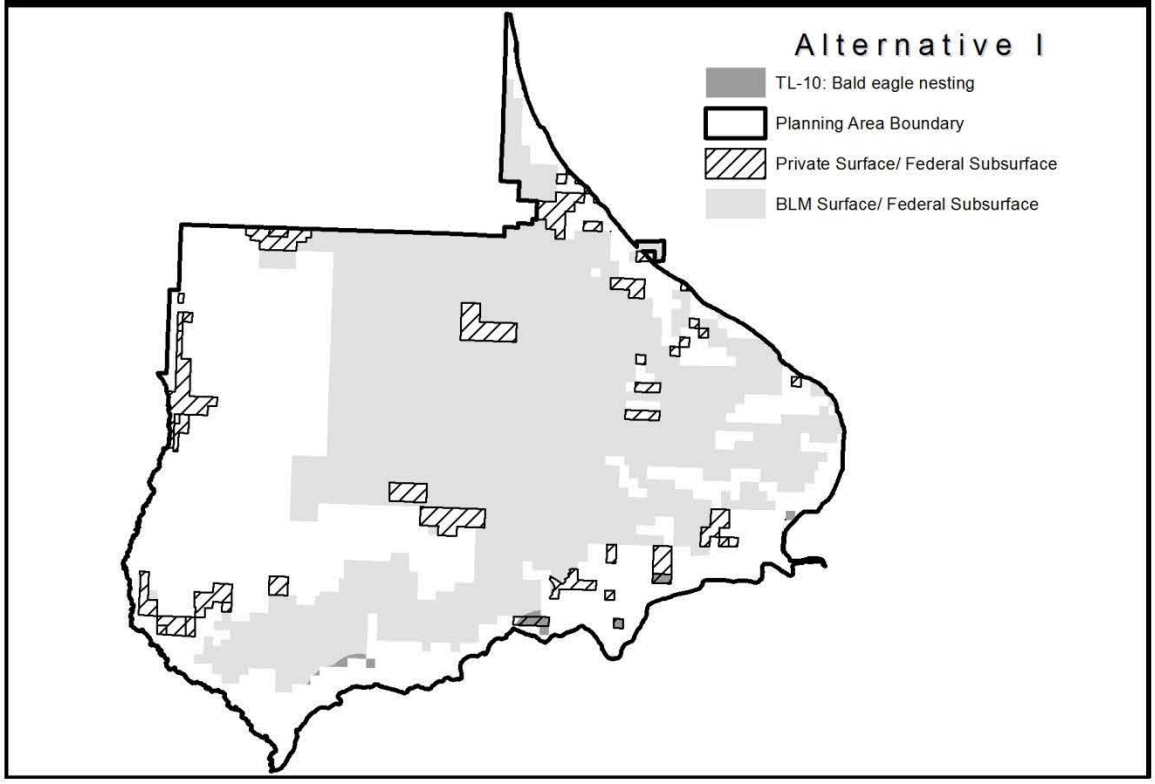
TL-1: Big Game Winter Habitat



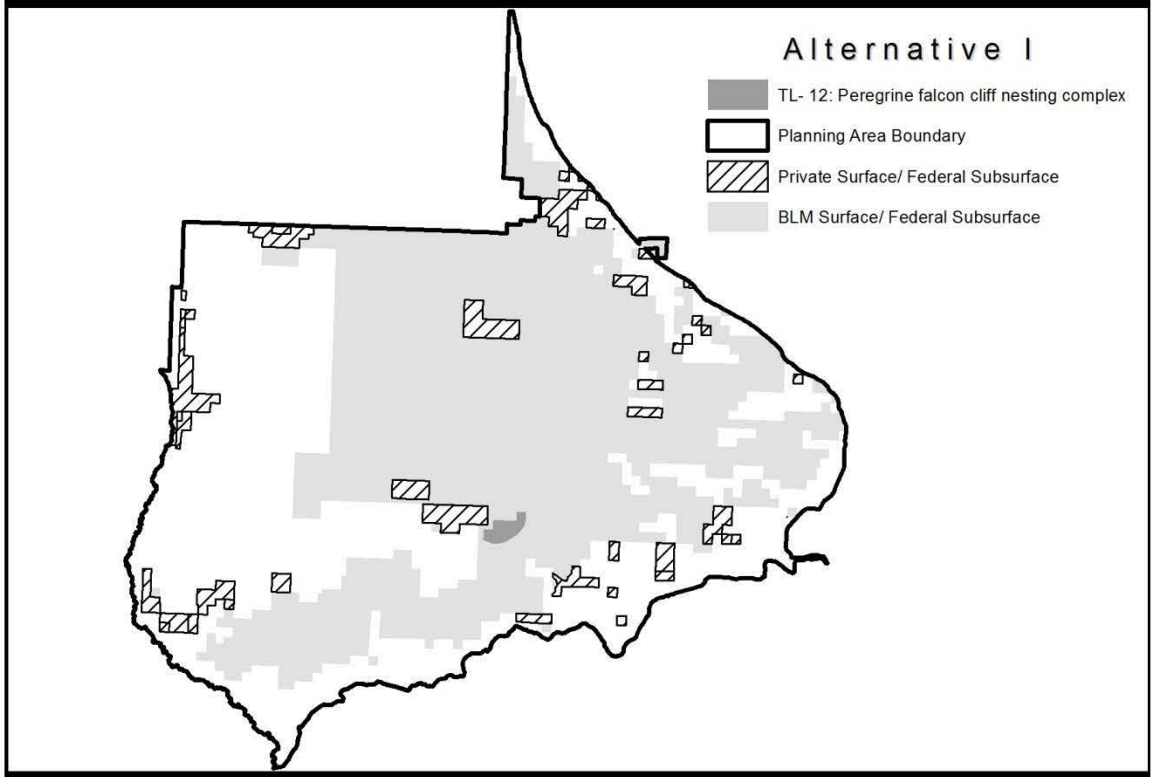
TL-6: Raptor Nesting



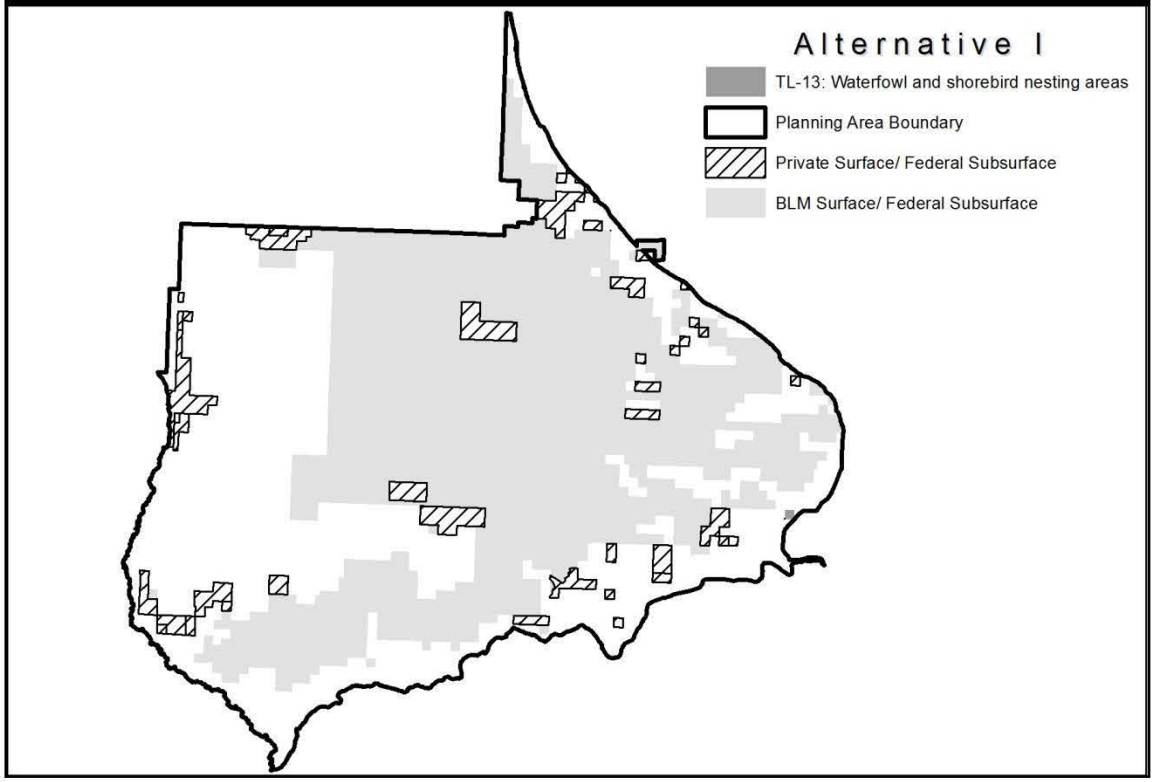
TL-10: Bald Eagle Nesting



TL-12: Peregrine Falcon Cliff Nesting Complex



TL-13: Waterfowl and Shorebird Nesting Areas



Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
No Surface Occupancy (NSO) Stipulations	
CRVFO-NSO-Roan-22: Steep Slopes (>50%), 27,620 acres	
Stipulation	**Standards**
NSO on slopes greater than 50 percent. No ground-disturbing activities on the 27,620 acres of slopes steeper than 50 percent.	1. No ground-disturbing activities will be granted in areas of steep slopes that also are designated as wildlife movement corridors. 2. Ground-disturbing activities in areas with slopes steeper than 50 percent will not be granted for access to areas with slopes less than 50 percent. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards detailed in Appendix I.
CRVFO-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat, 3,670 acres	
Stipulation	**Standards**
NSO to protect occupied and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the Endangered Species Act (ESA) or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 25 acres of habitat currently mapped as occupied or immediately adjacent to potential habitat.	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Ground-disturbing activities must avoid a 0.25-mile buffer around Mexican spotted owl nest sites year-round, with seasonal avoidance of active nests and a 0.5-mile buffer from February 1 - August 15.

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	3. If species affected by this stipulation is removed from the federal list, this stipulation would not apply to that species. Other requirements, however, will apply if the species remains classified as sensitive, or is otherwise protected. 4. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, must be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 5. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-25: Raptor Nest Sites, 910 acres	
Stipulation	**Standards**
NSO to protect approximately 910 acres around raptor nest areas not protected by the ESA or other species-specific stipulation. No ground-disturbing activities within 0.125 mile of an active nest (i.e., containing eggs or young or being attended by adults in preparation for nesting).	1. Site-specific ground-disturbing activity near active raptor nest sites will not be allowed between February 1 and August 15 unless the BLM determines, following consultation with CPW, that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure; abandonment of the nest; mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species, or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-

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	disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-26: Bald Eagle Nest or Winter Roost Sites, 380 acres	
Stipulation	**Standards**
NSO to protect approximately 380 acres of bald eagle nest, winter roost sites, and winter range. No ground disturbing activities within 0.25 mile of designated bald eagle nesting or roosting habitat, within bald eagle winter range, or within 0.25 mile of Fravert Reservoir (subject to valid existing rights and authorizations).	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values

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	protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim, 11,410 acres	
Stipulation	**Standards**
NSO to protect important wildlife security areas below the rim, especially those for deer and elk. No ground-disturbing activities in approximately 11,410 acres that provide high-value habitats along and below the base of the Roan Cliffs.	1. Ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors.

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	2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-28: High-value Special Status Fish Species Habitat, 15,820 acres	
Stipulation	**Standards**
NSO to protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat. No ground-disturbing activities in approximately 15,820 acres that would result in loss or degradation of areas designated as high-value habitat for Colorado River cutthroat trout.	1. Prior to implementing any ground-disturbing activity or other project component in areas designated as high-value habitat for Colorado River cutthroat trout, the proponent must provide an assessment of potential impacts if any, to this resource value. The assessment will be based on current baseline data, collected by the proponent as approved by the BLM; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. Ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance of the species of interest. In making this determination, the BLM will consider the following resource factors: habitat conditions needed for feeding, spawning, survival of eggs and larvae, and refugia during high or low flow. Impairment could include siltation of substrate; changes in flow regime (e.g., localized damming); loss of overhanging vegetation canopy; reduction in bank stability; reduction in water quality; and direct mortality of trout or trout eggs; behavioral and ecological relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species of interest or cause habitat to become unusable. Approval of ground-disturbing activities granted in

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	any given year will not constitute approval for subsequent years; in such cases, approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that: (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-23: Riparian and Wetland Habitat, 490 acres	
Stipulation	**Standards**
NSO to protect approximately 490 acres of riparian or wetland vegetation. Ground-disturbing activities including oil and gas facilities, roads, pipelines, electric transmission lines, communication facilities, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.	1. A ground-disturbing activity may be permitted only if BLM determines that (a) the activity will not cause loss of riparian vegetation or, if riparian vegetation is lost, that the loss is limited to no more than 0.1 acre, and 100 linear feet, per mile of stream; (b) any temporarily disturbed areas must be revegetated with existing or similar species, including use of containerized nursery stock rather than seeds to replace woody plants on a one-to-one basis (trees) or area-for-area basis (shrubs); (c) revegetation success will be achieved within 2 years; (d) the activity will not impair water quality, flow regime, aquatic habitat quality, and channel and bank stability; and

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	(e) no practicable alternative is available. Resource factors include topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or enhancement of the resource values. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such instances approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-30: I-70 Viewshed (VRM Class II), 13,770 acres	
Stipulation	**Standards**
NSO to protect 13,770 acres of the Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the

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	type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I), 1,620 acres	
Stipulation	**Standards**
NSO to protect East Fork Falls Viewshed (VRM Class II).	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential

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	adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-21: Anvil Points Claystone Cave, 120 acres	
Stipulation	**Standards**
NSO to protect 120 acres encompassing the Anvil Points Claystone Cave. No ground disturbing activities in the area encompassing the cave opening, subsurface features, and watersheds overlying the caves.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. A ground-disturbing activity may be permitted only if the BLM determines that a proposed activity would not impair the cave values, supported by a demonstration of such, based on monitoring data or another method with a high degree of scientific reliability, and considering the type, amount, duration, and timing of the activity; and after consultation with CPW regarding wildlife habitat values.

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	3. During and subsequent to the ground-disturbing activities covered by this provision, ongoing monitoring data will be collected using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified; and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-29: Colorado River Corridor, 440 acres	
Stipulation	**Standards**
NSO to protect approximately 440 acres of high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of high-water mark on either side of river.	1. A specific activity may be allowed if the BLM determines that (a) the specific activity or requested change would not impair water quality, high-quality habitat, and scenic qualities after considering the vegetation, topography, existing habitat impacts, and other site-specific or activity-specific factors and the amount, type, and duration of surface disturbance proposed, and (b) any lost vegetation would be replaced with the same or similar species within 3 to 5 years. 2. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories, 10 acres	
Stipulation	**Standards**
Prohibit surface occupancy and surface-disturbing activities for spent shale repositories 1, 2 and 3	An exception, modification or waiver may be granted if BLM determines that there is an urgent health or safety need.

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GRSG-NSO-46e1: *NSO within 2 miles of active GRSG leks, in GRSG ADH, no exceptions anticipated*	
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference	
GRSG-NSO-46e2: *Exceptions, modifications, and waivers on the remainder of PHMA. Authorized Officer could grant and exception or modification in consultations with the State of Colorado.*	
Stipulation incorporates stipulation NSO-46e(2) from the NCGSG Proposed LUPA/FEIS by reference	
Controlled Surface Use (CSU) Stipulations	
CRVFO-CSU-Roan-12: Habitat for Special Status Plant Species Populations and Significant Plant Communities, 17,840 acres	
Stipulation	**Standards**
CSU to protect approximately 17,840 acres of special status plant species or significant plant communities. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources for disturbance within a watershed that would disturb, alter, or interrupt the hydrologic or ecological processes that support special status plant species or significant plant communities. Special status plants include the following: DeBeque milkvetch (*Astragalus debequaeus*), DeBeque phacelia (*Phacelia submutica*), hanging garden sullivantia (*Sullivantia hapemanii*), Parachute penstemon (*Penstemon debilis*), Piceance bladderpod (*Lesquerella parviflora*), Roan Cliffs blazingstar (*Mentzelia rhizomata*), sun-loving meadowrue *(Thalictrun heliophilum*), and Utah fescue (*Argillochloa dasyclada*).	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values associated with species health and ecological function of associated habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the status of the population; ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of the population or community; the effects on both individuals of the species and populations; the relationship to topography and other vegetation; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or community. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or nonimpairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are

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	noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I
CRVFO-CSU-Roan-07: Riparian and Wetland Habitat, 11,440 acres	
Stipulation	**Standards**
CSU to protect 11,440 acres of riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.	1. The BLM will consider the following resource factors: proper hydrological and ecological functioning; protection of habitat supporting fish and wildlife resources; ecological requirements to maintain the riparian area; the type, amount, and duration of the surface disturbance; the relative extent and condition of the riparian area; the relationship to topography and surrounding vegetation; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or condition of the riparian area. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from

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	which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex, 370 acres	
Stipulation	**Standards**
CSU to protect approximately 370 acres of peregrine falcon cliff nesting complex. Ground-disturbing activities may be relocated outside of the cliff-nesting complex along the Roan Cliffs.	1. A site-specific ground-disturbing activity may be allowed within the CSU only if, following consultation with CPW, the BLM determines that the specific activity or requested change would not impair behaviors, habitat use and quality, and reproductive success of the peregrine falcon present within the area. In making this determination, the BLM will consider the status of the nest (active or inactive); behavioral and ecological requirements of the species; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVFO-CSU-Roan-09: Wildlife Security Areas Above the Rim, 11,410 acres	
Stipulation	**Standards**
CSU to protect important wildlife security areas above the rim, especially deer and elk. Ground disturbing activities may be relocated more than 200 meters to avoid approximately 11,410 acres of wildlife security areas above the rim.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVFO-CSU-Roan-10: Big Game Migration Corridors, 1,560 acres	
Stipulation	**Standards**
CSU to protect contiguity and extent of big game migration corridors. Ground-disturbing activities may be relocated more than 200 meters to avoid approximately 1,560 acres of big game migration corridors.	1. A site-specific ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of big game species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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CRVFO-CSU-Roan-11:Sensitive Bat Species Habitat, 120 acres	
Stipulation	**Standards**
CSU to protect and preserve bat habitat values of the Anvil Points Claystone Cave. Special design, construction, implementation, and/or mitigation measures including relocation of operations by more than 200 meters to protect approximately 120 acres of habitat may be required for those species listed as sensitive by the BLM.	1. If the BLM, in consultation with CPW, determines that a proposed surface disturbing activity will unacceptably impair resource values associated with sensitive bat species habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of sensitive bat species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVFO-CSU-Roan-04: Erosive Soils and Slopes (>30%), 24,300 acres	
Stipulation	**Standards**
CSU for erosive soils with slopes greater than 30 percent. The BLM may require special analysis, design, construction, operation, mitigation, reclamation measures, monitoring, and/or relocation by more than 200 meters to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in the 24,300 acres with highly erosive soils on slopes steeper than 30 percent.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to preserve soil stability and productivity and minimize adverse impacts from soil erosion. The BLM's determination will be based on site-specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. BMPs (Appendix H) and reclamation standards (Appendix I will be used to mitigate soil impacts. 4. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area, 33,010 acres	
Stipulation	**Standards**
CSU to protect 33,010 acres within the Parachute Creek high-value watershed and Watershed Management Area (WMA). Provide resource protections through actions that minimize disturbance and habitat fragmentation, and protect key habitats from disturbance.	1. Prior to exploration and/or lease development within the Planning Area, the operator must submit a Master Development Plan (MDP) identifying projected activity (including well locations, pipelines, and facilities) during the next 2 to 5 years and appropriate monitoring and methodologies to ensure compliance with the BLM identified standards (including limitations on surface disturbance).

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
	2. All oil and gas operations and activities on top of the plateau will be under the control of a single operator; the BLM will directly control and manage the timing, location, and type of all operations by that single operator in accordance with the following decisions: 2.1 Oil and gas development activities (well pads and facilities) will be restricted to six specific development areas along ridge tops on slopes less than 20 percent. Access routes and pipelines will be allowed on slopes less than 50 percent. The least percent slope will be used to the extent practicable. 2.2 Operations, excluding exploration activities, will be staged and sequenced over time from one geographic area to the next with each area being substantially developed prior to moving to the next. 2.3 Surface disturbance associated with development and production activities will be allowed on only one of six development areas at a time; exploratory wells may be drilled in other areas in a non-sequential area-by-area manner sufficient to plan future drilling operations. Activities will be subject to the disturbance limitations identified in Section 2.4. Production (the flow of gas) will be allowed from multiple areas at any one time. Re-entry into existing wells or drilling of new wells will be subject to phasing and sequencing by area. In order to progress from one geographic area to the next, the lessee must first demonstrate and document compliance with the standards associated with the various stipulations and requirements of this plan. 2.4 Total unreclaimed surface disturbance because of exploration, development, and production activities will be limited to 350 acres at any given time with the exceptions as provided below in Section 2.4.2. For purposes of this stipulation, areas will be considered reclaimed only if they meet the requirements of the five-year reclamation standards outlined in Appendix I. 2.4.1 Unreclaimed surface disturbance associated with construction of the following would accrue toward the 1-percent limit: 2.4.1.1. Disturbance associated with well pads above a threshold of 1 acre per pad; 2.4.1.2. Pipelines, whether for oil, gas, or water; 2.4.1.3. Compressors, dehydration units, storage tanks, maintenance buildings, and other surface facilities; 2.4.1.4. Borrow ditches, water diversion structures, and cut/fill slopes on any route used for oil and gas access; and 2.4.1.5. Construction of new routes and realignment, widening, or other improvement of existing routes used for oil and gas access.

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	2.4.2 Unreclaimed surface disturbance associated with the following would not accrue toward the 1-percent limit: 2.4.2.1. The existing driving surface (or improvements to the driving surface) on existing routes designated as open (not to exceed a total of 96 miles atop the plateau); 2.4.2.2. The existing driving surface (or improvements to the driving surface) on existing routes to be designated as administrative use only (not to exceed a total of 47 miles atop the plateau); and 2.4.2.3. Up to one acre per well pad to accommodate unavoidable long-term disturbance associated with production activities at operating wells. 2.5 Five-year interim reclamation standards must be met on 90 percent or more of disturbed lands within any given development area, as determined by the BLM, prior to development operations being allowed in another development area. For purposes of this stipulation, areas will be considered reclaimed only if they meet the requirements of the five-year reclamation standards outlined in Appendix I. 2.6 Drilling pads will be a minimum of approximately 2,640 feet apart, and development and production facilities will be clustered and designed to minimize surface impacts. Where practicable, centralize pads for frac material storage. 2.7 Open and administrative motorized routes will be limited to approximately 191 miles. 2.8 Exceptions will be allowed only where necessary to reduce impacts, such as using a longer route to avoid a sensitive resource or reduce visual impacts and direct habitat loss. 2.9 Innovative reclamation and performance-based monitoring standards will be implemented. 2.10 Roads and natural gas production facilities, pipelines, and staging areas along roadways, will be consolidated to minimize disturbance and associated disruption of wildlife habitat. 2.10.1 To the fullest extent practicable, the use of pipelines and other methods to transport drilling and produced water, as well as fracing and other fluids will be incorporated. 2.10.2 Where practicable, pipelines to remove condensate and gas will be utilized. 2.10.3 Specific roadways and consolidation locations will be approved by the

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	BLM during the MDP process. 2.11 Before any on-the-ground lease operations are considered for approval by the BLM on top of the plateau, lessees will reach formal agreement on one operator to conduct all operations on behalf of all the lessees. All lessees/leases will join a Federal Unitization Agreement, approved by the BLM. The Unitization Agreement will be non-contracting. The agreement will allow the BLM to directly control and manage the timing, location, and type of all operations occurring on the entire top of the plateau. In effect, all of the leases will act administratively as a single lease; the BLM will work with just one operator for the life of all oil and gas operations occurring on top of the plateau. The Federal Unitization Agreement will (among other things) identify the agreed-upon single operator, and provisions on how to allocate the benefits of gas and/or production to all of the leases. 3. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with the WMA, or relocation or modification of such activity is found to be acceptable If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values, the BLM will modify or relocate the proposed activity. The BLM will consider the following resource factors: protection of ecological, hydrological, and habitat functions and resources; the type, amount, and duration of the surface disturbance; relationship to naturally occurring conditions; topography; type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset any adverse effects; and other factors that may affect the paleontological resource. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity will provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. The BLM will determine what level of protection available under this stipulation is required to protect Colorado River cutthroat trout and habitat, rare and/or significant natural plant communities, and municipal water supply and quality. The BLM's determination would be based on site-specific conditions and the type, amount, and duration of the associated impacts. 4. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. This monitoring may specifically include but not be

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	limited to monitoring of surface and groundwater. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures to be applied to future proposed activities. 5. Short-term (reclaimed within two years of initiation) activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan-14: VRM Class II Areas Below the Rim, 29,560 acres	
Stipulation	**Standards**
CSU to protect approximately 29,560 acres in VRM Class II areas. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class II areas below the rim to retain the existing landscape character and allow only limited changes.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class II objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually or as required by the BLM. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
	identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan-15: VRM Class III Areas Above the Rim, 32,880 acres	
Stipulation	**Standards**
CSU to protect 32,880 acres of VRM Class III areas on top of the plateau. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class III areas.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class III objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component.

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	3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan -16: Hubbard Mesa Open OHV Riding Area, 2,330 acres	
Stipulation	**Standards**
CSU to protect recreation opportunities and settings in the Hubbard Mesa Off-Highway Vehicle (OHV) Riding Area 2,330-acre Special Recreation Management Area (SRMA). The BLM may require special design, construction, operation, mitigation, and reclamation measures, including relocation by more than 200 meters.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values with OHV opportunities within the Hubbard Mesa area, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: existing OHV use; existing OHV riding opportunities; anticipated future use; management of OHV use; type, amount, and duration of the surface disturbance; the relative extent of OHV use and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect OHV riding opportunities. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from

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	which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I
CRVFO-CSU-Roan-18: Sharrard Park Paleontological Resources, 1,020 acres	
Stipulation	**Standards**
CSU to protect 1,020 acres of the Sharrard Park paleontological resource. The BLM may require special survey, design, construction, operation, and reclamation measures, or relocation by more than 200 meters in identified portions of Wasatch Formation outcrops in Sharrard Park. Prior to any ground disturbing activity, the operator must have the paleontological resources surveyed within 200 feet of the proposed disturbance by a BLM approved paleontologist. Other special measures include requirements that (a) on-site personnel are informed of the potential for fossils, (b) the proponent will notify the BLM if any fossils are found, and (c) activities do not disturb fossils in any way.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to protect, preserve, and/or recover the fossil resources at specific sites or for specific activities within this area. The BLM determination will be based on site specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Timing Limitation (TL) Stipulations	
CRVFO-TL-Roan-13:Big Game Winter Range, 38,430 acres	
Stipulation	**Standards**
TL to protect and maintain physical and biological components important to deer and elk winter range (approximately 38,430 acres) and the obligate species, both on federal lands and across the landscape as a whole, as opportunities present. This includes reducing or eliminating stress induced impacts to deer and elk associated with human activity during critical winter months when animals are already stressed by environmental factors and concentrated on limited winter range. Surface disturbance and human activities that lessen the quality of the deer and elk winter range will not be allowed from December 1 to April 30. Ongoing drilling and other activities and operations will be designed and implemented such that the well bore is adequately secured and that all drilling and surface-disturbing operations cease by December 1 in important and critical deer and elk winter habitats. In the event of unforeseeable and unplanned events, extensions not exceeding two weeks in duration may be authorized to ensure safe shutdown of drilling operations, and conservation of mineral resources. Human activities including visitations for production activities and well monitoring from December 1 to April 30 will be designed and carried out to minimize impacts. This includes well monitoring through telemetry, scheduling of all nonemergency well maintenance activities outside the December 1 to April 30 timeframe, conducting unavoidable and necessary on-the ground visits between the hours of 10:00 a.m. and 3:00 p.m., and minimizing on-the-ground visitations.	1. Site-specific ground-disturbing activity in big game winter range may be allowed between December 1 and April 30 if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with the quantity and quality of the winter range for the species of interest. In making this determination, the BLM will consider the following resource factors: minimization of the footprint of activities; fragmentation; impacts to winter range across the Planning Area as a whole; effectiveness of voluntary off-site mitigation of habitat with respect to quantity, quality, and duration of both the surface-disturbing activity and mitigation; the relative extent of available winter range; relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the winter range or cause winter range to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. The big game winter range TL may not apply, and the restriction may be considered to be met, if the BLM determines, following consultation with CPW, that animals are not using the habitat, are not likely to use the habitat in a particular season, and that activities will not lessen overall habitat quality in future years. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVFO-TL-Roan-14: Raptor Nest Sites, 3,550 acres	
Stipulation	**Standards**
TL to protect approximately 3,550 acres of nesting and fledging habitat for raptors not protected by species-specific measures. This includes owls, northern harriers, accipiters, buteos, golden eagle, osprey, and falcons except the American kestrel. Within a 0.25-mile radius of a nest, no activities or other sources of disturbance with the potential to cause the nest not to be used or lead to nest failure, abandonment, or mortality of fledglings will be allowed. Stipulations will be applied annually from February 1 through August 15.	1. Site-specific ground-disturbing activity near active raptor nest sites may be allowed between February 1 and August 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
CRVFO-TL-Roan-15: Bald Eagle Nest or Winter Roost Sites, 510 acres	
Stipulation	**Standards**
TL to protect approximately 510 acres of nesting, fledging, and winter roost habitat of the bald eagle. Within a 0.5-mile radius of a nest, no activities or other sources of disturbance that could cause the nest not to be used or lead to nest abandonment, failure, or mortality of fledglings will be allowed. Stipulations will	1. Site-specific ground-disturbing activity at bald eagle nests or winter roost sites may be allowed between November15 and June 15 if the BLM determines, following Section 7 consultation with the USFWS that the requested activity would not impair values associated with maintenance or recovery of the species; behaviors associated with winter roosting, nesting, and

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
be applied annually from November 15 through June 15.	fledging; or fledging habitat. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); the type, intensity, and duration of disturbance; measures required by the USFWS; potential for the activity to cause the roost or nest not to be used; potential for nest failure, abandonment of the roost or nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect roosting or nesting success. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. This TL will be applied to wells that are drilled directionally from private surface into Federal minerals for the Federal lease being developed. Where the Federal lease does not include a relevant TL stipulation (and a nest or roost site falls within the identified buffer), BLM would not approve any permits for Federal wells or grant a right-of-way across BLM land unless the proponent has agreed to a voluntary TL (allowing a determination of “No Effect”) or until Section 7 consultation on proposed action has been completed and any associated terms and conditions agreed to by the proponent. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVFO-TL-Roan-16: Peregrine Falcon Cliff Nesting Complex, 920 acres	
Stipulation	**Standards**
TL to protect approximately 920 acres of nesting and fledging habitat of the State-listed threatened peregrine falcon. Within a 0.5-mile radius of the cliff-nesting complex on the Roan Cliffs, no activities or other sources of disturbance that could cause abandonment of a nest or established territory will be allowed. Stipulations will be applied annually, from March 15 through July 31.	1. Site-specific ground-disturbing activity at the peregrine falcon cliff-nesting complex may be allowed between March 15 and July 31 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
CRVFO-TL-Roan-17: Waterfowl and Shorebird Nesting Areas, 90 acres	
Stipulation	**Standards**
TL to protect approximately 90 acres of nesting and brood-rearing habitats at the Fravert Reservoir Watchable Wildlife Area. No ground-disturbing activities or other sources of disturbance, from April 15 through July 15, or until all young have hatched and dispersed from the production area, or that could cause	1. Site-specific ground-disturbing activity at the Fravert Reservoir Watchable Wildlife Area may be allowed between April 15 and July 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
waterfowl and shorebirds not to nest or lead to nest failure or abandonment within 0.25- mile of the nesting and production area of Fravert Reservoir will be allowed.	making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); hatching and dispersal of young from the production or nesting area; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GRSG-TL-46e: *No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).*	
Stipulation incorporates stipulation GRSG-TL-46e from the NCGSG Proposed LUPA/FEIS by reference.	
GRSG-TL-PHMAPHMA-ROW-TL: *Prohibit surface occupancy and surface disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).*	
Stipulation incorporates stipulation GRSG-TL-PHMA-ROW-TL from the NCGSG Proposed LUPA/FEIS by reference.	

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
CRVO-TL- Roan 1: Migratory Bird Nesting Season	
Stipulation: Prohibit surface occupancy and surface-disturbing activities from May 15 to July 15. The stipulation would be applied based on biological surveys and species habitat preferences. **Purpose:** To protect use of nesting and fledgling habitat for birds of conservation concern (BCC). **Exception:** Standard exceptions apply. The application of the timing limitation would consider: the type of equipment to be used, the scale, and the duration of the project; species potentially present; habitat types present; breeding phenology; weather conditions; elevation; distance to known nests; and terrain.. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.	
CRVO-TL- Roan 2: Elk Production Area, 24,400 acres	
Stipulation: Prohibit surface occupancy and surface disturbing activities from April 15 to June 30 in mapped elk production areas to reduce behavioral disruption during parturition and early young rearing period. This stipulation does not apply to operation and maintenance of production facilities. **Exception:** The Field Manager may grant an exception if an environmental analysis indicates that the proposed action can be conditioned so as not to interfere with habitat function or compromise animal condition within the project vicinity. An exception may also be granted if the proponent, Bureau of Land Management, and Colorado Division of Wildlife negotiate compensation that would satisfactorily offset anticipated impacts to big game production or habitat condition, or an agreement can be reached where by a COGCC wildlife mitigation plan can be accommodated consistent with established RMP objectives and decisions. An exception may also be granted for actions intended to enhance the long term utility for availability of suitable habitat. **Modification:** The Field Manager may modify the size and time frames of this stipulation if Colorado Division of Wildlife monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. **Waiver:** This stipulation may be waived if Colorado Division of Wildlife determines that the area is no longer utilized by big game for production purposes.	
Lease Notices (LN) Stipulations	
CRVFO-LN-Roan-14: Master Development Plan (MDP)	
Stipulation	**Standards**
A MDP will be required of oil and gas operators prior to exploration or development activities.	1. For all activities in each of the geographic areas atop the plateau (see Map 1), and in areas being actively explored or developed below the rim, the operator must submit a MDP. The MDP must include all anticipated activities for a minimum of 2 years following the date of submission, for all operator-controlled federal leases or units. A longer term is encouraged and would be allowed under this standard to expedite the permitting process, provide for efficiencies as provided for in Standard 6 of this stipulation, and reduce costs to the operator for MDP preparation. 2. The boundaries of the geographic areas to be addressed atop the plateau, as identified by the BLM, may be modified with approval from the BLM. The

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
	boundaries of all other geographic areas must be proposed by the operator and must be approved by the BLM. 3. The MDP must identify all anticipated exploration, development, and production activities on federal leases within the area, identifying well locations, roads, pipelines, and any other exploration or production disturbance or facilities. 4. The MDP must include all specific measures needed to comply with standards associated with all stipulations and any other decisions of this RMPA. 5. The MDP must include an analysis of site-specific and cumulative environmental effects and mitigation. The MDP must also address reasonable alternatives, and other information sufficient to satisfy the requirements of the National Environmental Policy Act (NEPA). The extent of the analysis will be dependent on the extent of surface ownership, extent of lease holdings, topography, access, resource concerns, and the ability to tier to the Roan Plateau Environmental Impact Statement (EIS), consistent with 40 CFR § 1500. The extent of the analysis needed to comply with 40 CFR § 1500 may appropriately vary when considering individual wells or small groups of exploratory wells or for directional wells drilled on previously developed wellpads. 6. To the extent practicable, the activities identified in the MDPP must be presented in such a manner as to support the orderly and efficient exploration and development of mineral resources in an environmentally responsible manner. 7. MDPs may be modified by operators as needed, and shall be reviewed by the operators not less than annually. As appropriate, either a statement documenting that the MDP is current or a modified MDP shall be provided to the BLM.
CRVFO-LN-Roan-34: ESA Consultation	
Stipulation	**Standards**
Endangered Species Act, Section 7 Consultation Stipulation.	1. The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not

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Appendix Table C-2. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative II, FEIS Proposed Plan	
	approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.
GRSG PHMA LN-46e: *Any lands leased in PHMA are subject to the restrictions of 1 disturbance per 640 acres calculated by CO management zone to allow clustered development.*	
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference	
GRSG PHMA LN -54e: *Within PHMA, operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single well Applications for Permit to Drill for all exploratory wells.*	
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference	
CRVFO-LN-Roan-35: Emergency Response Plan	
The operator is required to prepare and maintain a current emergency response plan. The plan shall be provided to the BLM, Colorado State Patrol, the affected county and communities, and the general public. The plan shall contain information sufficient to describe the potential for emergency incidents related to fluid minerals development that pose an immediate danger to human health and safety and would normally require immediate actions by the operator to remove the threat, such as for hazardous materials spills; actions to be taken by the operator in the event of such an incident; and a communications plan to inform appropriate authorities and potentially affected citizens.	

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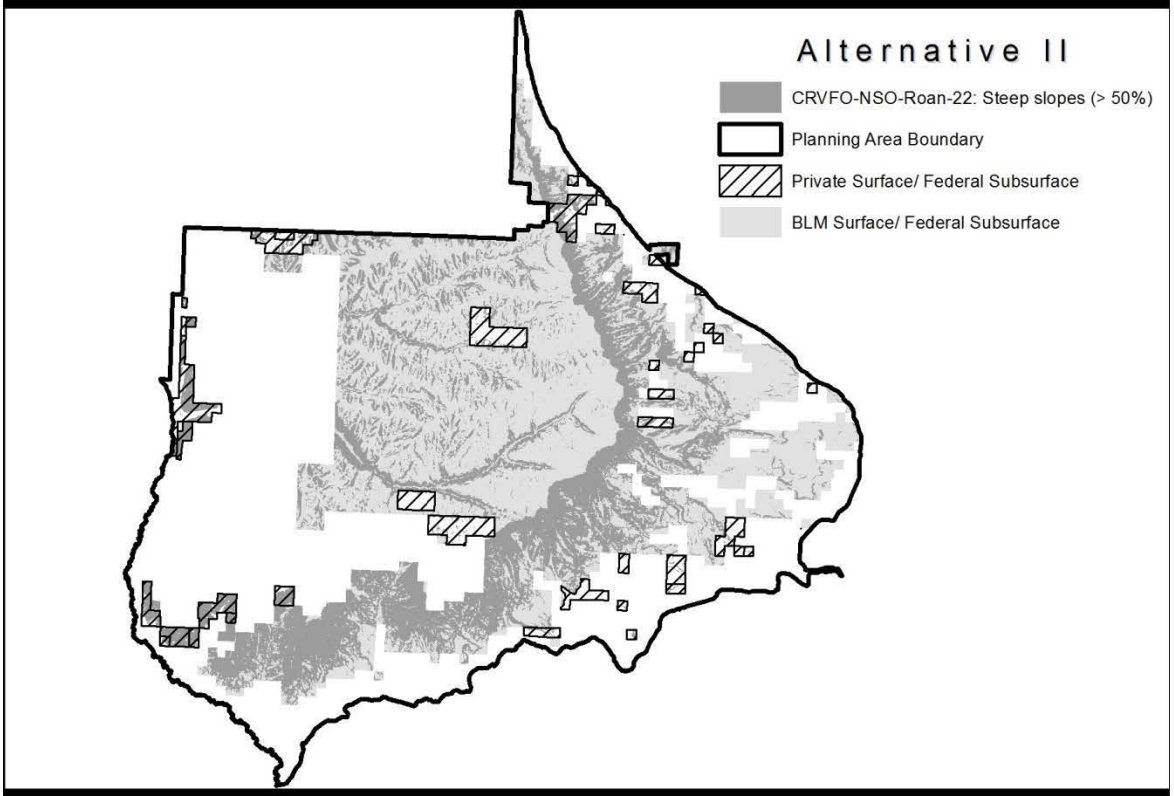
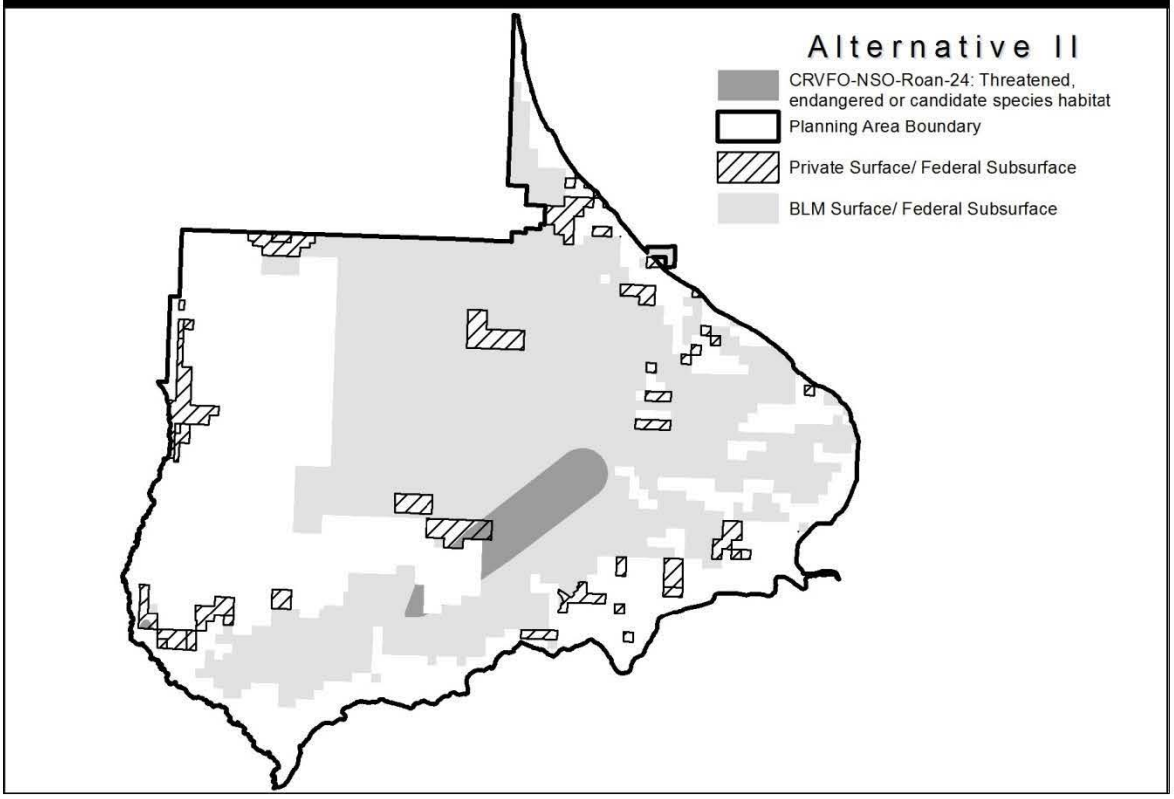
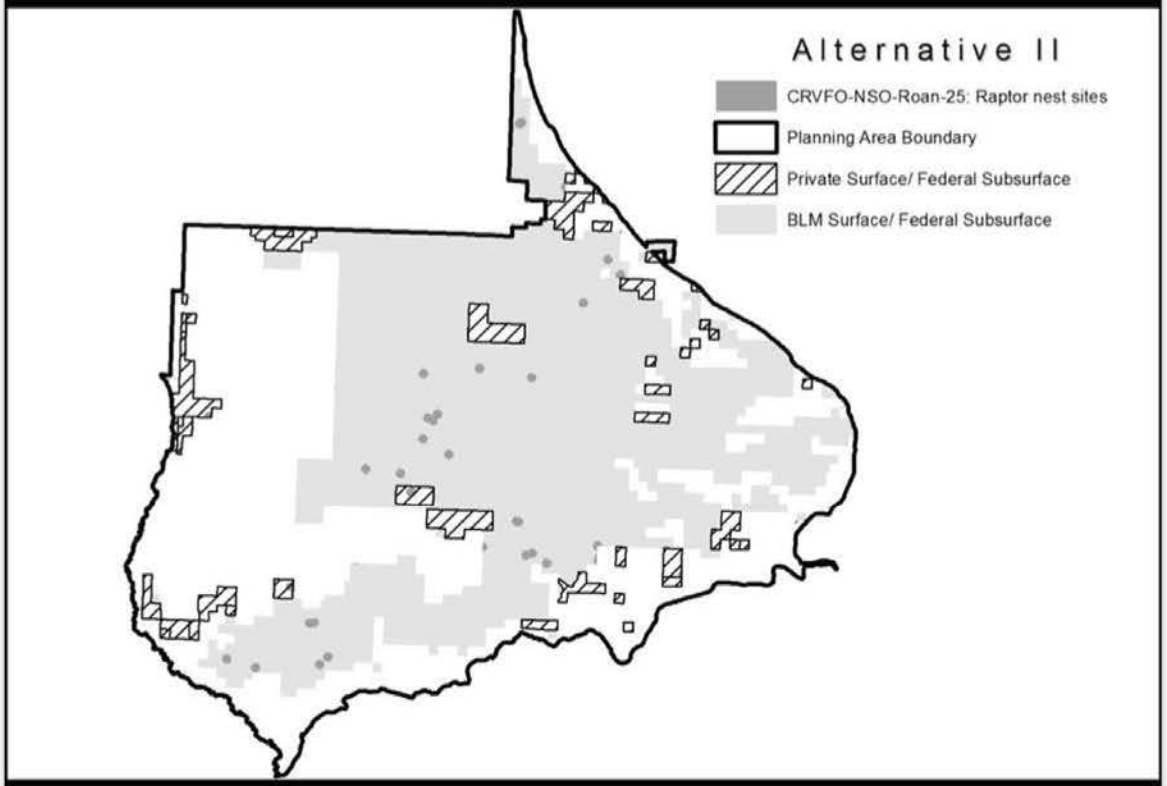
CRVFO-NSO-Roan-22: Steep Slopes (> 50%)



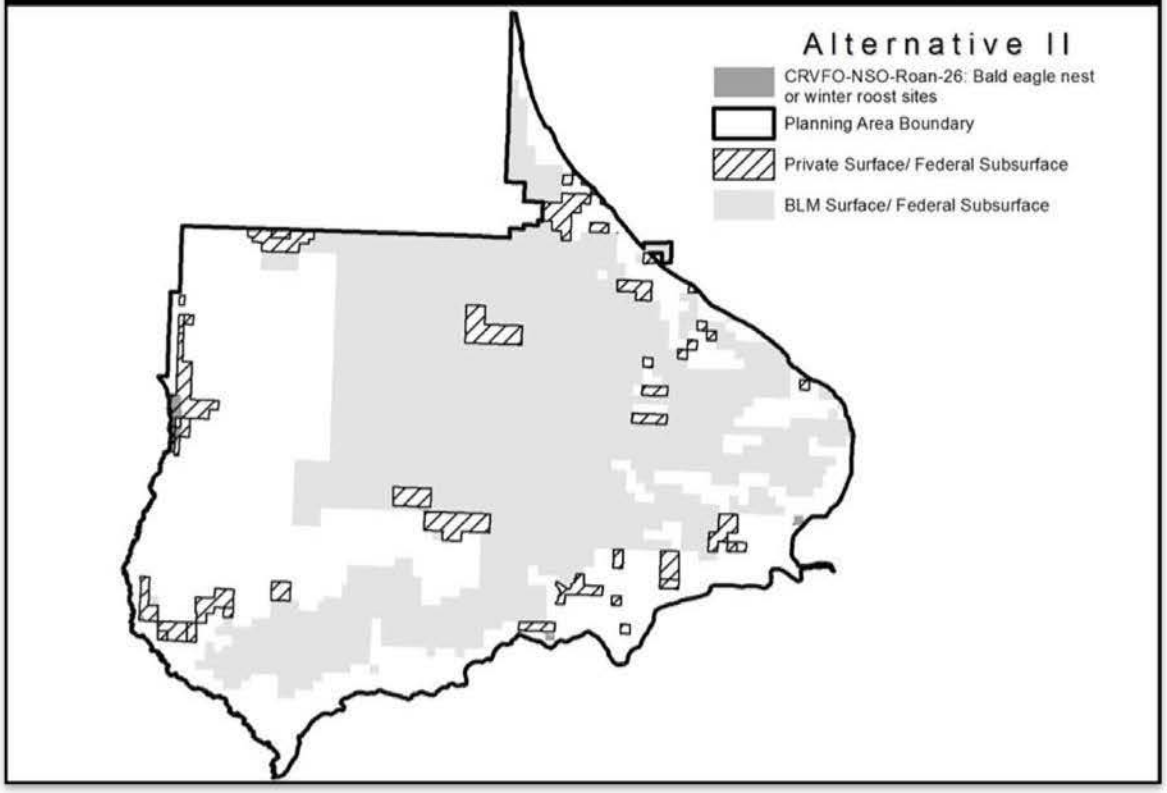
CRVFO-NSO-Roan-24: Threatened, endangered or candidate species habitat



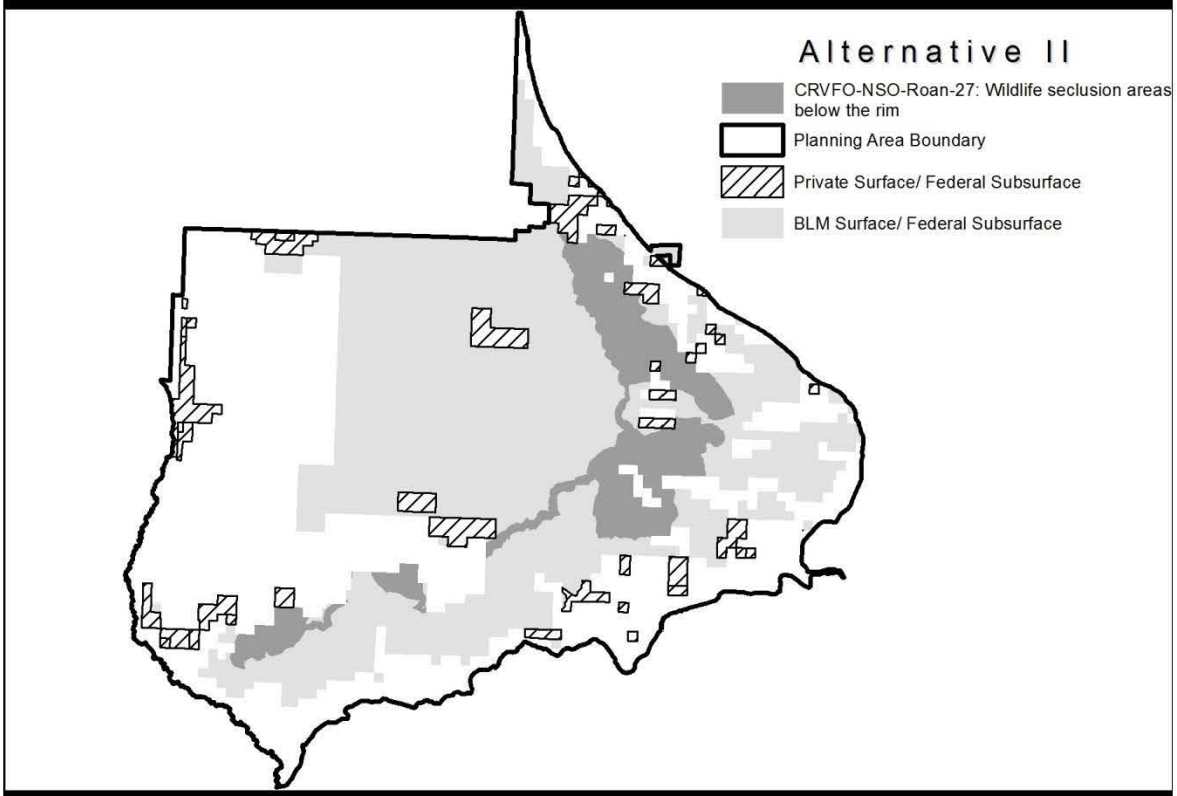
CRVFO-NSO-Roan-25: Raptor Nest Sites



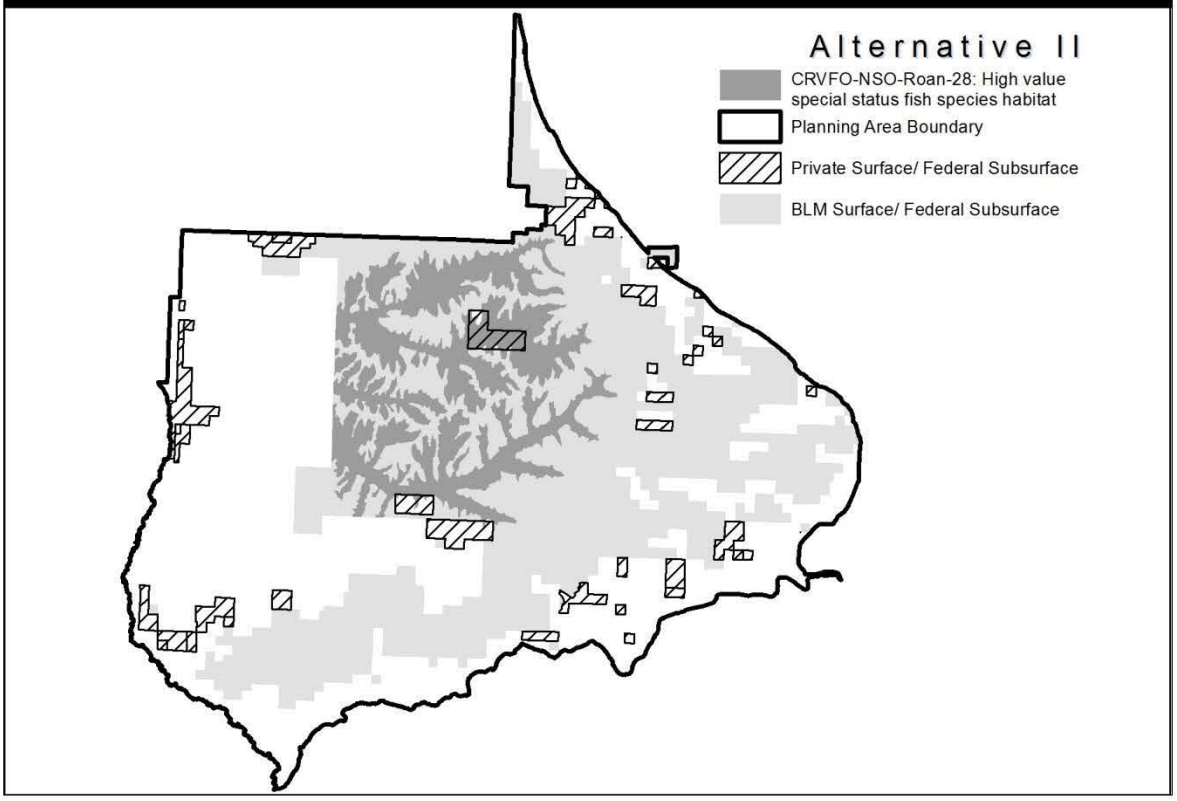
CRVFO-NSO-Roan-26: Bald Eagle Nest or Winter Roost Sites



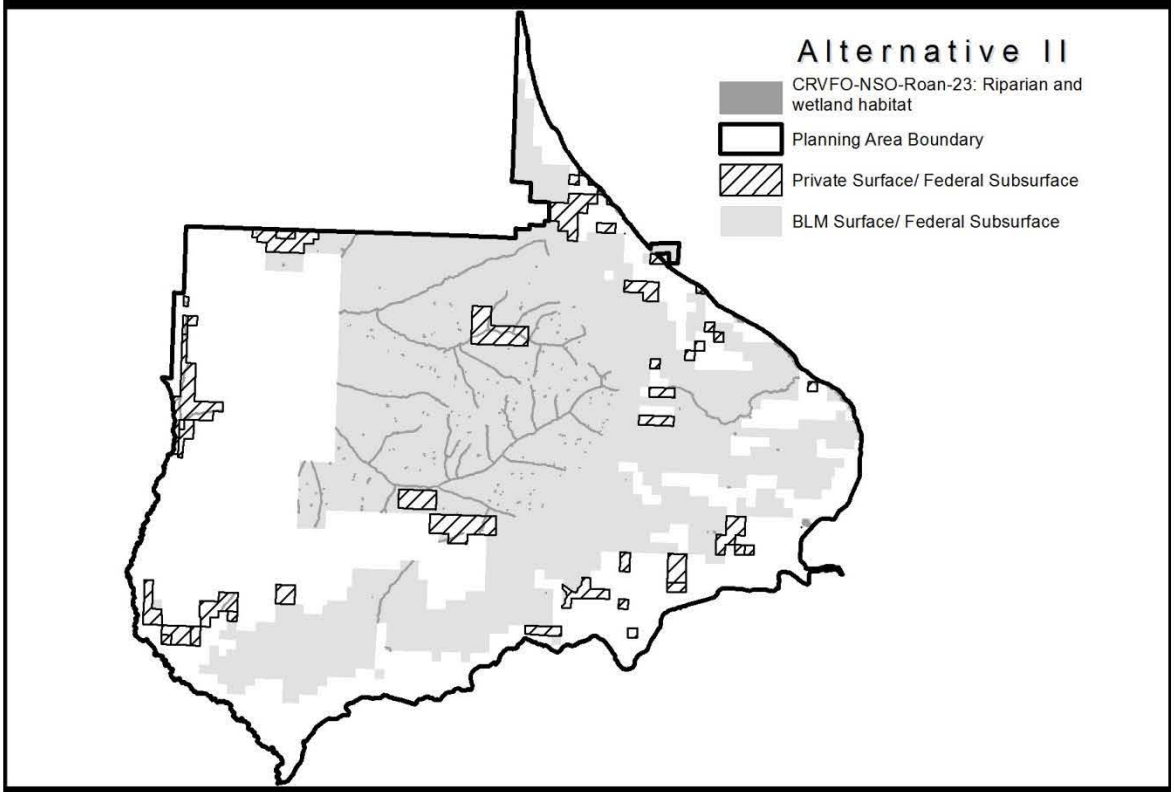
CRVFO-NSO-Roan-27: Wildlife seclusion areas below the rim



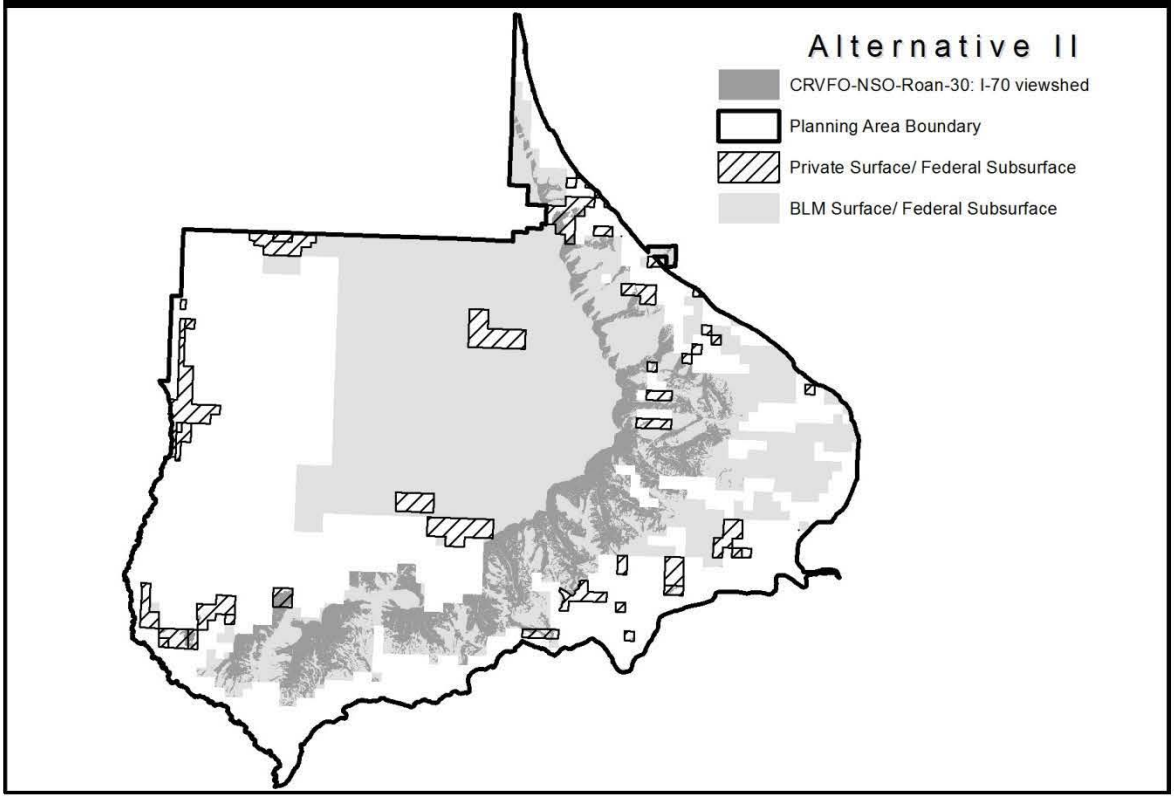
CRVFO-NSO-Roan-28: High value special status fish species habitat



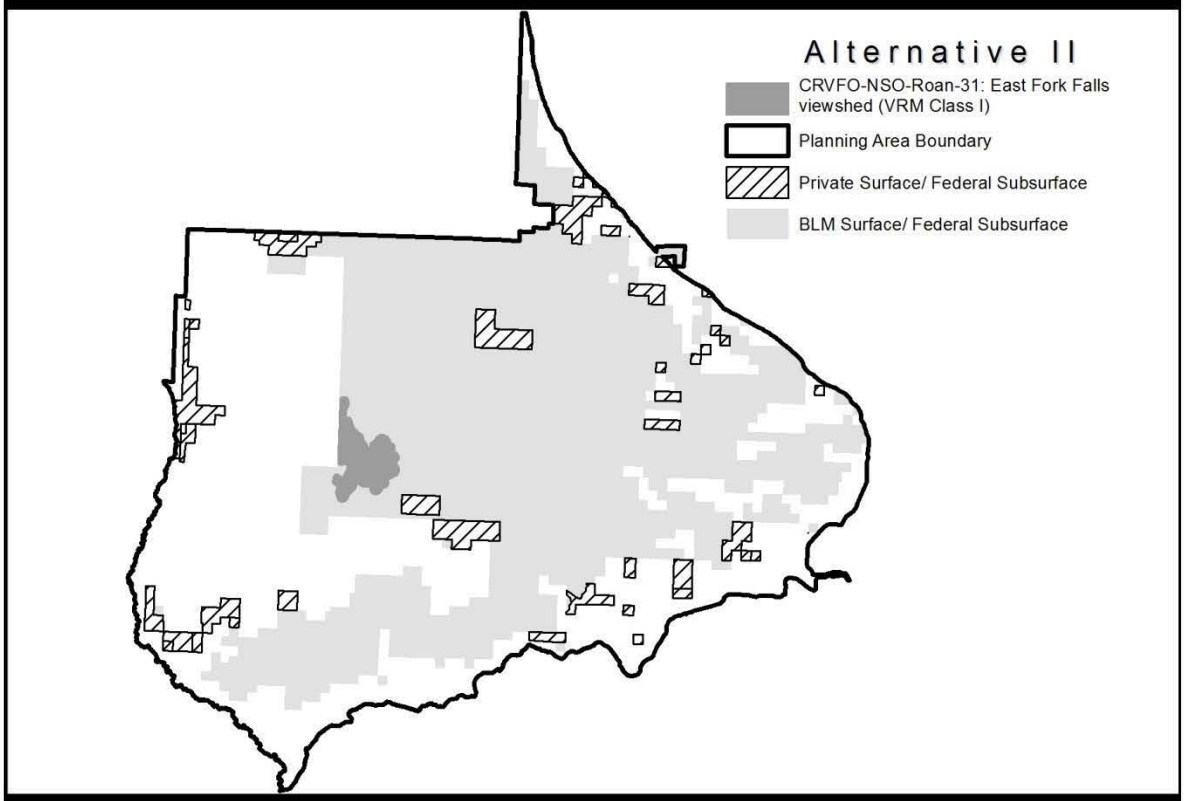
CRVFO-NSO-Roan-23: Riparian and wetland habitat



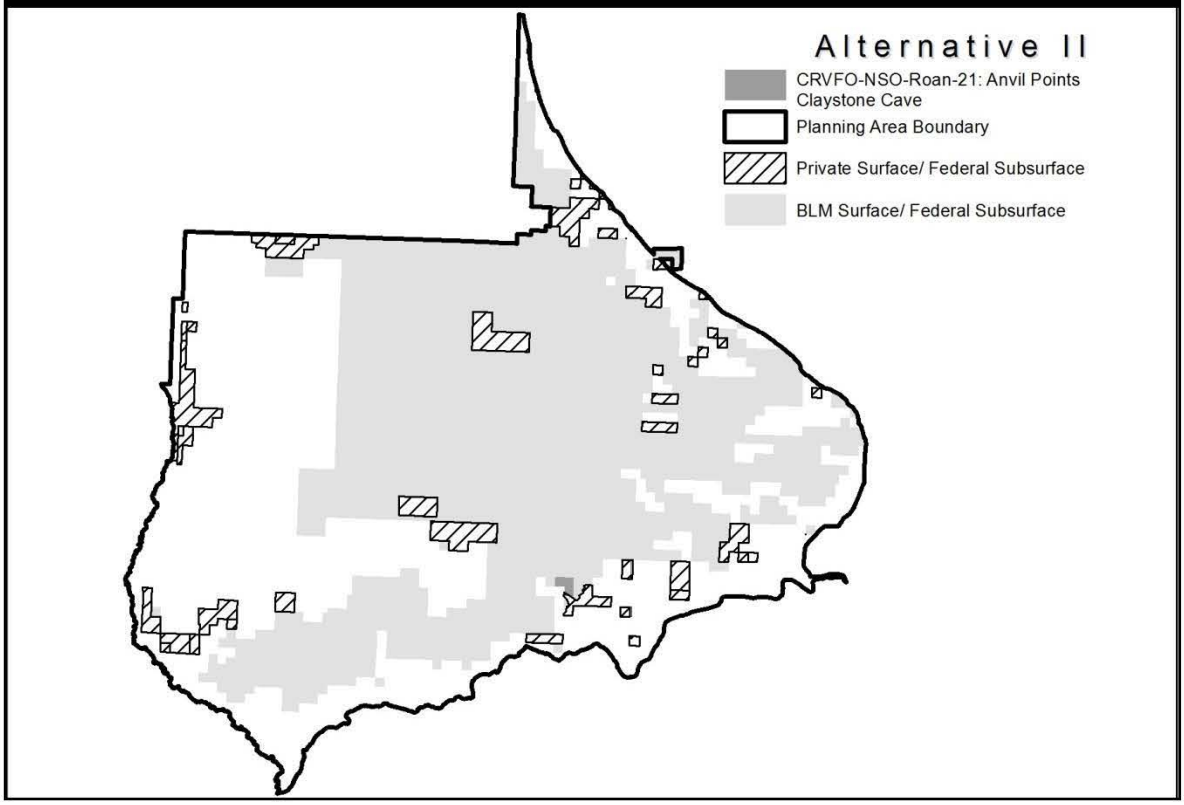
CRVFO-NSO-Roan-30: I-70 Viewshed (VRM Class II)

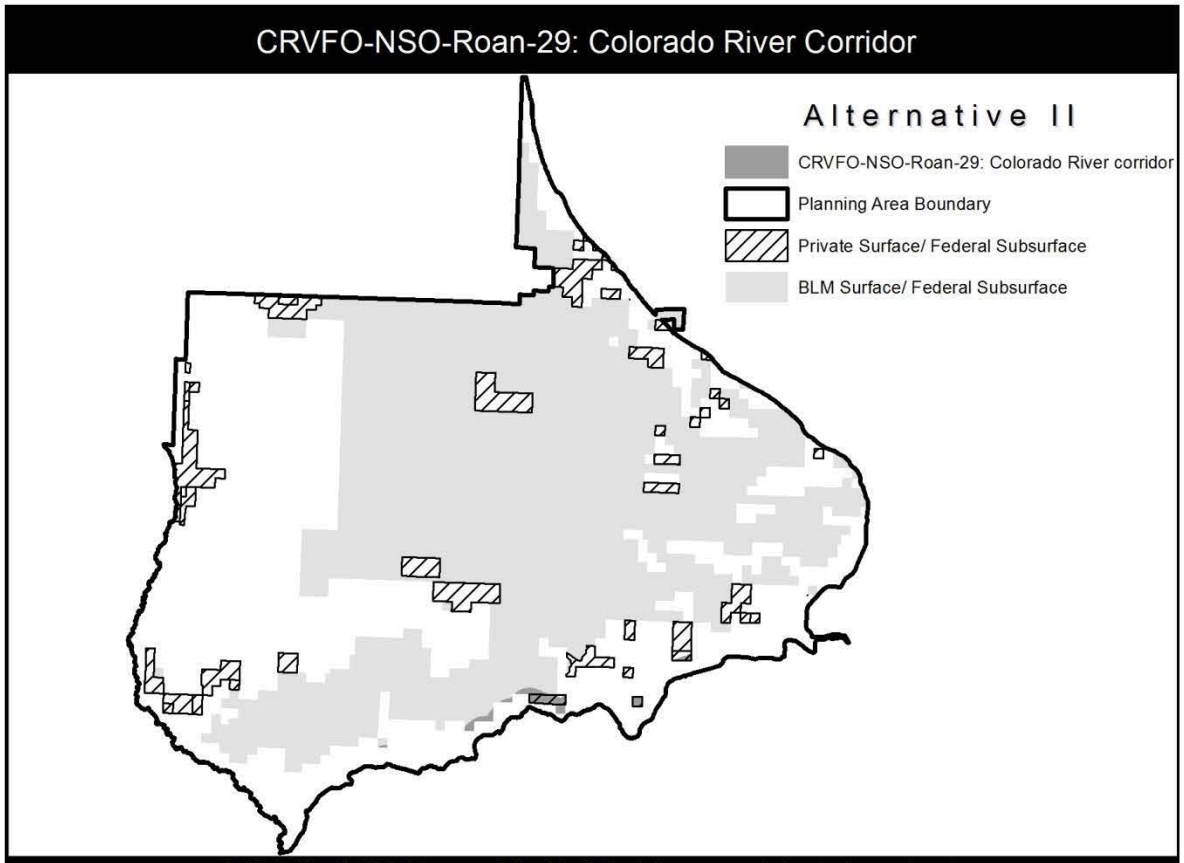


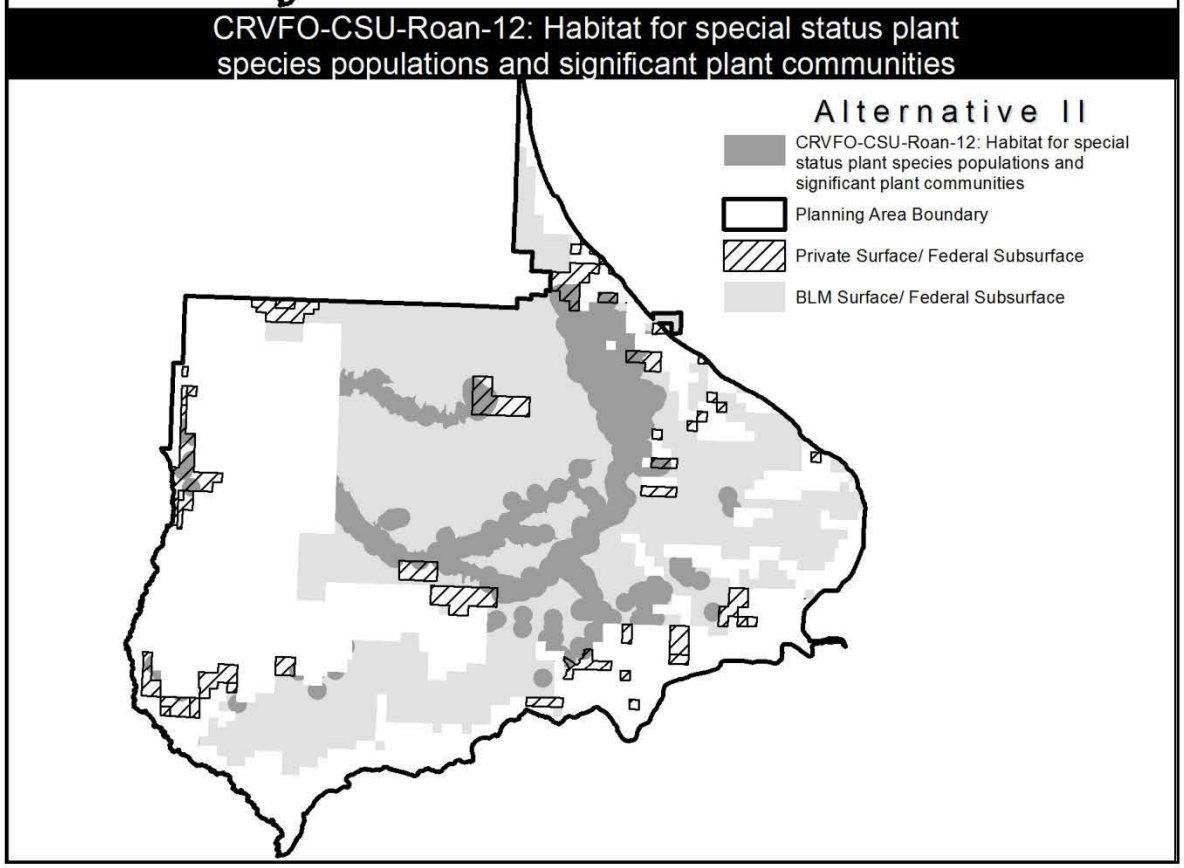
CRVFO-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I)



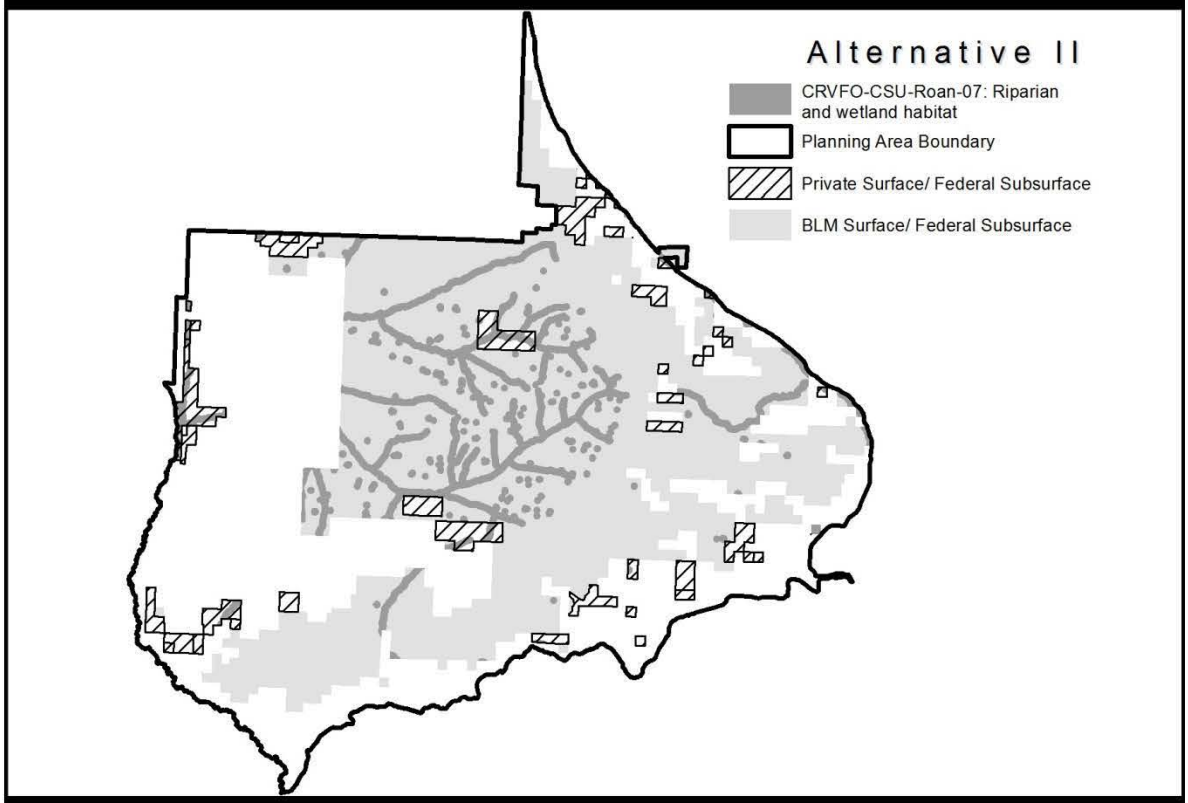
CRVFO-NSO-Roan-21: Anvil Points Claystone Cave



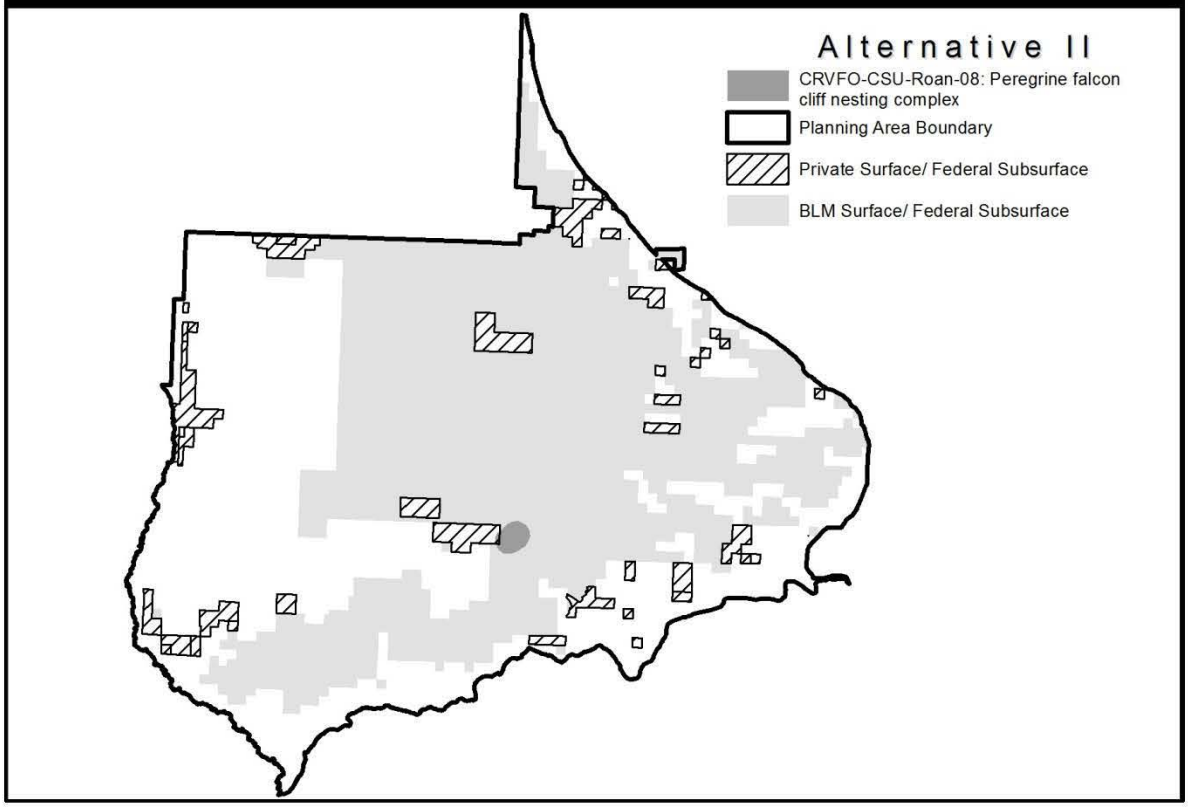

CRVFO-NSO-Roan-29: Colorado River Corridor
Alternative II
CRVFO-NSO-Roan-29: Colorado River corridor
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


CRVFO-CSU-Roan-12: Habitat for special status plant species populations and significant plant communities
Alternative II
CRVFO-CSU-Roan-12: Habitat for special status plant species populations and significant plant communities
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

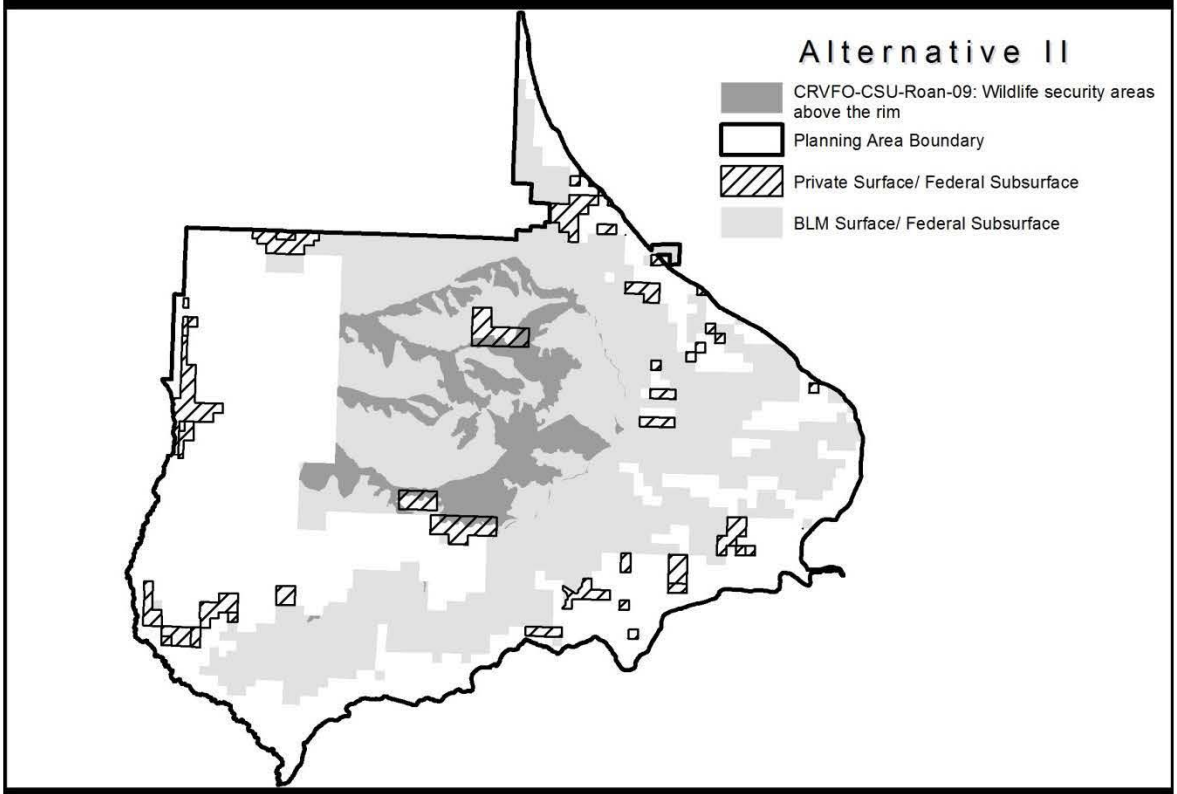
CRVFO-CSU-Roan-07: Riparian and Wetland Habitat



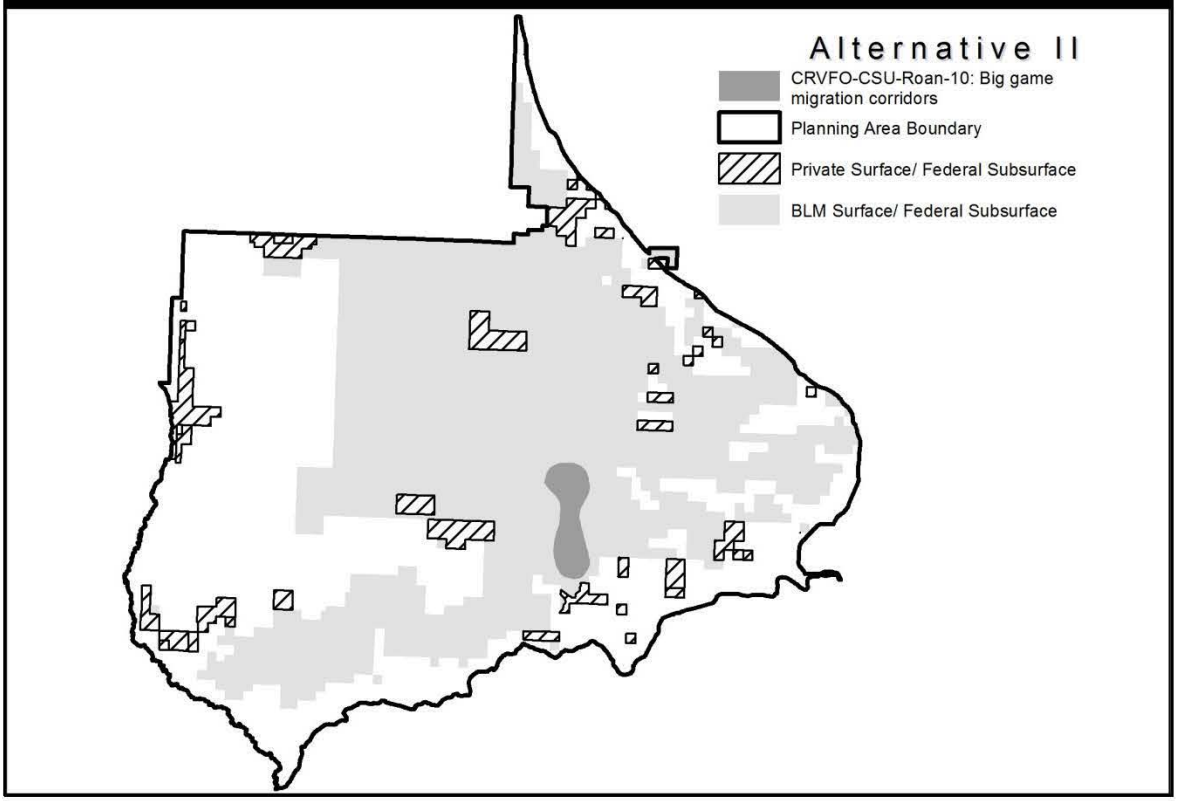
CRVFO-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex



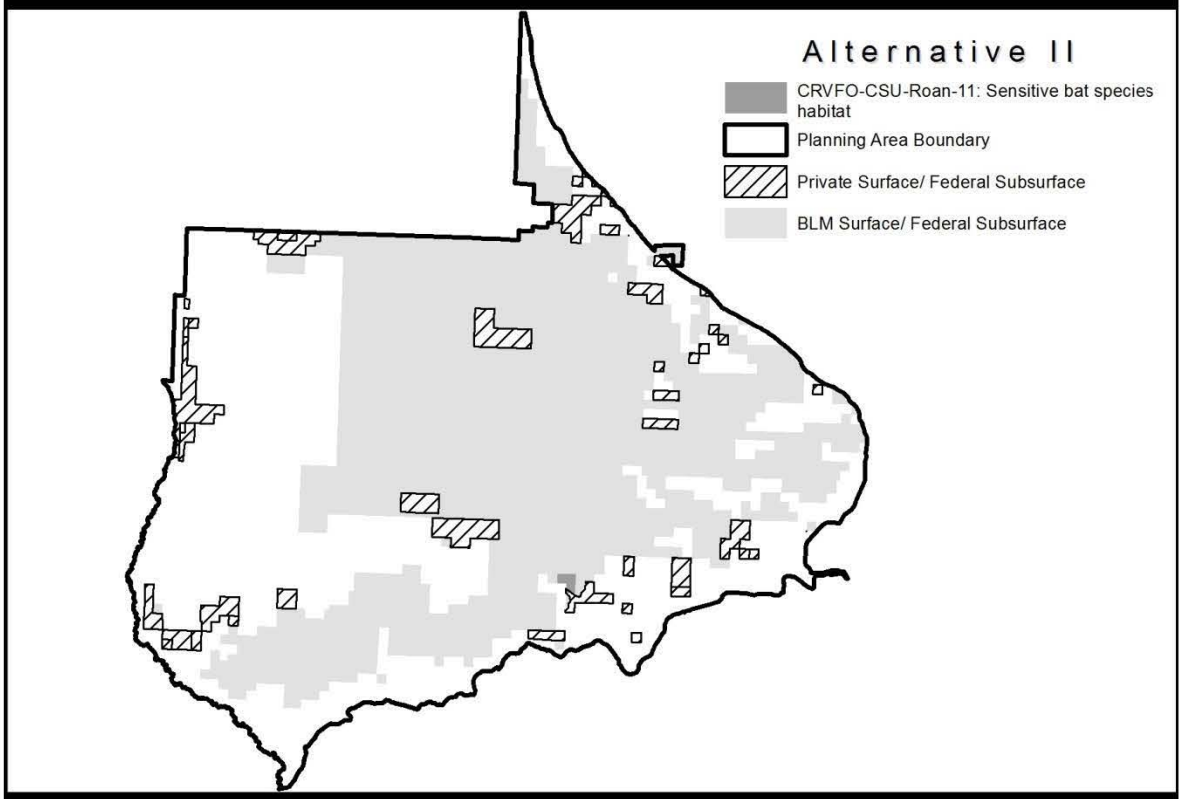
CRVFO-CSU-Roan-09: Wildlife security areas above the rim



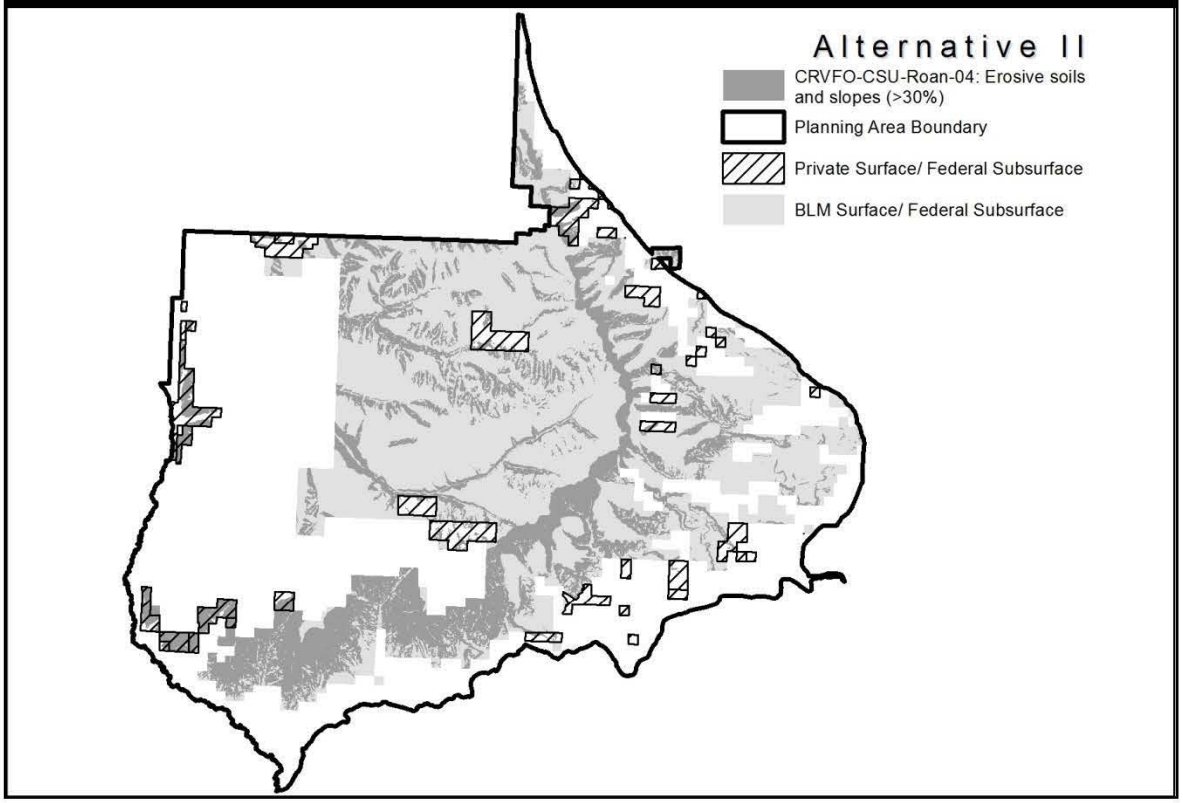
CRVFO-CSU-Roan-10: Big game migration corridors



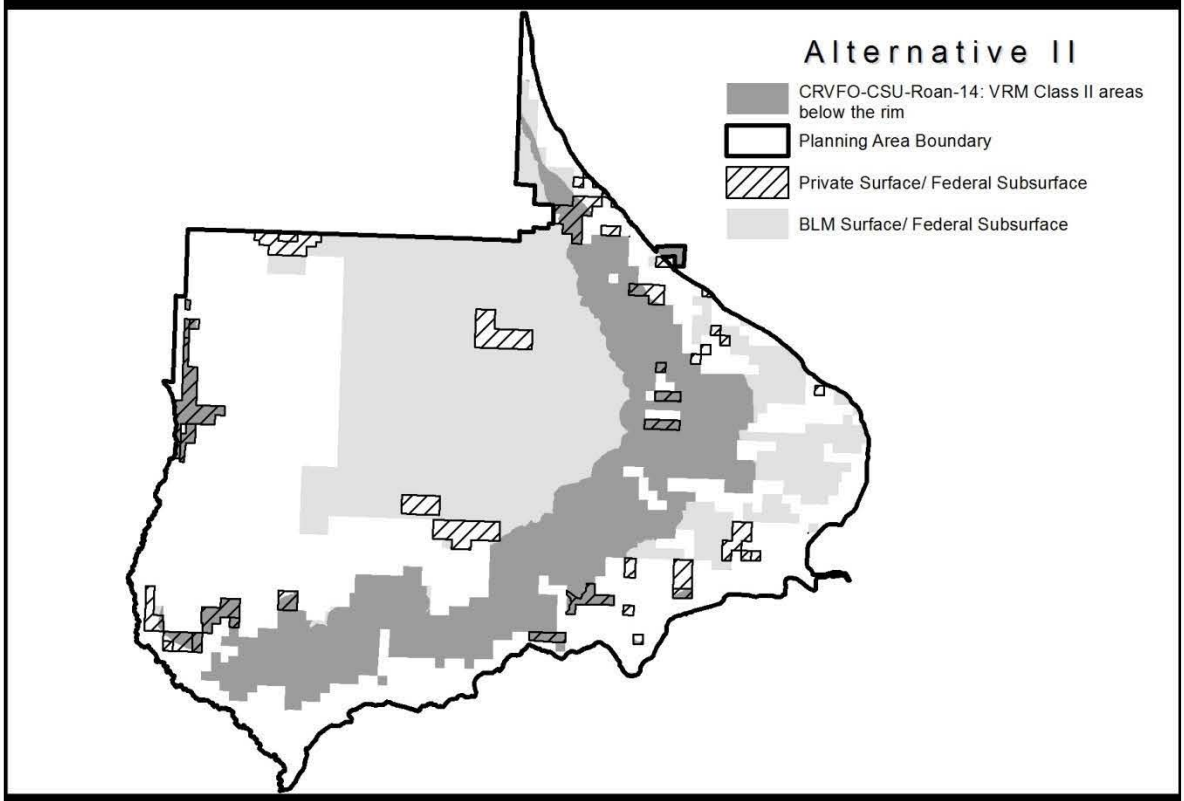
CRVFO-CSU-Roan-11: Sensitive bat species habitat



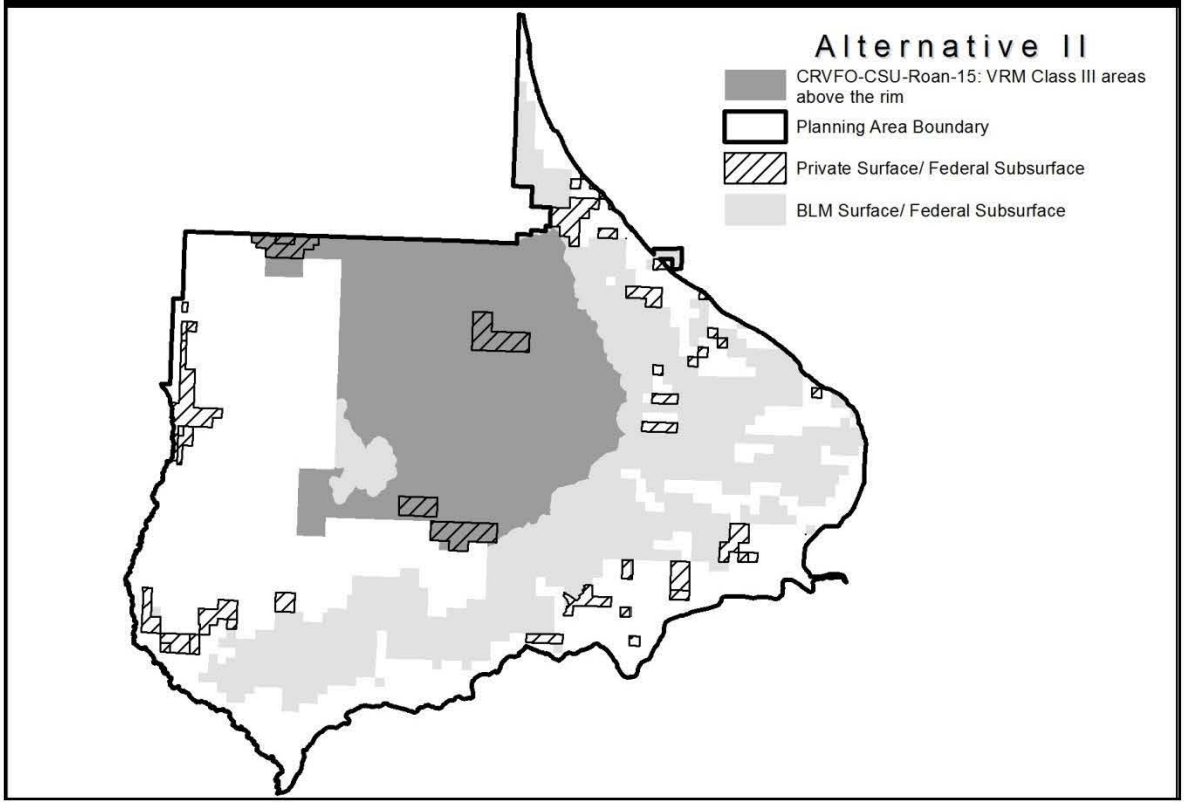
CRVFO-CSU-Roan-04: Erosive soils and slopes (>30%)



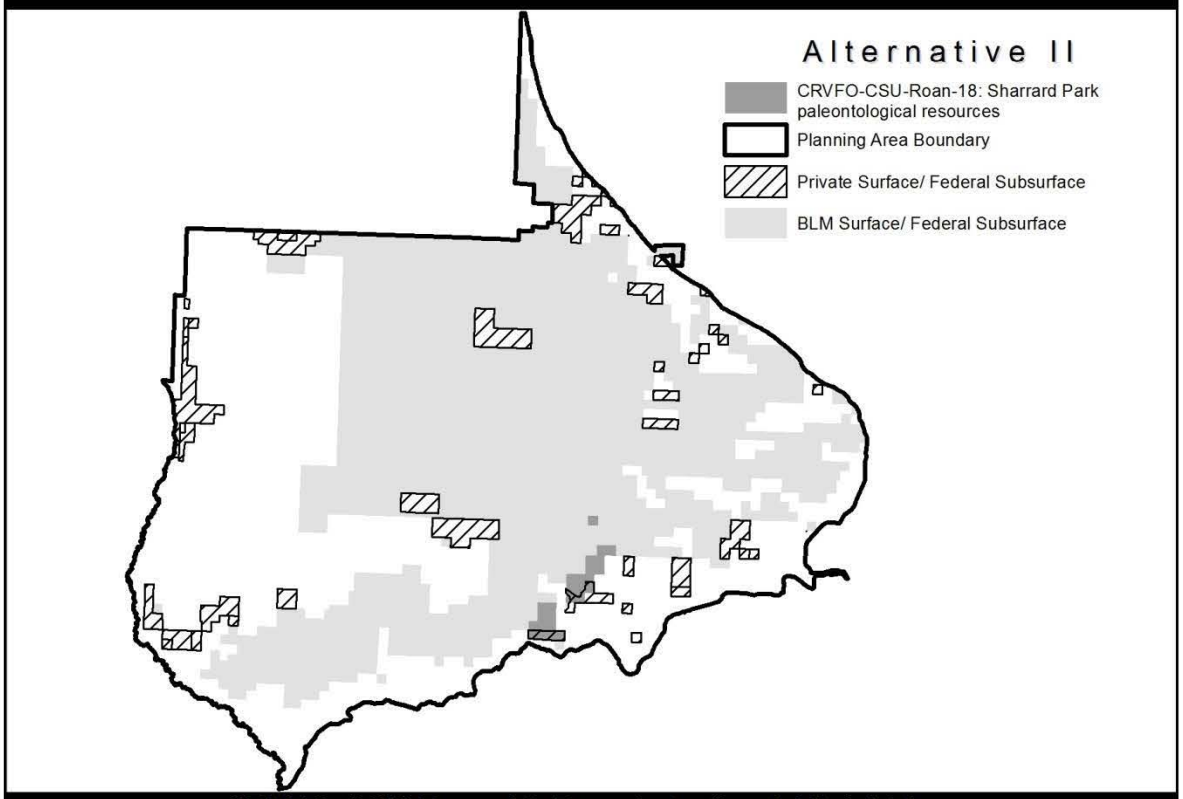
CRVFO-CSU-Roan-14: VRM Class II Areas Below the Rim



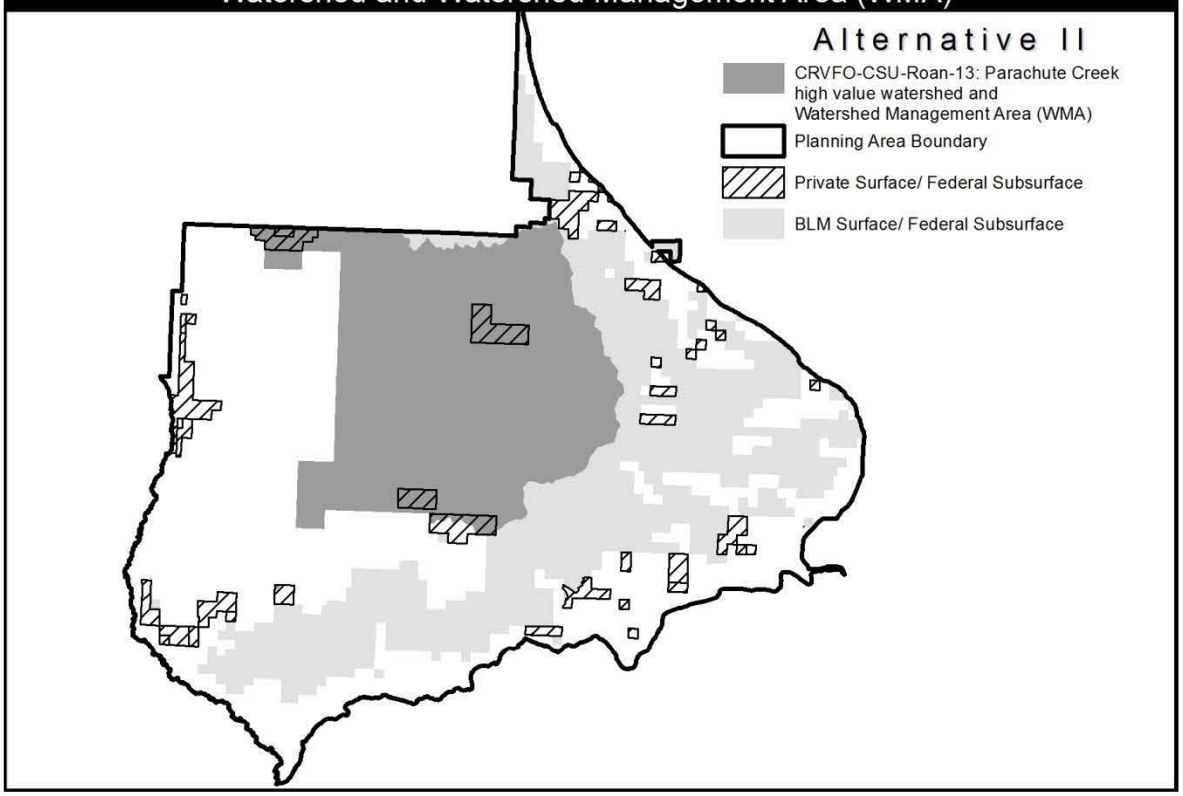
CRVFO-CSU-Roan-15: VRM Class III Areas Above the Rim



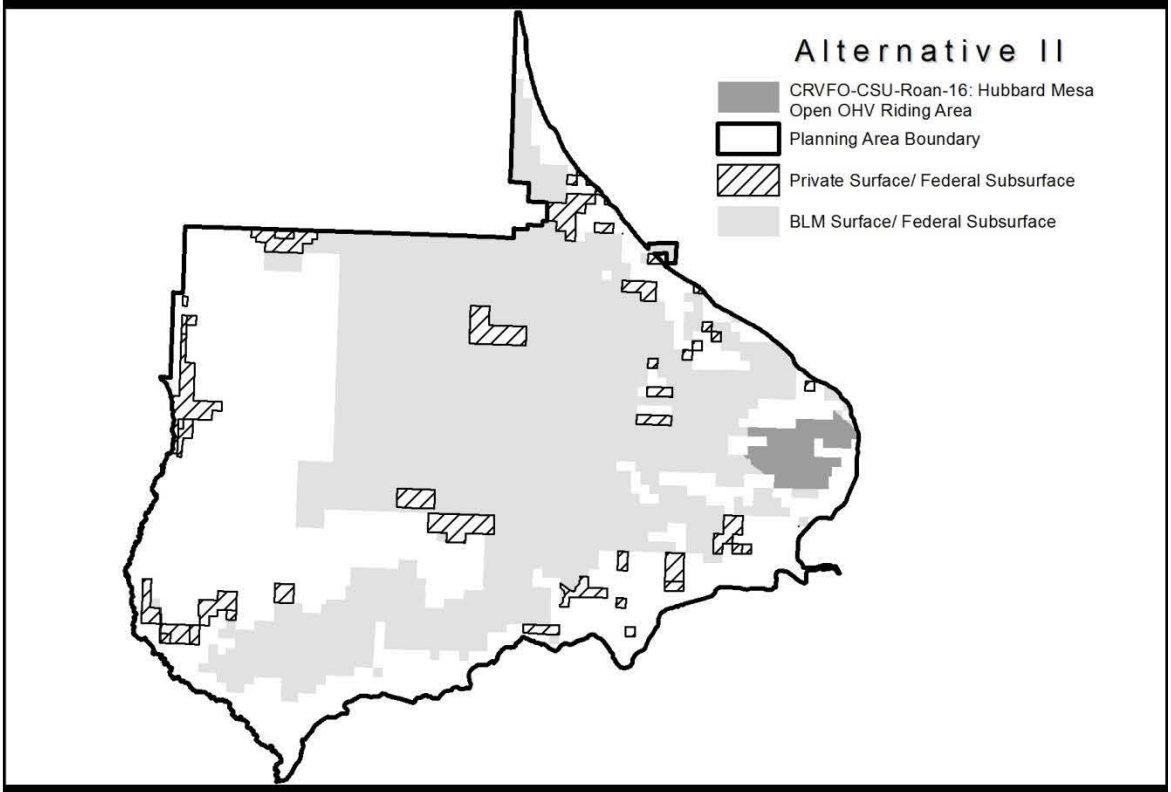
CRVFO-CSU-Roan-18: Sharrard Park Paleontological Resources



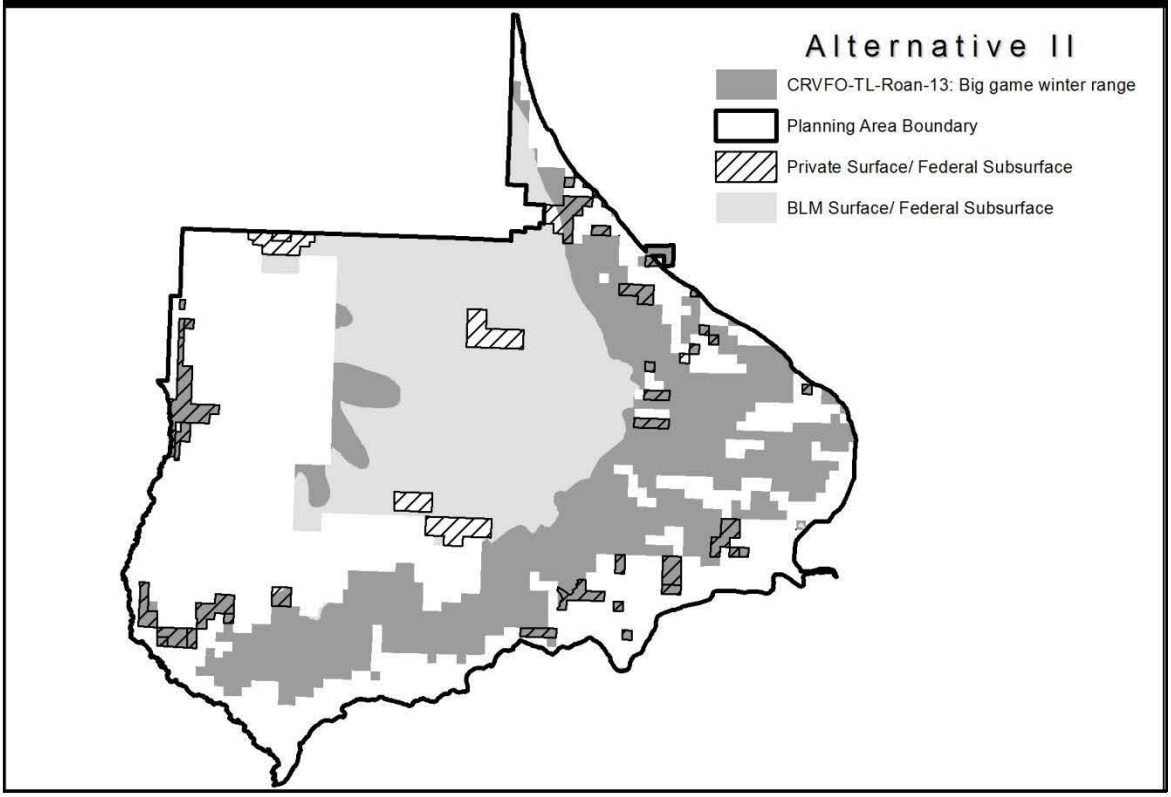
CRVFO-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area (WMA)



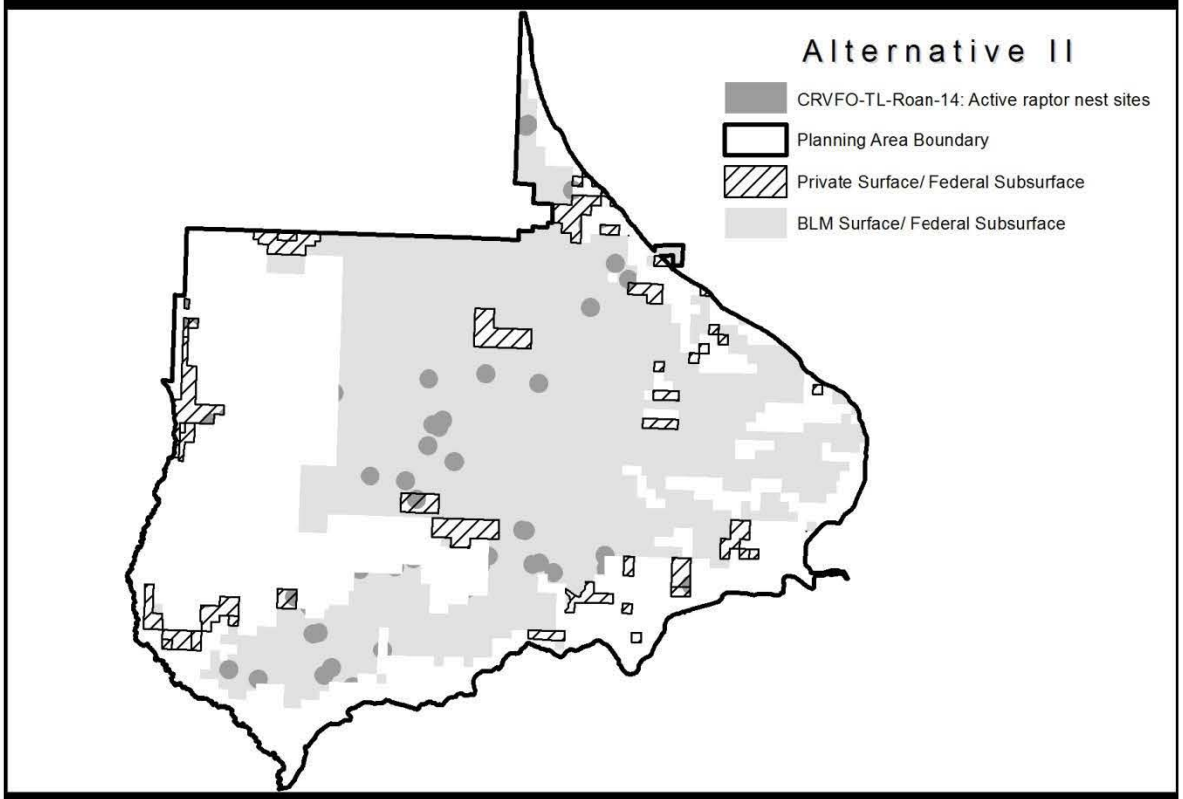
CRVFO-CSU-Roan-16: Hubbard Mesa Open OHV Riding Area



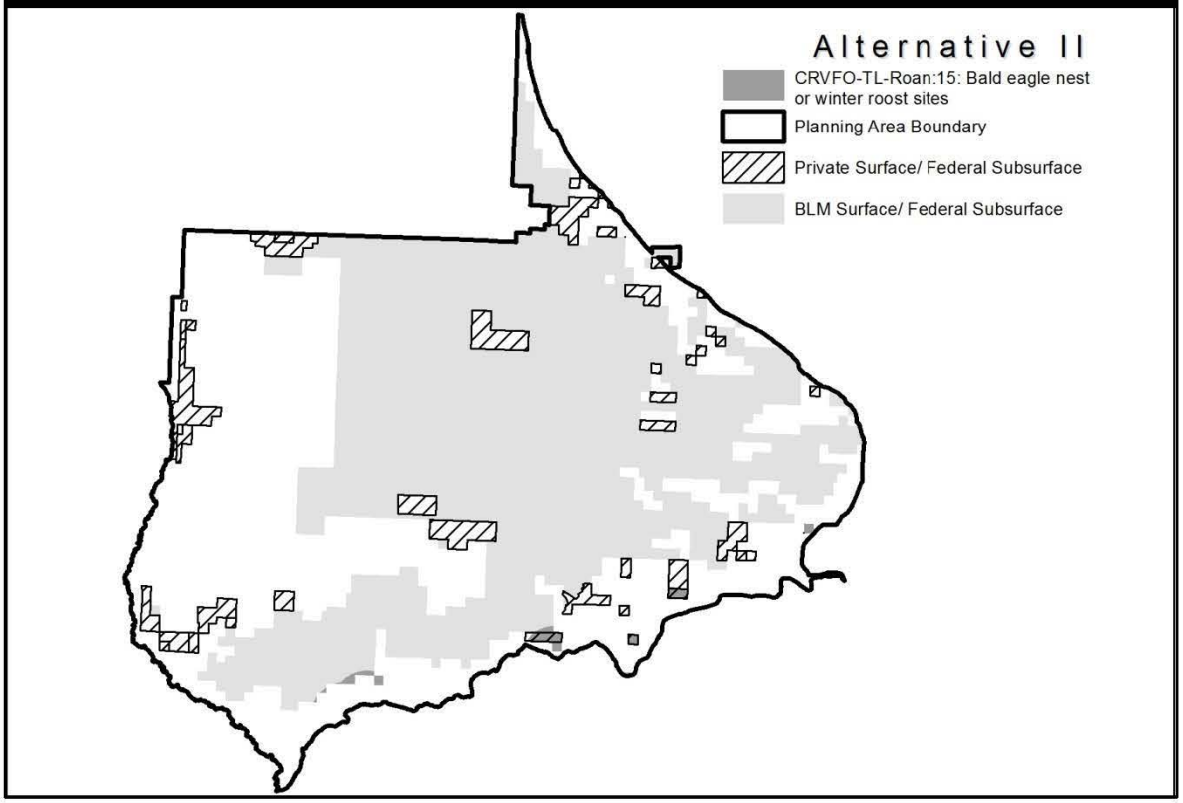
CRVFO-TL-Roan-13: Big game winter range



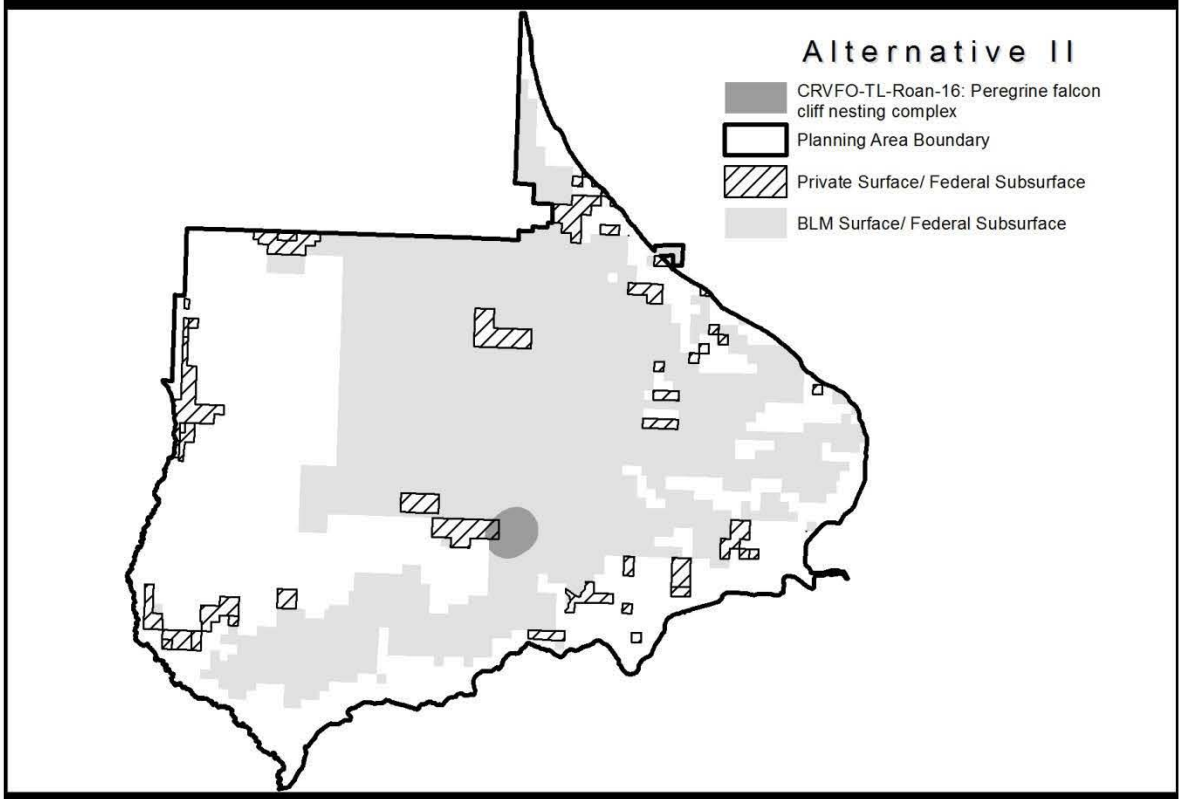
CRVFO-TL-Roan-14: Active Raptor Nest Sites



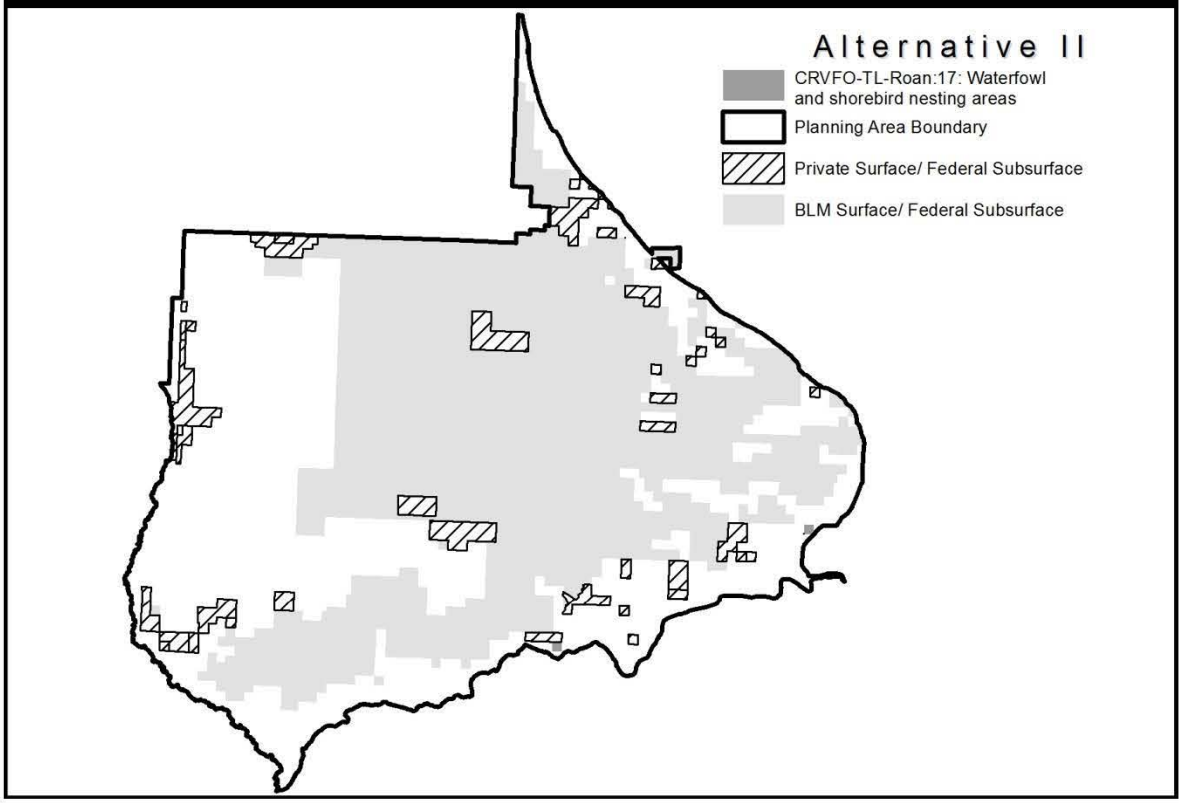
CRVFO-TL-Roan:15: Bald Eagle Nest or Winter Roost Sites

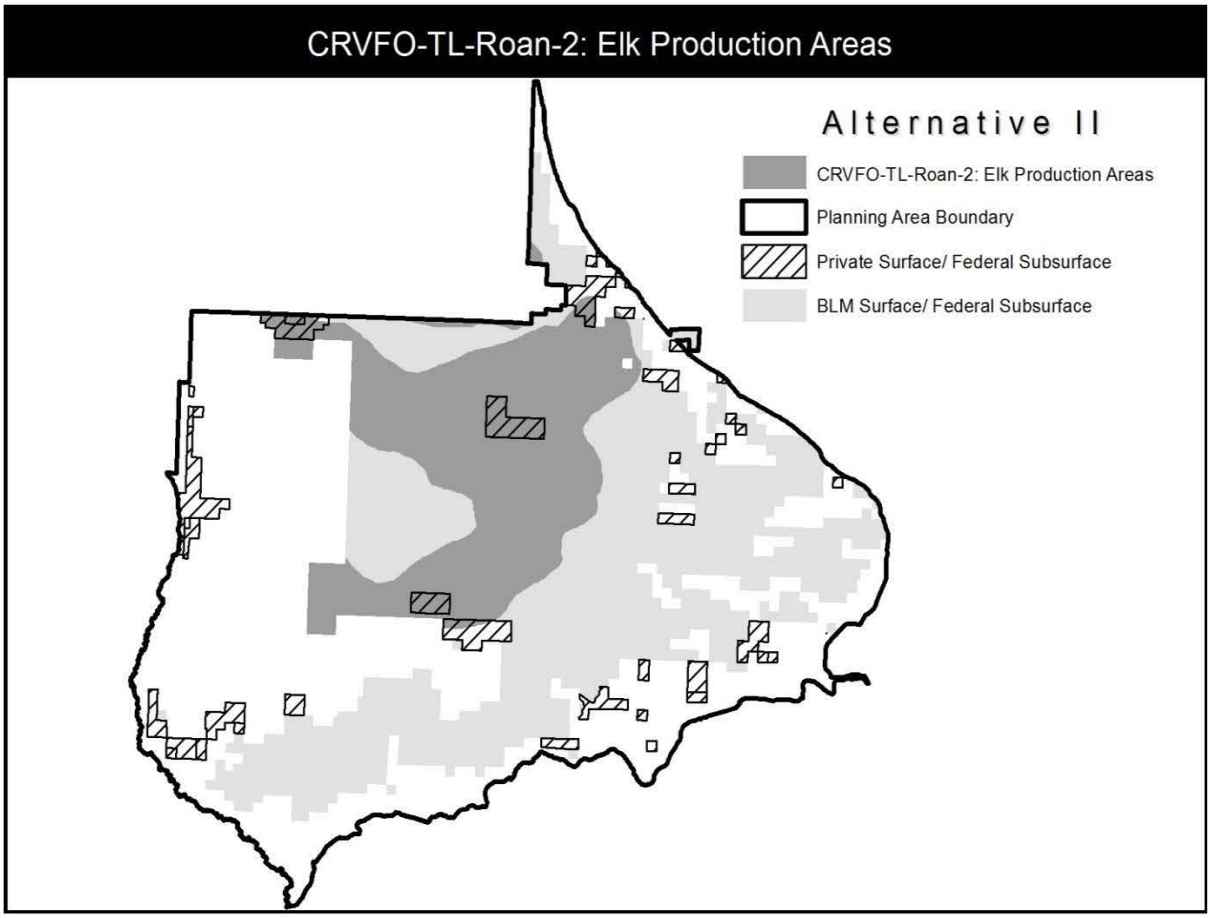


CRVFO-TL-Roan-16: Peregrine Falcon Cliff Nesting Complex



CRVFO-TL-Roan:17: Waterfowl and Shorebird Nesting Areas




CRVFO-TL-Roan-2: Elk Production Areas
Alternative II
CRVFO-TL-Roan-2: Elk Production Areas
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
No Surface Occupancy (NSO) Stipulations
CRVFO-NSO-2: Steep Slopes (>50%), 27,620 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities on slopes greater than 50 percent. **Purpose:** To maintain soil productivity and provide necessary protection to prevent excessive soil erosion on steep slopes and to reduce risks to human health and safety from placement of infrastructure on steep slopes. **Exception:** Standard exceptions apply. **Modification:** Standard modifications apply **Waiver:** Standard waivers apply
CRVFO-NSO-9: Threatened, Endangered, Proposed, and Candidate Plant Species, 3,670 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within 200 meters (656-foot) of habitat areas for those plant species listed under ESA as threatened or endangered, and for federal proposed or candidate plant species. Habitat areas include currently or historically occupied habitat, areas designated as critical habitat, suitable habitat in close proximity to occupied habitat, and habitat necessary for the maintenance or recovery of the species. **Purpose:** To protect threatened, endangered, proposed, and candidate plants, immediately adjacent suitable habitat and pollinator habitat, from direct and indirect impacts. **Exception:** Standard exceptions apply. In addition, all of the following conditions must be met: a) Valid current surveys for protected species have been completed. b) Mitigation has been applied to avoid adverse impacts to protected species. c) Section 7 consultation with USFWS on federally listed or proposed threatened or endangered species has been completed. d) The proposed disturbance would occur in unsuitable habitat. Other surface-disturbing activities may be allowed in suitable habitat if conditions 1 through 3 above are met, and the purpose or the result of the activity would improve habitat conditions for the protected species. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
CRVFO-NSO-18: Special Status Bat Species Hibernation, Maternity Roosts, Bachelor Roosts and Fall Swarming Sites, 120 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a 0.25-mile radius of special status (i.e., endangered, threatened, candidate, or BLM sensitive) bat use areas to protect sites used for the purposes of maternity roosts, bachelor roosts, and hibernation or fall swarming activities. The stipulation will be applied based on biological surveys and CPW data as revised. **Purpose:** To protect sites documented as being used for the purposes of maternity roosts, hibernation or fall swarming activities. **Exception:** Standard exceptions apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-NSO-19: Threatened, Endangered, Proposed, and Candidate Fish and Wildlife Species, 3,670 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities on habitat areas for fish and wildlife species listed by the federal or state government as endangered or threatened and for Federal proposed or candidate species. Habitat areas include occupied habitat and habitat necessary for the maintenance or recovery of the species. **Purpose:** To maintain the integrity of habitats for endangered, threatened or candidate species necessary for the maintenance or recovery of the species. **Exception:** Standard exceptions apply. In addition, after Section 7 consultation with USFWS, exceptions may be permitted. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-NSO-8: Raptors (Non-Special Status Raptor Species), 910 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a buffer zone centered on a nest site. Buffer widths are 0.25-mile for: • golden eagle • Cooper's hawk • sharp-shinned hawk • red-tailed hawk • Swainson's hawk • owls Buffer widths are 0.5-mile for: • prairie falcon

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
• northern goshawk Does not apply to turkey vulture, northern harrier, or American kestrel. Special status raptors are addressed separately. **Purpose:** Maintain the integrity of nest sites and surrounding habitat. **Exception:** Standard exceptions apply. More specifically, an exception can be granted if the nest site has not been occupied within the last 5 years. The activity must be conditioned so as not to impair the utility of the site for future nesting. **Modification:** Standard modifications apply. More specifically a modification may be granted if conditions have changed such that there is no reasonable likelihood of future site occupation. **Waiver:** Standard waivers apply.
CRVFO-NSO-12: Bald Eagle Roost or Nest Site, 380 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a 0.25-mile radius of the roost or nest site. The stipulation will be applied based on biological surveys, CPW data or USFWS data as revised. **Purpose:** To maintain the integrity of occupied (used within the last 5 years) winter roost sites and surrounding habitat. **Exception:** Standard exceptions apply. More specifically, an exception can be granted if the nest or roost site has not been occupied within the last 5 years. The activity must be conditioned so as not to impair the utility of the site for future nesting or roosting. **Modification**: Standard modifications apply. More specifically a modification may be granted if conditions have changed such that there is no reasonable likelihood of future site occupation. **Waiver:** Standard waivers apply.
GS-NSO-ROAN-27: Wildlife Security Areas Below the Rim, 11,410 acres
Stipulation: Protect important wildlife security areas below the rim, especially those for deer and elk. No ground-disturbing activities in approximately 11,410 acres that provide high-value habitats along and below the base of the Roan Cliffs. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect important wildlife security areas below the rim. **Exceptions:** Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-NSO-ROAN-28: High-Value Special Status Fish Species Habitat, 15,820 acres
Stipulation: Protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat. No ground-disturbing activities in approximately 15,820 acres that would result in loss or degradation of areas designated as high-value habitat for Colorado River cutthroat trout. Prior to implementing any ground-disturbing activity or other project component in areas designated as high-value habitat for Colorado River cutthroat trout, the proponent must provide an assessment of potential impacts if any, to this resource value. The assessment will be based on current baseline data, collected by the proponent as approved by the BLM; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat. **Exceptions:** Ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance of the species of interest. In making this determination, the BLM will consider the following resource factors: habitat conditions needed for feeding, spawning, survival of eggs and larvae, and refugia during high or low flow. Impairment could include siltation of substrate; changes in flow regime (e.g., localized damming); loss of overhanging vegetation canopy; reduction in bank stability; reduction in water quality; and direct mortality of trout or trout eggs; behavioral and ecological relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species of interest or cause habitat to become unusable. Approval of ground disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases, approval for such activities must be granted (or extended) annually by the BLM. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply.

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
Waiver: Standard waivers apply.
CRVFO-NSO-5: Riparian and Wetland Habitat, 490 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a buffer distance of 328 horizontal feet from the outer edge of riparian/wetland zones. **Purpose:** The purpose is to: 1. Maintain the proper functioning condition, including the vegetative, hydrologic and geomorphic functionality of the perennial water body. 2. Protect water quality, riparian/wetland vegetation, and aquatic habitats. 3. Provide a clean, reliable source of water for downstream users. 4. Benefit fisheries, amphibians, waterfowl, migratory birds, and other species dependent on aquatic and riparian habitats as well as the habitat itself. **Exception:** Standard exceptions apply. In addition, given the multiple resource values addressed by this NSO, an exception may be granted on a case-by-case basis if the Authorized Officer determines that the following criteria are met: • The activity would improve resource conditions (e.g., meet RMP resource objectives or achieve the standards for public land health). Restoration or enhancement work is designed to improve aquatic habitat conditions, riparian vegetation, or benefit aquatic dependent species over the long term. • The activity would have insignificant impacts on water quality, stream channel stability, and aquatic dependent species, where no reasonable alternative exists. • The activity would not cause unacceptable adverse impacts to the riparian or wetland resource (e.g., a decline in condition as defined by RMP objectives) • The activity would result in no net loss of riparian/wetland vegetation. • The activity would involve a stream crossing (e.g., roads, fences or pipelines) where there is no reasonable alternative. • The location of the activity within the riparian or wetland resource may be necessary to avoid unacceptable impacts to other resource values. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-NSO-ROAN-30: I-70 Viewshed (VRM Class II), 13,770 acres
Stipulation: Protect 13,770 acres of the Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
to future proposed activities. **Purpose:** To protect Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. **Exceptions:** Standard exceptions apply. In addition, an exception could be granted if a viewshed analysis indicates no impairment of the visual resources from the driving corridor. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-NSO-ROAN-31: East Fork Falls Viewshed (VRM Class I), 1,620 acres
Stipulation: Prohibit surface occupancy and surface disturbing activities within areas designated VRM Class I. **Purpose:** To preserve the existing character of the landscape. **Exception:** Standard exceptions apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-NSO-ROAN-21: Anvil Points Claystone Cave, 120 acres
Stipulation: Protect 120 acres encompassing the Anvil Points Claystone Cave. No ground disturbing activities in the area encompassing the cave opening, subsurface features, and watersheds overlying the caves. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. During and subsequent to the ground-disturbing activities covered by this provision, ongoing monitoring data will be collected using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the

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BLM must be promptly notified; and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect the Anvil Points Claystone Cave. **Exceptions:** A ground-disturbing activity may be permitted only if the BLM determines that a proposed activity would not impair the cave values, supported by a demonstration of such, based on monitoring data or another method with a high degree of scientific reliability, and considering the type, amount, duration, and timing of the activity; and after consultation with CPW regarding wildlife habitat values. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-NSO-4: Major River Corridors, 440 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within 0.5-mile of either side of the high water mark (bank-full stage) of the Colorado River. **Purpose:** To protect these riverine and adjacent areas that provide (a) special status fish and wildlife species habitat, (b) important riparian values, (c) water quality/filtering values, (d) waterfowl and shorebird production values, (e) valuable amphibian habitat, and (f) high scenic and recreation values. Included in this area are public lands near the Eagle and Colorado Rivers designated as RMAs in which BLM provides facilities to enhance recreation opportunities and maintain recreational setting characteristics. **Exception:** Standard exceptions apply. In addition, the distance from the river may be reduced after the Authorized Officer has considered the habitat values and the species present, the topography and vegetation of the area, and the type and amount of surface disturbance proposed. For the Eagle and Colorado Rivers, additional exception criteria include measures to mitigate impacts on recreation such as: a) screening operations from scenic views, b) reducing drill rig and other equipment noise to an acceptable level, c) protecting the recreating public from operations, and d) restoring disturbed areas to a condition substantially unnoticeable to the casual observer. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GRSG-NSO-46e1: *NSO within 2 miles of active GRSG leks, in GRSG ADH, no exceptions anticipated*
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference
GRSG-NSO-46e2: *Exceptions, modifications, and waivers on the remainder of PHMA. Authorized Officer could grant and exception or modification in consultations with the State of Colorado.*
Stipulation incorporates stipulation NSO-46e(2) from the NCGSG Proposed LUPA/FEIS by reference

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CRVFO-NSO-Roan 1: All Sensitive Resources and Natural Values Atop Roan Plateau, 34,890 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within 200 meters (656-foot) of habitat areas, or known locations, of all sensitive resources and natural values above the rim in the Roan Plateau Planning Area. **Purpose:** To protect all sensitive resources and natural values above the rim in the Roan Plateau Planning Area. **Exception:** No exceptions apply. **Modification:** No modifications apply. **Waiver:** No waivers apply.
CRVFO-NSO-Roan 2: Lands Managed to Protect Wilderness Characteristics, 19,330 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within 200 meters (656-foot) of outer boundary of three units determined to contain wilderness characteristics: East Fork Unit, Southeast Cliff Unit, and Northeast Cliff Unit. **Purpose:** To protect and maintain wilderness characteristics and supplemental values. **Exception:** No exceptions apply. **Modification**: No modifications apply. **Waiver:** No waivers apply.
CRVFO-NSO-Roan 4: Designated Municipal Watershed, 70 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within: 1) the primary zone of a source water protection area for a permitted public water system; or 2) 1,000 horizontal feet of either side of a classified surface water supply stream segment (measured from the average high water mark) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado used as a public (municipal) water supply. A permitted public water system will have a number assigned by the State of Colorado. A watershed that serves a public water system as defined by the State of Colorado is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. **Purpose:** To protect the watershed that serves a drinking water supply for a permitted public water system from potential contamination. **Exception:** BLM may consider use of new technology or engineered plans designed to protect water supply streams and intakes from operations located closer than specified in the stipulation. Consideration of special technology or designs will be coordinated with appropriate water authorities and owners (e.g. municipalities, home owners associations, source water protection stakeholder groups, etc.). In addition, activity may be permitted if the Authorized Officer determines, in consultation with the appropriate water authorities and owners, that the applicant's proposal would not cause a decrease in water quality. **Modification:** The water supply or water intake is altered. **Waiver:** The water intake is not used as a public water supply.

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CRVFO-NSO-39: Historic Properties (200 meters [656 feet])
Stipulation: Prohibit surface occupancy and surface-disturbing activities within 200 meters (656) feet of historic properties. **Purpose:** To protect historic properties. **Exception:** Standard exceptions apply. No additional specific exception criteria apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories 10 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities for spent shale repositories. **Purpose:** To protect spent shale repositories. **Exception:** Standard exceptions apply. No additional specific exception criteria apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
Controlled Surface Use (CSU) Stipulations
GS-CSU-Roan-12: Habitat for Special Status Plant Species Populations and Significant Plant Communities, 17,840 acres
Stipulation: Protect approximately 17,840 acres of special status plant species habitat or significant plant communities. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within a watershed that would disturb, alter, or interrupt the hydrologic or ecological processes that support special status plant species or significant plant communities. Special status plants include the following: DeBeque milkvetch *(Astragalus debequaeus),* hanging garden sullivantia *(Sullivantia hapemanii),* Piceance bladderpod *(Lesquerella parviflora),* Roan Cliffs blazingstar *(Mentzelia rhizomata),* and sun-loving meadowrue *(Thalictrun heliophilum).* Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect special status plant species habitat or significant plant communities. **Exceptions:** A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values associated with species health and ecological function of associated habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the status of the population; ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of the population or community; the effects on both individuals of the species and populations; the relationship to topography and other vegetation;

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or community. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-CSU-4: Riparian/Wetland Vegetation Zones, 11,440 acres
Stipulation: Apply CSU constraint from 328 to 500 horizontal feet from the outer edge of the riparian/wetland zones. Surface-disturbing activities may require special design, construction, and implementation measures, including relocation of operations beyond 200 meters (656 feet). The actual required measures will be based on the purpose, nature, and extent of the disturbance, the affected wetland/riparian area and values, and the feasibility of relocating the project. **Purpose:** To maintain proper functioning condition (including the vegetative, hydrologic, and geomorphic functionality) of the riparian and wetland zones. • Protect water quality. • Protect fish habitat. • Protect other aquatic habitat values. • Provide a clean, reliable source of water for downstream users. • Indirectly benefit migratory birds, wildlife habitat, amphibians, and other species. **Exception:** Standard exceptions apply. In addition, an exception may be granted by the Authorized Officer on a case-by-case basis considering the following criteria: The activity would improve resource conditions (e.g., meet RMP resource objectives or achieve the standards for public land health). Restoration or enhancement work is designed to improve aquatic habitat conditions, riparian vegetation, or benefit aquatic dependent species over the long term. • The activity will have insignificant impacts on water quality, stream channel stability, and aquatic dependent species, where no reasonable alternative exists. • The activity will not cause unacceptable adverse impacts to the riparian or wetland resource (e.g., a decline in condition as defined by RMP objectives) • The activity results in no net loss of riparian/wetland vegetation. • Involves stream crossings (e.g., roads, fences or pipelines) where there is no reasonable alternative. • Location of the activity within the riparian or wetland resource may be necessary to avoid unacceptable impacts to other resource values.

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
In situations where a surface-disturbing activity is excepted, the activity could be subject to additional conditions or approvals, reclamation measures, or best management practices. Measures applied will be based on the nature, extent, and values potentially affected by the surface-disturbing activity. Exceptions to allow surface-disturbing activities are granted on a one-time, case-by-case basis and do not create a precedent for subsequent approvals. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex, 370 acres
Stipulation: Protect approximately 370 acres of peregrine falcon cliff nesting complex. Ground-disturbing activities may be relocated outside of the cliff-nesting complex along the Roan Cliffs. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect peregrine falcon cliff nesting complex. **Exception:** A site-specific ground-disturbing activity may be allowed within the CSU only if, following consultation with CPW, the BLM determines that the specific activity or requested change would not impair behaviors, habitat use and quality, and reproductive success of the peregrine falcon present within the area. In making this determination, the BLM will consider the status of the nest (active or inactive); behavioral and ecological requirements of the species; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-09: Wildlife Security Areas Above the Rim, 11,410 acres
Stipulation: Protect important wildlife security areas above the rim, especially deer and elk. Ground disturbing activities may be relocated more than 200 meters to avoid approximately 11,410 acres of wildlife security areas above the rim. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
to future proposed activities. **Purpose:** To protect important wildlife security areas above the rim, especially deer and elk. **Exceptions:** A site-specific ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-10: Big Game Migration Corridors, 1,560 acres
Stipulation: Protect contiguity and extent of big game migration corridors. Ground-disturbing activities may be relocated more than 200 meters to avoid approximately 1,560 acres of big game migration corridors. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect contiguity and extent of big game migration corridors. **Exceptions:** A site-specific ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of big game species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively **Modification:** Standard modifications apply.

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Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
Waiver: Standard waivers apply.
GS-CSU-ROAN-17: Wild and Scenic River Suitability, 7,750 acres
Stipulation: Protect 24 stream miles and associated buffers on 7,750 acres in portions of the East Fork Parachute Creek and Trapper/Northwater Creek drainages. No ground disturbing activities would be allowed within the boundary of the suitable stream segment, general 0.25 miles on either side. **Purpose:** To protect the East Fork Parachute Creek and Trapper/Northwater Creek drainages. **Exceptions:** A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with WSR designation, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: type and location of outstandingly remarkable values (ORVs). free flowing condition, water quality, and tentative classification; the type, amount, and duration of the surface disturbance; the relative extent of ORVs; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect ORVs, or that may affect the outcome of a suitability study. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-CSU-1: Slopes Greater than 30% or Fragile/Saline Soils, 50,730 acres
Stipulation: As appropriate, apply CSU constraint on areas: 1) with slopes steeper than 30 percent or 2) areas with fragile and saline soils regardless of slope based on the NRCS soil description and surveys. Fragile soils as defined by the NRCS include those having shallow depth to bedrock, minimal structure and organic matter in the surface layer, and textures making them easily detached and eroded. The soil map unit description rates soils in the resource area as to their susceptibility to water erosion. Wind erosion may also be a hazard, particularly when surface litter and vegetation are removed by fire. A potentially saline soil has Mancos shale parent geology. The following soil/slope characteristics are indicative of a potentially fragile soil: 1. Soils rated as highly or severely erodible by wind or water 2. Soils on slopes greater than 35%, particularly if they have one of the following characteristics: a) a surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay; b) a depth to bedrock less than 20 inches; c) an erosion hazard rating of high or very high; and d) a K (soil erodibility potential) factor greater than 0.32. **Purpose:** To: • reduce erosion potential, to maintain soil stability and productivity of sensitive areas;

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• ensure successful reclamation; and • minimize contributions of salinity, selenium and sediments likely to affect downstream water quality, fisheries and other downstream aquatic habitats. **Exception:** Standard exceptions apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-14: VRM Class II Areas Below the Rim, 29,560 acres
Stipulation: Protect approximately 29,560 acres in VRM Class II areas. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class II areas below the rim to retain the existing landscape character and allow only limited changes. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually or as required by the BLM. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. **Purpose:** To protect VRM Class II areas. **Exceptions:** A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class II objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-15: VRM Class III Areas Above the Rim, 32,880 acres
Stipulation: Protect 32,880 acres of VRM Class III areas on top of the plateau. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class III areas. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted

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during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. **Purpose:** To protect VRM Class III Areas. **Exception:** A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class III objectives, or if relocation or modification of such activity is found to be acceptable. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GS-CSU-Roan-16: Hubbard Mesa Open OHV Riding Area, 2,330 acres
Stipulation: Protect recreation opportunities and settings in the Hubbard Mesa Off-Highway Vehicle (OHV) Riding Area. BLM may require special design, construction, operation, mitigation, and reclamation measures, including relocation by more than 200 meters. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect recreation opportunities and settings in the Hubbard Mesa Off-Highway Vehicle (OHV) Riding Area. **Exceptions:** A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values with OHV opportunities within the Hubbard Mesa area, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: existing OHV use; existing OHV riding opportunities; anticipated future use; management of OHV use; type, amount, and duration of the surface disturbance; the relative extent of OHV use and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect OHV riding opportunities. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.

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GS-CSU-Roan-18: Sharrard Park Paleontological Resources, 1,020 acres
Stipulation: Protect 1,020 acres of the Sharrard Park paleontological resource. The BLM may require special survey, design, construction, operation, and reclamation measures, or relocation by more than 200 meters in identified portions of Wasatch Formation outcrops in Sharrard Park. Prior to any ground disturbing activity, the operator must have the paleontological resources surveyed within 200 feet of the proposed disturbance by a BLM approved paleontologist. Other special measures include requirements that (a) on-site personnel are informed of the potential for fossils; (b) the proponent will notify the BLM if any fossils are found; and (c) activities do not disturb fossils in any way. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to protect, preserve, and/or recover the fossil resources at specific sites or for specific activities within this area. The BLM determination will be based on site specific conditions and the type, amount, and duration of the associated impacts. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. **Purpose:** To protect the Sharrard Park paleontological resources. **Exceptions:** Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendices A and C, respectively. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply
Timing Limitations (TL) Stipulations
CRVFO-TL-2: Big Game Winter Habitat, 38,430 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities from December 1 to April 15 to protect: mule deer critical winter range; elk winter concentration areas; moose winter range; Rocky Mountain bighorn sheep winter, severe winter and winter concentration areas; and pronghorn winter concentration area. **Purpose:** To reduce behavioral disruption of big game during the winter season. Exception: Standard exceptions apply. In addition, site-specific ground-disturbing activities between December 1 and April 15 may be allowed if BLM determines, following consultation with CPW, that the requested activity would not impair values associated with the quantity and quality of the winter range for the species of interest. In making this determination, the proponent of any ground-disturbing activity asking for an exception will provide to BLM an assessment with their proposal that documents anticipated compliance or non-impairment of resource values protected by this stipulation based on the following resource factors:

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• current baseline data; the type, location, duration, and intensity of potential adverse effects • minimization of the footprint of activities • changes to winter habitat effectiveness, fragmentation, and habitat loss across the game management unit as a whole • the relative extent of available winter range; relationship to topography and vegetation screening; • effectiveness of proposed voluntary offsite mitigation and conservation measures to offset any adverse effects • other factors that may affect the winter range or cause winter range to become unusable Under mild winter conditions, the last 60 days of the seasonal limitation period may be suspended after consultation with CPW. Approval of ground-disturbing activities granted in any given year may not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by BLM. **Modification:** Standard modifications apply. A modification may also be approved if the proponent, Bureau of Land Management, and Colorado Parks and Wildlife agree to compensatory mitigation that satisfactorily offset detrimental impacts to big game winter range or its use, or an agreement can be reached where by a wildlife mitigation plan can be accommodated consistent with established RMP objectives and decisions. **Waiver:** Standard waivers apply.
CRVFO-TL-5: Raptors (Non-special Status Raptor Species), 3,550 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities to protect use of nesting and fledgling habitat during the following time periods: The timing limitation is applied within a 0.25-mile radius on species-specific dates as follows: • Red-tailed hawk and all owls: February 15 to July 15 • all Swainson's hawk: April 1 to July 15 • Osprey: April 1 to August 31 • Cooper's hawk and sharp-shinned hawk: April 15 to July 15 The timing limitation is applied within a 0.5-mile radius on species-specific dates as follows: • Golden eagle: December 15 to July 15 • Northern goshawk: March 1 to September 15 • Prairie falcon: March 15 to July 15 **Purpose:** To protect nesting and fledgling habitat during use. **Exception:** Standard exceptions apply. In addition, the stipulation may be suspended during any year in which the nest is unoccupied two weeks after the last date incubation should have begun. This date will be determined by a BLM biologist in consultation with CPW or USFWS biologists as necessary. The timing

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limitations may be excepted once the young have fledged and dispersed from the nest. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-TL-6: Waterfowl and Shorebird Nesting and Production Areas, 90 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities from April 15 to July 15 in a 328 feet radius of: goose winter concentration areas, goose brood concentration areas, geese production areas, great blue heron historic nest areas, and great blue heron nesting areas to protect nesting waterfowl and shorebirds. **Purpose:** To protect nesting waterfowl and shorebirds. **Exception:** Exceptions may be granted after consultation with the CPW if nesting waterfowl and shorebirds are not present at the reservoirs, or if operations can be located in such a manner as to minimize disturbance to nesting waterfowl and shorebirds. **Modification**: Standard modifications apply. **Wavier:** Standard waivers apply.
CRVFO-TL-8: Bald Eagle Nest Sites and Winter Roost Sites, 510 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a 0.5-mile buffer around nest sites and around winter roost sites during the flowing time periods: • Nest Sites: November 15 to July 31 • Winter Roost Sites: November 15 to March 15. The stipulation will be applied based on surveys, CPW data, or USFWS data as revised. Purpose: To: (a) protect nesting, including nest-centered courtship, nest attentiveness and construction or repair, egg-laying, incubation, feeding of nestlings, and post-fledging use of the nest; and (b) prevent disruption of wintering bald eagles at winter roost sites. **Exception:** Nest Sites. An exception can be granted or the distance reduced in years when a nest site is unoccupied by May 15 or once the young have fledged and dispersed from the nest. Winter Roost Sites. An exception can be granted or the distance reduced to 0.25-mile, if an environmental analysis of the proposed action indicates that the nature or conduct of the activity could be conditioned so as not to impair the utility of the site. **Modification**: Standard modifications apply. More specifically a modification may be granted if conditions have changed such that there is no reasonable likelihood of future site occupation. **Waiver:** Standard waivers apply.

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CRVFO-TL-10: Peregrine Falcon Nesting Complex, 920 acres
Stipulation: Prohibit surface occupancy and surface-disturbing activities within a 0.5-mile buffer around the cliff-nesting complex from March 15 to July 31. The stipulation will be applied based on surveys, CPW data, or USFWS data as revised. **Purpose:** To protect reproductive activity at nest sites and avoid nest abandonment. **Exception:** Standard exceptions apply. The limitation may be suspended in years when the nest site is unoccupied by May 15, or once the young have fledged and dispersed from the nest. The activity must be conditioned so as not to impair the utility of the site for future nesting. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
GRSG-TL-46e: No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).
Stipulation incorporates stipulation GRSG-TL-46e from the NCGSG Proposed LUPA/FEIS by reference.
GRSG-TL-PHMAPHMA-ROW-TL: Prohibit surface occupancy and surface disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).
Stipulation incorporates stipulation GRSG-TL-PHMA-ROW-TL from the NCGSG Proposed LUPA/FEIS by reference.
CRVFO-TL- Roan 1: Migratory Bird Nesting Season
Stipulation: Prohibit surface occupancy and surface-disturbing activities from May 15 to July 15. The stipulation would be applied based on biological surveys and species habitat preferences. **Purpose:** To protect use of nesting and fledgling habitat for birds of conservation concern (BCC). **Exception:** Standard exceptions apply. The application of the timing limitation would consider: the type of equipment to be used, the scale, and the duration of the project; species potentially present; habitat types present; breeding phenology; weather conditions; elevation; distance to known nests; and terrain.. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVFO-TL- Roan 2: Elk Production Area, 24,400 acres
Stipulation: Prohibit surface occupancy and surface disturbing activities from April 15 to June 30 in mapped elk production areas to reduce behavioral disruption during parturition and early young rearing period. This stipulation does not apply to operation and maintenance of production facilities. **Exception:** The Field Manager may grant an exception if an environmental analysis indicates that the proposed action can be conditioned so as not to interfere with habitat function or compromise animal condition within the project vicinity. An exception may also be granted if the proponent, Bureau of Land Management, and Colorado Division of Wildlife negotiate compensation that would satisfactorily offset anticipated impacts to big game production or habitat condition, or an agreement can be reached where by a COGCC wildlife mitigation plan can be accommodated consistent with established RMP objectives and decisions. An exception may also be granted for actions intended to enhance the long term utility for availability of suitable habitat.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
Modification: The Field Manager may modify the size and time frames of this stipulation if Colorado Division of Wildlife monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. **Waiver:** This stipulation may be waived if Colorado Division of Wildlife determines that the area is no longer utilized by big game for production purposes.
CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes
Stipulation: Prohibit surface occupancy and surface-disturbing activities during species-specific spawning periods to reduce impacts to breeding adults, eggs, emerging larval fish, and avoid stream channel disturbances: Non-Special Status Species: • Rainbow trout: March 1 to June 15 • Brown trout: October 1 to May 1 • Brook trout: August 15 to May 1. Special Status Species: • Cutthroat trout: May 1 to September 1 • Bluehead sucker: May 1 to July 15 • Flannelmouth sucker: April 1 to July 1 • Roundtail chub: May 15 to July 15 • Mountain sucker: May 1 to July 15. **Purpose:** To promote recruitment by protecting adult fish, redds (egg masses) in the gravel, and emerging fry during spawning periods. **Exception:** Standard exceptions apply. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
Lease Notices (LN) Stipulations
GS-LN-Roan-14: Master Development Plan
Stipulation: A MDP will be required of oil and gas operators prior to exploration or development activities. For all activities in areas atop the plateau, and in areas being actively explored or developed below the rim, the operator must submit a MDP. The MDP must include all anticipated activities for a minimum of 2 years following the date of submission, for all operator-controlled federal leases or units. A longer term is encouraged and would be allowed under this standard to expedite the permitting process, provide for efficiencies as provided for in Standard 6 of this stipulation, and reduce costs to the operator for MDP preparation. The boundaries of the geographic areas to be addressed atop the plateau, as identified by the BLM, may be modified with approval from the BLM. The boundaries of all other geographic areas must be proposed by the operator and must be approved by

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

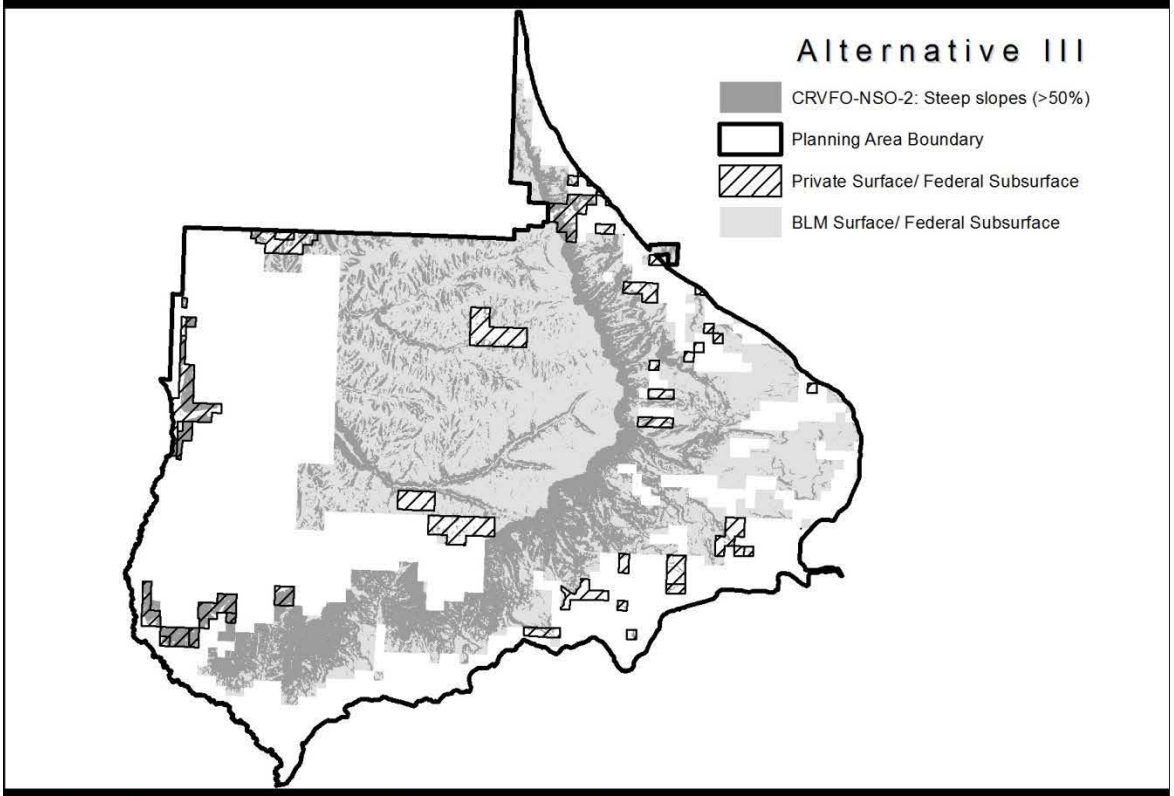
Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
the BLM. The MDP must identify all anticipated exploration, development, and production activities on federal leases within the area, identifying well locations, roads, pipelines, and any other exploration or production disturbance or facilities. The MDP must include all specific measures needed to comply with standards associated with all stipulations and any other decisions of this RMPA. The MDP must include an analysis of site-specific and cumulative environmental effects and mitigation. The MDP must also address reasonable alternatives, and other information sufficient to satisfy the requirements of the National Environmental Policy Act (NEPA). The extent of the analysis will be dependent on the extent of surface ownership, extent of lease holdings, topography, access, resource concerns, and the ability to tier to the Roan Plateau Environmental Impact Statement (EIS), consistent with 40 CFR § 1500. The extent of the analysis needed to comply with 40 CFR § 1500 may appropriately vary when considering individual wells or small groups of exploratory wells or for directional wells drilled on previously developed wellpads. To the extent practicable, the activities identified in the MDP must be presented in such a manner as to support the orderly and efficient exploration and development of mineral resources in an environmentally responsible manner. MDPs may be modified by operators as needed, and shall be reviewed by the operators not less than annually. As appropriate, either a statement documenting that the MDP is current or a modified MDP shall be provided to the BLM.
GS-LN-Roan-34: ESA Consultation
The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.
GRSG PHMAPHMA LN-46e: Any lands leased in PHMA are subject to the restrictions of 1 disturbance per 640 acres calculated by CO management zone to allow clustered development.
Stipulation currently under development as part of the NCGSG RMP/EIS process
GRSG PHMAPHMA LN -54e: Within PHMA, operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single well Applications for Permit to Drill for all exploratory wells.
Stipulation currently under development as part of the NCGSG RMP/EIS process
CRVFO-LN-Roan-35: Emergency Response Plan
The operator is required to prepare and maintain a current emergency response plan. The plan shall be provided to the BLM, Colorado State Patrol, the affected county and communities, and the general public. The plan shall contain information sufficient to describe the potential for emergency incidents related to fluid minerals development that pose an immediate danger to human health and safety and would normally require immediate actions by the operator to remove the threat, such as for hazardous materials spills; actions to be taken by the operator in the event of such an incident; and a communications plan to inform appropriate authorities and potentially affected citizens.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

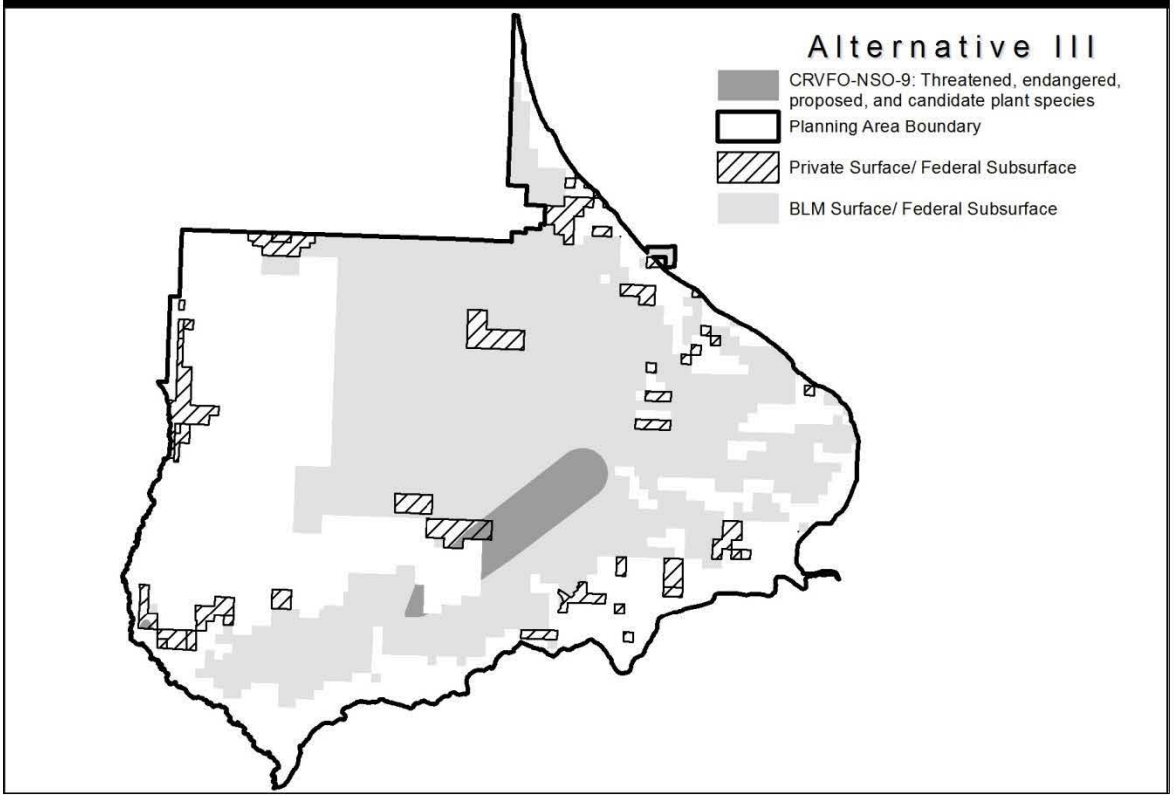
Appendix Table C-3. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative III, Community Alternative[1]
Conditions of Approval (COAs) Stipulations
GRSG PHMAPHMA COA-47-51b/c
The operator/lessee is required to conduct site- specific review of proposed projects prior to approval of Applications for Permit to drill. For leases within PHMA, the following COAs would apply: • Preclude new surface occupancy on existing leases within PHMA. • If the lease is entirely within PHMA, do not allow surface occupancy of any portion within 4 miles around the lek and limit permitted disturbances to one per section with no more than 3 percent surface disturbance in that section. • If the entire lease is within the 4-mile lek perimeter, limit permitted disturbances to one per section with no more than 3 percent surface disturbance in that section. Require any development to be placed at the most distal part of the lease from the lek, or depending on topography and other habitat aspects, in an area that is demonstrably less harmful to GRSG, such as based on topography or vegetation. The surface occupancy restriction criteria identified in this notice may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on federal, state, or private lands within PHMA.
GRSG PHMAPHMA COA-52b/d
Apply a seasonal restriction on exploratory drilling in PHMA to prohibit surface-disturbing activities during the lekking, nesting, and early brood rearing season. This COA is to be attached to leases within PHMA and could preclude the lessee the right to occupy the surface of the lease within PHMA during nesting and early brood rearing.
GRSG ADH COA-52c
Apply seasonal restriction on exploratory drilling to prohibit surface-disturbing activities during the lekking, nesting, and early brood rearing season in ADH. This restriction shall also apply to related activities that are disruptive to GRSG, including vehicle traffic and other human presence. This COA to be attached to leases within ADH could preclude the lessee the right to occupy the surface of the lease within ADH during nesting and early brood rearing.
GRSG PHMAPHMA COA-55b
For leases that are not yet developed within PHMA, the proposed surface disturbance cannot exceed 3 percent within that Colorado MZ. This restriction on surface occupancy may preclude surface occupancy and maybe beyond the ability of the lessee to meet due to existing surface disturbance on federal, state, or private lands within PHMA.

[1] NSO, CSU, and TL stipulations may overlap within and among categories. Acres of stipulations cannot be summed to calculate total area affected.

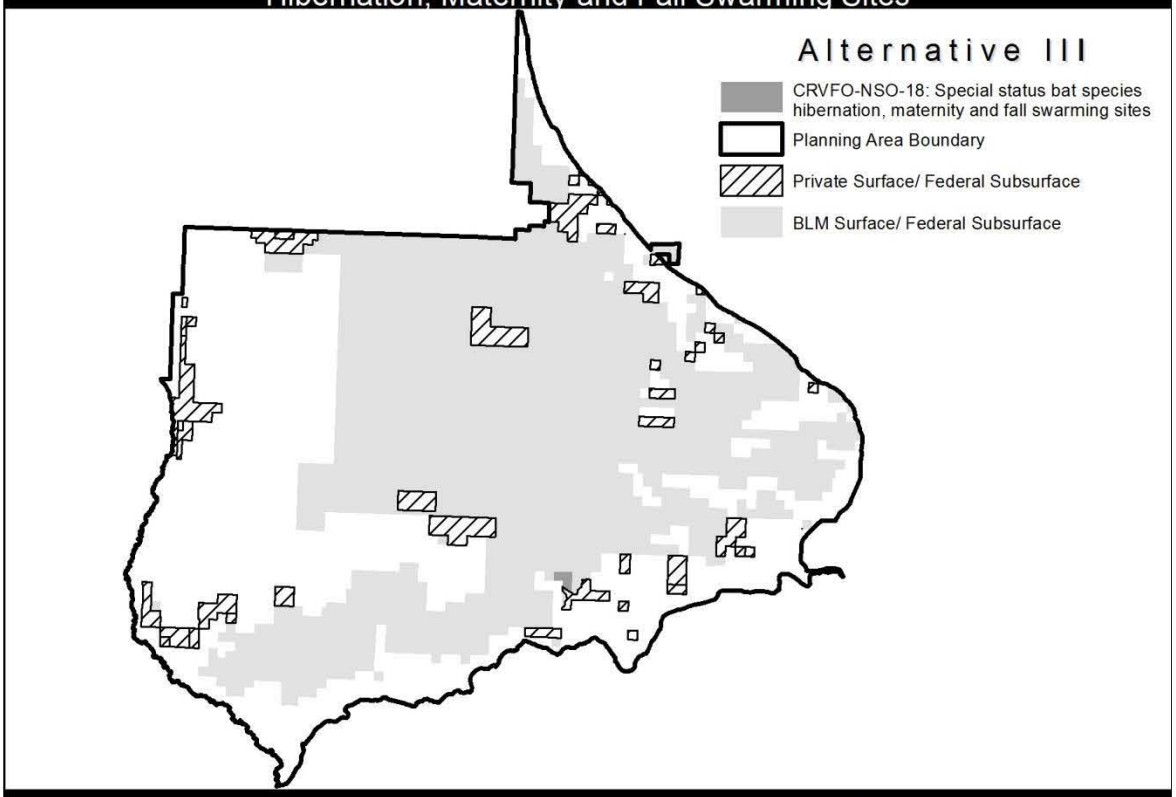
CRVFO-NSO-2: Steep Slopes (>50%)



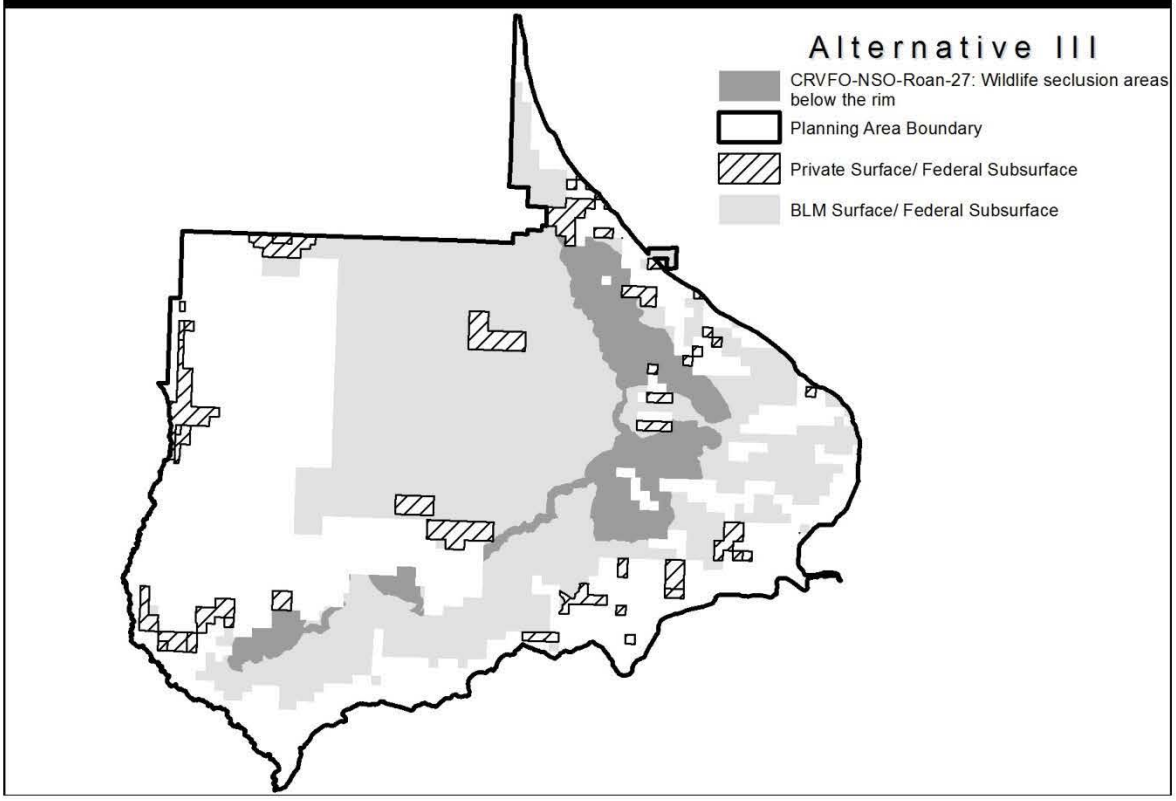
CRVFO-NSO-9: Threatened, Endangered, Proposed, and Candidate Plant Species



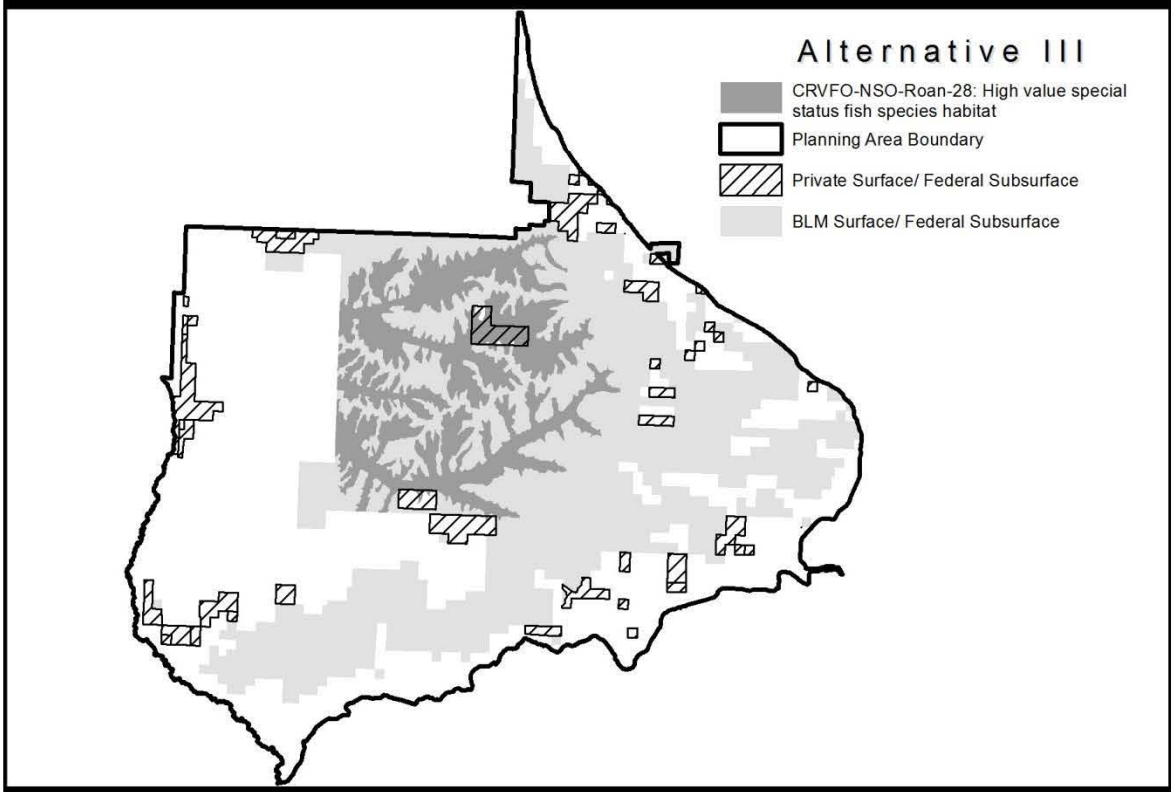
CRVFO-NSO-18: Special Status Bat Species Hibernation, Maternity and Fall Swarming Sites



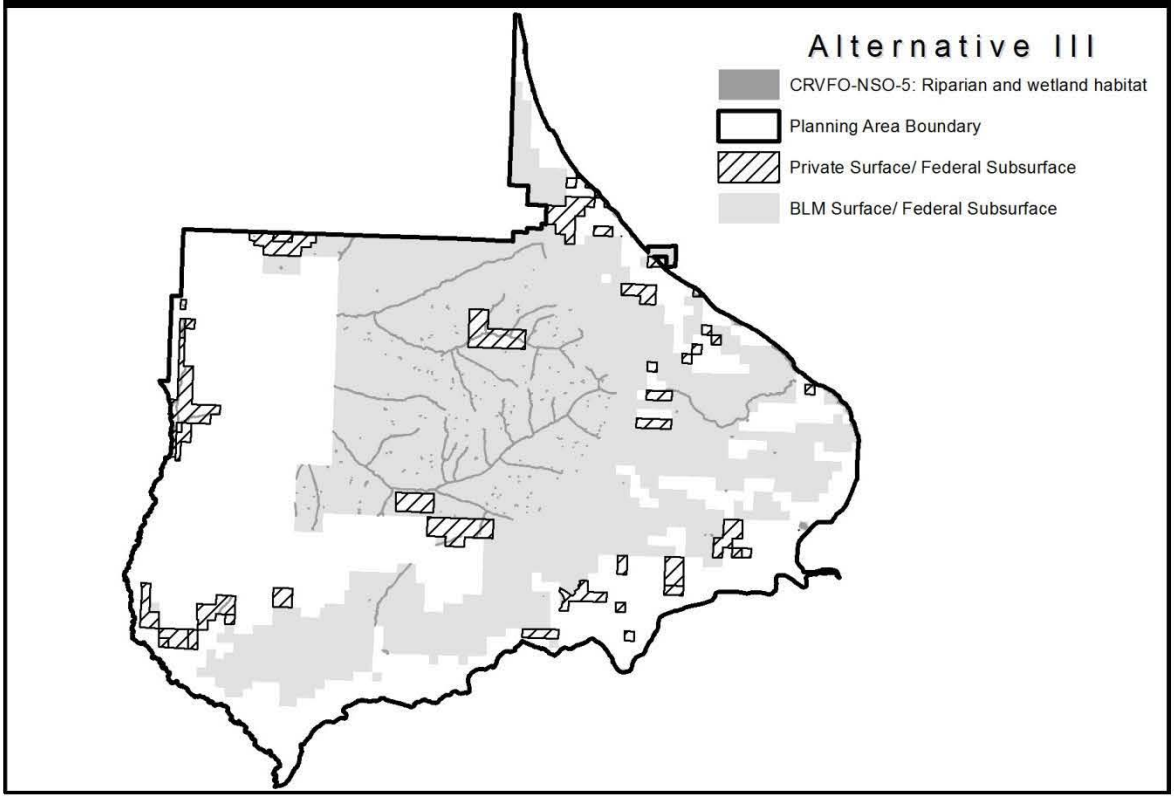
CRVFO-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim



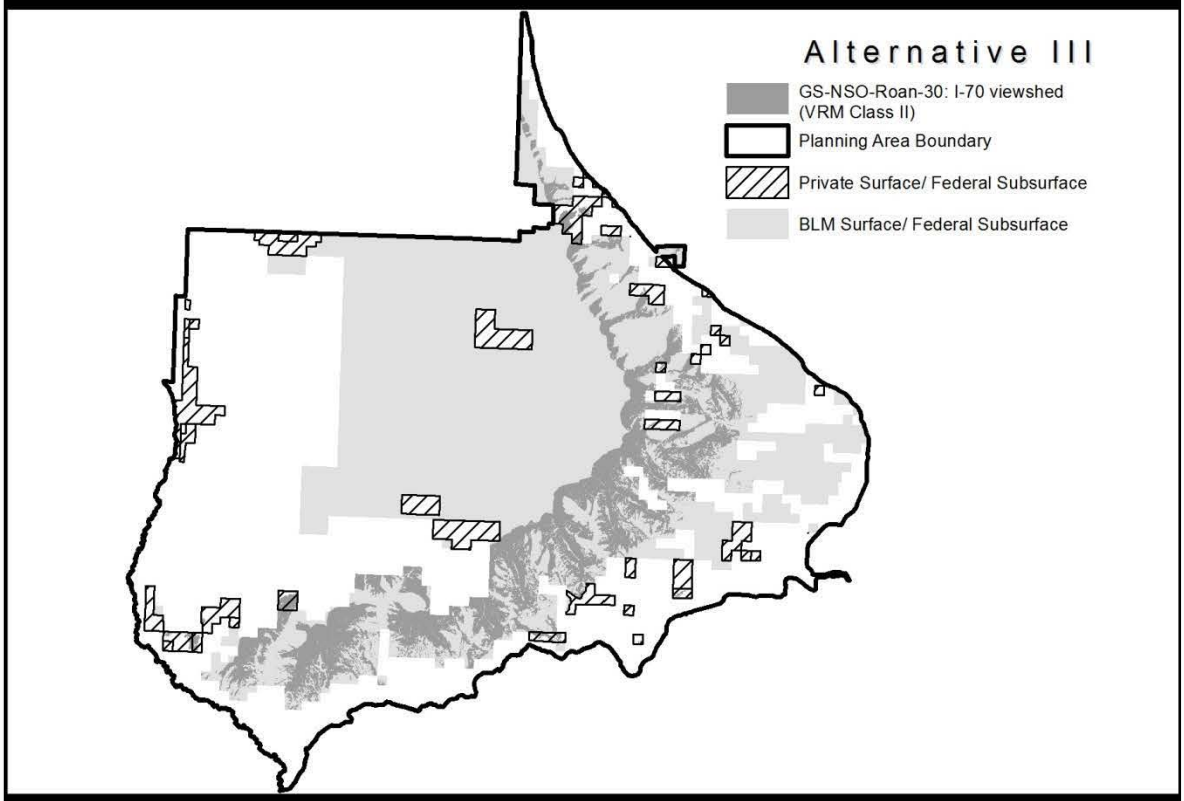
CRVFO-NSO-Roan-28: High Value Special Status Fish Species Habitat



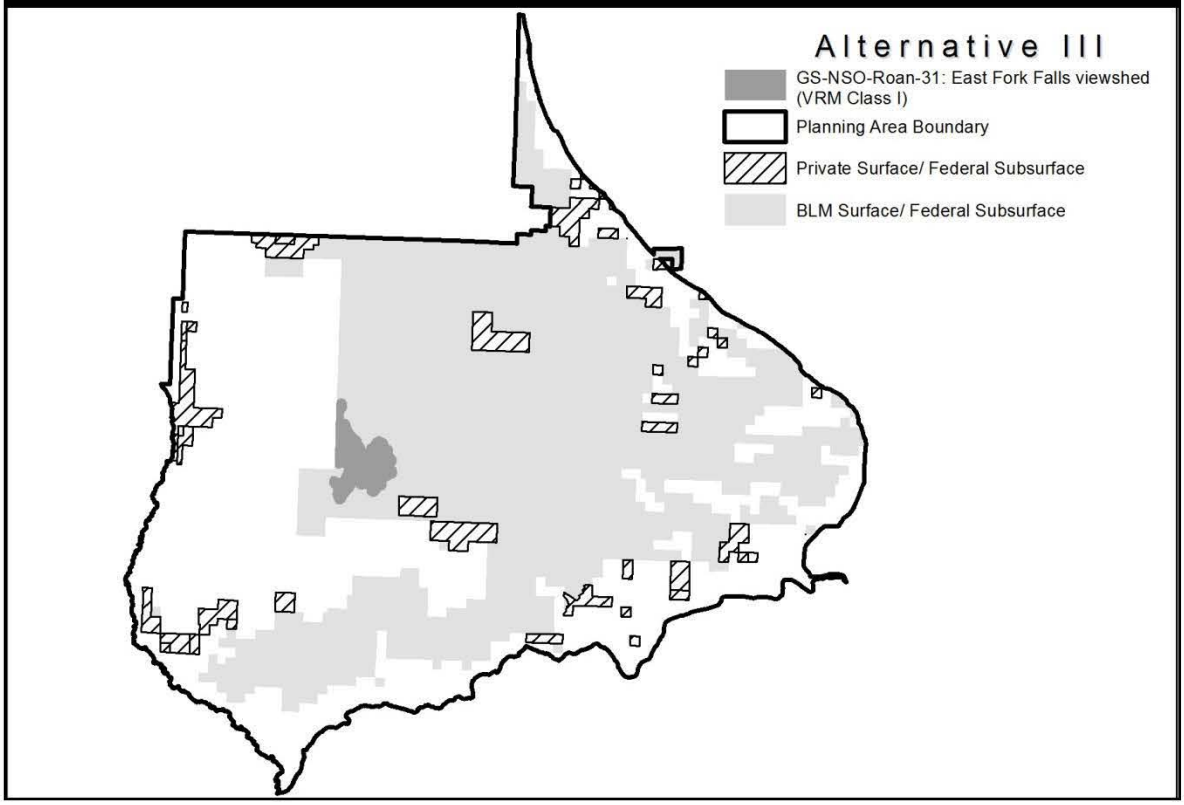
CRVFO-NSO-5: Riparian and Wetland Habitat

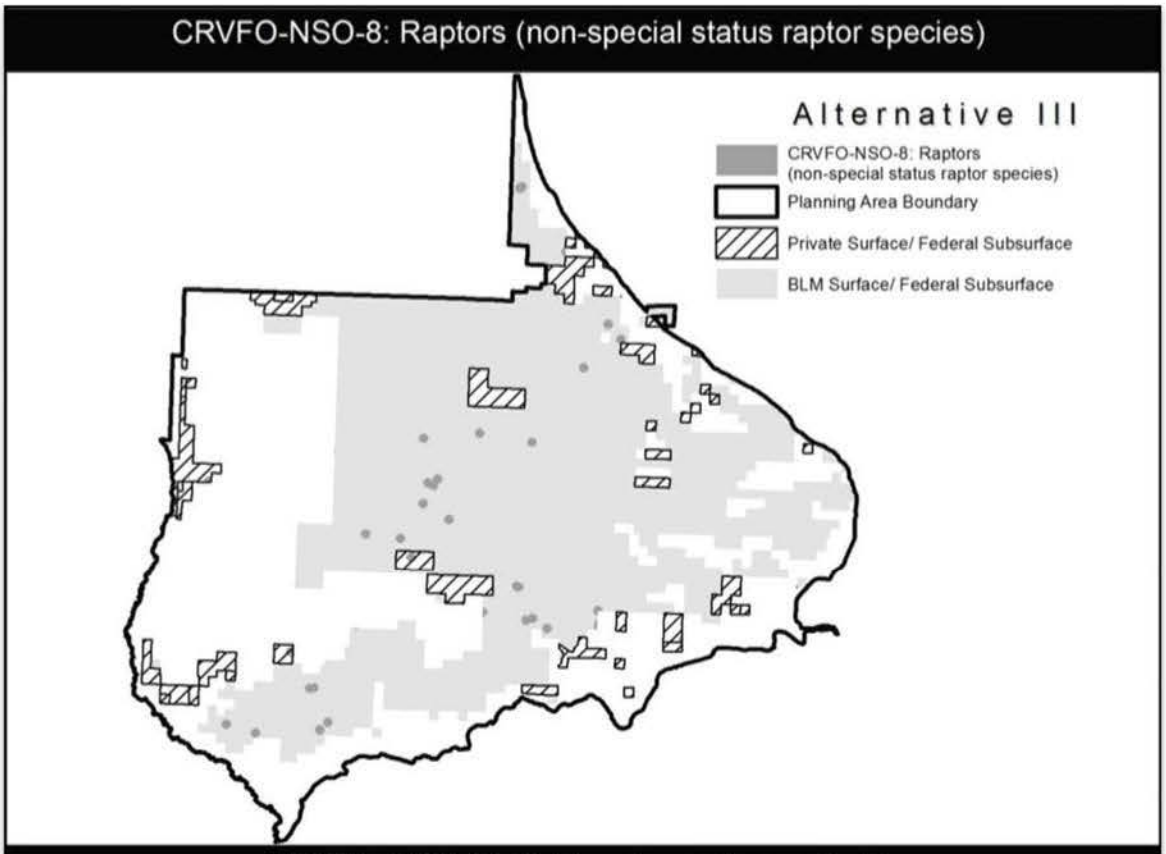


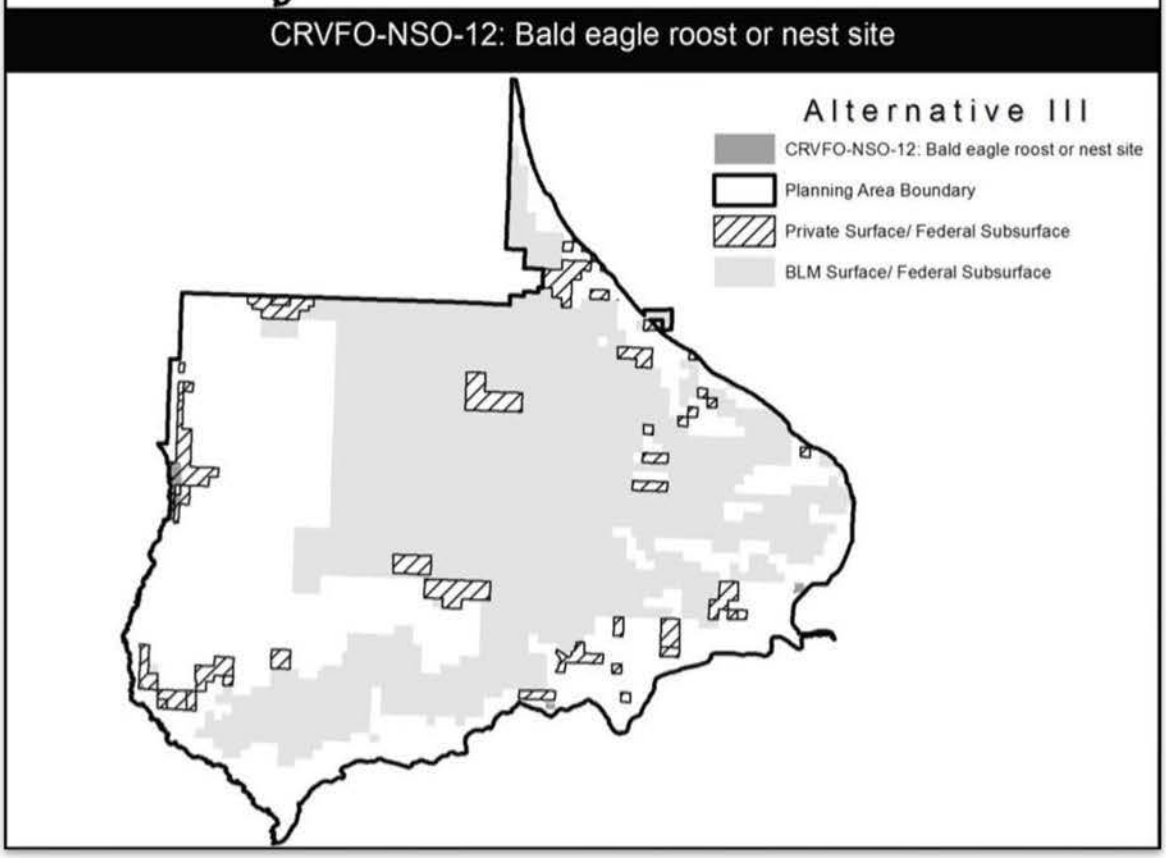
GS-NSO-Roan-30: I-70 Viewshed (VRM Class II)



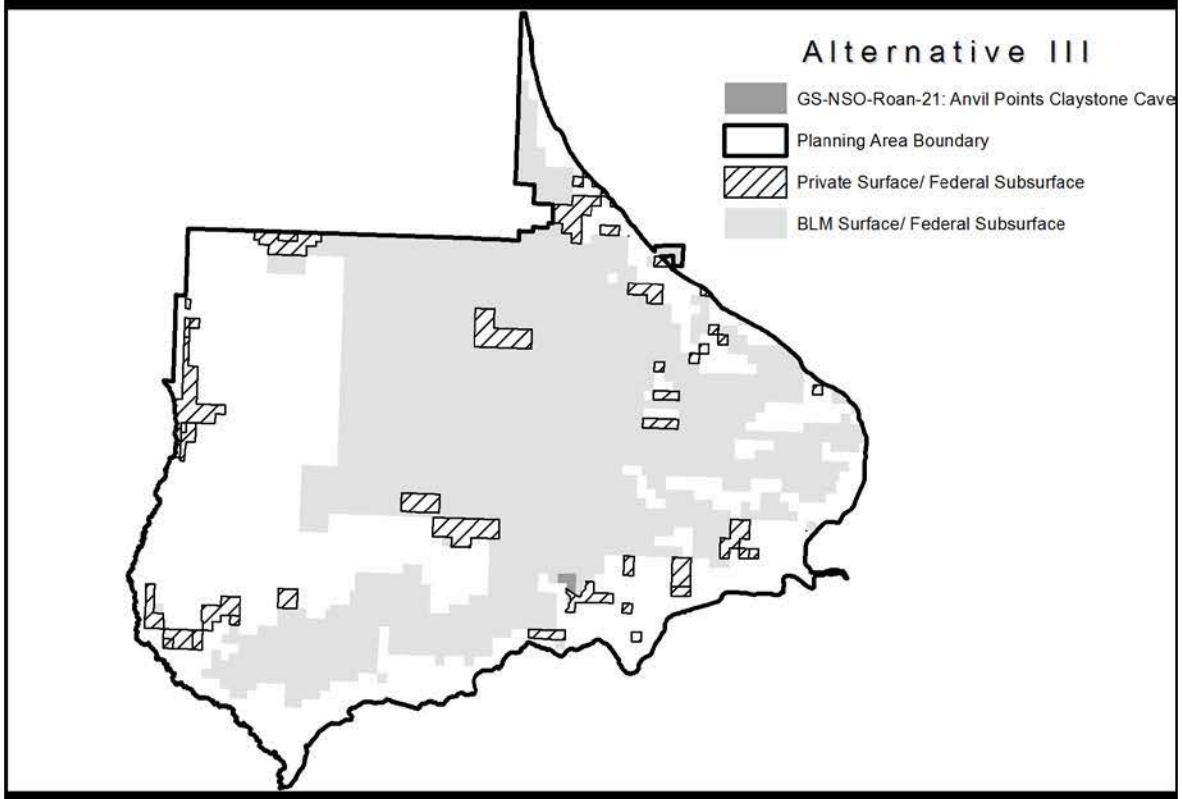
GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I)



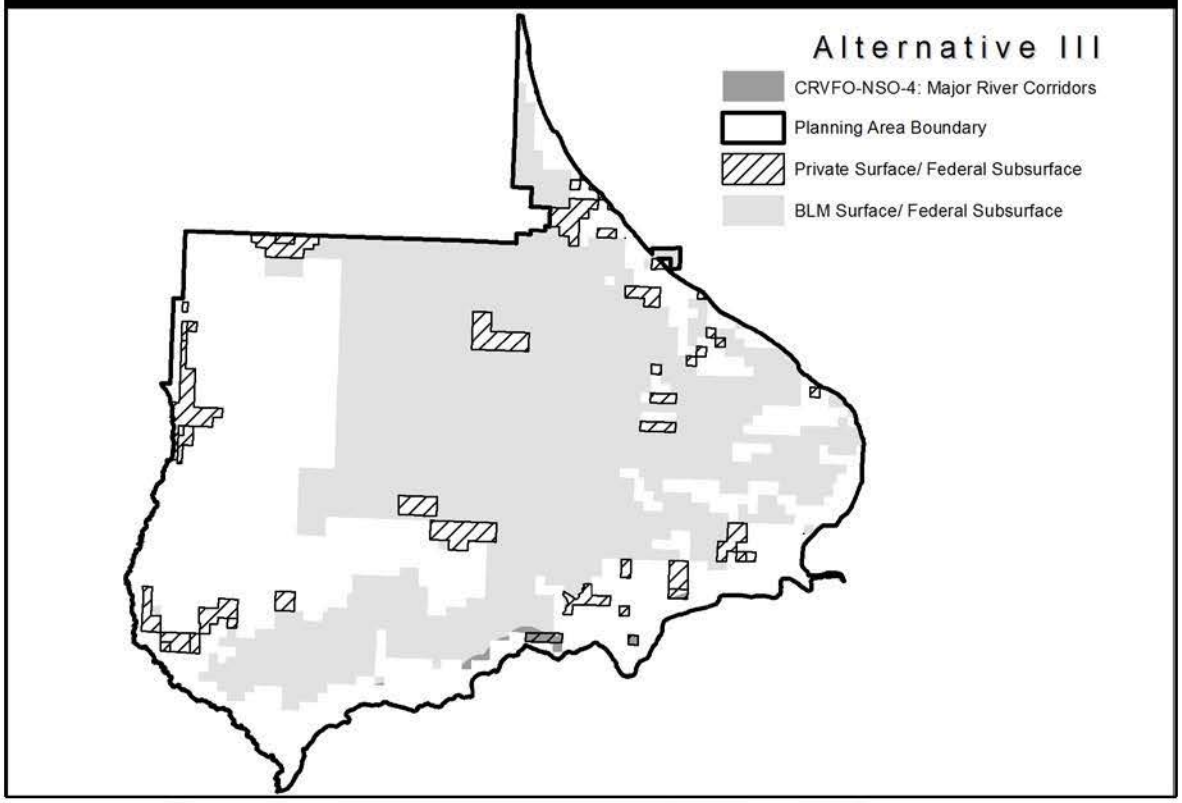

CRVFO-NSO-8: Raptors (non-special status raptor species)
Alternative III
CRVFO-NSO-8: Raptors
(non-special status raptor species)
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


CRVFO-NSO-12: Bald eagle roost or nest site
Alternative III
CRVFO-NSO-12: Bald eagle roost or nest site
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

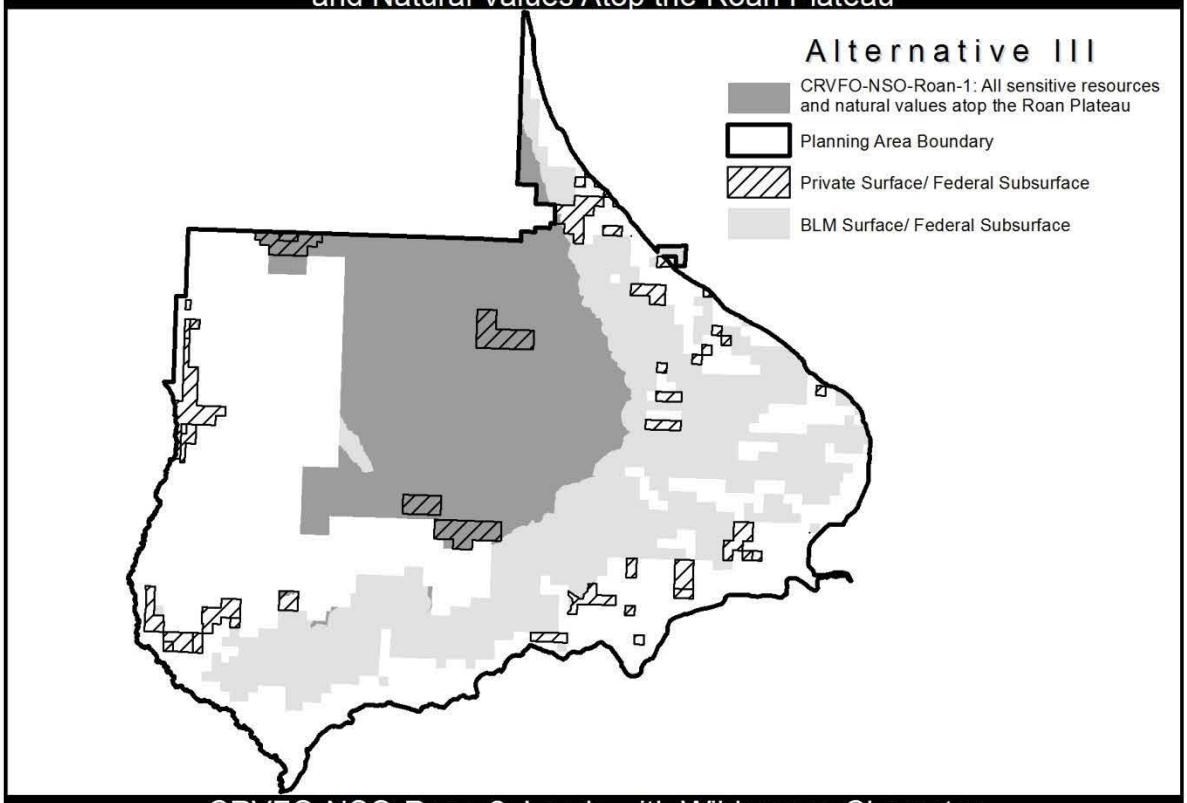
GS-NSO-Roan-21: Anvil Points Claystone Cave



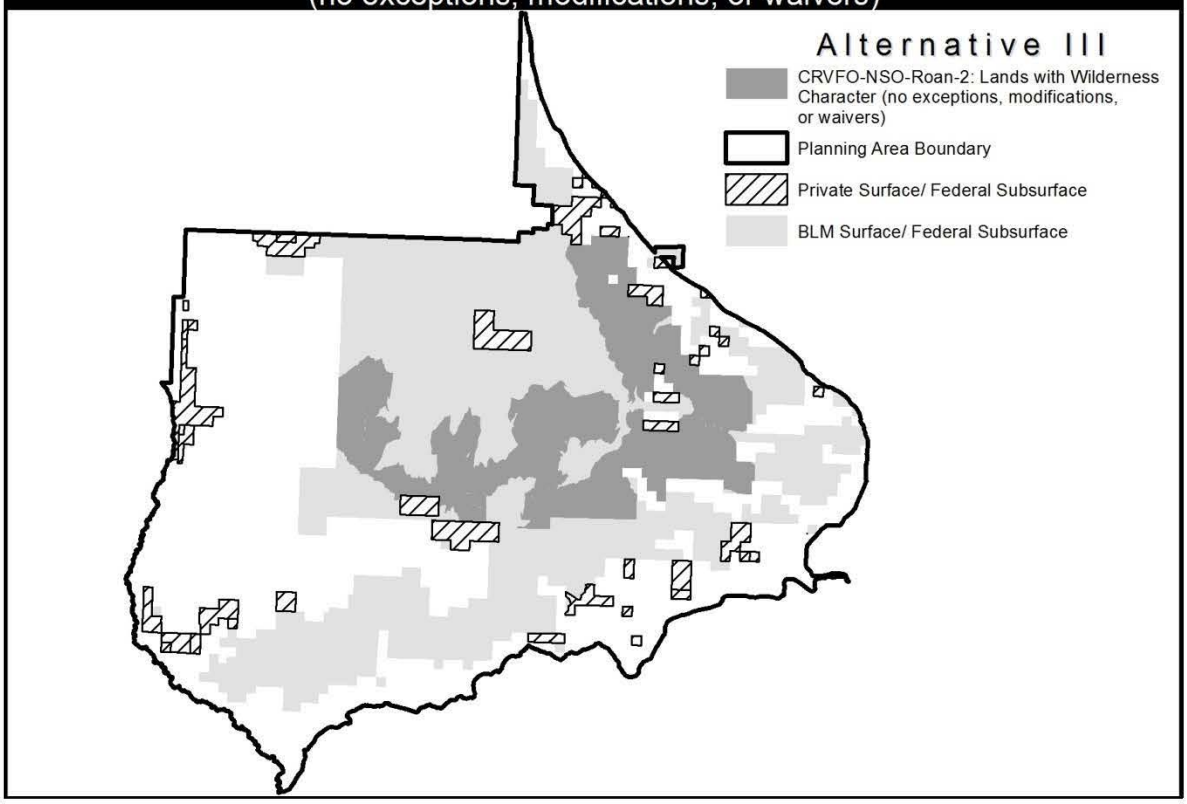
CRVFO-NSO-4: Major River Corridors

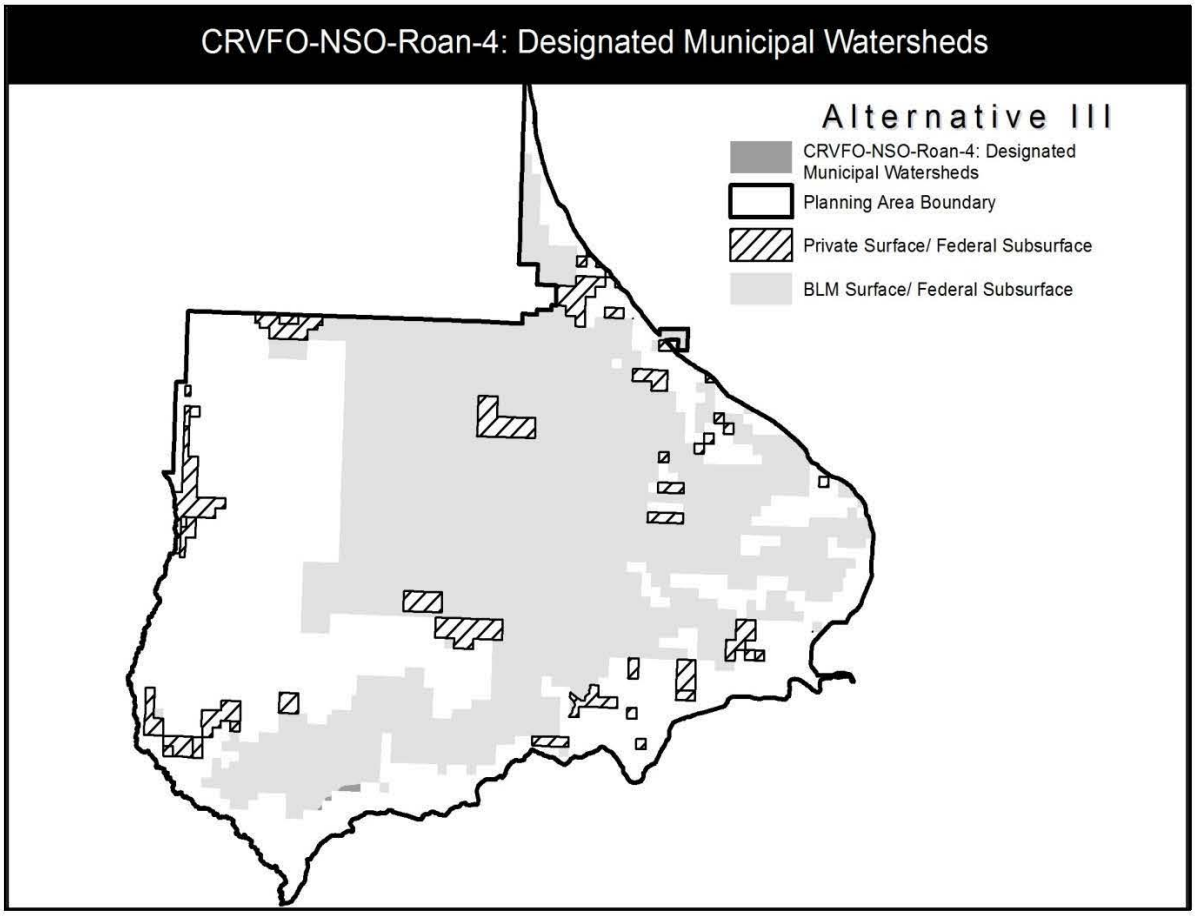


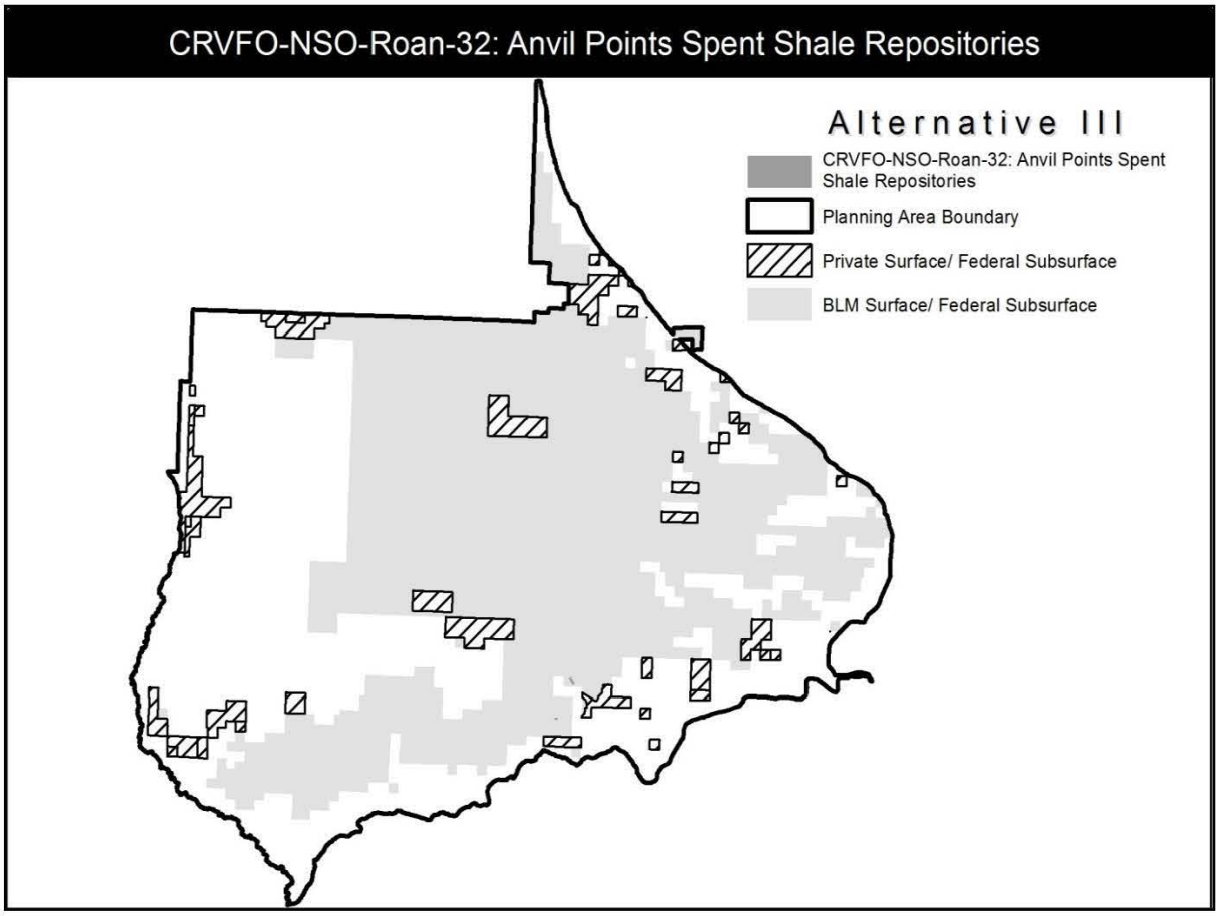
CRVFO-NSO-Roan-1: All Sensitive Resources and Natural Values Atop the Roan Plateau



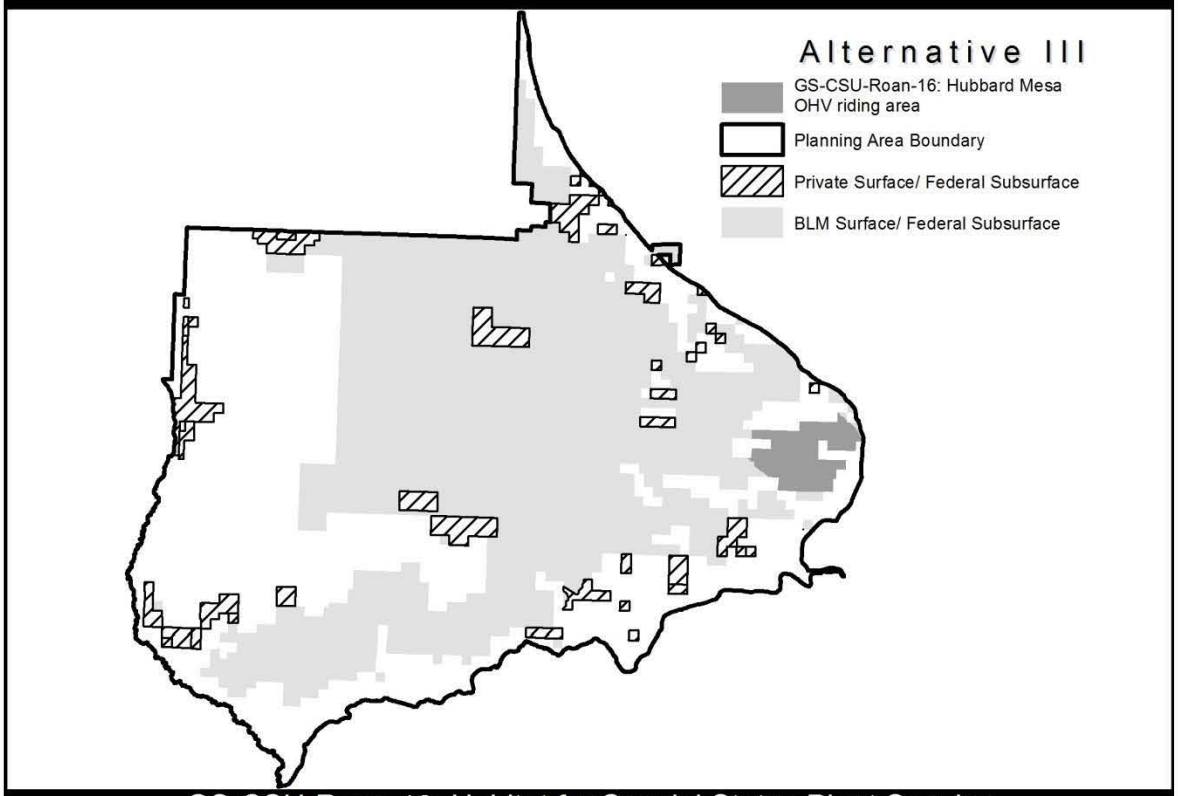
CRVFO-NSO-Roan-2: Lands with Wilderness Character (no exceptions, modifications, or waivers)



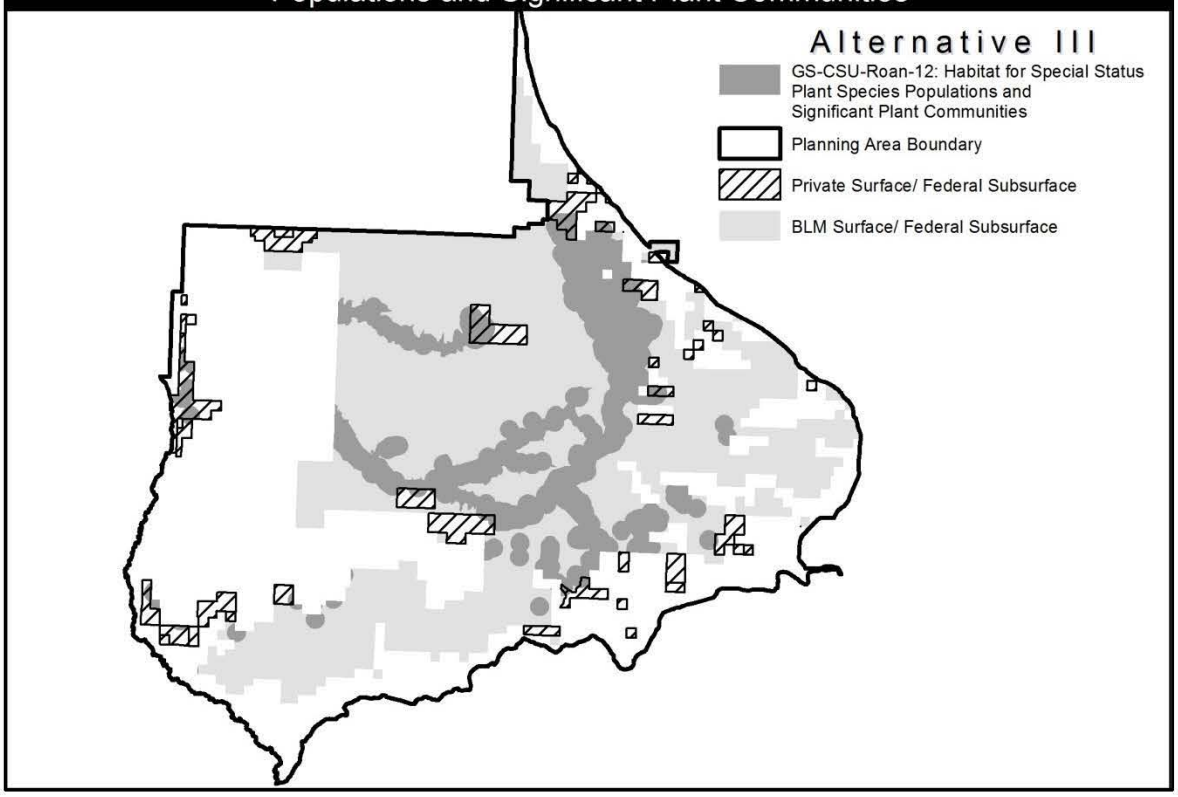

CRVFO-NSO-Roan-4: Designated Municipal Watersheds
Alternative III
CRVFO-NSO-Roan-4: Designated Municipal Watersheds
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories
Alternative III
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

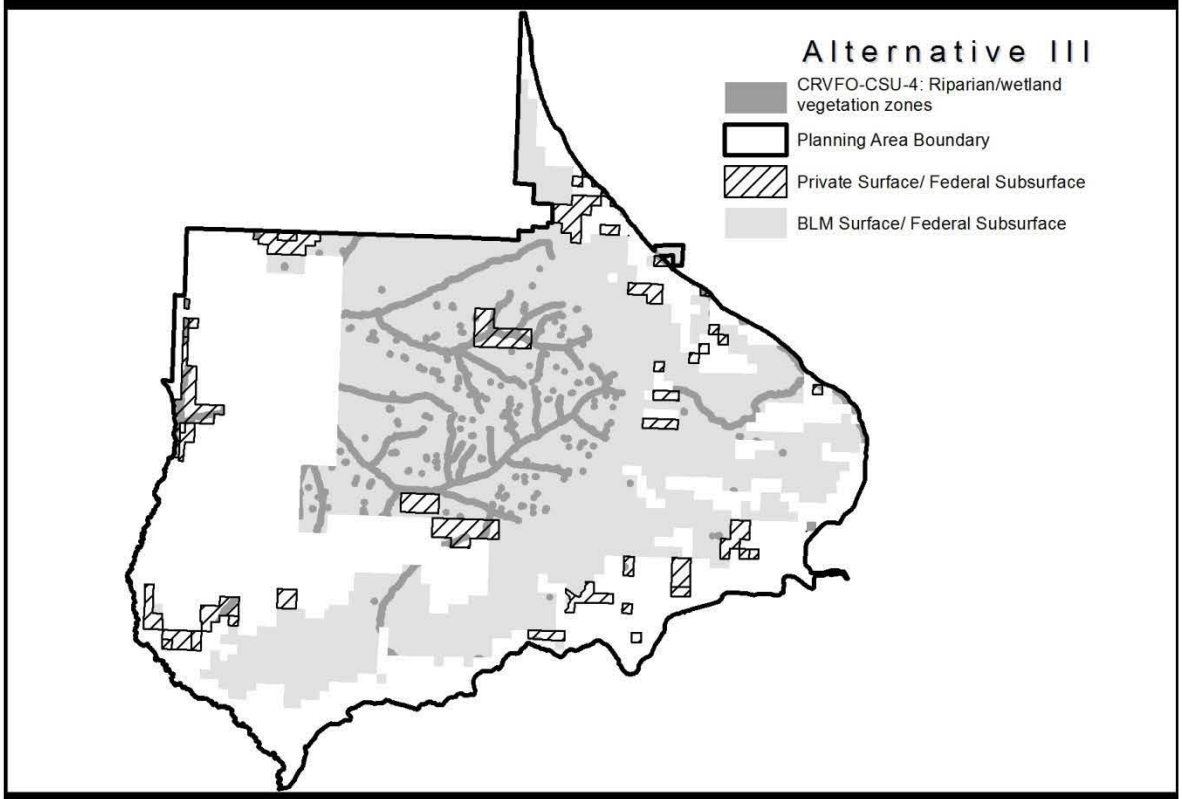
GS-CSU-Roan-16: Hubbard Mesa OHV Riding Area



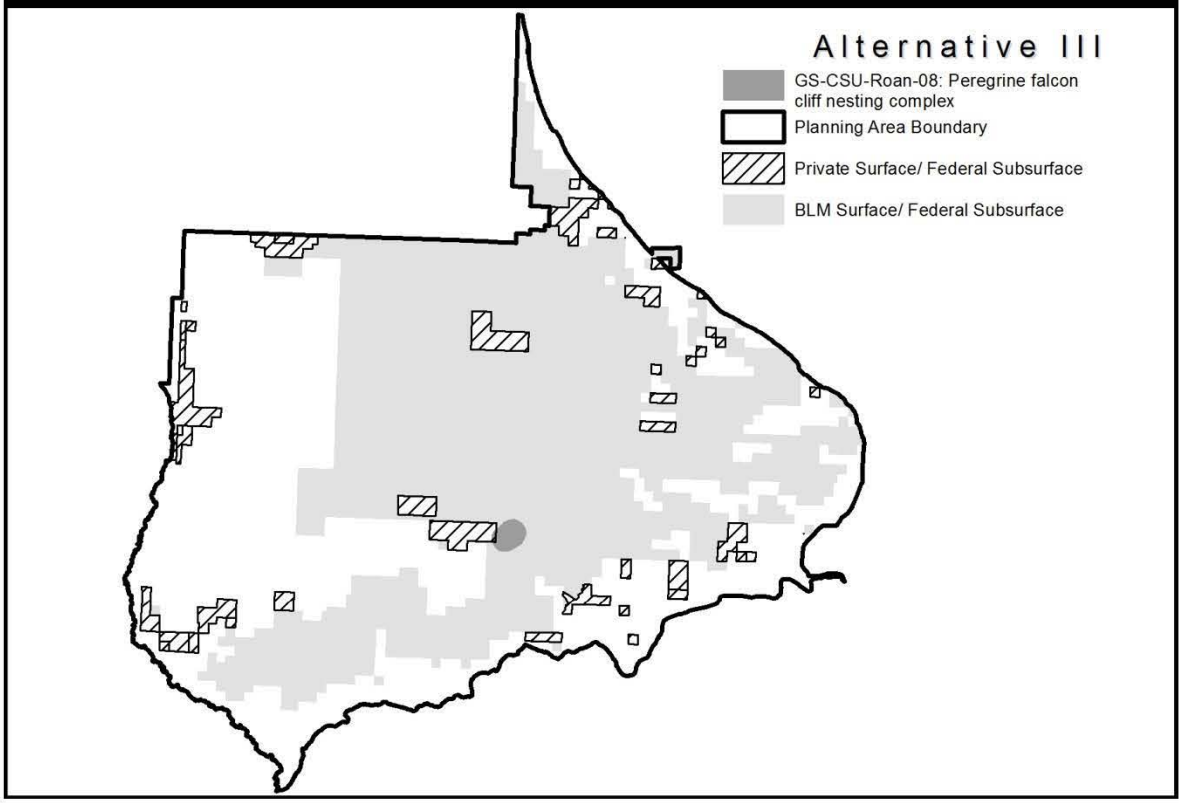
GS-CSU-Roan-12: Habitat for Special Status Plant Species Populations and Significant Plant Communities



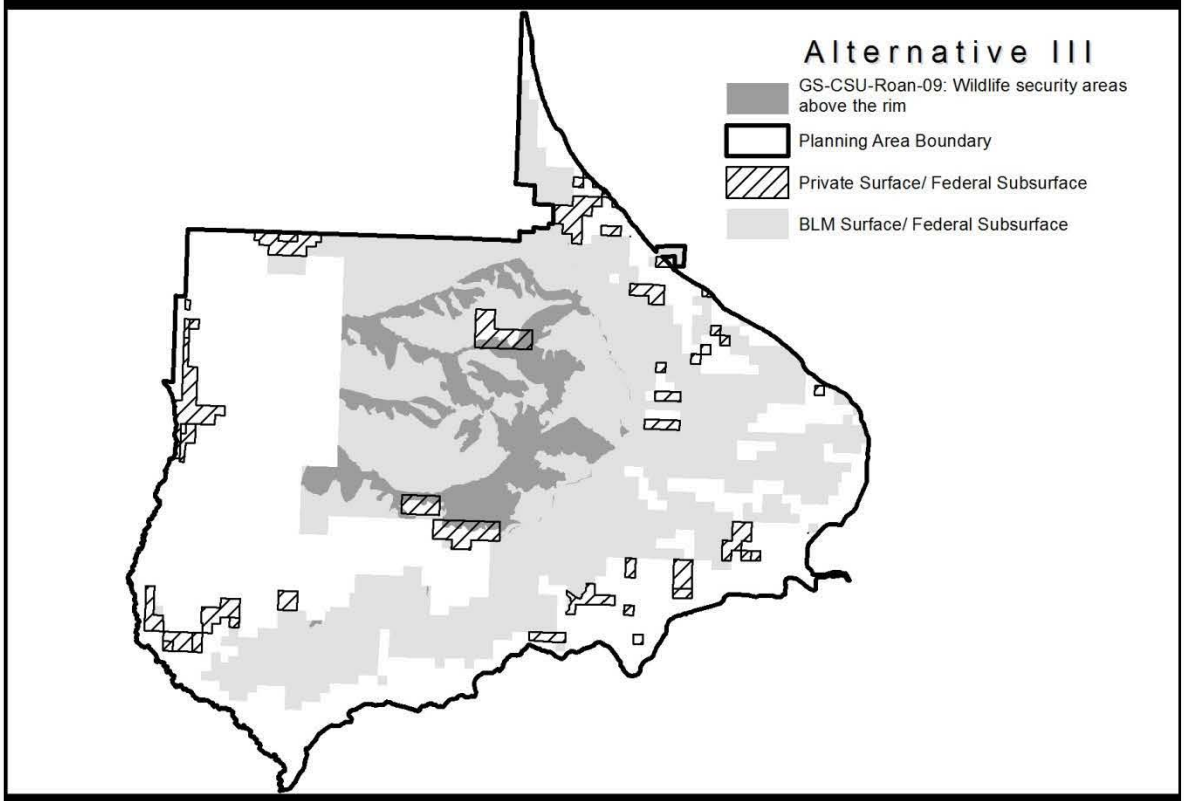
CRVFO-CSU-4: Riparian/Wetland Vegetation Zones



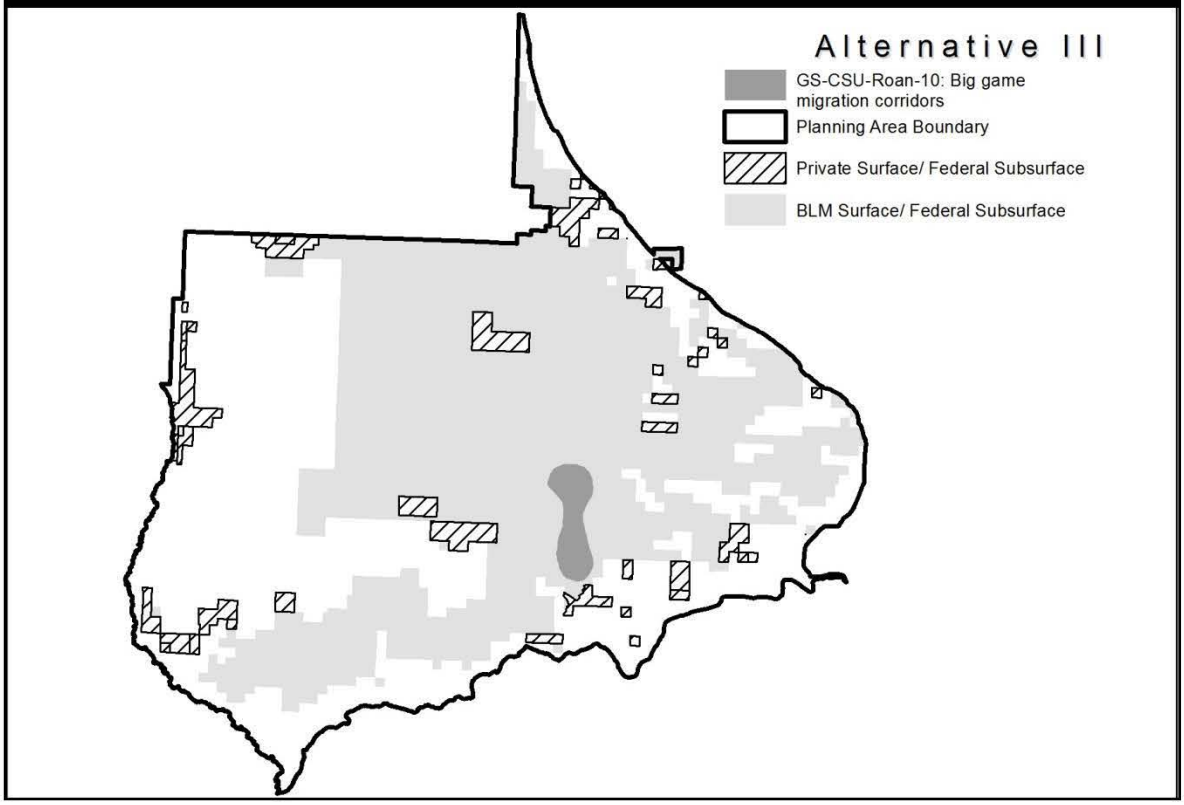
GS-CSU-Roan-8: Peregrine Falcon Cliff Nesting Complex



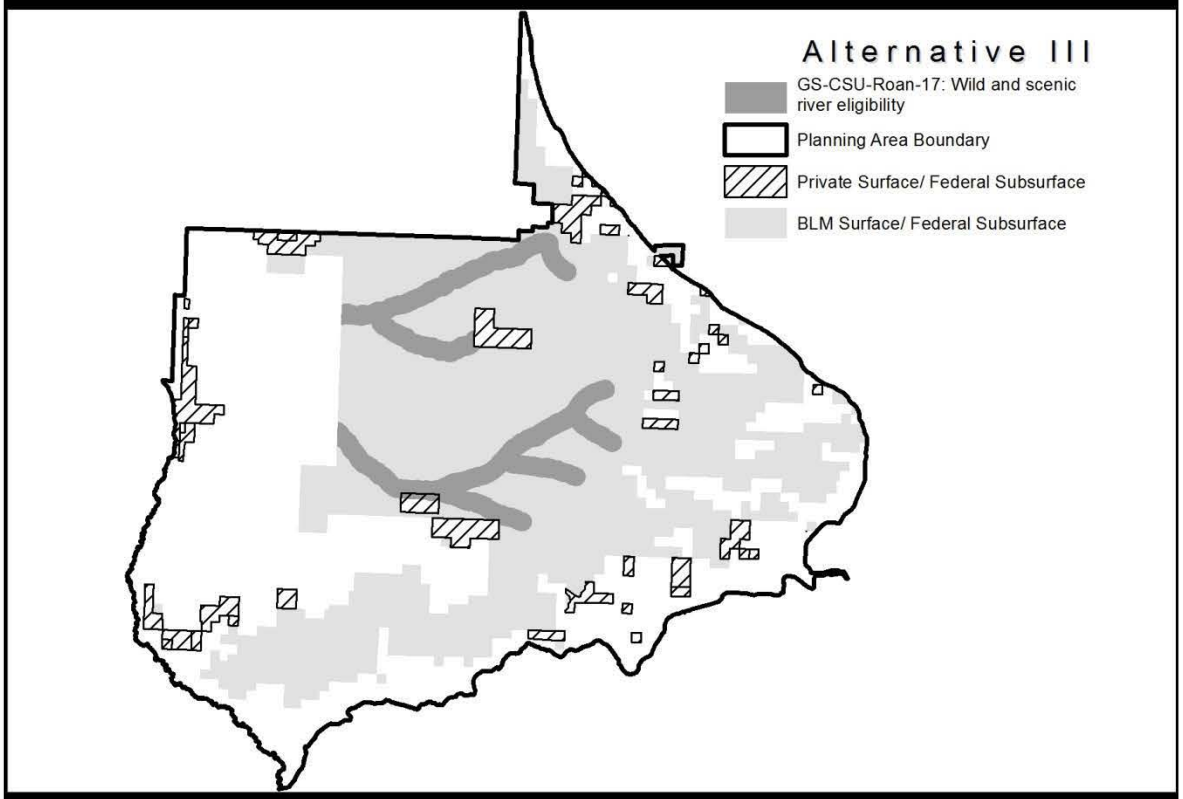
GS-CSU-Roan-09: Wildlife Security Areas Above the Rim



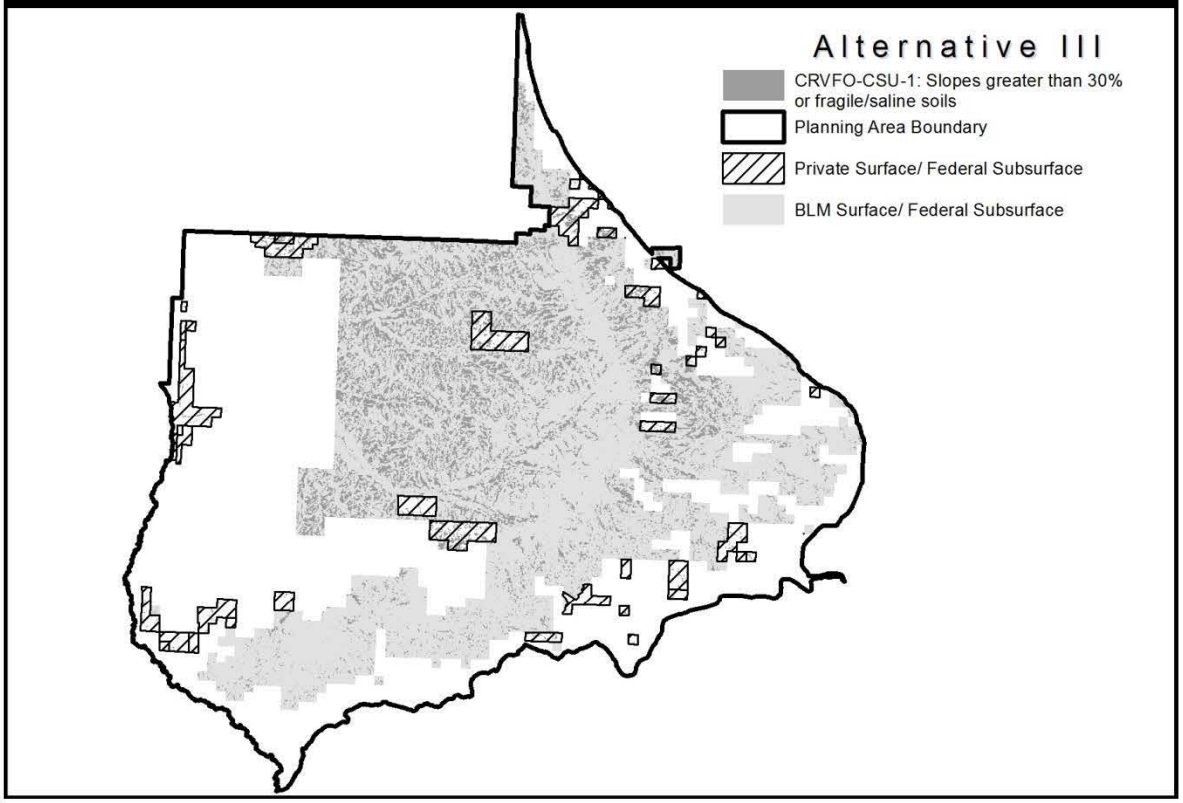
GS-CSU-Roan-10: Big Game Migration Corridors



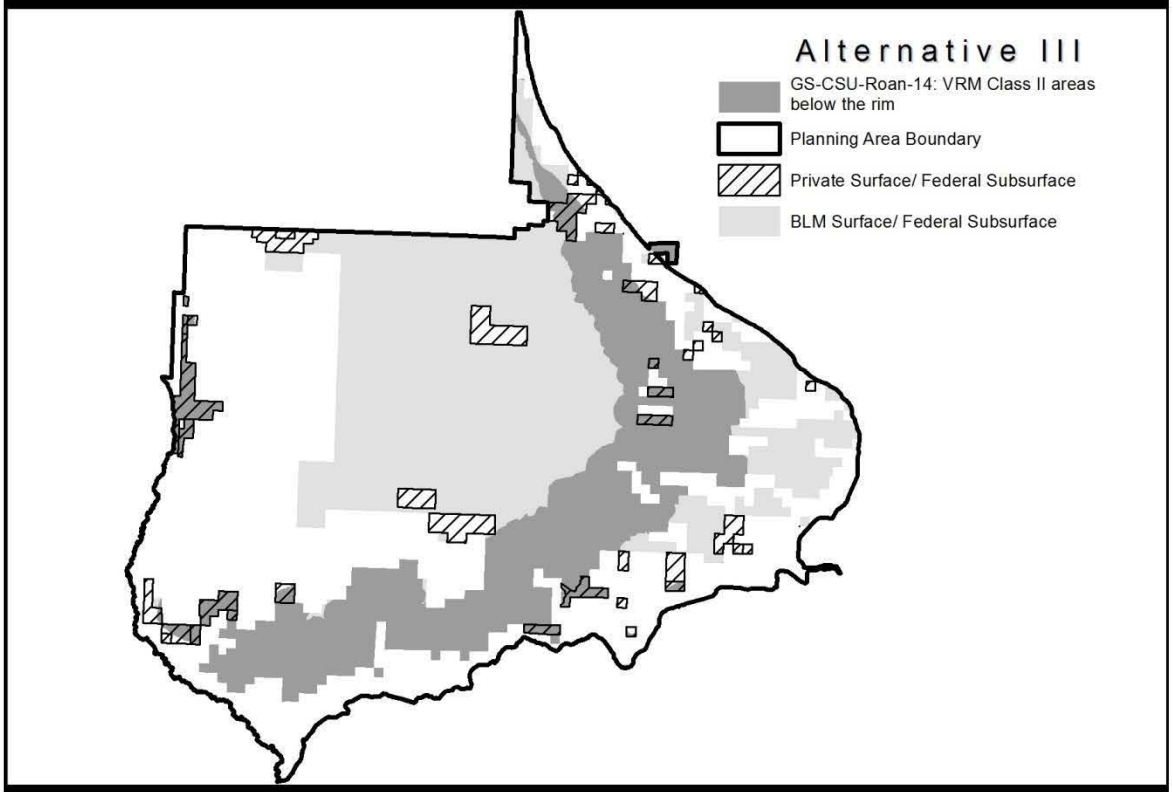
GS-CSU-Roan-17: Wild and Scenic River Eligibility



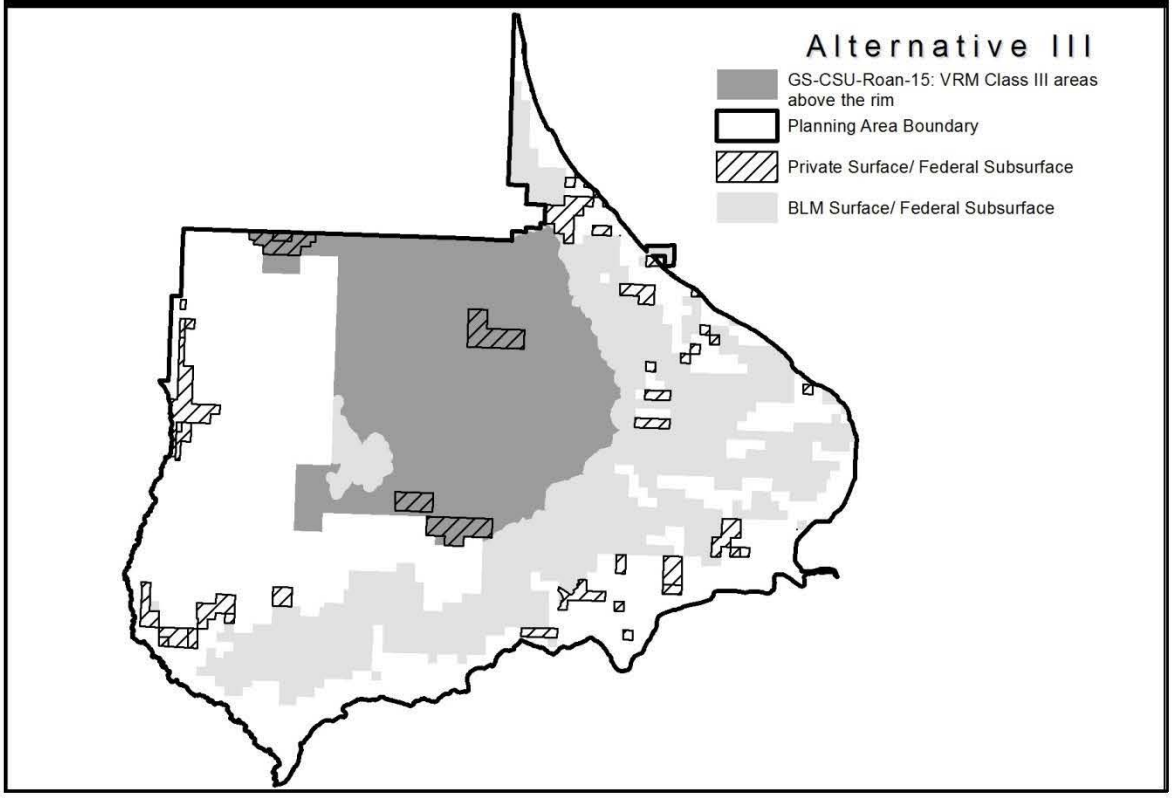
CRVFO-CSU-1: Slopes Greater than 30% or Fragile/Saline Soils

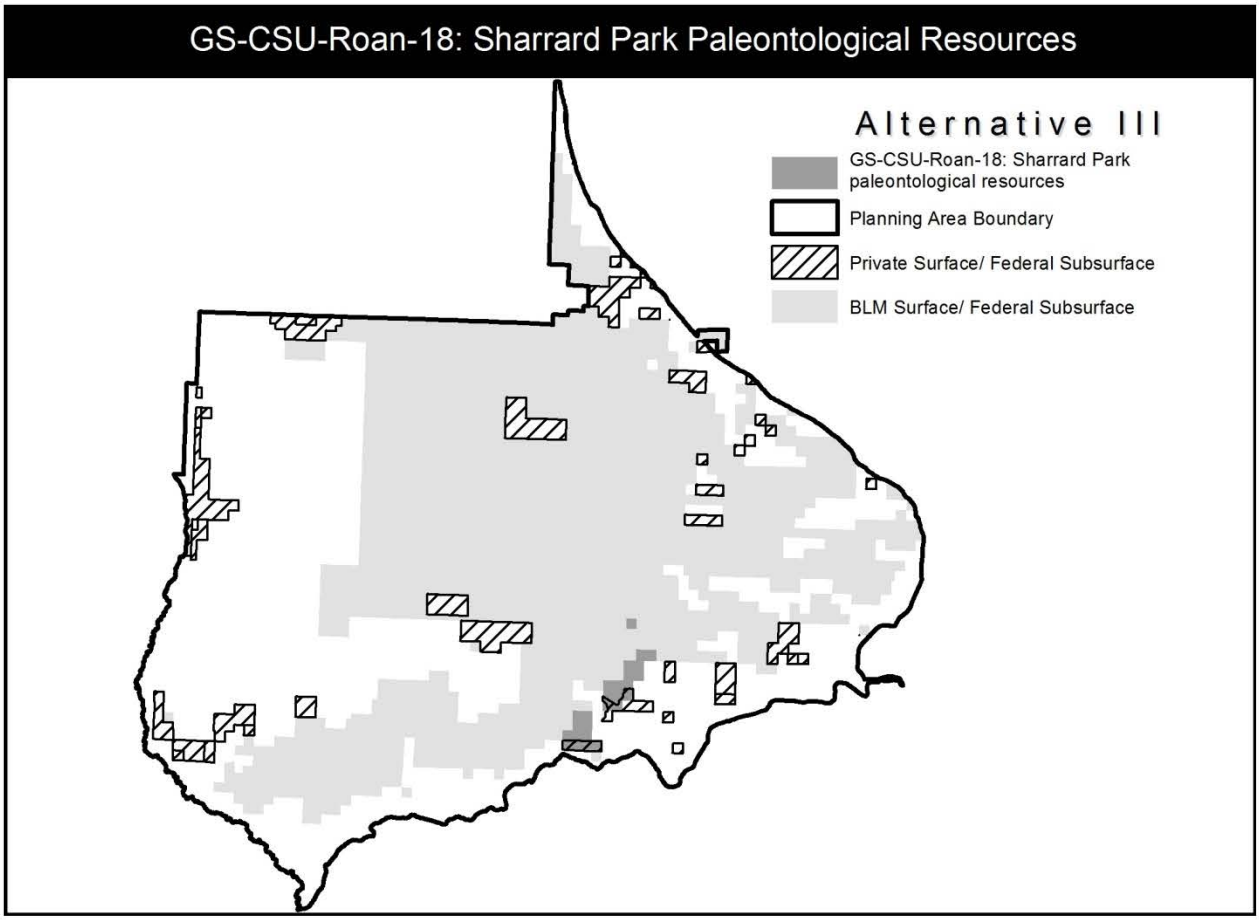


GS-CSU-Roan-14: VRM Class II Areas Below the Rim

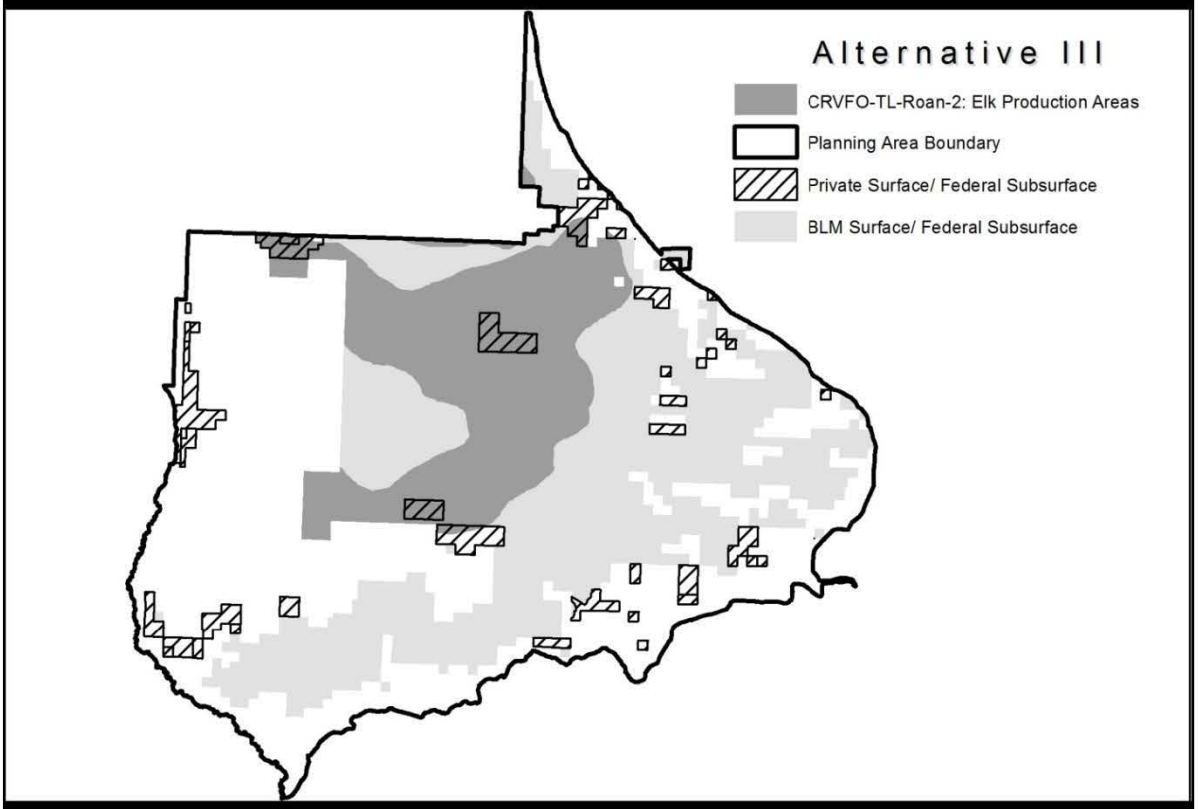


GS-CSU-Roan-15: VRM Class III Areas Above the Rim

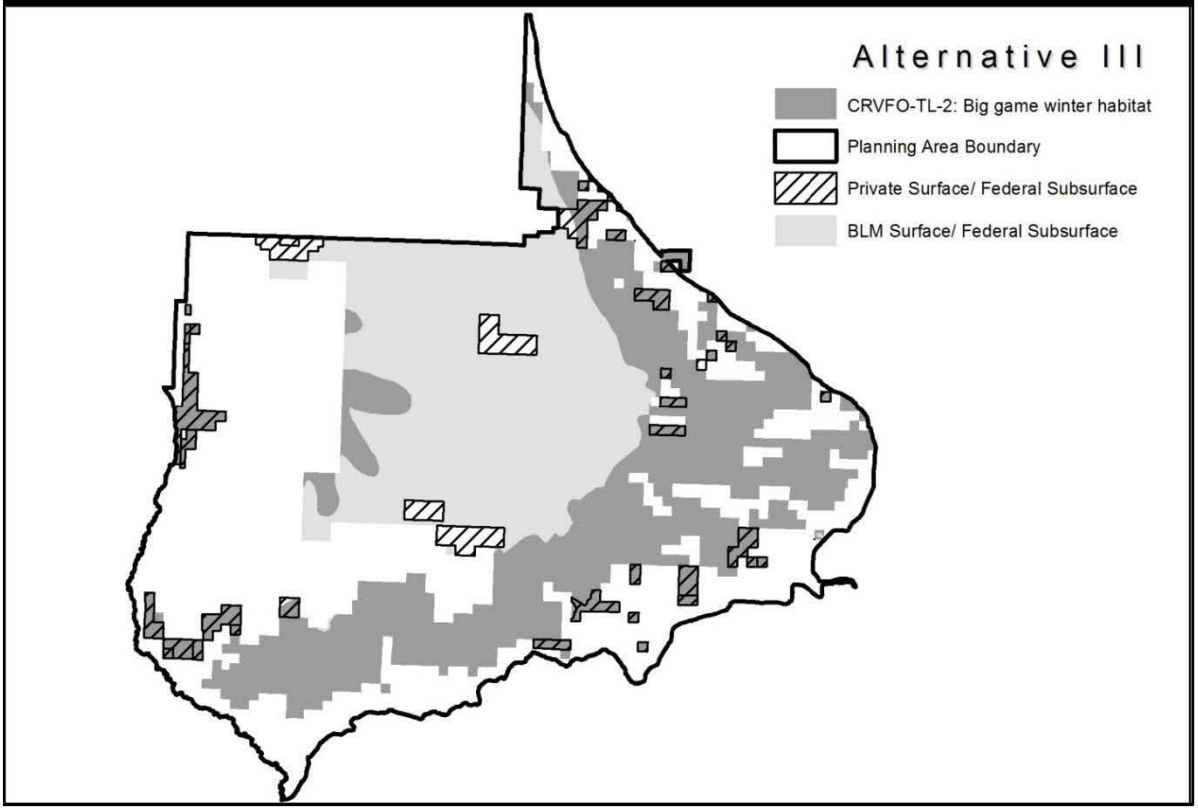



GS-CSU-Roan-18: Sharrard Park Paleontological Resources
Alternative III
GS-CSU-Roan-18: Sharrard Park paleontological resources
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

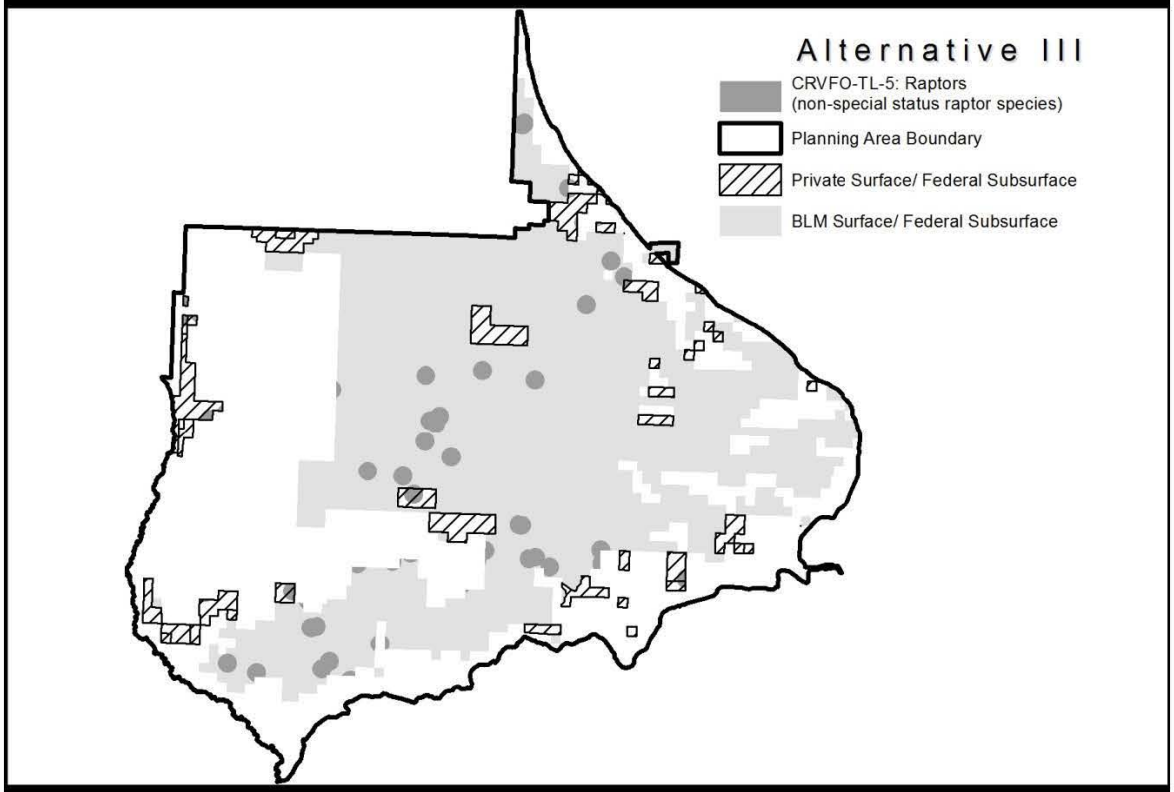
CRVFO-TL-Roan-2: Elk Production Areas



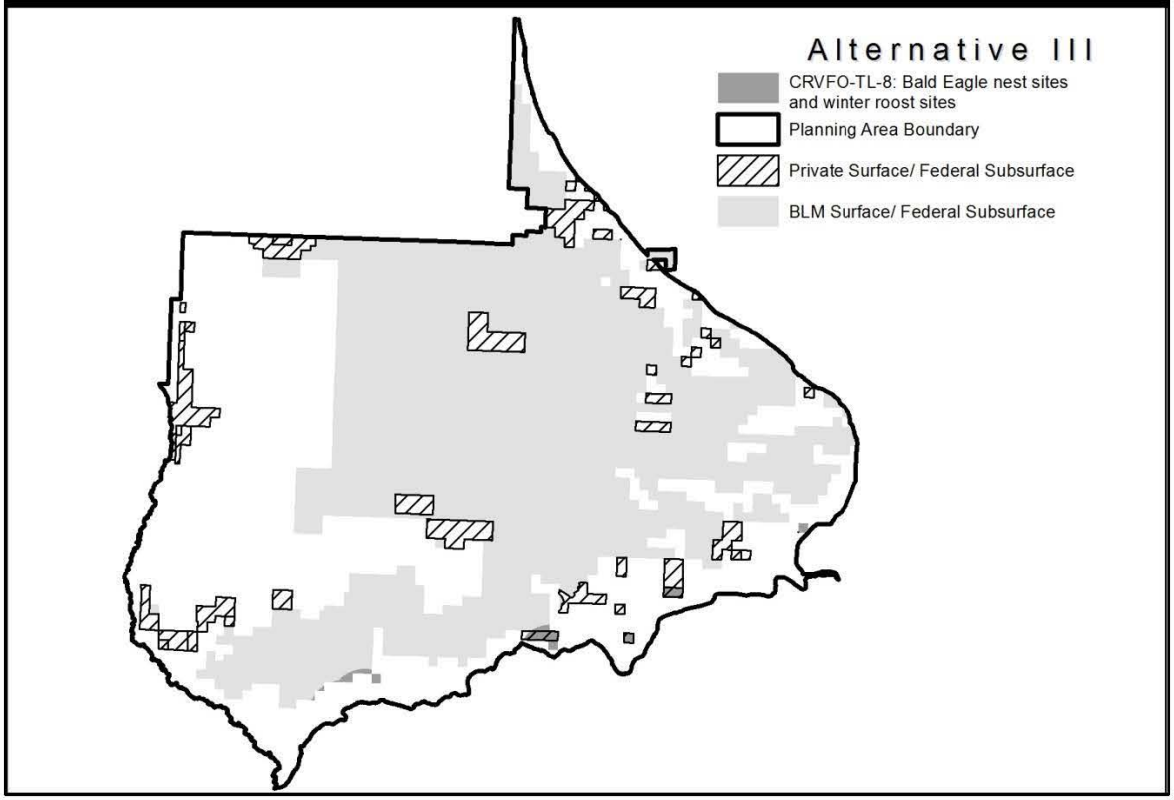
CRVFO-TL-2: Big Game Winter Habitat



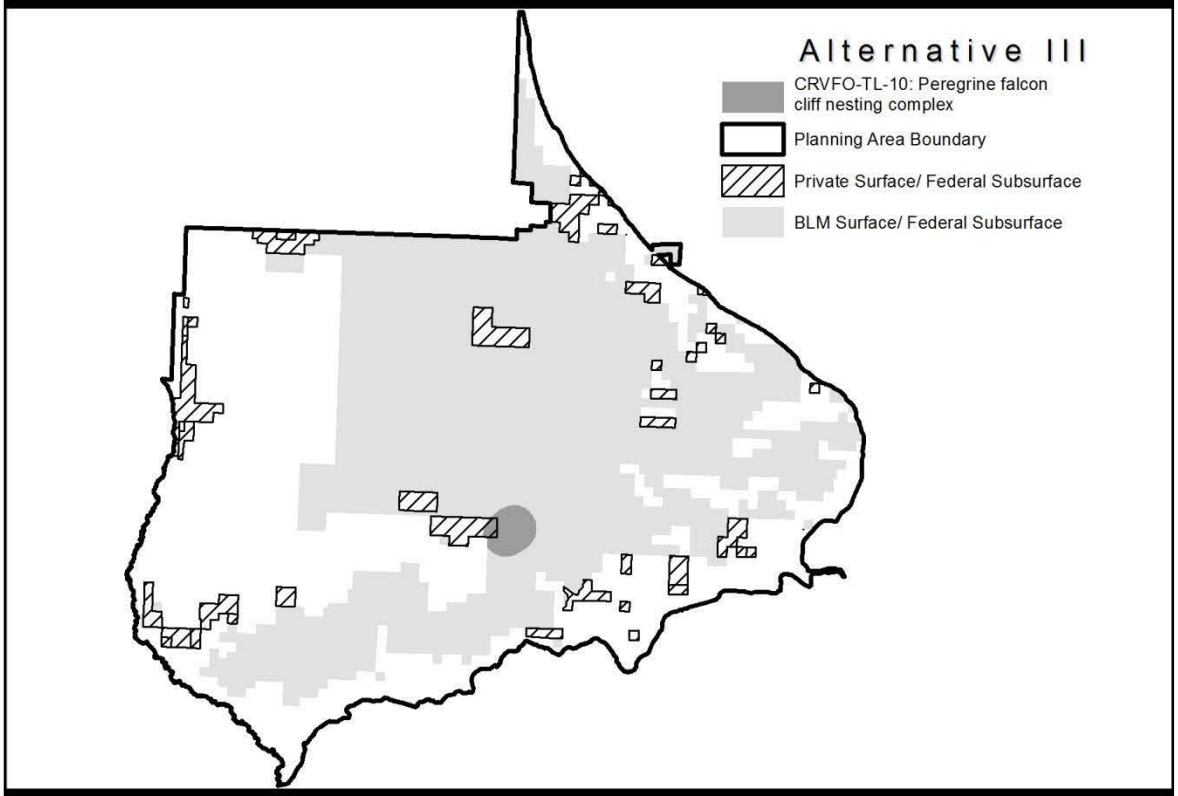
CRVFO-TL-5: Raptors (Non-special status raptor species)



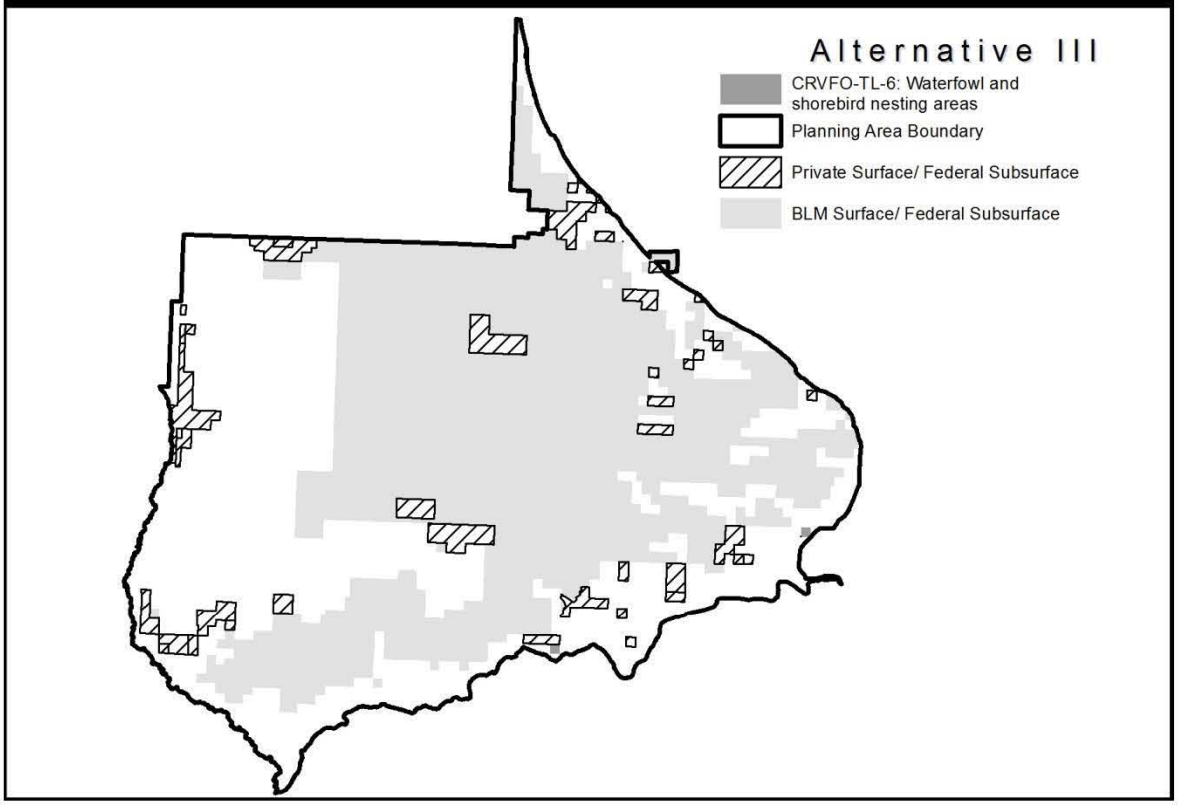
CRVFO-TL-8: Bald Eagle Nest Sites and Winter Roost Sites



CRVFO-TL-10: Peregrine Falcon Cliff Nesting Complex



CRVFO-TL-6: Waterfowl and Shorebird Nesting Areas



Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
No Surface Occupancy (NSO) Stipulations	
GS-NSO-Roan-22: Steep Slopes (>50%), 13,840 acres	
Stipulation	**Standards**
NSO on slopes greater than 50 percent. No ground-disturbing activities on the 13,840 acres of slopes steeper than 50 percent.	1. No ground-disturbing activities will be granted in areas of steep slopes that also are designated as wildlife movement corridors. 2. Ground-disturbing activities in areas with slopes steeper than 50 percent will not be granted for access to areas with slopes less than 50 percent. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards detailed in Appendix I.
GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat, 290 acres*	
Stipulation	**Standards**
NSO to protect occupied habitat, designated critical habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the Endangered Species Act (ESA) or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, critical habitat, or immediately adjacent to potential habitat. *GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat as mapped and applied for analysis for this Proposed RMPA, has not been applied to designated Critical Habitat for Parachute penstemon on BLM surface and Federal minerals available for leasing within the Planning Area. The Settlement Agreement, which is the basis of the oil and gas leasing and development components of the Proposed RMPA, includes the condition that the alternative's management be consistent with the terms of the2008 Base and Retained leases, including the attached stipulations. This Critical Habitat was designated after those leases were issued in 2008, and thus is not a component of the stipulations. BLM would fulfill its Section 7 consultation obligations in accordance with the ESA and through application of GS-LN-Roan-34 and GS-CSU-Roan-12, including Parachute penstemon	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Ground-disturbing activities must avoid a 0.25-mile buffer around Mexican spotted owl nest sites year-round, with seasonal avoidance of active nests and a 0.5-mile buffer from February 1 - August 15.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	3. If species affected by this stipulation is removed from the federal list, this stipulation would not apply to that specie. Other requirements, however, will apply if the species remains classified as sensitive, or is otherwise protected. 4. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, must be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 5. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-25: Raptor Nest Sites, 590 acres	
Stipulation	**Standards**
NSO to protect approximately 590 acres around raptor nest areas not protected by the ESA or other species-specific stipulation. No ground-disturbing activities within 0.125 mile of an active nest (i.e., containing eggs or young or being attended by adults in preparation for nesting).	1. Site-specific ground-disturbing activity near active raptor nest sites will not be allowed between February 1 and August 15 unless the BLM determines, following consultation with CPW, that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure; abandonment of the nest; mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species, or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-

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	disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-26: Bald Eagle Nest or Winter Roost Sites, 380 acres	
Stipulation	**Standards**
NSO to protect approximately 380 acres of bald eagle nest, winter roost sites, and winter range. No ground disturbing activities within 0.25 mile of designated bald eagle nesting or roosting habitat, within bald eagle winter range, or within 0.25 mile of Fravert Reservoir (subject to valid existing rights and authorizations).	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CSU-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim, 6,830 acres	
Stipulation	**Standards**
NSO to protect important wildlife security areas below the rim, especially those for deer and elk. No ground-disturbing activities in approximately 6,830 acres that provide high-value habitats along and below the base of the Roan Cliffs.	1. Ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and

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	(b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-28: High-value Special Status Fish Species Habitat, 1,820 acres	
Stipulation	**Standards**
NSO to protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat. No ground-disturbing activities in approximately 1,820 acres that would result in loss or degradation of areas designated as high-value habitat for Colorado River cutthroat trout.	1. Prior to implementing any ground-disturbing activity or other project component in areas designated as high-value habitat for Colorado River cutthroat trout, the proponent must provide an assessment of potential impacts if any, to this resource value. The assessment will be based on current baseline data, collected by the proponent as approved by the BLM; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. Ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance of the species of interest. In making this determination, the BLM will consider the following resource factors: habitat conditions needed for feeding, spawning, survival of eggs and larvae, and refugia during high or low flow. Impairment could include siltation of substrate; changes in flow regime (e.g., localized damming); loss of overhanging vegetation canopy; reduction in bank stability; reduction in water quality; and direct mortality of trout or trout eggs; behavioral and ecological relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species of interest or cause

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	habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases, approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-23: Riparian and Wetland Habitat, 130 acres	
Stipulation	**Standards**
NSO to protect approximately 130 acres of riparian or wetland vegetation. Ground-disturbing activities including oil and gas facilities, roads, pipelines, electric transmission lines, communication facilities, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.	1. A ground-disturbing activity may be permitted only if BLM determines that (a) the activity will not cause loss of riparian vegetation or, if riparian vegetation is lost, that the loss is limited to no more than 0.1 acre, and 100 linear feet, per mile of stream; (b) any temporarily disturbed areas must be revegetated with existing or similar species, including use of containerized nursery stock rather than seeds to replace woody plants on a one-to-one basis (trees) or area-for-area basis (shrubs); (c) revegetation success will be achieved within 2 years; (d) the activity will not impair water quality, flow regime, aquatic habitat quality,

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	and channel and bank stability; and (e) no practicable alternative is available. Resource factors include topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or enhancement of the resource values. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such instances approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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GS-NSO-Roan-30: I-70 Viewshed (VRM Class II), 9,780 acres	
Stipulation	**Standards**
NSO to protect 9,780 acres of the Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I), 600 acres	
Stipulation	**Standards**
NSO to protect East Fork Falls Viewshed (VRM Class II).	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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GS-NSO-Roan-21: Anvil Points Claystone Cave, 120 acres	
Stipulation	**Standards**
NSO to protect 120 acres encompassing the Anvil Points Claystone Cave. No ground disturbing activities in the area encompassing the cave opening, subsurface features, and watersheds overlying the caves.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. A ground-disturbing activity may be permitted only if the BLM determines that a proposed activity would not impair the cave values, supported by a demonstration of such, based on monitoring data or another method with a high degree of scientific reliability, and considering the type, amount, duration, and timing of the activity; and after consultation with CPW regarding wildlife habitat values. 3. During and subsequent to the ground-disturbing activities covered by this provision, ongoing monitoring data will be collected using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified; and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-29: Colorado River Corridor, 320 acres	
Stipulation	**Standards**
NSO to protect approximately320 acres of high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of high-water mark on either side of river.	1. A specific activity may be allowed if the BLM determines that (a) the specific activity or requested change would not impair water quality, high-quality habitat, and scenic qualities after considering the vegetation, topography, existing habitat impacts, and other site-specific or activity-specific factors and the amount, type, and duration of surface disturbance proposed, and (b) any lost

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	vegetation would be replaced with the same or similar species within 3 to 5 years. 2. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GRSG-NSO-46e1: *NSO within 2 miles of active GRSG leks, in GRSG ADH, no exceptions anticipated*	
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference	
GRSG-NSO-46e2: *Exceptions, modifications, and waivers on the remainder of PHMA. Authorized Officer could grant and exception or modification in consultations with the State of Colorado.*	
Stipulation incorporates stipulation NSO-46e(2) from the NCGSG Proposed LUPA/FEIS by reference	
CRVFO-NSO-Roan 4: Designated Municipal Watershed, 70 acres	
Stipulation: Prohibit surface occupancy and surface-disturbing activities within: 1) the primary zone of a source water protection area for a permitted public water system; or 2) 1,000 horizontal feet of either side of a classified surface water supply stream segment (measured from the average high water mark) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado used as a public (municipal) water supply. A permitted public water system will have a number assigned by the State of Colorado. A watershed that serves a public water system as defined by the State of Colorado is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. **Purpose:** To protect the watershed that serves a drinking water supply for a permitted public water system from potential contamination. **Exception:** BLM may consider use of new technology or engineered plans designed to protect water supply streams and intakes from operations located closer than specified in the stipulation. Consideration of special technology or designs will be coordinated with appropriate water authorities and owners (e.g. municipalities, home owners associations, source water protection stakeholder groups, etc.). In addition, activity may be permitted if the Authorized Officer determines, in consultation with the appropriate water authorities and owners, that the applicant's proposal would not cause a decrease in water quality. **Modification:** The water supply or water intake is altered. **Waiver:** The water intake is not used as a public water supply.	
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories, 10 acres	
Stipulation	**Standards**
Prohibit surface occupancy and surface-disturbing activities for spent shale repositories 1, 2 and 3	An exception, modification or waiver may be granted if BLM determines that there is an urgent health or safety need.

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Controlled Surface Use (CSU) Stipulations	
GS-CSU-Roan-12: Habitat for BLM Sensitive Plant Species Populations and Significant Plant Communities, 8,030 acres	
Stipulation	**Standards**
CSU to protect approximately 8,030 acres of special status plant species or significant plant communities. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources for disturbance within a watershed that would disturb, alter, or interrupt the hydrologic or ecological processes that support special status plant species or significant plant communities. Special status plants include the following: DeBeque milkvetch (*Astragalus debequaeus*), DeBeque phacelia (*Phacelia submutica*), hanging garden sullivantia (*Sullivantia hapemanii*), Parachute penstemon (*Penstemon debilis*), Piceance bladderpod (*Lesquerella parviflora*), Roan Cliffs blazingstar (*Mentzelia rhizomata*), sun-loving meadowrue *(Thalictrun heliophilum*), and Utah fescue (*Argillochloa dasyclada*).	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values associated with species health and ecological function of associated habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the status of the population; ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of the population or community; the effects on both individuals of the species and populations; the relationship to topography and other vegetation; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or community. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or nonimpairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically

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	protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-07: Riparian and Wetland Habitat, 3,770 acres	
Stipulation	**Standards**
CSU to protect 3,770 acres of riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.	1. The BLM will consider the following resource factors: proper hydrological and ecological functioning; protection of habitat supporting fish and wildlife resources; ecological requirements to maintain the riparian area; the type, amount, and duration of the surface disturbance; the relative extent and condition of the riparian area; the relationship to topography and surrounding vegetation; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or condition of the riparian area. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex, 10 acres	
Stipulation	**Standards**
CSU to protect approximately 10 acres of peregrine falcon cliff nesting complex. Ground-disturbing activities may be relocated outside of the cliff-nesting complex along the Roan Cliffs.	1. A site-specific ground-disturbing activity may be allowed within the CSU only if, following consultation with CPW, the BLM determines that the specific activity or requested change would not impair behaviors, habitat use and quality, and reproductive success of the peregrine falcon present within the area. In making this determination, the BLM will consider the status of the nest (active or inactive); behavioral and ecological requirements of the species; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-09: Wildlife Security Areas Above the Rim, 2,020 acres	
Stipulation	**Standards**
CSU to protect important wildlife security areas above the rim, especially deer and elk. Ground disturbing activities may be relocated more than 200 meters to avoid approximately 2,020 acres of wildlife security areas above the rim.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-10: Big Game Migration Corridors, 580 acres	
Stipulation	**Standards**
CSU to protect contiguity and extent of big game migration corridors. Ground-disturbing activities may be relocated more than 200 meters to avoid approximately 580 acres of big game migration corridors.	1. A site-specific ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of big game species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-11:Sensitive Bat Species Habitat, 120 acres	
Stipulation	**Standards**
CSU to protect and preserve bat habitat values of the Anvil Points Claystone Cave. Special design, construction, implementation, and/or mitigation measures including relocation of operations by more than 200 meters to protect approximately 120 acres of habitat may be required for those species listed as sensitive by the BLM.	1. If the BLM, in consultation with CPW, determines that a proposed surface disturbing activity will unacceptably impair resource values associated with sensitive bat species habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of sensitive bat species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-04: Erosive Soils and Slopes Greater Than 30 %, 23,550 acres	
Stipulation	**Standards**
CSU for erosive soils with slopes greater than 30 percent. The BLM may require special analysis, design, construction, operation, mitigation, reclamation measures, monitoring, and/or relocation by more than 200 meters to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in the 23,550 acres with highly erosive soils on slopes steeper than 30 percent.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to preserve soil stability and productivity and minimize adverse impacts from soil erosion. The BLM's determination will be based on site-specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. BMPs (Appendix H) and reclamation standards (Appendix I) will be used to mitigate soil impacts. 4. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area, 4,450 acres	
Stipulation	**Standards**
CSU to protect 4,450 acres within the Parachute Creek high-value watershed and Watershed Management Area (WMA). Provide resource protections through actions that minimize disturbance and habitat fragmentation, and protect key habitats from disturbance.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with the WMA, or relocation or modification of such activity is found to be acceptable If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values, the BLM will modify or relocate the

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	proposed activity. The BLM will consider the following resource factors: protection of ecological, hydrological, and habitat functions and resources; the type, amount, and duration of the surface disturbance; relationship to naturally occurring conditions; topography; type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset any adverse effects; and other factors that may affect the paleontological resource. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity will provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. The BLM will determine what level of protection available under this stipulation is required to protect Colorado River cutthroat trout and habitat, rare and/or significant natural plant communities, and municipal water supply and quality. The BLM's determination would be based on site-specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. This monitoring may specifically include but not be limited to monitoring of surface and groundwater. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures to be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-14: VRM Class II Areas Below the Rim, 23,740 acres	
Stipulation	**Standards**
CSU to protect approximately 23,740 acres in VRM Class II areas. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class II areas below the rim to retain the existing landscape character and allow only limited changes.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class II objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually or as required by the BLM. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-15: VRM Class III Areas Above the Rim, 4,190 acres	
Stipulation	**Standards**
CSU to protect 4,190 acres of VRM Class III areas on top of the plateau. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class III areas.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class III objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan -16: Hubbard Mesa Open OHV Riding Area, 2,320 acres	
Stipulation	**Standards**
CSU to protect recreation opportunities and settings in the Hubbard Mesa Off-Highway Vehicle (OHV) Riding Area 2,320- acre Special Recreation Management Area (SRMA). The BLM may require special design, construction, operation, mitigation, and reclamation measures, including relocation by more than 200 meters.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values with OHV opportunities within the Hubbard Mesa area, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: existing OHV use; existing OHV riding opportunities; anticipated future use; management of OHV use; type, amount, and duration of the surface disturbance; the relative extent of OHV use and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect OHV riding opportunities. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
GS-CSU-Roan-18: Sharrard Park Paleontological Resources, 1,020 acres	
Stipulation	**Standards**
CSU to protect 1,020 acres of the Sharrard Park paleontological resource. The BLM may require special survey, design, construction, operation, and reclamation measures, or relocation by more than 200 meters in identified portions of Wasatch Formation outcrops in Sharrard Park. Prior to any ground disturbing activity, the operator must have the paleontological resources surveyed within 200 feet of the proposed disturbance by a BLM approved paleontologist. Other special measures include requirements that (a) on-site personnel are informed of the potential for fossils, (b) the proponent will notify the BLM if any fossils are found, and (c) activities do not disturb fossils in any way.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to protect, preserve, and/or recover the fossil resources at specific sites or for specific activities within this area. The BLM determination will be based on site specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan 17: Lease Area Above the Rim, 4,640 acres	
A. No more than 7 well pads may be located on the Retained Leases; including pads drilled for either exploration or production activities. Subject to onsite inspection and approval by the BLM and other regulatory agencies, well pads shall be located approximately as depicted in the attached map. Exhibit 2.A. Each well pad may disturb no more than 10 acres of the surface when drilling operations are occurring, and may be limited to a smaller size if BLM determines 10 acres are not needed for projected drilling operations. Each well pad shall be limited to approximately 3 acres of unreclaimed surface during production. There shall be no more than four pads on the Retained Leases at any time that take up more than three acres each of un-reclaimed surface. Those four pads may take up to a total of approximately 40 acres of un-reclaimed surface, with drilling operations occurring on no more than two of the pads at any one time. For purposes of this requirement, surface is considered reclaimed if BLM determines that its interim reclamation requirements have been met. The Retained Leases are not required to be joined in a federal unit.	

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA
B. Primary access shall be limited to designated roads approximately as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval. Operators may not use Cow Creek Road or the Rim Road east of the retained leases for access except in emergencies. For purposes of this requirement, an "emergency" means unforeseeable physical inaccessibility for other routes or an unforeseeable condition creating a significant risk of environmental harm or injury to persons. Limitations on contractual access from the south or west, or foreseeable delays in obtaining access for drilling, site preparation, completion activities, or regularly-scheduled maintenance and other activities, do not represent an emergency. Where an emergency situation exists, access for maintenance of on-going active drilling and completion operations, and service for existing production, is allowed.
C. Pipeline and gathering line infrastructure, water lines, and utility lines, shall be collocated with designated access roads as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval, and may depart from designated access roads if BLM determines that doing so reduces net disturbance or visual impacts. No less than 90 percent of the total pipeline length shall be collocated.
D. Prior to exploration and/or lease development on the Retained Leases, the operator must submit a proposed Master Development Plan ("MDP") identifying projected activity (including well locations, roads, pipelines, facilities and associated infrastructure) and appropriate monitoring and methodologies in conformance with the requirements of the resource management plan as adopted to incorporate the Settlement Alternative.
E. Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's proposed MDP.
F. The following will be required in any approved MDP, and incorporated as conditions of approval for all drilling permits:
a. Road engineering standards to minimize disturbance associated with road improvements;
b. Requirements for removing unnecessary infrastructure as soon as feasible;
c. The required reclamation plan will include reclamation processes that can be reasonably expected to meet the 5 year reclamation standard within 3 growing seasons;
d. Closed-loop drilling systems and/or tanks shall be used instead of pits, except for pits used solely to store fresh water;
e. Telemetry for remote monitoring of producing wells;
f. Wellheads to be subject to appropriate measures for visual impact mitigation;
g. Conveyance by pipeline of drilling water, water used for hydraulic fracturing and completions, and flowback water, to minimize truck traffic;
h. Centralized water management during drilling, completion and production (e.g., not every location will have pits);
i. Recycling of water used during well completions, and recycling of produced water while well completion activities are in progress;
j. Conveyance by pipeline of produced water and condensate to centralized facilities to minimize truck traffic;
k. Utilize centralized compression, storage, separation and dehydration facilities;
l. No more than 3 centralized facilities will be constructed for all centralized management purposes in Paragraphs F.h., F.j. and F.k., and those facilities will be located on three of the potential locations indicated on the attached map, Exhibit 2.A.;

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
m. Disclosure of all chemicals used during drilling and production activities. Chemicals used during completion activities shall be disclosed pursuant to Colorado Oil and Gas Conservation Commission rules; n. Tier III equivalent or lower emissions for drill rigs for all wells; o. Vapor combustors or vapor recovery on all condensate tanks, water tanks and dehydrators, and no/low-bleed control valves on all facilities; p. Reduced-emission ("green") completions, as defined by 40 C.F.R. § 60.5430; and q. Utilize liquids lifting practices to limit venting, including plunger lifts or alternative technologies that are at least as effective in limiting venting. G. Potential conditions of approval identified in the applicable record of decision replace those identified in the 2006 Proposed Resource Management Plan Amendment/Final Environmental Impact Statement and associated records of decision.	
CRVFO-CSU-Roan 18: Lease Area Below the Rim, 14,260 acres	
Prior to exploration and/or lease development on it Base Leases, an operator shall submit a proposed master development plan ("MDP") identifying its projected activities. Prior to submitting the MDP, an operator shall consult with the Colorado Division of Parks and Wildlife and Bureau of Land Management to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's MDP.	
Timing Limitation (TL) Stipulations	
GS-TL-Roan-13: Big Game Winter Range, 31,410 acres	
Stipulation	**Standards**
TL to protect and maintain physical and biological components important to deer and elk winter range (approximately 31,410 acres) and the obligate species, both on federal lands and across the landscape as a whole, as opportunities present. This includes reducing or eliminating stress induced impacts to deer and elk associated with human activity during critical winter months when animals are already stressed by environmental factors and concentrated on limited winter range. Surface disturbance and human activities that lessen the quality of the deer and elk winter range will not be allowed from December 1 to April 30. Ongoing drilling and other activities and operations will be designed and implemented such that the well bore is adequately secured and that all drilling and surface-disturbing operations cease by December 1 in important and critical deer and elk winter habitats. In the event of unforeseeable and unplanned events, extensions not exceeding two weeks in duration may be authorized to ensure safe shutdown of drilling operations, and conservation of mineral resources. Human activities including visitations for production activities and well monitoring from December 1 to April 30 will be designed and carried out to minimize impacts.	1. Site-specific ground-disturbing activity in big game winter range may be allowed between December 1 and April 30 if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with the quantity and quality of the winter range for the species of interest. In making this determination, the BLM will consider the following resource factors: minimization of the footprint of activities; fragmentation; impacts to winter range across the Planning Area as a whole; effectiveness of voluntary off-site mitigation of habitat with respect to quantity, quality, and duration of both the surface-disturbing activity and mitigation; the relative extent of available winter range; relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the winter range or cause winter range to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation,

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
This includes well monitoring through telemetry, scheduling of all nonemergency well maintenance activities outside the December 1 to April 30 timeframe, conducting unavoidable and necessary on-the ground visits between the hours of 10:00 a.m. and 3:00 p.m., and minimizing on-the-ground visitations.	and (b) considers the above-mentioned resource factors. 2. The big game winter range TL may not apply, and the restriction may be considered to be met, if the BLM determines, following consultation with CPW, that animals are not using the habitat, are not likely to use the habitat in a particular season, and that activities will not lessen overall habitat quality in future years. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-14: Raptor Nest Sites, 2,300 acres	
Stipulation	**Standards**
TL to protect approximately 2,300 acres of nesting and fledging habitat for raptors not protected by species-specific measures. This includes owls, northern harriers, accipiters, buteos, golden eagle, osprey, and falcons except the American kestrel. Within a 0.25-mile radius of a nest, no activities or other sources of disturbance with the potential to cause the nest not to be used or lead to nest failure, abandonment, or mortality of fledglings will be allowed. Stipulations will be applied annually from February 1 through August 15.	1. Site-specific ground-disturbing activity near active raptor nest sites may be allowed between February 1 and August 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-15: Bald Eagle Nest or Winter Roost Sites, 510 acres	
Stipulation	**Standards**
TL to protect approximately 510 acres of nesting, fledging, and winter roost habitat of the bald eagle. Within a 0.5-mile radius of a nest, no activities or other sources of disturbance that could cause the nest not to be used or lead to nest abandonment, failure, or mortality of fledglings will be allowed. Stipulations will be applied annually from November 15 through June 15.	1. Site-specific ground-disturbing activity at bald eagle nests or winter roost sites may be allowed between November15 and June 15 if the BLM determines, following Section 7 consultation with the USFWS that the requested activity would not impair values associated with maintenance or recovery of the species; behaviors associated with winter roosting, nesting, and fledging; or fledging habitat. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); the type, intensity, and duration of disturbance; measures required by the USFWS; potential for the activity to cause the roost or nest not to be used; potential for nest failure, abandonment of the roost or nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect roosting or nesting success. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. This TL will be applied to wells that are drilled directionally from private surface into Federal minerals for the Federal lease being developed. Where the Federal lease does not include a relevant TL stipulation (and a nest or roost site falls within the identified buffer), BLM would not approve any permits for Federal wells or grant a right-of-way across BLM land unless the proponent has agreed

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	to a voluntary TL (allowing a determination of "No Effect") or until Section 7 consultation on proposed action has been completed and any associated terms and conditions agreed to by the proponent. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-16: Peregrine Falcon Cliff Nesting Complex, 130 acres	
Stipulation	**Standards**
TL to protect approximately 130 acres of nesting and fledging habitat of the State-listed threatened peregrine falcon. Within a 0.5-mile radius of the cliff-nesting complex on the Roan Cliffs, no activities or other sources of disturbance that could cause abandonment of a nest or established territory will be allowed. Stipulations will be applied annually, from March 15 through July 31.	1. Site-specific ground-disturbing activity at the peregrine falcon cliff-nesting complex may be allowed between March 15 and July 31 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-17: Waterfowl and Shorebird Nesting Areas, 90 acres	
Stipulation	**Standards**
TL to protect approximately 90 acres of nesting and brood-rearing habitats at the Fravert Reservoir Watchable Wildlife Area. No ground-disturbing activities or other sources of disturbance, from April 15 through July 15, or until all young have hatched and dispersed from the production area, or that could cause waterfowl and shorebirds not to nest or lead to nest failure or abandonment within 0.25- mile of the nesting and production area of Fravert Reservoir will be allowed.	1. Site-specific ground-disturbing activity at the Fravert Reservoir Watchable Wildlife Area may be allowed between April 15 and July 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); hatching and dispersal of young from the production or nesting area; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GRSG-TL-46e: *No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing*	

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA
(March 1- July 15).
Stipulation incorporates stipulation GRSG-TL-46e from the NCGSG Proposed LUPA/FEIS by reference.
GRSG-TL-PHMA-ROW-TL: Prohibit surface occupancy and surface disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).
Stipulation incorporates stipulation GRSG-TL-PHMA-ROW-TL from the NCGSG Proposed LUPA/FEIS by reference.
CRVO-TL- Roan 1: Migratory Bird Nesting Season
Stipulation: Prohibit surface occupancy and surface-disturbing activities from May 15 to July 15. The stipulation would be applied based on biological surveys and species habitat preferences. **Purpose:** To protect use of nesting and fledgling habitat for birds of conservation concern (BCC). **Exception:** Standard exceptions apply. The application of the timing limitation would consider: the type of equipment to be used, the scale, and the duration of the project; species potentially present; habitat types present; breeding phenology; weather conditions; elevation; distance to known nests; and terrain.. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVO-TL- Roan 3: Elk Production Area, 500 acres
Stipulation: Prohibit surface occupancy and surface disturbing activities from April 15 to June 30 in mapped elk production areas to reduce behavioral disruption during parturition and early young rearing period. This stipulation does not apply to operation and maintenance of production facilities. **Exception:** The Field Manager may grant an exception if an environmental analysis indicates that the proposed action can be conditioned so as not to interfere with habitat function or compromise animal condition within the project vicinity. An exception may also be granted if the proponent, Bureau of Land Management, and Colorado Division of Wildlife negotiate compensation that would satisfactorily offset anticipated impacts to big game production or habitat condition, or an agreement can be reached where by a COGCC wildlife mitigation plan can be accommodated consistent with established RMP objectives and decisions. An exception may also be granted for actions intended to enhance the long term utility for availability of suitable habitat. **Modification**: The Field Manager may modify the size and time frames of this stipulation if Colorado Division of Wildlife monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. **Waiver**: This stipulation may be waived if Colorado Division of Wildlife determines that the area is no longer utilized by big game for production purposes.
CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes
Stipulation: Prohibit surface occupancy and surface-disturbing activities during species-specific spawning periods to reduce impacts to breeding adults, eggs, emerging larval fish, and avoid stream channel disturbances: Non-Special Status Species: • Rainbow trout: March 1 to June 15 • Brown trout: October 1 to May 1

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- Brook trout: August 15 to May 1.

Special Status Species:

- Cutthroat trout: May 1 to September 1
- Bluehead sucker: May 1 to July 15
- Flannelmouth sucker: April 1 to July 1
- Roundtail chub: May 15 to July 15
- Mountain sucker: May 1 to July 15.

Purpose: To promote recruitment by protecting adult fish, redds (egg masses) in the gravel, and emerging fry during spawning periods.

Exception: Standard exceptions apply (Section B.3).

Modification: Standard modifications apply (Section B.3).

Waiver: Standard waivers apply (Section B.3).

Lease Notices (LN) Stipulations

GS-LN-Roan-14: Master Development Plan (MDP)

Stipulation	Standards
A MDP will be required of oil and gas operators prior to exploration or development activities.	1. For all activities in each of the geographic areas atop the plateau and in areas being actively explored or developed below the rim, the operator must submit a MDP. The MDP must include all anticipated activities for a minimum of 2 years following the date of submission, for all operator-controlled federal leases or units. A longer term is encouraged and would be allowed under this standard to expedite the permitting process, provide for efficiencies as provided for in Standard 6 of this stipulation, and reduce costs to the operator for MDP preparation. 2. The boundaries of the geographic areas to be addressed atop the plateau, as identified by the BLM, may be modified with approval from the BLM. The boundaries of all other geographic areas must be proposed by the operator and must be approved by the BLM. 3. The MDP must identify all anticipated exploration, development, and production activities on federal leases within the area, identifying well locations, roads, pipelines, and any other exploration or production disturbance or facilities. 4. The MDP must include all specific measures needed to comply with standards associated with all stipulations and any other decisions of this RMPA.

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Appendix Table C-4. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Proposed RMPA	
	5. The MDP must include an analysis of site-specific and cumulative environmental effects and mitigation. The MDP must also address reasonable alternatives, and other information sufficient to satisfy the requirements of the National Environmental Policy Act (NEPA). The extent of the analysis will be dependent on the extent of surface ownership, extent of lease holdings, topography, access, resource concerns, and the ability to tier to the Roan Plateau Environmental Impact Statement (EIS), consistent with 40 CFR § 1500. The extent of the analysis needed to comply with 40 CFR § 1500 may appropriately vary when considering individual wells or small groups of exploratory wells or for directional wells drilled on previously developed wellpads. 6. To the extent practicable, the activities identified in the MDP must be presented in such a manner as to support the orderly and efficient exploration and development of mineral resources in an environmentally responsible manner. 7. MDPs may be modified by operators as needed, and shall be reviewed by the operators not less than annually. As appropriate, either a statement documenting that the MDP is current or a modified MDP shall be provided to the BLM.
GS-LN-Roan-34: ESA Consultation	
Stipulation	**Standards**
Endangered Species Act, Section 7 Consultation Stipulation.	1. The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.

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GRSG PHMA LN-46e: Any lands leased in PHMA are subject to the restrictions of 1 disturbance per 640 acres calculated by CO management zone to allow clustered development.
Stipulation currently under development as part of the NCGSG RMP/EIS process
GRSG PHMA LN -54e: Within PHMA operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single well Applications for Permit to Drill for all exploratory wells.
Stipulation currently under development as part of the NCGSG RMP/EIS process
CRVFO-LN-Roan-35: Emergency Response Plan
The operator is required to prepare and maintain a current emergency response plan. The plan shall be provided to the BLM, Colorado State Patrol, the affected county and communities, and the general public. The plan shall contain information sufficient to describe the potential for emergency incidents related to fluid minerals development that pose an immediate danger to human health and safety and would normally require immediate actions by the operator to remove the threat, such as for hazardous materials spills; actions to be taken by the operator in the event of such an incident; and a communications plan to inform appropriate authorities and potentially affected citizens.

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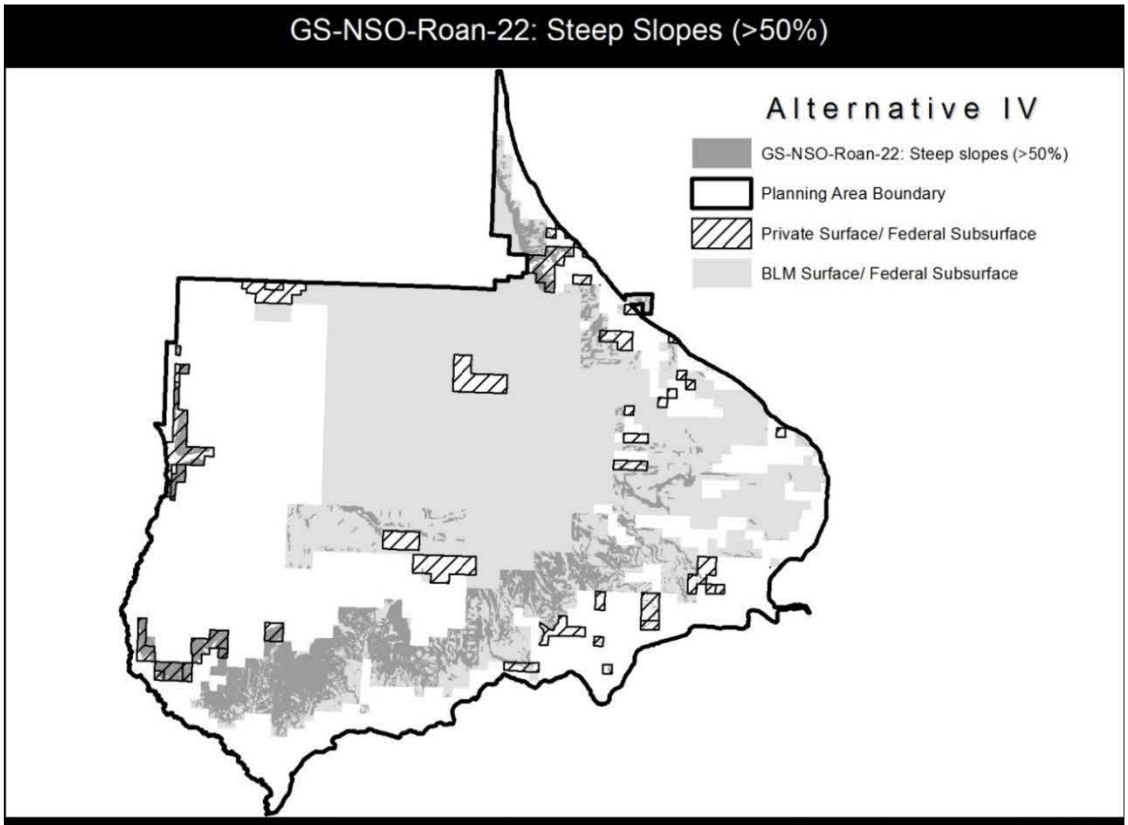
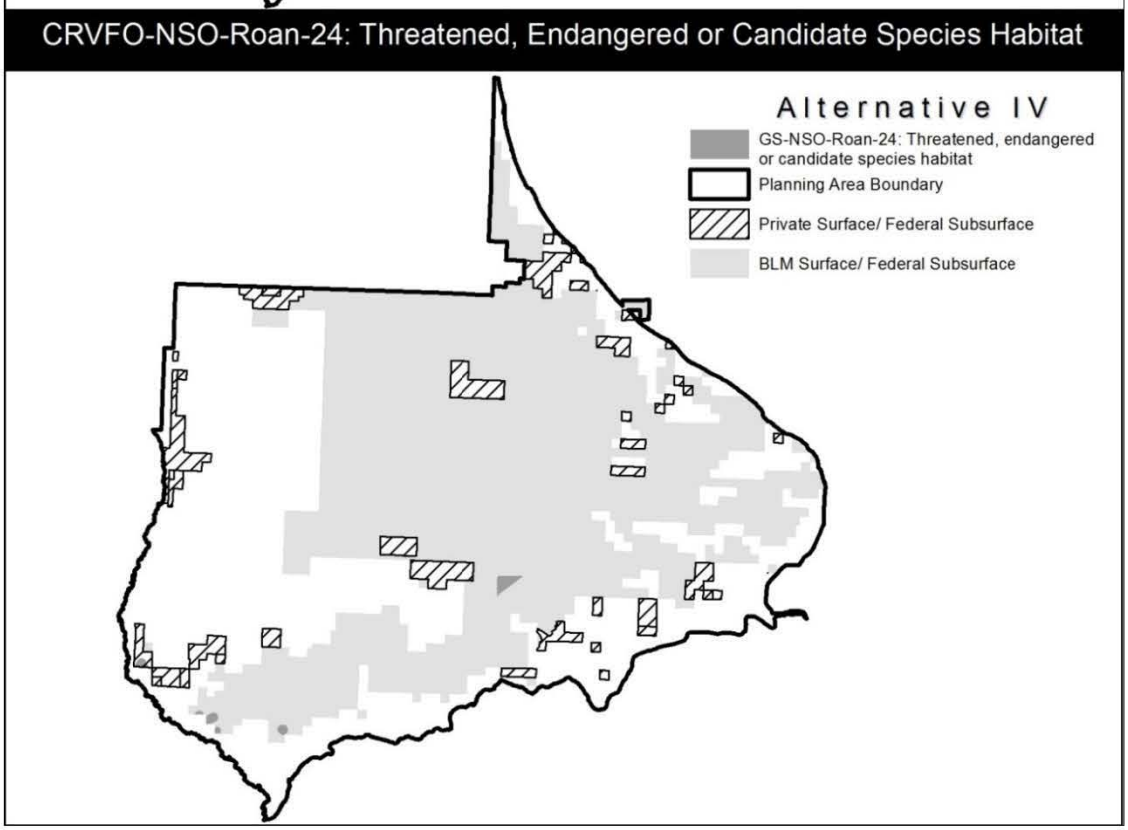
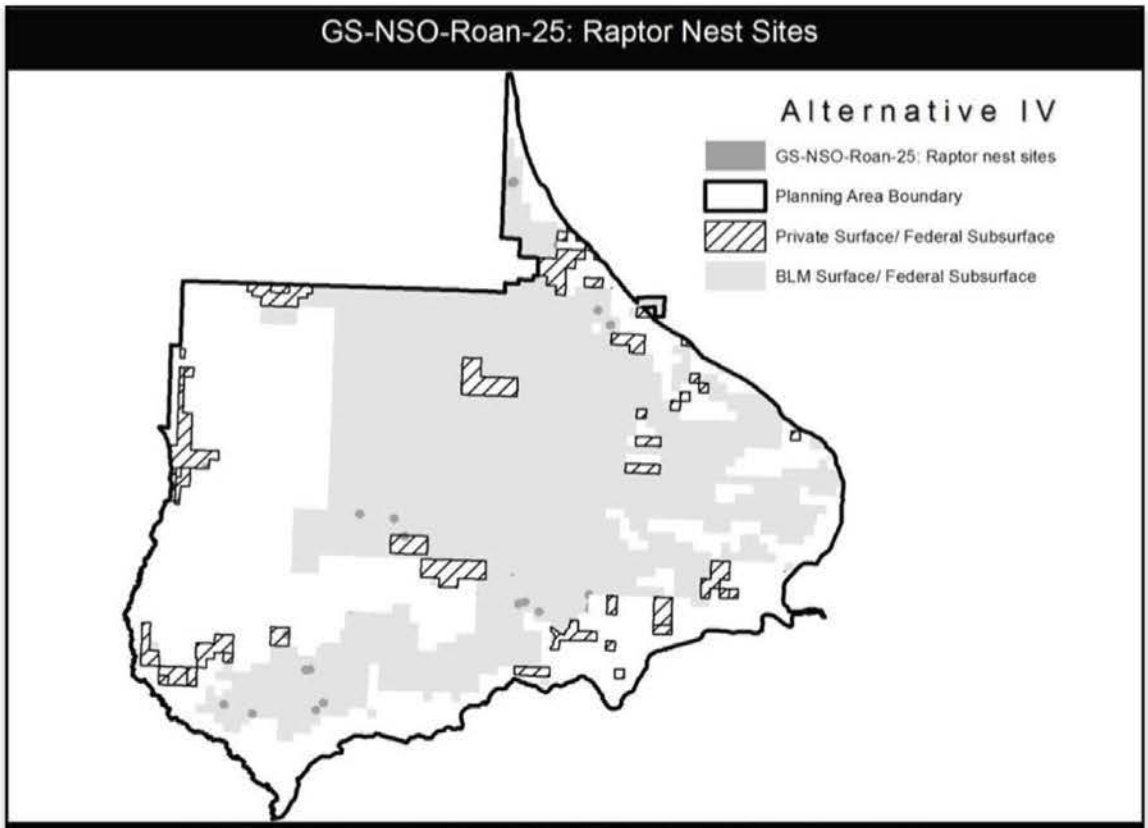
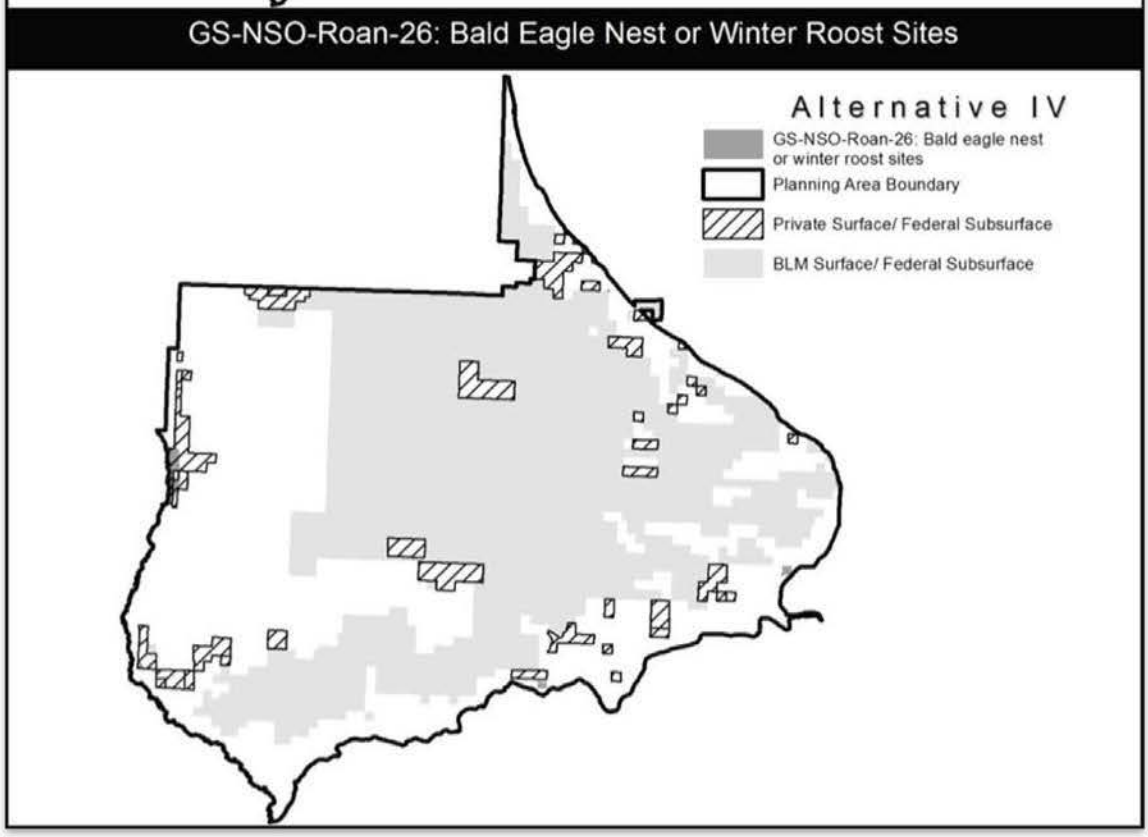
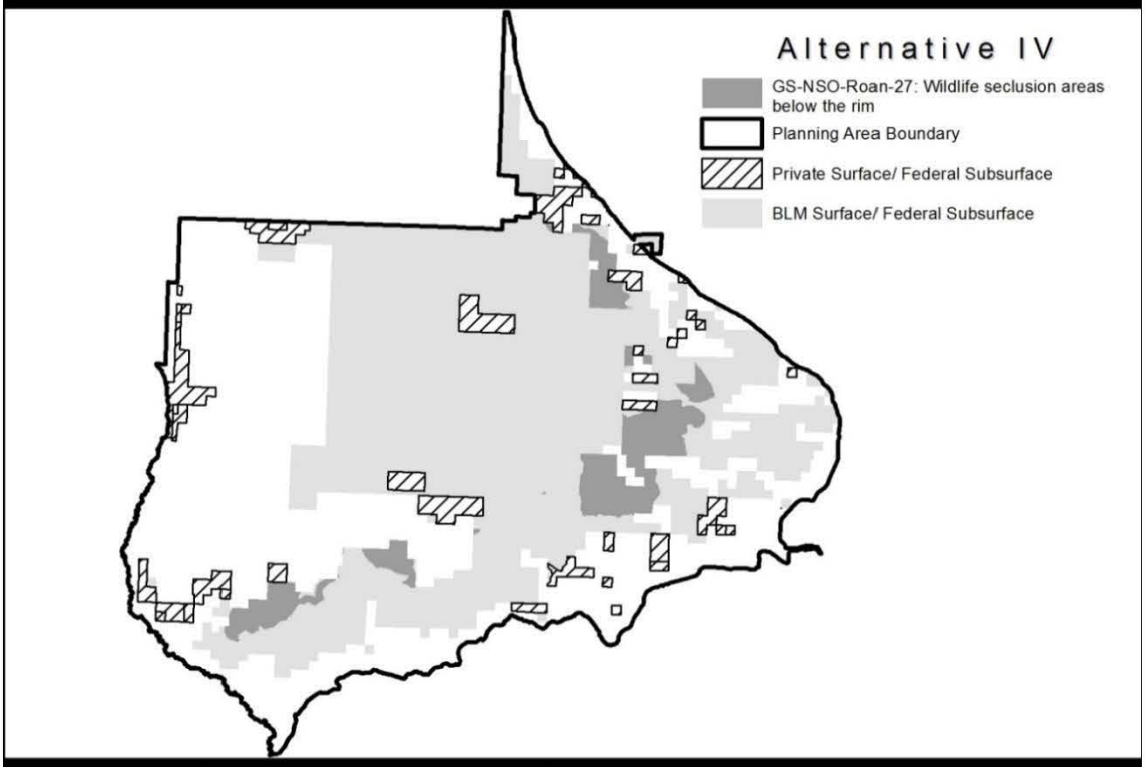

GS-NSO-Roan-22: Steep Slopes (>50%)
Alternative IV
GS-NSO-Roan-22: Steep slopes (>50%)
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


CRVFO-NSO-Roan-24: Threatened, Endangered or Candidate Species Habitat
Alternative IV
GS-NSO-Roan-24: Threatened, endangered or candidate species habitat
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

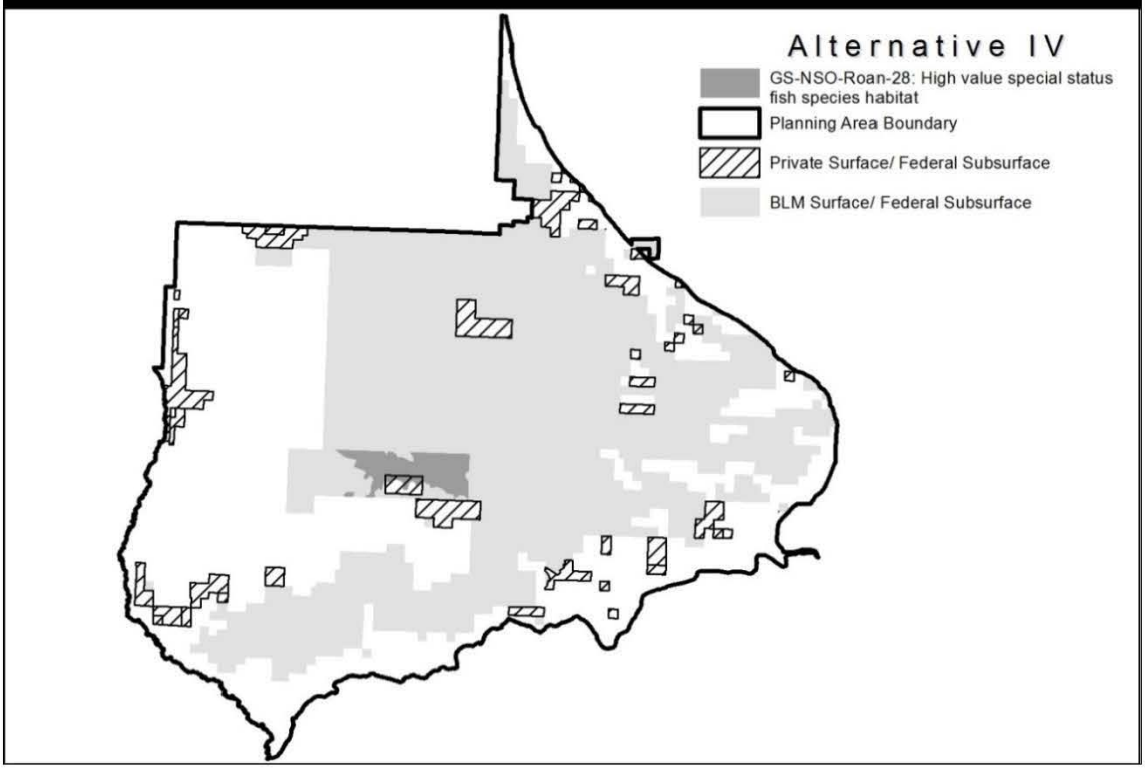

GS-NSO-Roan-25: Raptor Nest Sites
Alternative IV
GS-NSO-Roan-25: Raptor nest sites
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

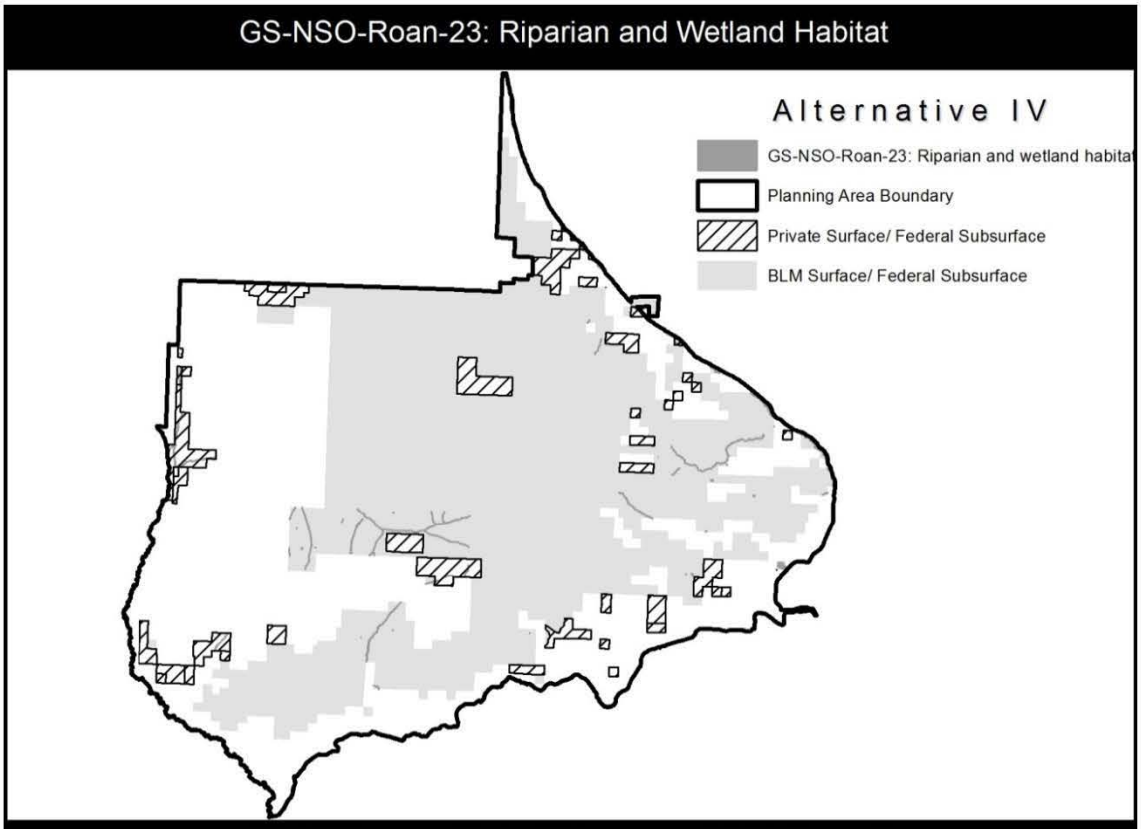

GS-NSO-Roan-26: Bald Eagle Nest or Winter Roost Sites
Alternative IV
GS-NSO-Roan-26: Bald eagle nest or winter roost sites
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

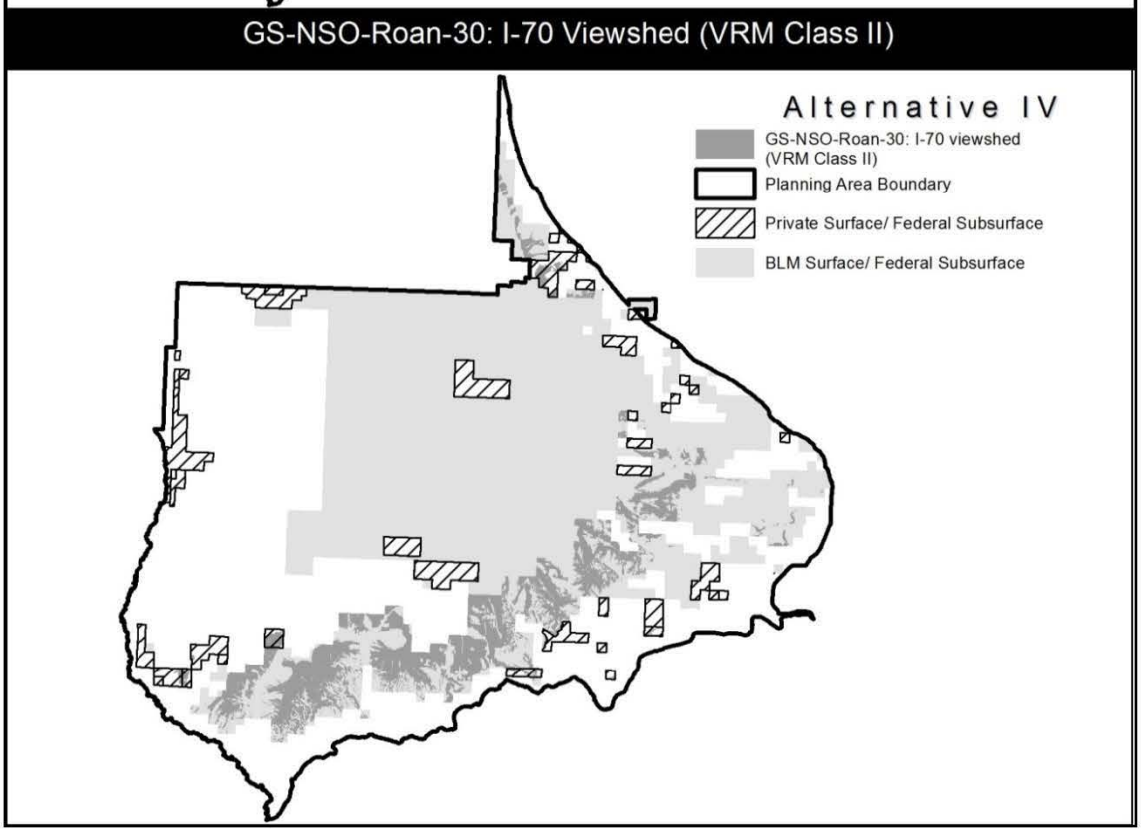
GS-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim



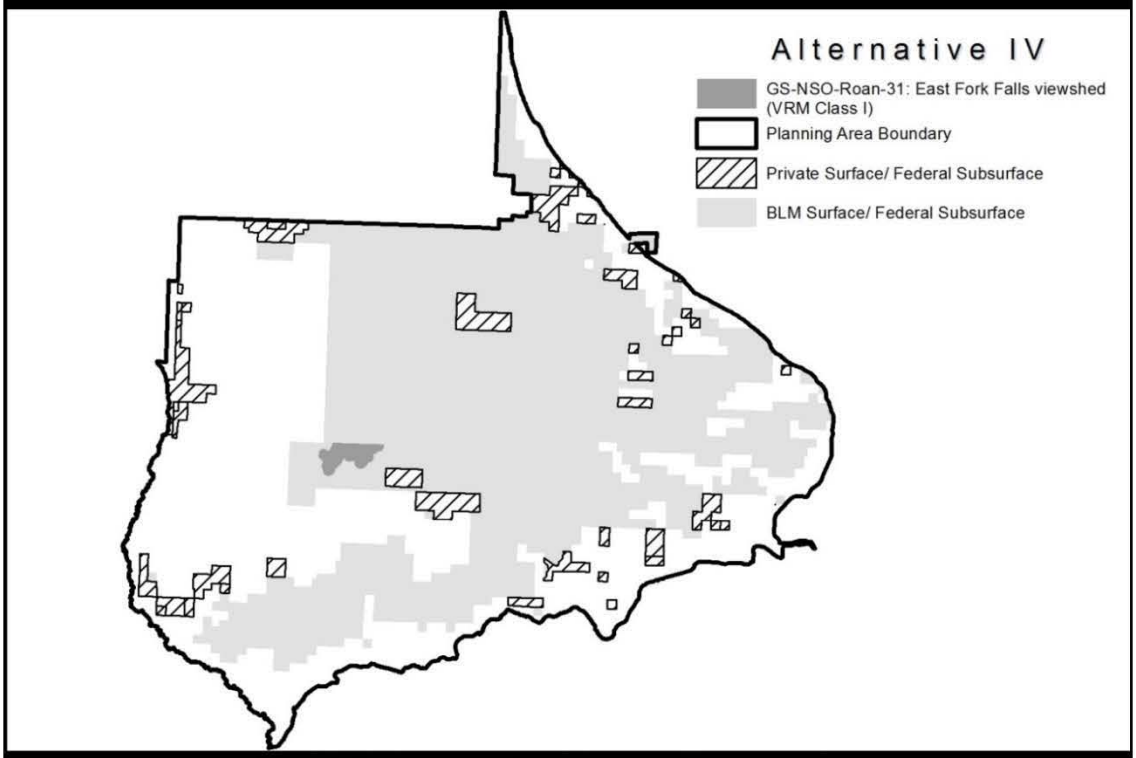
GS-NSO-Roan-28: High Value Special Status Fish Species Habitat



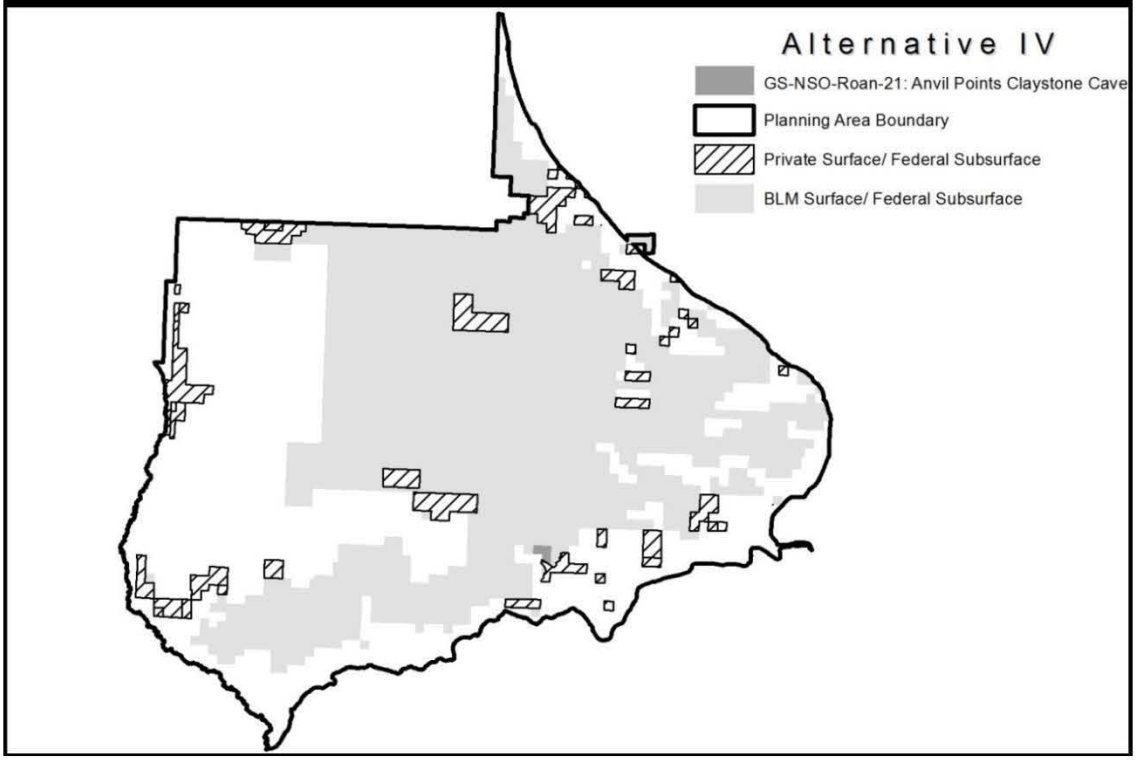

GS-NSO-Roan-23: Riparian and Wetland Habitat
Alternative IV
GS-NSO-Roan-23: Riparian and wetland habitat
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface


GS-NSO-Roan-30: I-70 Viewshed (VRM Class II)
Alternative IV
GS-NSO-Roan-30: I-70 viewshed (VRM Class II)
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

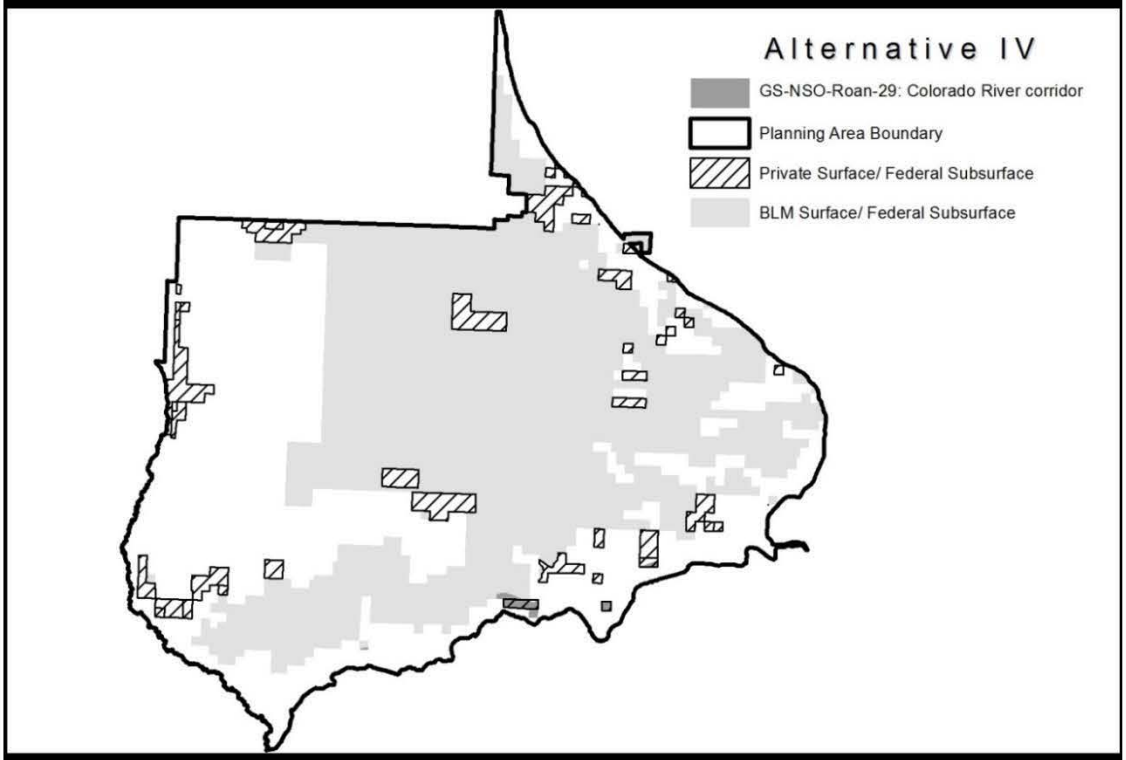
GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I)



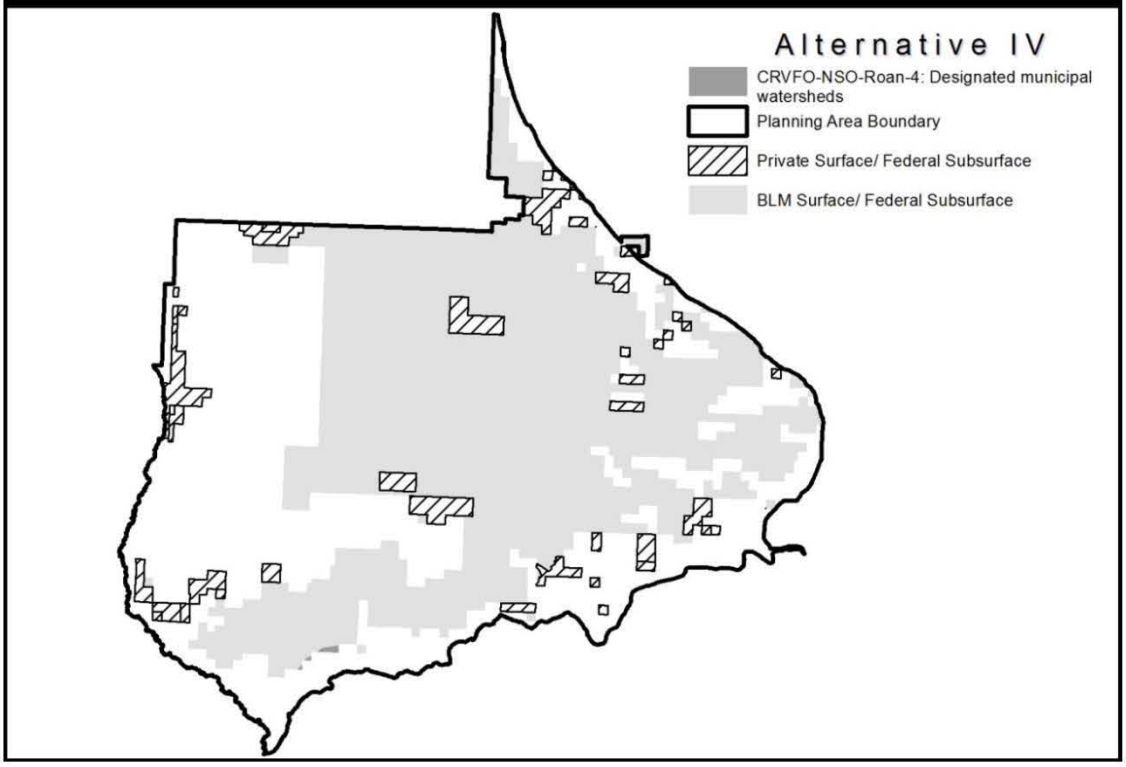
GS-NSO-Roan-21: Anvil Points Claystone Cave

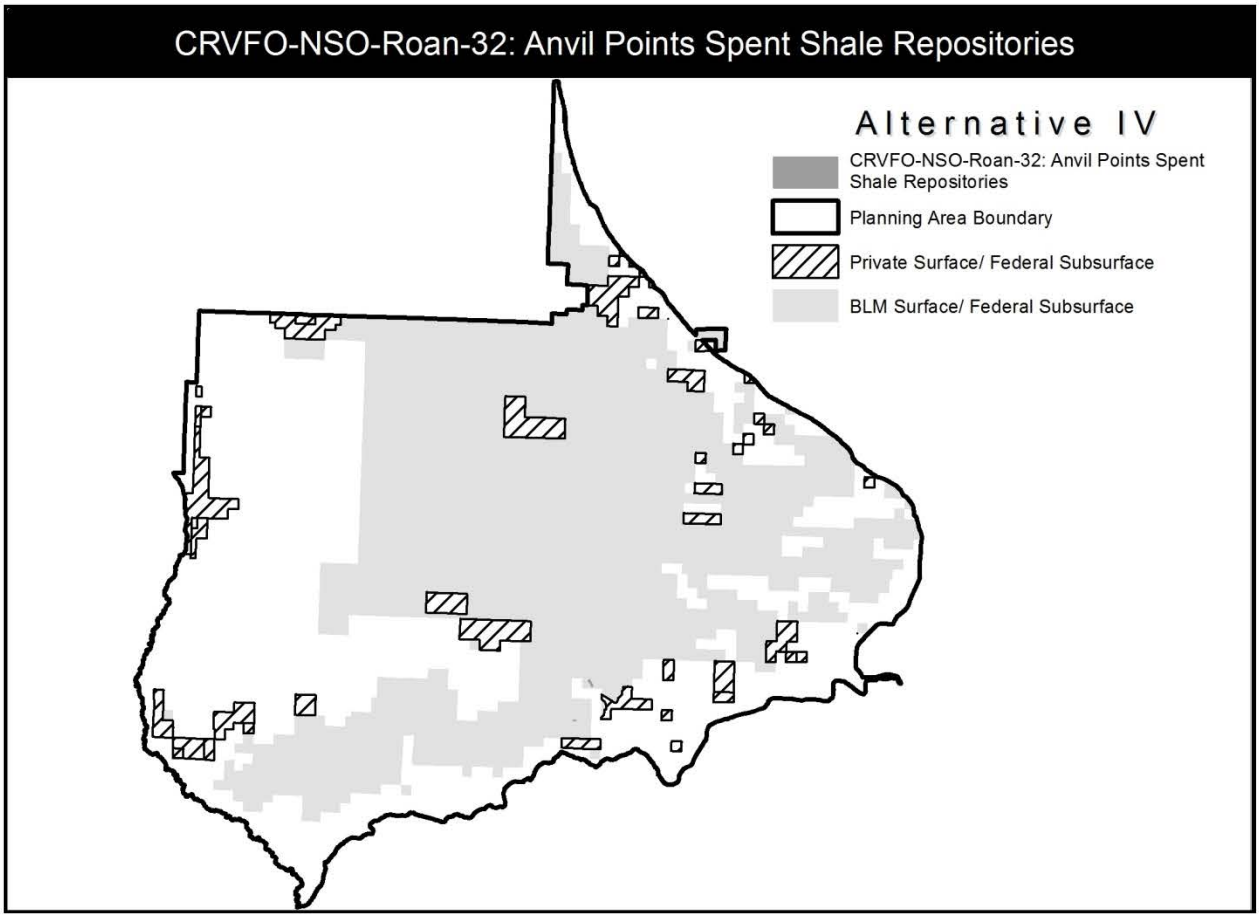


GS-NSO-Roan-29: Colorado River Corridor

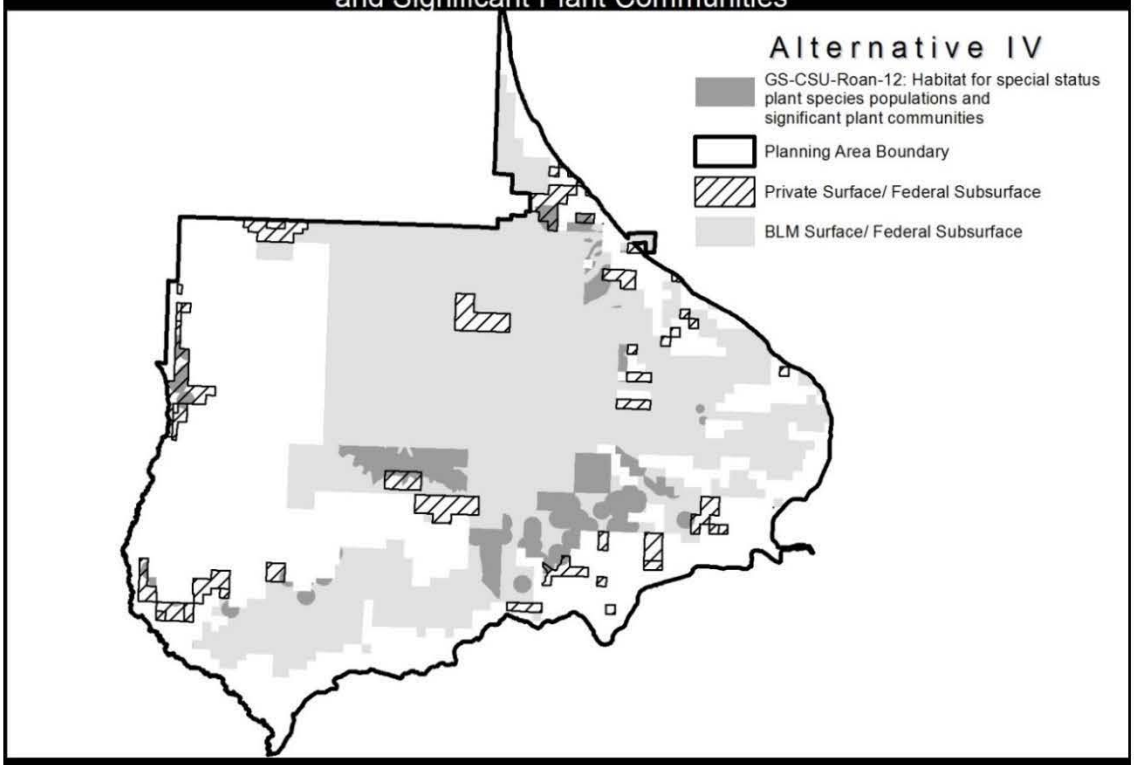


CRVFO-NSO-Roan-4: Designated Municipal Watersheds

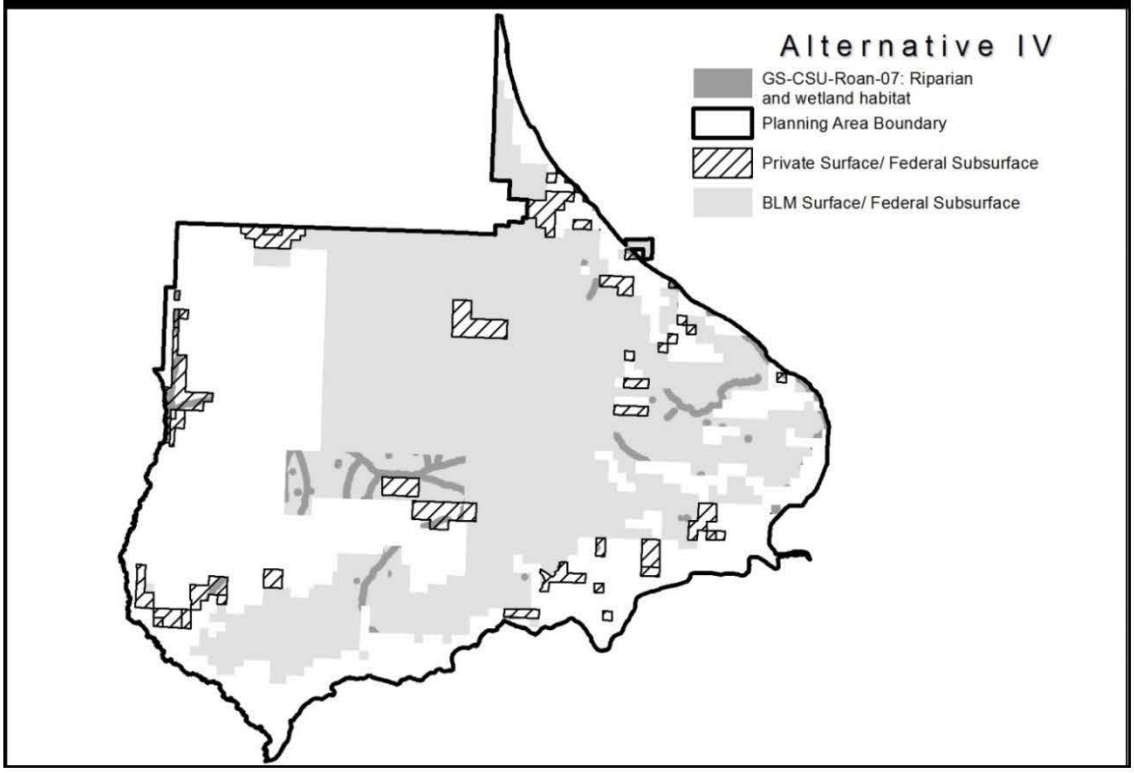



CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories
Alternative IV
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

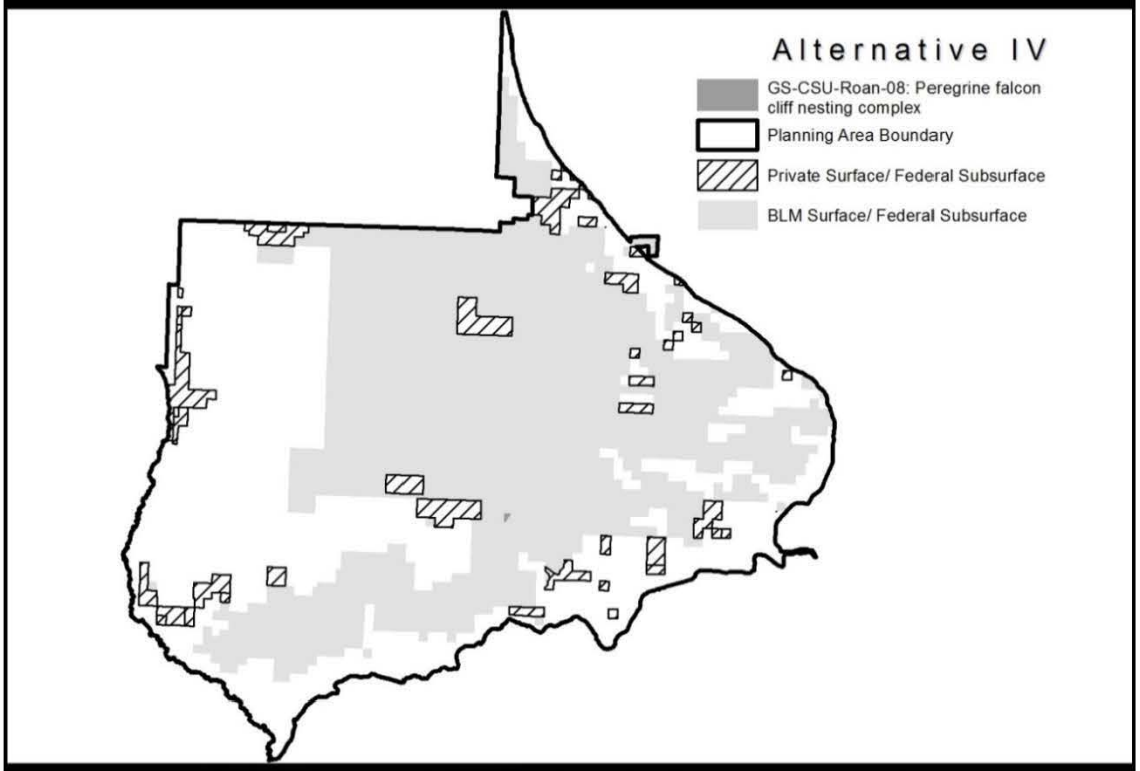
GS-CSU-Roan-12: Habitat for Special Status Plant Species Populations and Significant Plant Communities



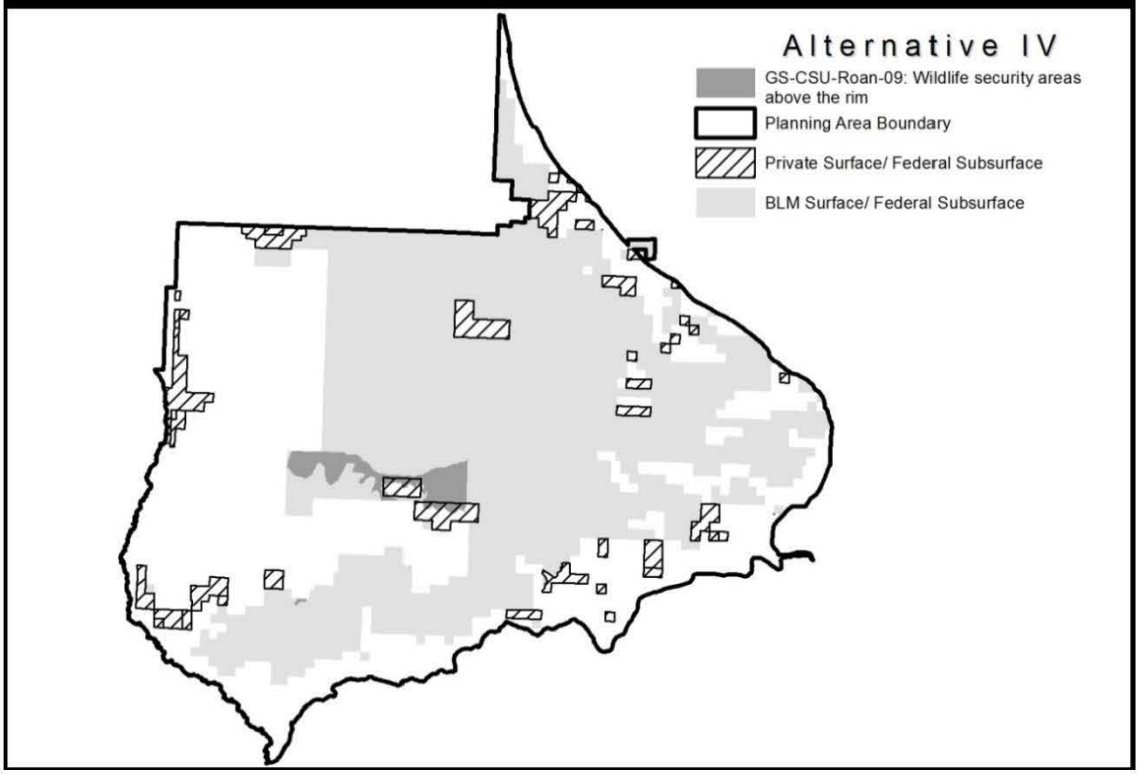
GS-CSU-Roan-07: Riparian and Wetland Habitat

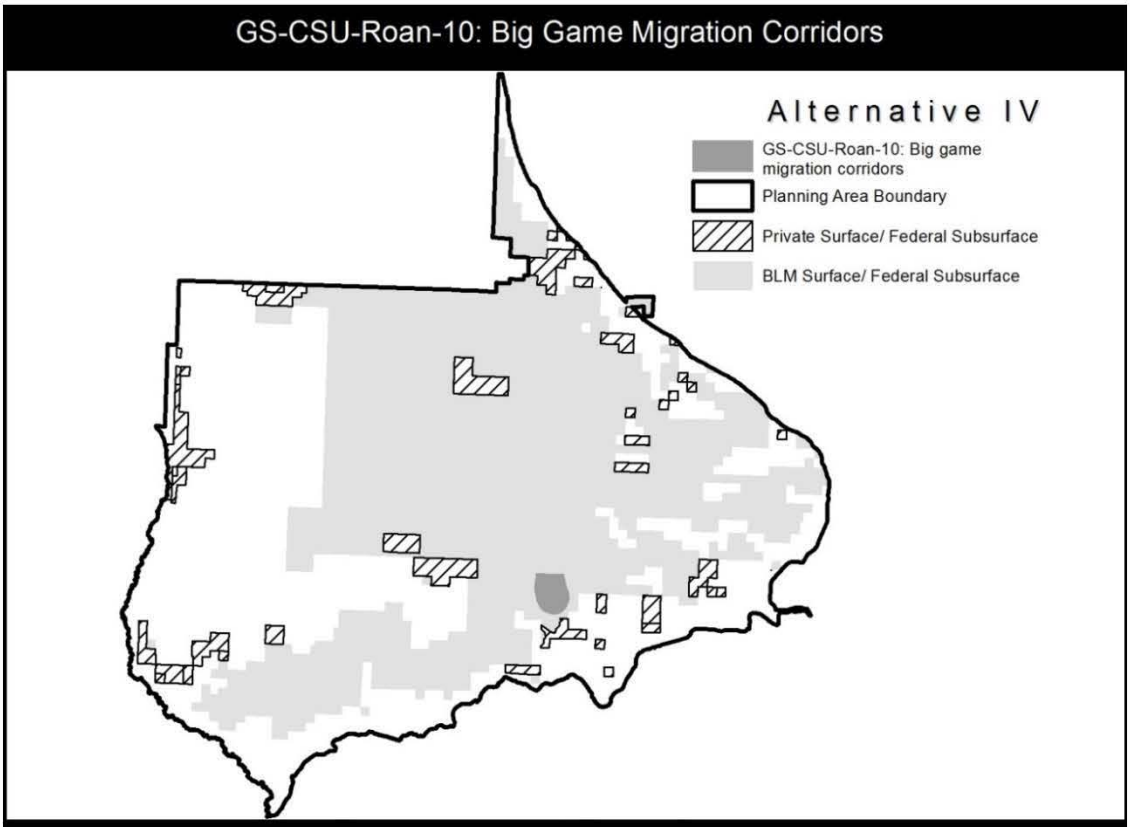


GS-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex



GS-CSU-Roan-09: Wildlife Security Areas Above the Rim




GS-CSU-Roan-10: Big Game Migration Corridors
Alternative IV
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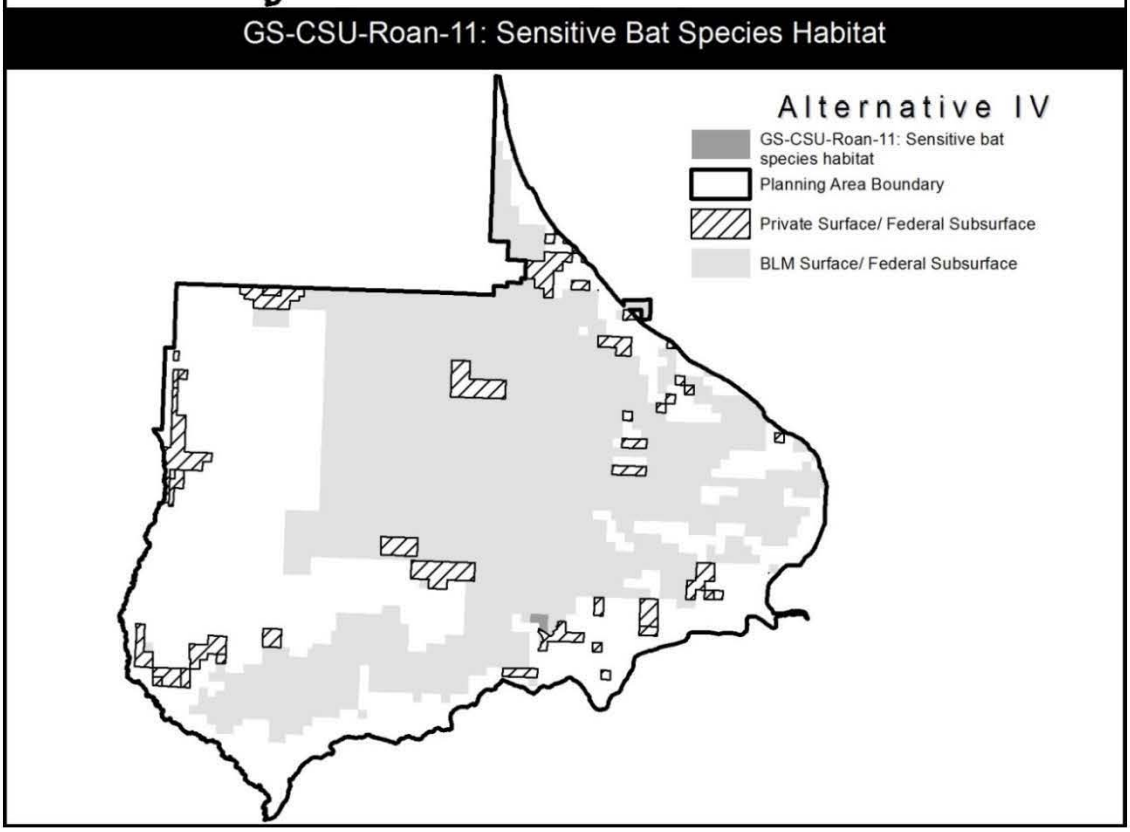
BLM Surface/ Federal Subsurface


GS-CSU-Roan-11: Sensitive Bat Species Habitat
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Planning Area Boundary
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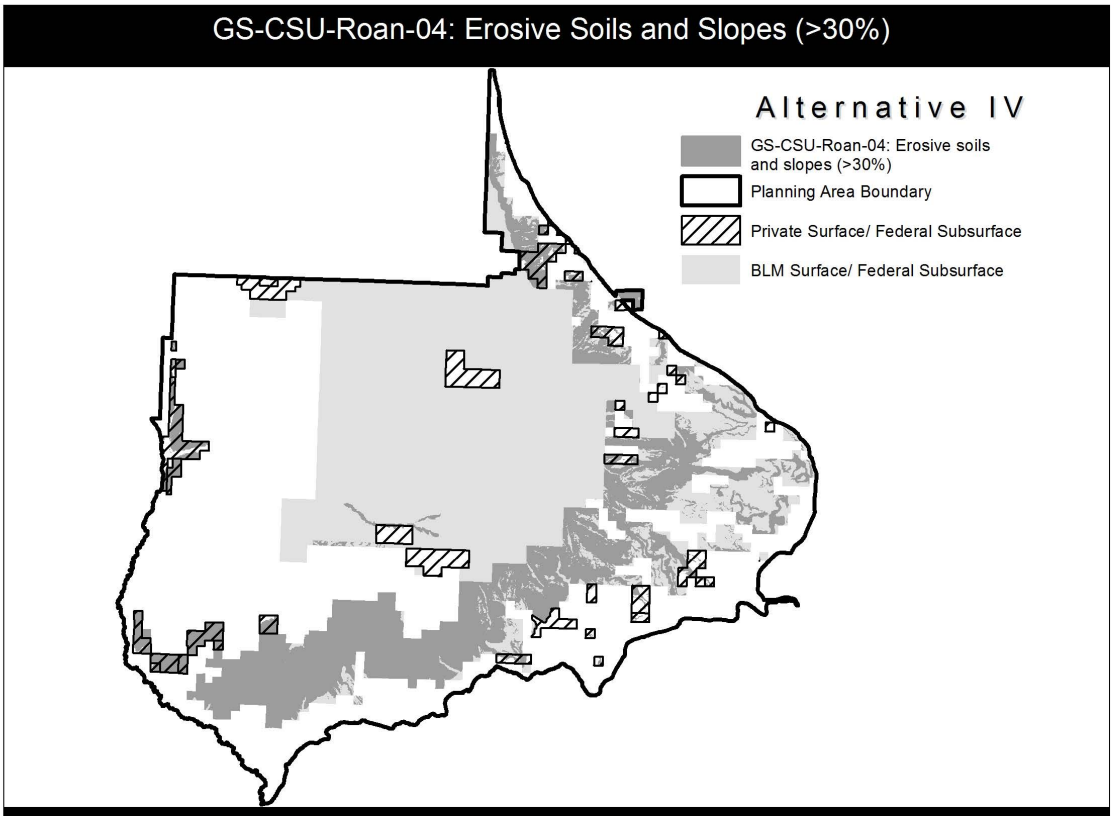
GS-CSU-Roan-04: Erosive Soils and Slopes (>30%)
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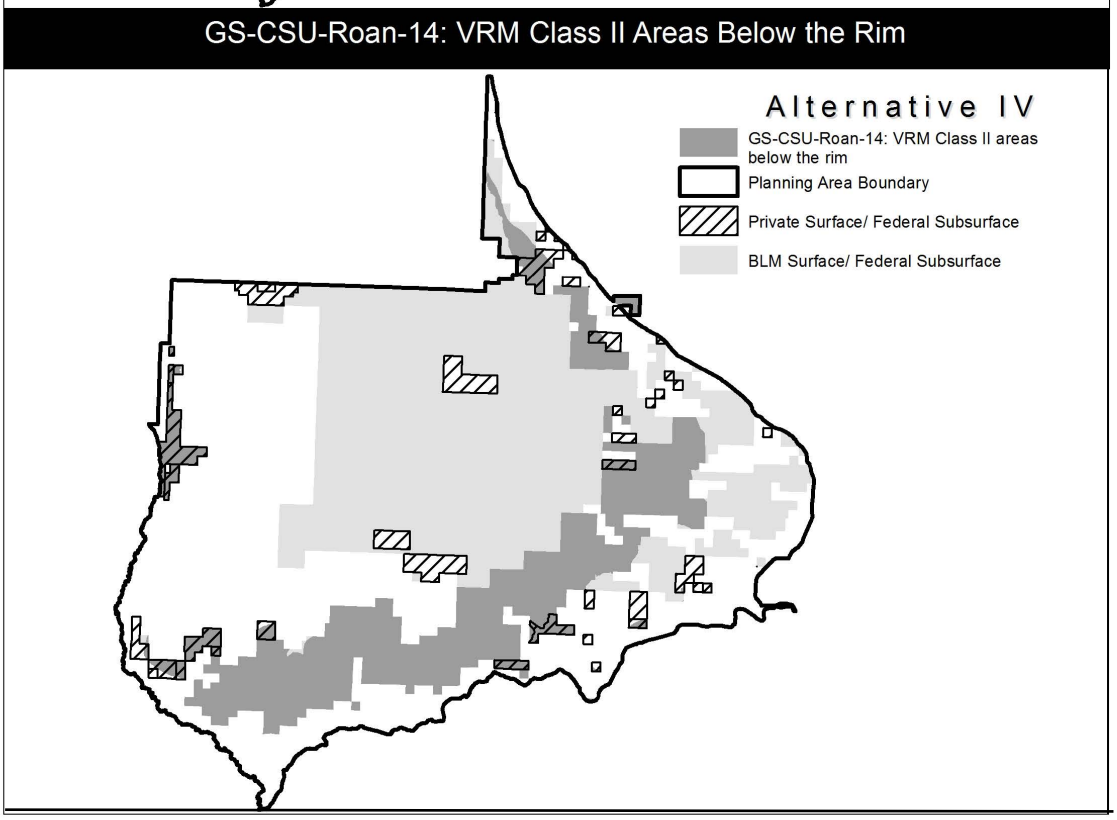
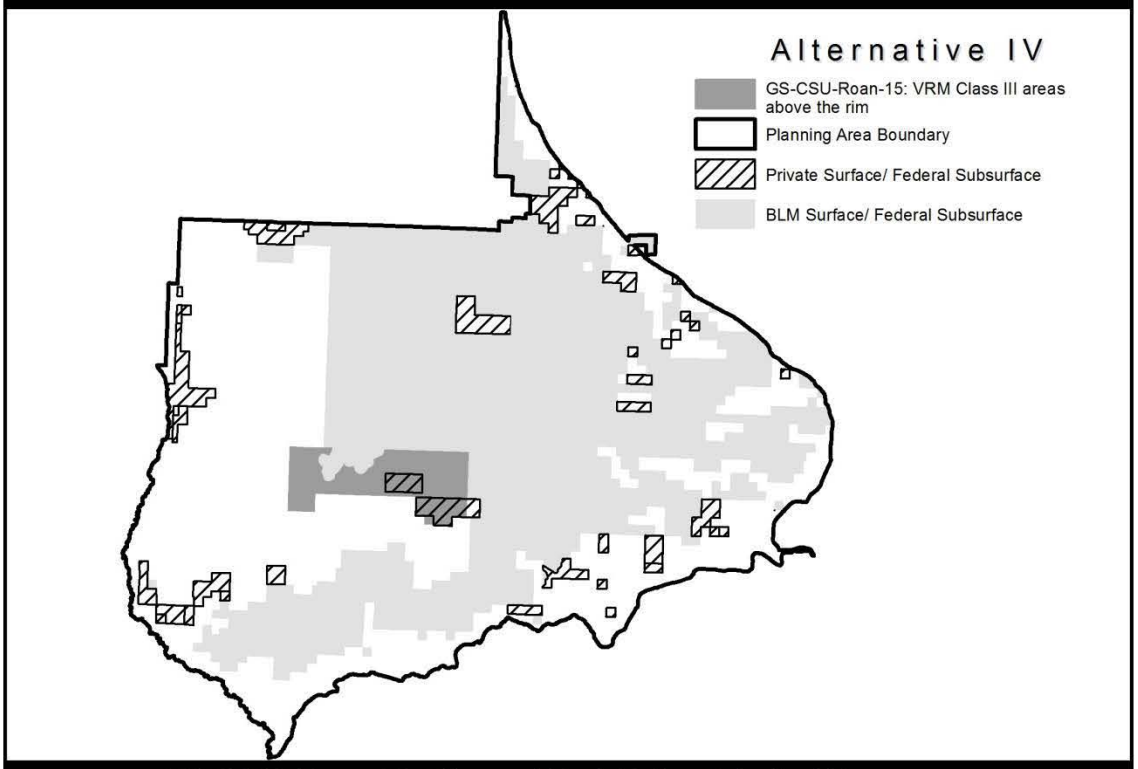
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

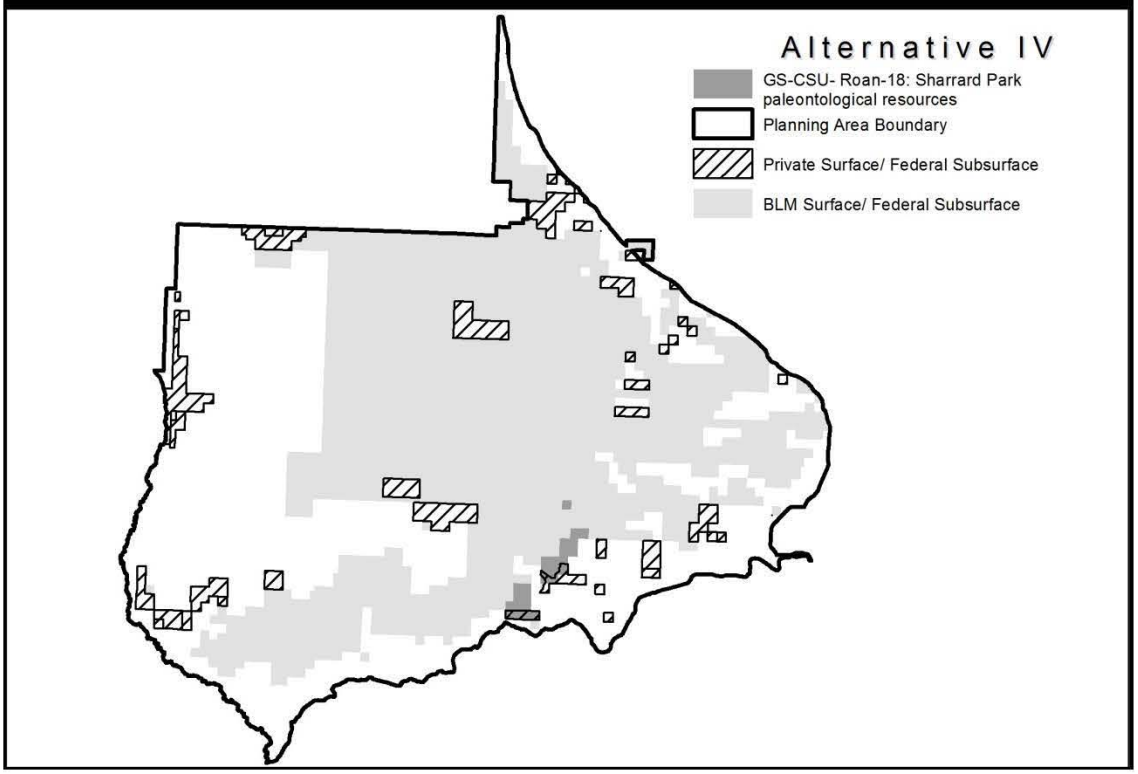

GS-CSU-Roan-14: VRM Class II Areas Below the Rim
Alternative IV
GS-CSU-Roan-14: VRM Class II areas below the rim
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

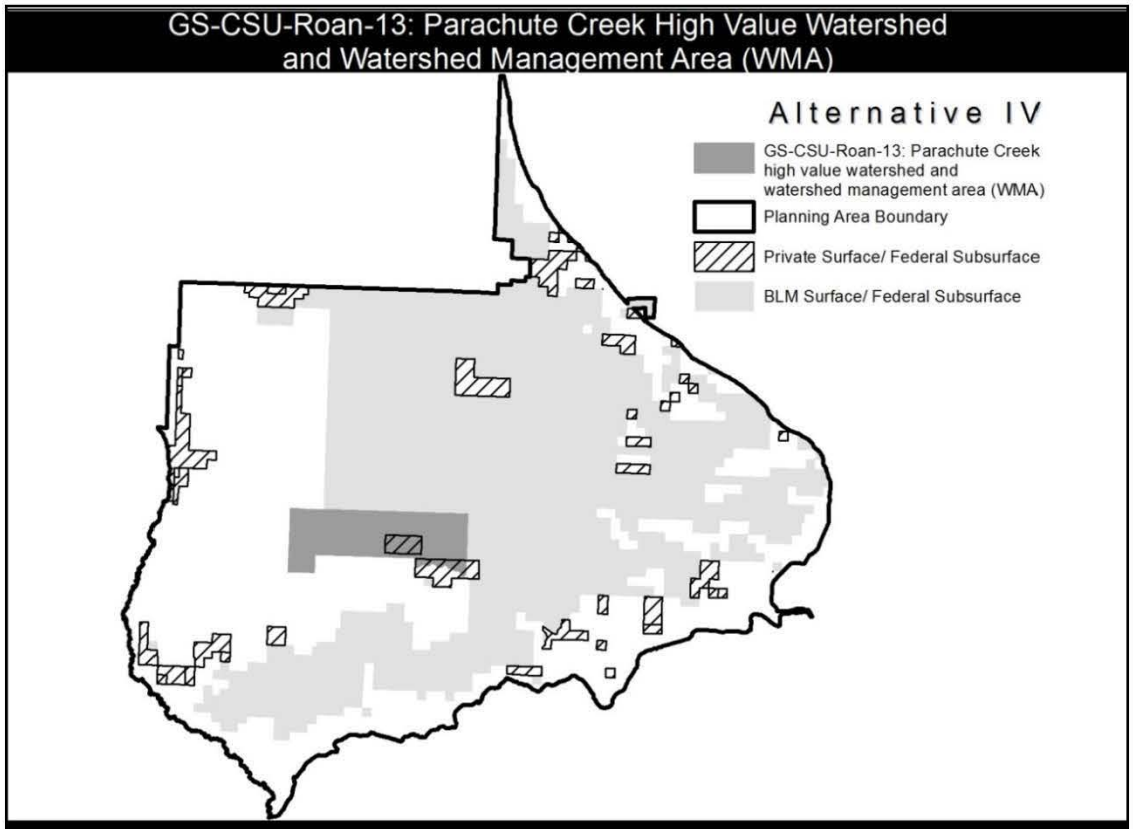
[Revised]

GS-CSU-Roan-15: VRM Class III Areas Above the Rim



GS-CSU- Roan-18: Sharrard Park Paleontological Resources




GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area (WMA)
Alternative IV
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Planning Area Boundary
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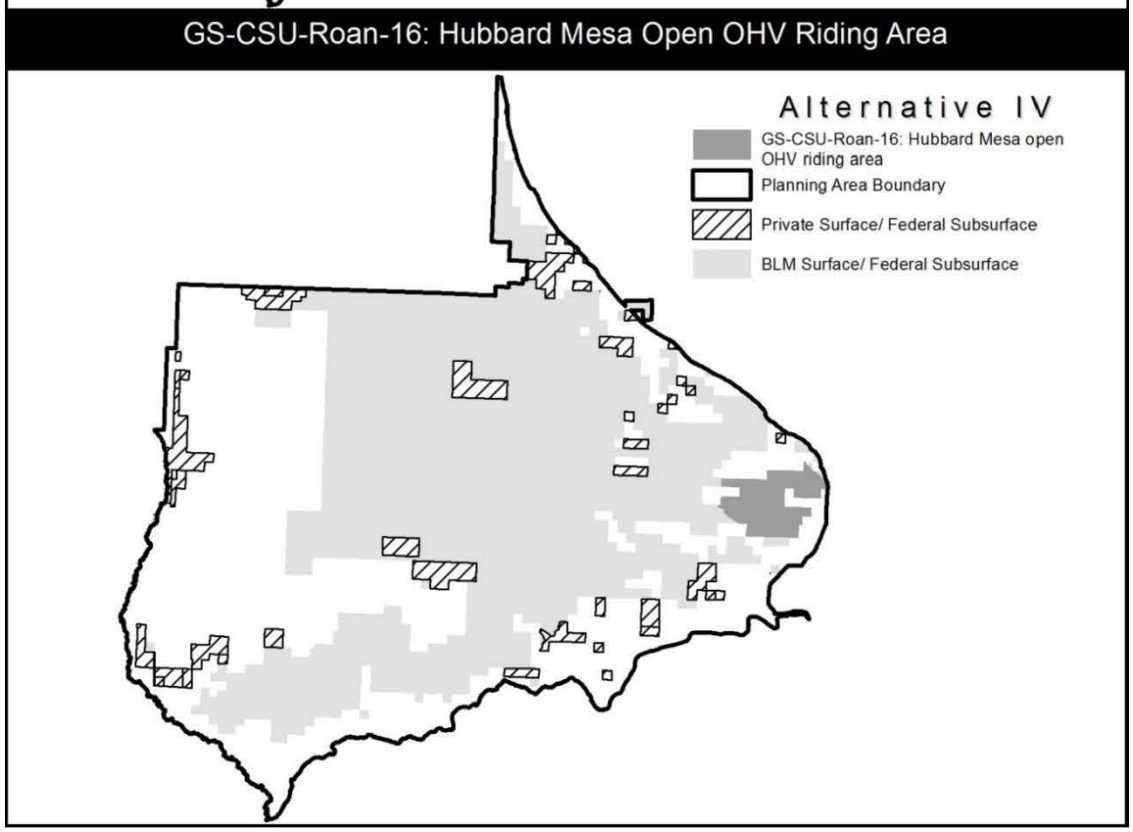
BLM Surface/ Federal Subsurface


GS-CSU-Roan-16: Hubbard Mesa Open OHV Riding Area
Alternative IV
GS-CSU-Roan-16: Hubbard Mesa open OHV riding area
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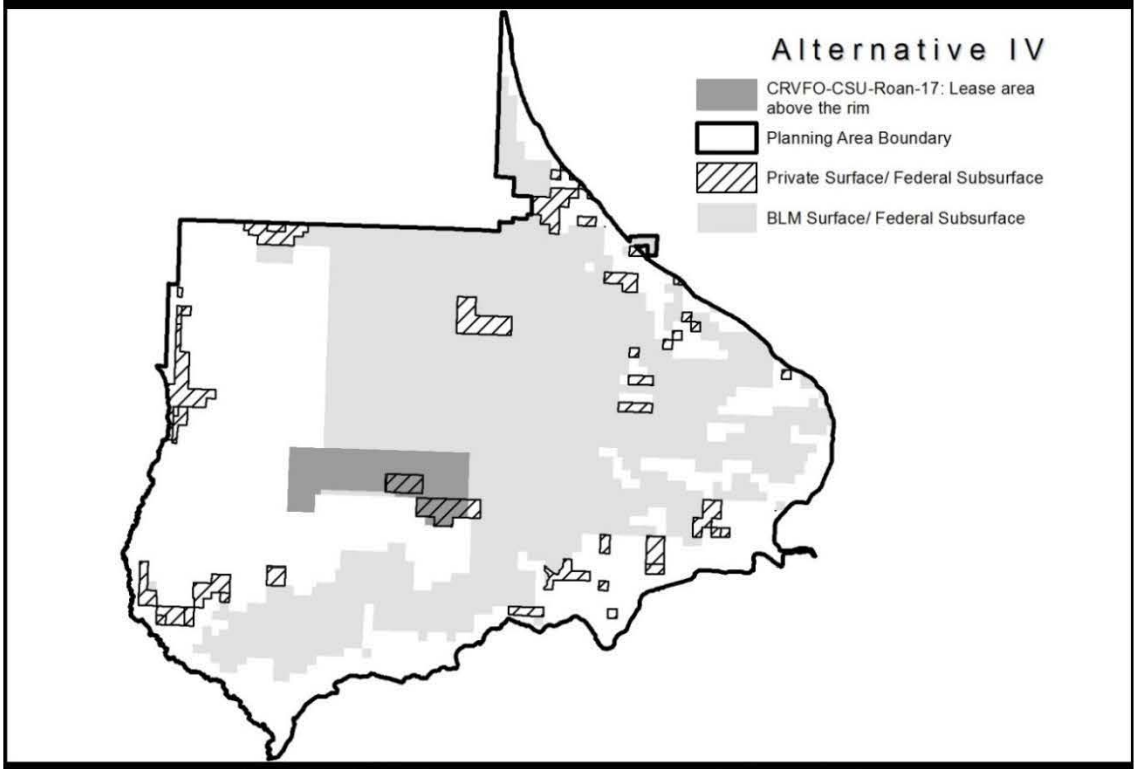
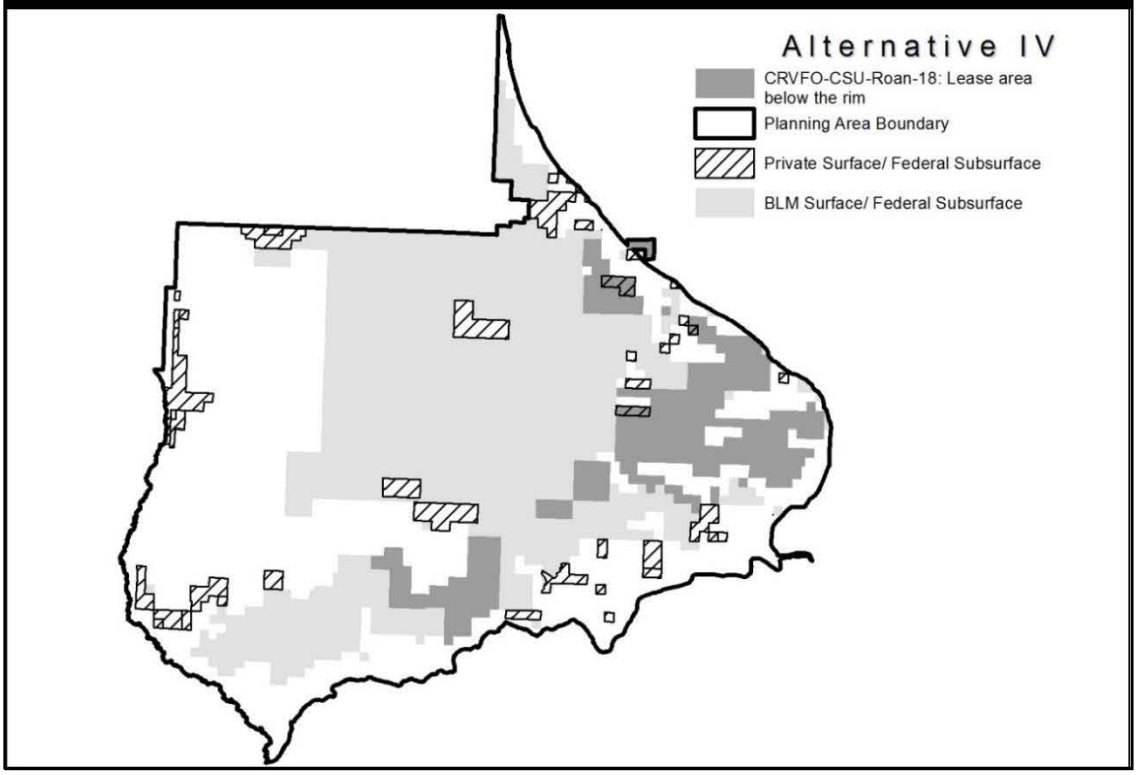
BLM Surface/ Federal Subsurface

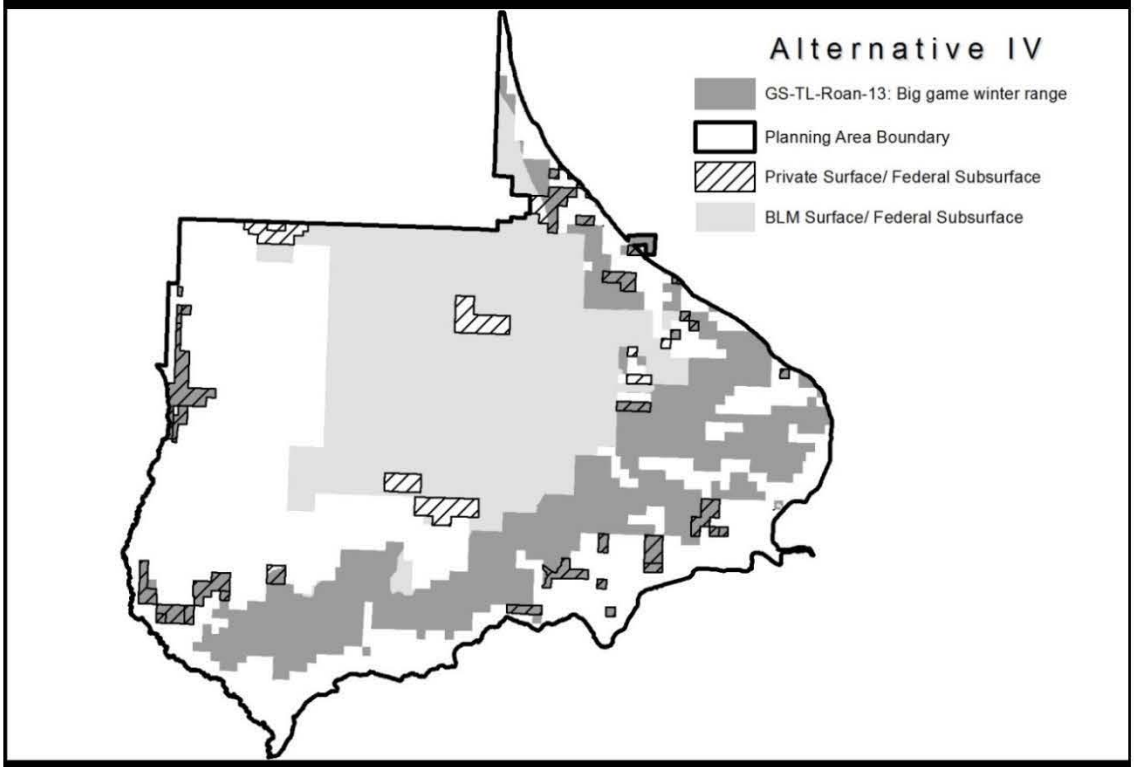
CRVFO-CSU-Roan-17: Lease Area Above the Rim



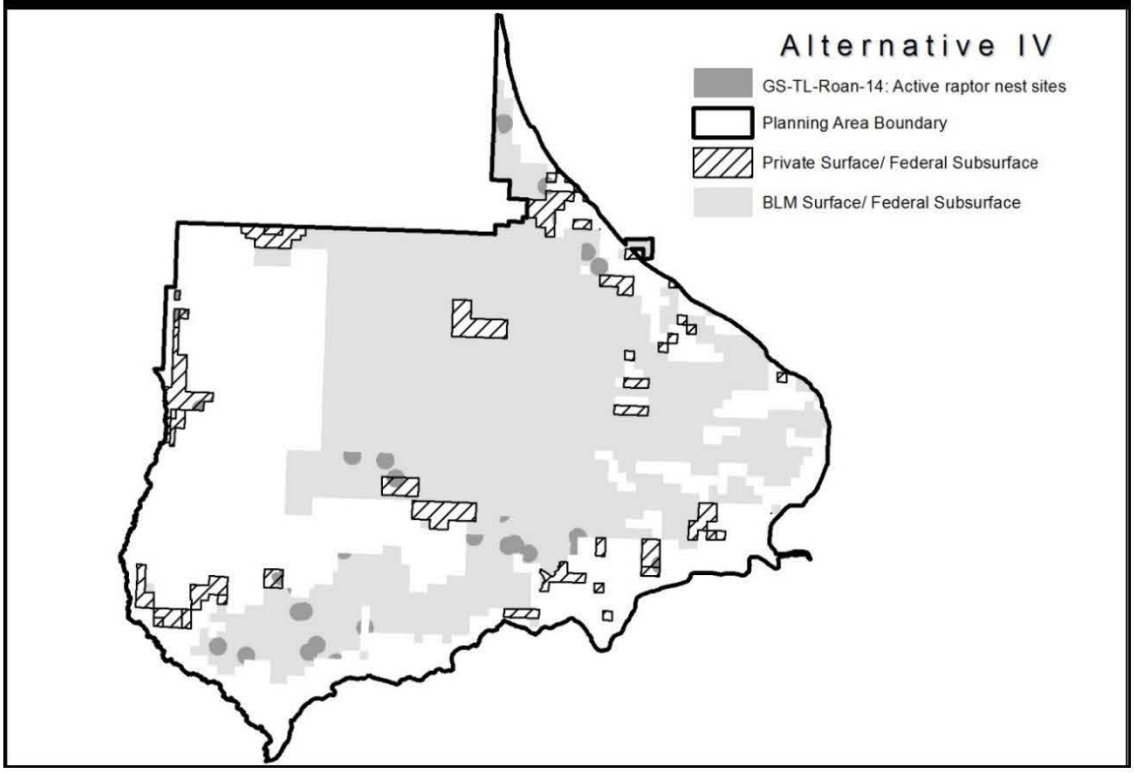
CRVFO-CSU-Roan-18: Lease Area Below the Rim



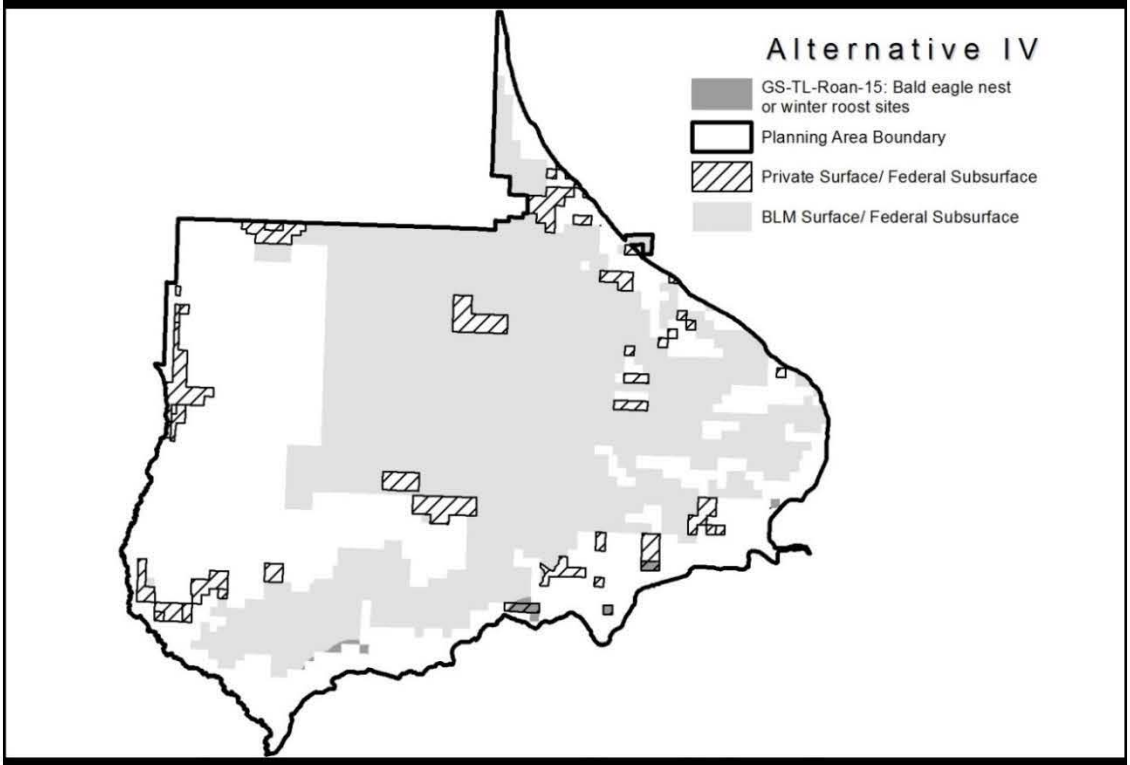
GS-TL-Roan-13: Big Game Winter Range



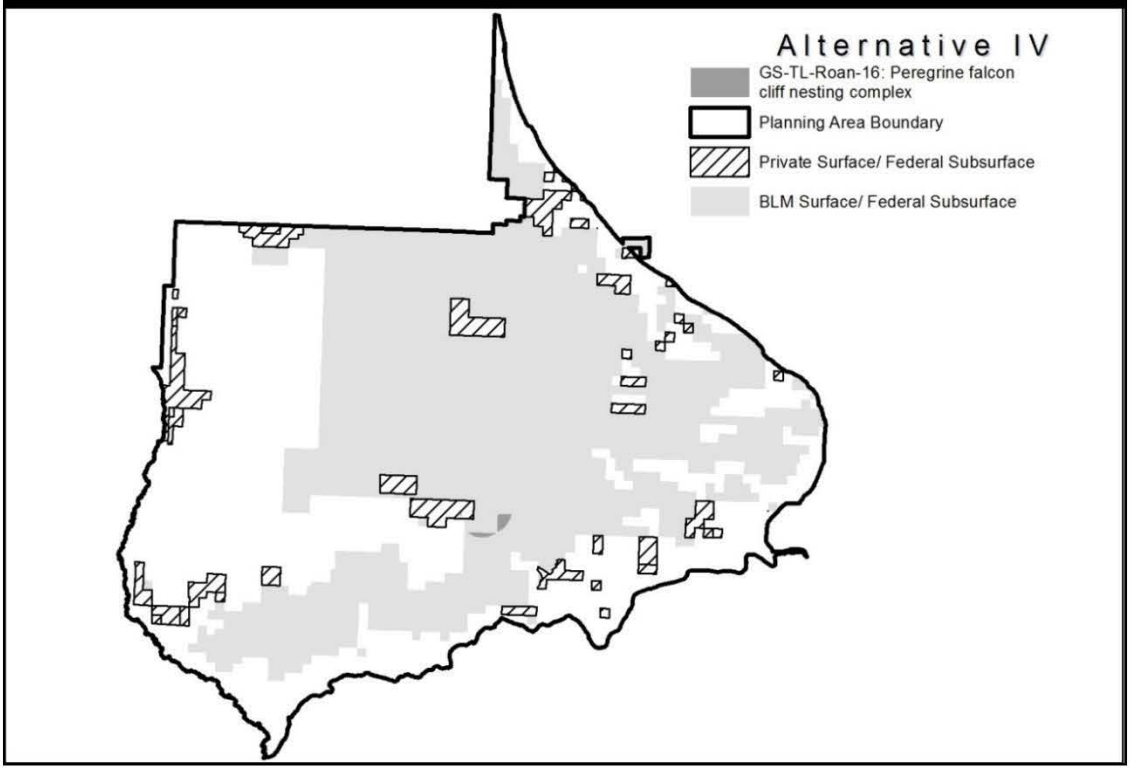
GS-TL-Roan-14: Active Raptor Nest Sites



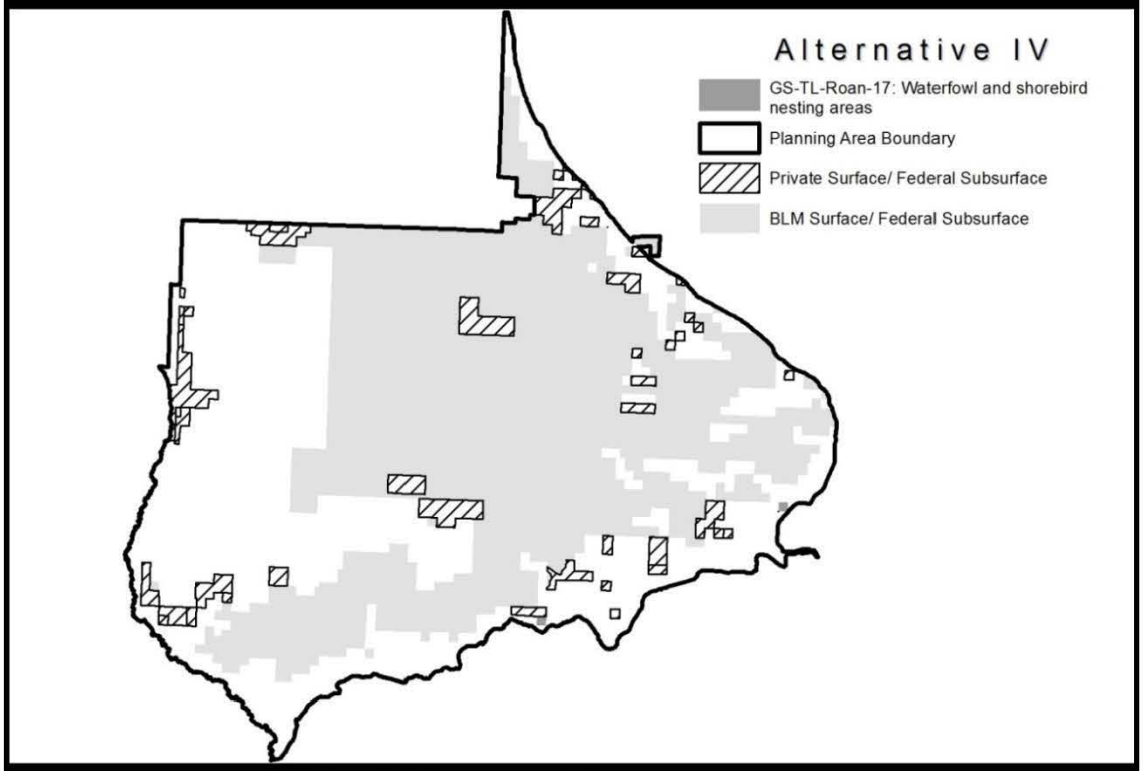
GS-TL-Roan-15: Bald Eagle Nest or Winter Roost Sites



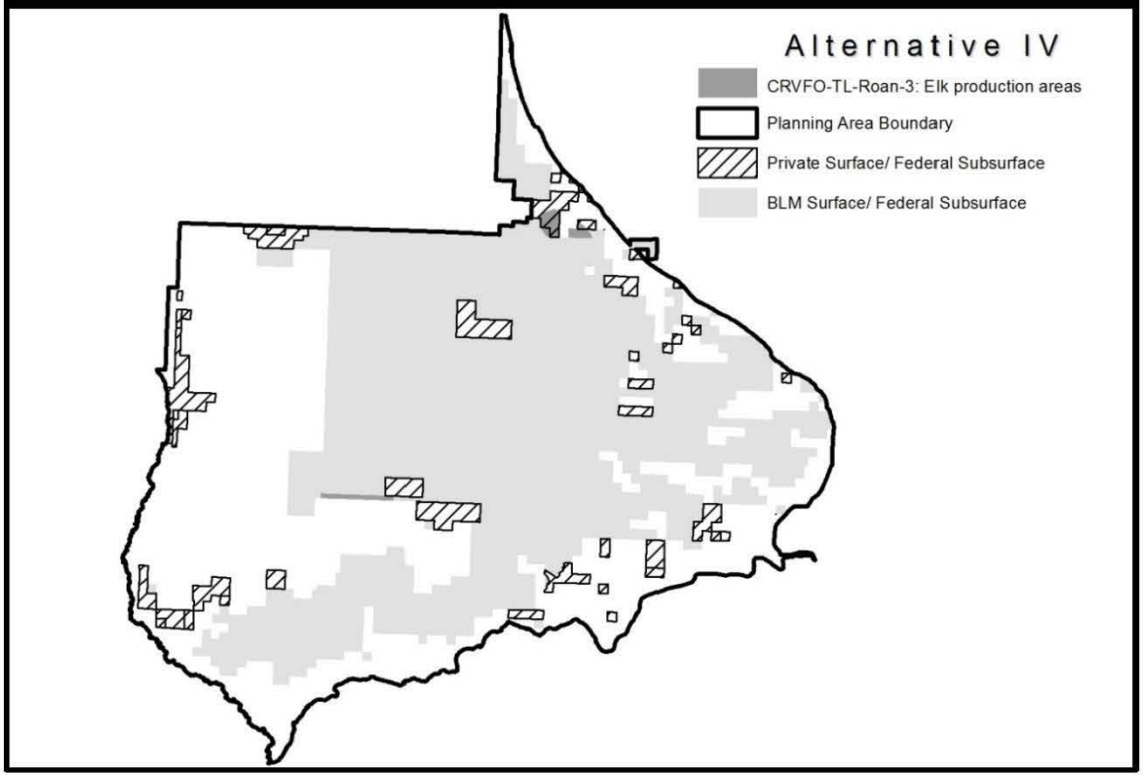
GS-TL-Roan-16: Peregrine Falcon Cliff Nesting Complex

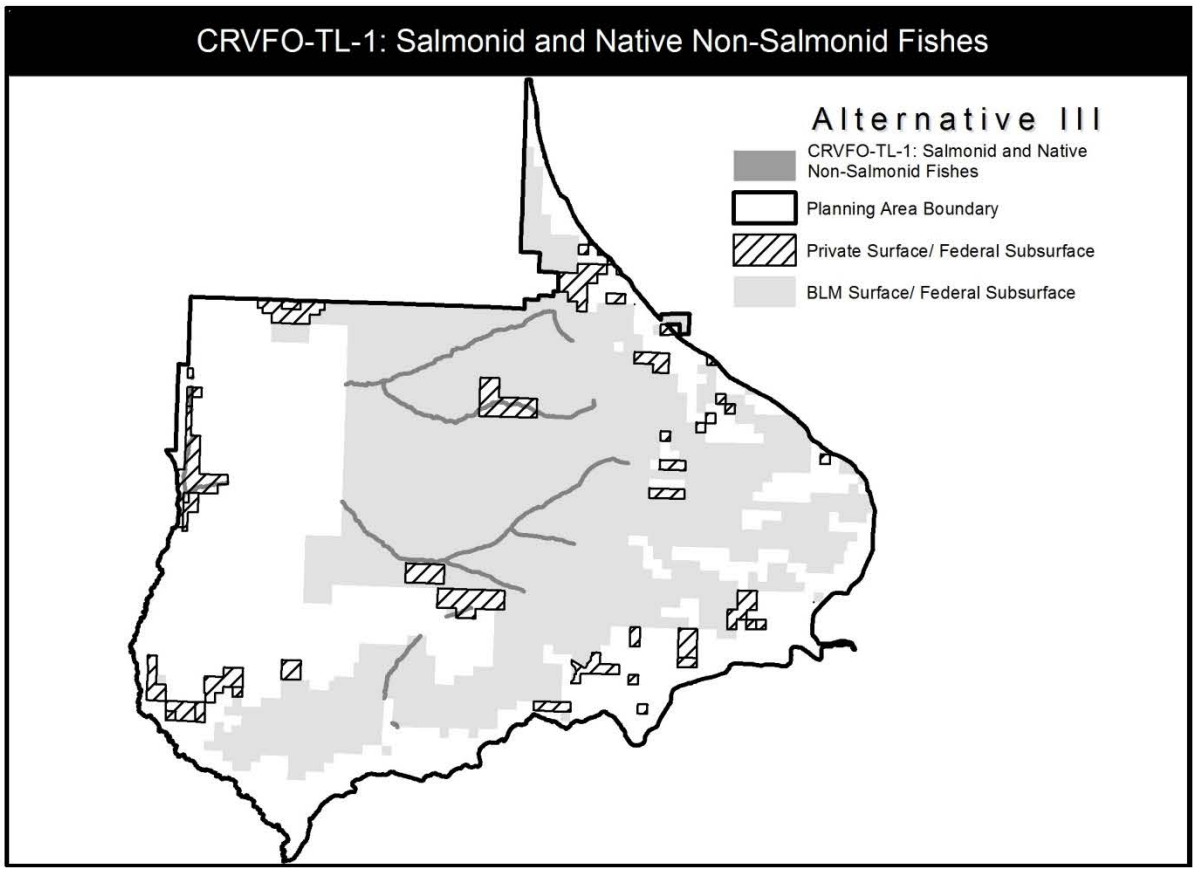


GS-TL-Roan-17: Waterfowl and Shorebird Nesting Areas



CRVFO-TL-Roan-3: Elk Production Areas




CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes
Alternative III
CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes
Planning Area Boundary
Private Surface/ Federal Subsurface
BLM Surface/ Federal Subsurface

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Appendix D

Visual Resource Management (VRM) Classes and Objectives

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Appendix D.

Visual Resource Management (VRM) Classes and Objectives

Purposes of Visual Resource Classes

Visual resource classes are categories assigned to public lands and serve two purposes: (1) an inventory tool that portrays the relative value of the visual resources, and (2) a management tool that portrays the visual management objectives. Visual resource classes are labeled Class I, Class II, Class III, and Class IV.

Visual Resource Inventory Classes

Visual resource inventory classes are assigned through the inventory process and are based on a combination of scenic quality, sensitivity level, and distance zones. Inventory classes provide the basis for considering visual values in the land use planning process. Inventory data is recorded and maintained in GIS within a BLM geodatabase data standard. This data will be used to ensure scenic values of the public lands are considered and documented in land use plans, and available for project level NEPA analysis of impacts on visual values. All BLM Field offices must use these standards when inventorying, recording, amending, or maintaining VRI data sets.

Visual Resource Management Classes

Visual resource management (VRM) classes are assigned through RMPs. The assignment of visual management classes is ultimately based on the management decisions made in RMPs. However, visual values must be considered throughout the RMP process. All actions proposed during the RMP process that would result in surface disturbances must consider the importance of the visual values and the impacts that the project may have on those values. Management decisions in the RMP must reflect the value of visual resources. In fact, the value of the visual resource may be the driving force for some management decisions. For example, highly scenic areas that need special management attention may be designated as scenic Areas of Critical Environmental Concern (ACECs) and classified as VRM Class I based on the importance of the visual values. A map is developed in each RMP showing the approved visual resource management classes.

Objectives for Visual Resource Classes

Class I. The objective for this class is to preserve the existing character of the landscape. This call provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II. The objective for this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III. The objective for this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape may be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV. The objective for this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape may be high. These management activities may dominate the view and be the major focus of view attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Monitoring

The visual contrast rating system described in BLM Manual 8400 will be used, where appropriate, in assessing proposals for projects on public lands or private lands with federal subsurface mineral rights. Potential projects are assessed for changes in existing form, line, color, and texture to determine their compatibility and contrast with the existing VRM class. Procedures assess, and as needed revise and implement, measures of visual mitigation and rehabilitation activities conducted for surface-disturbing activities.

Visual Simulations

Many proposed actions will require visual simulations to be done by the proponent or private contractors. Visual simulations will be done for selected Key Observation Points (KOPs) as identified by the BLM. The simulations must be accurate, reliable, valid, and representative of the real-world depiction of the finished or interim proposed action on the landscape. Simulations will be prepared to scale depicting any and all parts of the proposed action. This includes all structures and supporting infrastructure (roads, utilities, etc.) and the resulting disturbances to the surrounding landscape.

All requested simulations will be evaluated by the BLM staff to determine their accuracy and will become an official part of the documentation files (SEIS, EA, CX, etc.) for the proposed actions. Analysis and mitigation measures will be based on these simulations, and the proponent's end product will be held to the final visual simulation documents. If the end result is not what was represented within the visual simulations, the proponent will be out of compliance with the project proposal and the Environmental Assessment.

Appendix E

BLM Recreation Guidelines to Meet Public Land Health Standards in Colorado

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E-1. BLM Recreation Guidelines to Meet Public Land Health Standards in Colorado
Recreation Guidelines to Meet Public Land Health Standards 1 and 2
1. Manage recreational activities to maintain sufficient vegetation on upland areas to protect the soil from wind and water erosion and to buffer temperature extremes. 2. Minimize disturbances and manage recreation use in riparian areas to protect vegetation, fragile soils, springs, and wetlands. 3. Plan and locate routes, trails, and developments away from riparian and wetland areas and highly erodible soils. 4. Reduce stream crossings to the minimal number dictated by the topography. Reduce sedimentation and compaction associated with stream crossings. 5. Manage watercraft types and uses as appropriate to protect riparian systems and water quality from adverse impacts.
Recreation Guidelines to Meet Public Land Health Standard 3
1. Manage recreational use on public lands to promote the survival and health of native plants and animals. 2. Protect against the establishment or spread of noxious weeds. 3. Protect wildlife habitat by preserving connectivity and avoiding fragmentation. 4. Minimize wildlife disturbances and artificial attractions such as feeding wild animals or improper disposal of garbage. 5. Protect plant and animal communities by limiting recreational use by type, season, intensity, distribution, or duration.
Recreation Guidelines to Meet Public Land Health Standard 4
1. Protect habitat for Federal and State threatened or endangered species and other special-status species.
Recreation Guidelines to Meet Public Land Health Standard 5
1. Manage recreational uses in coordination with other uses on public lands to achieve or exceed applicable water quality standards. 2. Control water quality impacts resulting from recreational use, such as human waste, trash, and other elements.

E-2. BLM Recreation Setting Characteristics Matrix			
ROS Class	**Physical Setting Description**	**Social Setting Description**	**Operational Setting Description**
Urban	Near urban areas. Substantially modified environment. Numerous facilities to manage and accommodate intensive use.	High concentrations of people commonplace. In constant contact with other people.	Onsite management controls and regulations are numerous and cannot go unnoticed. Intensively managed. Multiple activities may occur. Regular highway vehicles are present
Rural	Within 0.5 mile developed areas and primary highways. Substantially modified environment having natural and manmade features (includes agricultural lands). Moderate number of facilities to manage use may exist.	Moderate to high degree of contact with others. Culturally modified landscape. People are almost continually in view.	Onsite management controls and regulations are numerous and easy to see. Land uses obvious.
Front Country	Within 0.5 mile of light-duty roads and areas with high route density. Resource modifications evident but balanced by the surrounding natural appearing environment.	Moderate to high degree of contact with others. See an average of 30 or more groups per day and fewer when away from roads. Human use alterations may be dominant.	Visitor management controls are noticeable but harmonize with the landscape. Basic visitor information facilities are present. Land uses like grazing are evident but fit into the natural landscape. OHV use occurs.
Middle Country	Within 0.5 mile of primitive motorized routes (4wd, high clearance). Resource modifications evident but balanced by the surrounding natural appearing environment. Some rustic facilities such as bulletin boards signs and motorized trails.	Moderate to high degree of contact with others. See an average of 15 or more groups per day and less when away from roads. Human use alterations easily noticeable.	A few subtle management controls or visitor information facilities present. Land uses are still subtle but still easy to see. Motorized use occurs (4wds, ATVs, and motorcycles).
Back Country	At least ½ mile from primitive motorized routes but not greater than 3 miles from all motorized routes. Largely unmodified natural appearing environment. Few primitive facilities such as signs and trails.	Little contact with others. See an average of 6 to 15 groups per day. Evidence of others subtly noticeable but not drawing attention when recreating.	A few subtle management controls or visitor information facilities present. Land uses are subtle. No motorized use.

E-2. BLM Recreation Setting Characteristics Matrix			
ROS Class	**Physical Setting Description**	**Social Setting Description**	**Operational Setting Description**
Primitive	Greater than 3 miles from all motorized routes. Unmodified natural environment, at least 5,000. Few to no facilities.	Very little contact with others. See an average of 6 or fewer groups per day. Evidence of others unnoticeable.	No onsite visitor management or information facilities. Land uses generally unnoticeable. No motorized or mechanized uses.

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Appendix F

Proposed Management and Setting Prescriptions
for Lands with Wilderness Characteristics

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Proposed Management and Setting Prescriptions for Lands with Wilderness Characteristics

Management activities would be guided by the principle of doing the minimum necessary to manage these lands in order to preserve their wilderness characteristics. Cultural, paleontological, vegetation, geologic and terrestrial/aquatic wildlife resources are important supplemental values to an area's wilderness characteristics. The following management and setting prescriptions are intended to protect these values along with wilderness characteristics (i.e., naturalness and outstanding opportunities for solitude or primitive recreation).

Surface-Disturbing Activities

Management Action and Allowable Use Decisions

- Apply a no surface occupancy stipulation (CRVFO-NSO-Roan 2) on use and occupancy of the land surface for fluid mineral exploration and development and other surface-disturbing activities (Alterntive III).

Valid Existing Rights

Management Action and Allowable Use Decisions

- New discretionary uses that create valid existing rights are not allowed if they would detract from the wilderness values. Specific exemptions/allowances are made for prior-existing rights may continue.

Forest/Vegetation Management

Management Action and Allowable Use Decisions

- These lands are closed to commercial timber harvest, firewood cutting, and special forest product harvest.

Best Management Practices to Guide Implementation-level Planning

- Vegetative manipulation to control insect and disease outbreaks or control invasive species is allowed when there is no effective alternative and when the control is necessary to maintain wilderness characteristics and maintain supplemental values.
- Control/manipulation methods may include hand (e.g., tools or chain saws), chemical (e.g., spraying weeds), and biological treatment provided it would not cause adverse impacts (apparent evidence of human intervention on the landscape) to the wilderness characteristics.

Wildlife Management

Management Action and Allowable Use Decisions

- Introduction of threatened, endangered, or other special-status species native to North America may be allowed.
- Management activities on these lands would emphasize natural processes for wildlife management.

Best Management Practices to Guide Implementation-level Planning

- These resources would be managed to maintain that character.
- Fishing, hunting, and trapping are allowable activities on these lands. The State of Colorado establishes regulations and enforcement for these uses. Nothing would be construed as affecting the jurisdiction or responsibilities of the State agencies with respect to fish and wildlife management on these lands.
- Stocking of wildlife and fish species native to the area is permitted.

Cultural and Paleontological Resource Management

Best Management Practices to Guide Implementation-level Planning

- Resource inventories, studies, and research involving surface examination may be permitted.
- Paleontological resource projects such as excavations would be evaluated on a case-by-case basis. These evaluations would ensure any impact to wilderness characteristics are temporary and wilderness characteristics are protected over the long-term.
- Rehabilitation, stabilization, reconstruction, and restoration work on historic structures; excavations; and extensive surface collection may also be permitted if they maintain the area's wilderness character.
- Permanent physical protection, such as fences, would be limited to those measures needed to protect resources eligible for the National Register of Historic Places and would be constructed so as to minimize impacts on naturalness.

Visual Resource Management

Management Action and Allowable Use Decisions

- Manage areas under VRM Class II objectives unless otherwise managed as VRM Class I.

Wildland Fire Management

Best Management Practices to Guide Implementation-level Planning

- Fire suppression and management would be consistent with the CRVFO Fire Management Plan (FMP). Wildland fire suppression and management objectives would recognize maintaining wilderness characteristics.
- Reduce the negative effects of wildland fire suppression by applying minimum impact suppression tactics (MIST).
- Placement of large fire camps would be outside of these areas.
- Perform rehabilitation of fire suppression impacts and emergency stabilization/restoration (ESR) as defined by the resource advisor to restore visual and wilderness characteristics.
- The use of natural firebreaks and roads to contain a wildland fire is encouraged.

Livestock Grazing Management

Best Management Practices to Guide Implementation-level Planning

- Within areas managed to maintain wilderness characteristics, existing livestock grazing and the activities and facilities that support a grazing program are permitted to continue.
- Adjustments in the numbers and kind of livestock permitted to graze would be made as a result of land health assessments and grazing compliance.
- The construction of new grazing facilities would be permitted if they are primarily for the purpose of protecting wilderness characteristics and more effective management of resources, rather than to accommodate increased numbers of livestock.
- The use of motorized equipment for emergency purposes is allowed for livestock management.

Recreation and Visitor Services Management

Management Action and Allowable Use Decisions

- Permanent recreation structures are not permitted.
- No new special recreation permits would be authorized unless they are necessary for helping people realize the primitive and unconfined recreational values (e.g., upland outfitting service).

- When commercial special recreation permits (SRP) are renewed, the terms and conditions of the SRP would be modified as necessary to comply with the *Management and Setting Prescriptions for Areas with Wilderness Characteristics.*
- No competitive events would be authorized.

Best Management Practices to Guide Implementation-level Planning

- Primitive and unconfined recreational activities such as hiking, camping, rock climbing, caving, fishing, hunting, trapping etc., are emphasized on these lands.
- Recreational or hobby collecting of mineral specimens when conducted without location of a mining claim may be allowed. This use would be limited to hand collection and detection equipment.

Comprehensive Trails and Travel Management

Management Action and Allowable Use Decisions

- The construction of new permanent or temporary routes would not be allowed.
- All lands are closed to over-snow travel.
- Access is granted for BLM administrative use.

Best Management Practices to Guide Implementation-level Planning

- BLM authorization to exercise valid and existing rights and for emergency and other purposes as authorized under 43 CFR 8340.0-5(a) (2), (3), (4) and (5).
- The use and the construction of temporary roads, structures, and installations are allowed for emergency purposes, but must be conducted to achieve the least disturbance and reclaimed as soon as possible.
- Unauthorized travel off designated routes would not be allowed.
- Motorized and mechanized routes would be minimized and restoration of unnecessary routes would be preformed to enhance and protect wilderness characteristics.
- For all authorizations that allow off-route motorized/mechanized travel, specify the following: what type of use is allowed and for what purpose, times, dates or seasons of access; and where motorized/mechanized vehicle travel off designated routes is allowed.
- In areas with limited travel designations, motorized/mechanized travel is allowed up to 300 feet from designated motorized/mechanized routes for direct access to dispersed campsites provided that: 1) no resource damage occurs; 2) no new routes are created; and 3) such access is not otherwise prohibited by the BLM Field Manager.

Land and Realty Management (Land Disposals, Rights-of-Ways (ROWs) and Use Authorizations)

Management Action and Allowable Use Decisions

- Lands with wilderness characteristics would be retained in public ownership. They would not be disposed through any means, including public sales, exchanges, patents under the Recreation and Public Purposes Act, State selections or other actions (except where a vested right was established prior to October 21, 1976).
- Prior existing rights, such as leases under the Recreation and Public Purposes Act, leases/permits under 43 CFR 2920, and rights-of-ways (ROWs) may be renewed.
- These lands would be designated as ROW exclusion areas. New authorizations, leases, or ROWs would not be authorized that are not compatible with the defined values.

Best Management Practices to Guide Implementation-level Planning

- The BLM would acquire State and private in-holdings when practicable. In unique situations and subject to public review, exchanges may be made involving Federal and non-Federal lands when such action would significantly benefit that area's wilderness characteristics.

- Adequate access to in-holdings that are compatible with the defined values would be authorized.
- New administrative use authorizations would be granted on a case-by-case basis if it is: 1) compatible with the defined values, or 2) necessary to administer and protect the lands with wilderness characteristics, and 3) necessary to protect the health and safety of persons within the area.

Fluid Minerals (Oil and Gas, Tar Sands, & Geothermal Resources) Management

Management Action and Allowable Use Decisions

- *No Fluid Mineral Leasing* - Close unleased federal mineral estate to oil and gas leasing and geophysical development.

Locatable Minerals, Mineral Materials, & Non-Energy Leasable Minerals Management

Management Action and Allowable Use Decisions

- Recommend for withdrawal to the Secretary of the Interior to close these lands to mining laws for locatable exploration or development.
- *Non-energy Solid Mineral Leasing* - All federal mineral estate within these lands would be closed to non-energy solid mineral leasing.
- *Mineral Material (salable) Disposal* - These lands are closed to mineral material (salable such as moss rock, top soil, sand and gravel, scoria, fill dirt) disposal.

Implementation-level Planning Guidance

- Within areas managed to maintain wilderness characteristics, existing mining operations would be regulated using the 43 CFR 3809 regulations to prevent unnecessary and undue degradation of the lands.
- Within areas managed to maintain wilderness characteristics, existing mineral leases represent a valid existing right. These rights are dependent upon the specific terms and conditions of each lease. Existing leases would be regulated through conditions of approval to prevent unnecessary or undue degradation.

Appendix G

Reasonable Foreseeable Development
Roan Plateau Planning Area

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Reasonable Foreseeable Development
Roan Plateau Planning Area

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11/17/2014 Revision for updated surface disturbance calculations

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List of Abbreviations

AU ..... Assessment Unit
BCF ..... One Billion Standard Cubic Feet of Gas
BLM ..... Bureau of Land Management
CA ..... Communitization Agreement
CBNG ..... Coalbed Natural Gas
COGCC ..... Colorado Oil and Gas Conservation Commission
CRVFO ..... Colorado River Valley Field Office
DOE ..... Department of Energy
EIA ..... United States Energy Information Administration
EIS ..... Environmental Impact Statement
EPCA ..... Energy Policy and Conservation Act
EUR ..... Estimated Ultimate Recovery
FAN ..... Final Abandonment Notice
GJFO ..... Grand Junction Field Office
MCF ..... One Thousand Standard Cubic Feet of Gas
mD ..... Millidarcy
MMBTU ..... One Million British Thermal Units
MMCF ..... One Million Standard Cubic Feet of Gas
MWX ..... Multiple Well Experiment
NGL ..... Natural Gas Liquids
NOSR ..... Naval Oil Shale Reserves
NSO ..... No Surface Occupancy
NYMEX ..... New York Mercantile Exchange
RFD ..... Reasonable Foreseeable Development Scenario
RMPA ..... Resource Management Plan Amendment
SCF ..... One Standard Cubic Foot of Gas
SEIS ..... Supplemental Environmental Impact Statement
TCF ..... One Trillion Standard Cubic Feet of Gas
TPS ..... Total Petroleum System
USFS ..... United States Forest Service
USGS ..... United States Geological Survey
WRFO ..... White River Field Office

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Summary

This Reasonable Foreseeable Development Scenario (RFD) was prepared to support the Resource Management Plan Amendment (RMPA) and Supplemental Environmental Impact Statement (SEIS) for the Roan Plateau Planning Area (RPPA) of the Colorado River Valley Field Office (CRVFO), Colorado. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the RPPA over the next 20 years.

The RPPA is in the southern part of the Piceance Basin, which is part of the greater geologic basin known as the Uinta-Piceance Basin. Current development is focused on the Mesaverde Formation. There currently are 2,661 wells in the RPPA, and oil and gas activities have switched from exploration to developmental. Little development has occurred on top of the plateau, but development below its rim (top of the cliffs) has been extensive, and approximately 50% of the acreage available for development has been developed.

The Bureau of Land Management (BLM) Energy Office staff at the CRVFO compiled data from various sources including historical oil and gas development trends and natural gas prices to estimate future development for the RPPA. The CRVFO estimates that 17.1 trillion cubic feet of gas (TCF) is technically recoverable from the Mesaverde Formation in the RPPA. Over the next 20 years, it is projected that 5,470 federal and fee wells could be drilled into the RPPA, with 1,070 federal wells on top of the plateau and 2,450 federal wells below the rim, see Table 3. This development is estimated to create an additional 5,928 aces of net disturbance, including 1,898 acres on federal lands.

Background

The development of the initial Roan Plateau RMP Amendment began with scoping in 2000. The Draft Environmental Impact Statement (EIS) was published in November 2004. The Final EIS was published in August 2006. The BLM then issued two Records of Decision, one in June 2007 and a second, pertaining to Areas of Critical Environmental Concern, in March 2008. A lawsuit filed in July 2008 that challenged the BLM's oil and gas leasing and management decisions for the Roan Plateau resulted in a June 22, 2012, ruling by the United States District Court for the District of Colorado. The Court set aside the Plan amendment and remanded the matter to the BLM for further action in accordance with the Court's decision.

In response to the Opinion and Order of the United States District Court for the District of Colorado on June 22, 2012, the RMPA/SEIS for the RPPA is being prepared. A Notice of Intent to initiate scoping for the SEIS was published to the Federal Register on January 28, 2013. The RMPA/SEIS will analyze options for future management of the RPPA consistent with the 2012 Court Order. It will also address significant new information arising since publication of the original Records of Decision (RODs) in August 2007 and March 2008 and issues identified by the scoping process.

Reconsideration of oil and gas development was a component of the Court Order and an issue identified during scoping; therefore, the BLM has concluded that it is appropriate to update the RFD prepared November 2005 for the RPPA in conjunction with the earlier 2006 RMPA/EIS.

A RFD is a long-term scenario used as a baseline for adjusting the projected amount of oil and gas activity for each alternative in the Draft Resource Management Plan. It is not a decision and does not authorize or approve any development. It is a rational estimate of development based under the assumption that all potential productive areas are open for oil and gas leasing and developed under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation,

or executive order. The RFD estimates the potential oil and gas activity on all lands, including private and state lands. The BLM only has jurisdiction over the activity on federal surface or federal minerals.

This RFD is intended for input into the RMPA/SEIS by:

- Describing the potential level of fluid mineral exploration and production to occur over the next 20 years and estimating the surface disturbance associated with that activity. This information will provide the planning team the basis for assessing the impacts to other resources within the RPPA. The analysis of impacts and associated mitigation measures will be described in the RMPA/SEIS and other National Environmental Policy Act (NEPA) documents.
- Providing a description of past and present exploration and development activities in the RPPA.
- Discussing ancillary facilities and surface impacts from past and current activity.
- Analyzing the geology, technologies, and methodologies that occur within the CRVFO in order to support assumptions and projections for the RFD.

The RFD was prepared in accordance with Instruction Memorandum No. 2004-089; subject "Policy for Reasonable Foreseeable Development (RFD) Scenario for Oil and Gas," dated January 16, 2004.

Description of Geology

Geologic Setting

The Piceance Basin is an elongated northwest-southeast trending structural basin about 100 miles long and 40 to 50 miles wide located in northwestern Colorado. The basin is bounded by the Grand Hogback monocline and the White River Uplift to the east, the Axial Basin Arch to the north, the Douglas Creek Arch to the west, and the Uncompahgre and Sawatch uplifts to the south. The general stratigraphy of the Piceance Basin ranges from Cambrian to Tertiary in age.

During the Cretaceous period 145 to 65.5 million years ago (Mya), the Piceance Basin region was situated on the on the western foreland margin of the Western Interior Seaway, which extended from the Gulf of Mexico to Canada. During Turonian through Campanian time, sediment was shed from the Sevier thrust belt in central Utah and southwestern Wyoming, transported eastward in fluvial depositional systems, and ultimately deposited in shoreline environments that rimmed the epeiric (inland) seaway. Costal-plain swamps developed landward of the Cretaceous shorelines that later formed the prolific coal-bearing successions of the Cameo coal and overlying coal intervals of the Williams Fork Formation. Regression of the seaway resulted in a general eastward progradation of the shorelines and concomitant eastward migration of the coal-bearing deposits.

During this time, several thousand feet of subsidence and accumulation of continental and marginal-marine sediment occurred. At the close of the Cretaceous, Laramide uplifts in the Sawatch Uncompahgre, Douglas Creek, and Uinta regions began to rise as is evident by either regionally extensive unconformities or thinning of the deposits over the incipient uplifts. The Laramide orogeny intensified during the Paleocene and continued throughout the Eocene, resulting in deposition of coarser-grained clastic detritus proximal to the uplifts and accumulation of finer-grained sediment in the intermountain basins.

A wide spectrum of local lithostratigraphic terms are used for facies-equivalent, correlative units of the Piceance Basin. For example, regression of the Western Interior Seaway during Late Campanian time is expressed as high stand progradational parasequence sets that constitute the Corcoran, Cozzette, and Rollins Members of the Mount Garfield Formation in the Book Cliffs area and the Iles Formation in the

Grand Hogback area. The overlying succession of fluvial strata is referred to as the Hunter Canyon Formation of the Mesaverde Group in the Book Cliffs area and the Williams Fork Formation in the Grand Hogback area. These fluvial deposits are succeeded by a 50- to 150-foot-thick interval of coarse-grained sandstone to conglomerate that, in some localities, possess a distinctive white appearance and are overlain by the brightly variegated Eocene Wasatch Formation. This coarse-grained interval has been referred to as the Ohio Creek Conglomerate and the Ohio Creek Member of the Mesaverde Group (Patterson, Kronmueller and Davies).

USGS Oil and Gas Assessment Units

When discussing geology, plays, assessment units (AU), and total petroleum systems (TPS) within the RPPA, it is necessary to include basin wide information. The majority of kerogen rich source rocks and gas bearing formations are contiguous throughout the basin, with the exception of transition zones and basin structural boundaries (i.e. the Grand Hogback, Douglas Arch, and the White River uplift.) The basin-centric nature of the RPPA's geographic and geophysical location means that it overlies all the hydrocarbon bearing formations that are prolific in other fields within the greater CRVFO planning area. Therefore, this document draws heavily from the RFD developed for the CRVFO's RMP.

An oil and gas "play" is a set of known or postulated oil and gas accumulations sharing similar geologic, geographic, and temporal properties, such as source rock, migration pathway, timing, trapping mechanism, and hydrocarbon type. A play may or may not differ from an AU, and an AU can include one or more plays. Conventional plays are plays associated with structural or stratigraphic traps, commonly bounded by a down-dip water contact, and therefore affected by the buoyancy of petroleum in water. Unconventional plays have the following characteristics: (1) are generally very large accumulations occupying the more central, deeper parts of basins; (2) have an absence of down-dip water contacts; (3) are abnormally over- or under-pressured; (4) contain gas that is in the pressuring phase; (5) produce little or no water; (6) have a permeability of less than 0.1 millidarcy (mD); (7) are overlain by a normally pressured transition zone containing gas and water; (8) contain thermogenic gas; (9) have a source of gas that is local—typically from either interbedded or adjacent lithologies; (10) have a 0.75 to 0.9 percent vitrinite reflectance at the top of accumulations; (11) consist only secondarily in structural and stratigraphic traps and; (12) are "sealed" by the presence of multiple fluid phases in low-permeability reservoirs. The U.S. Geological Survey (USGS) has prepared a schematic, shown in Figure 1, illustrating the different types of oil and gas resources.

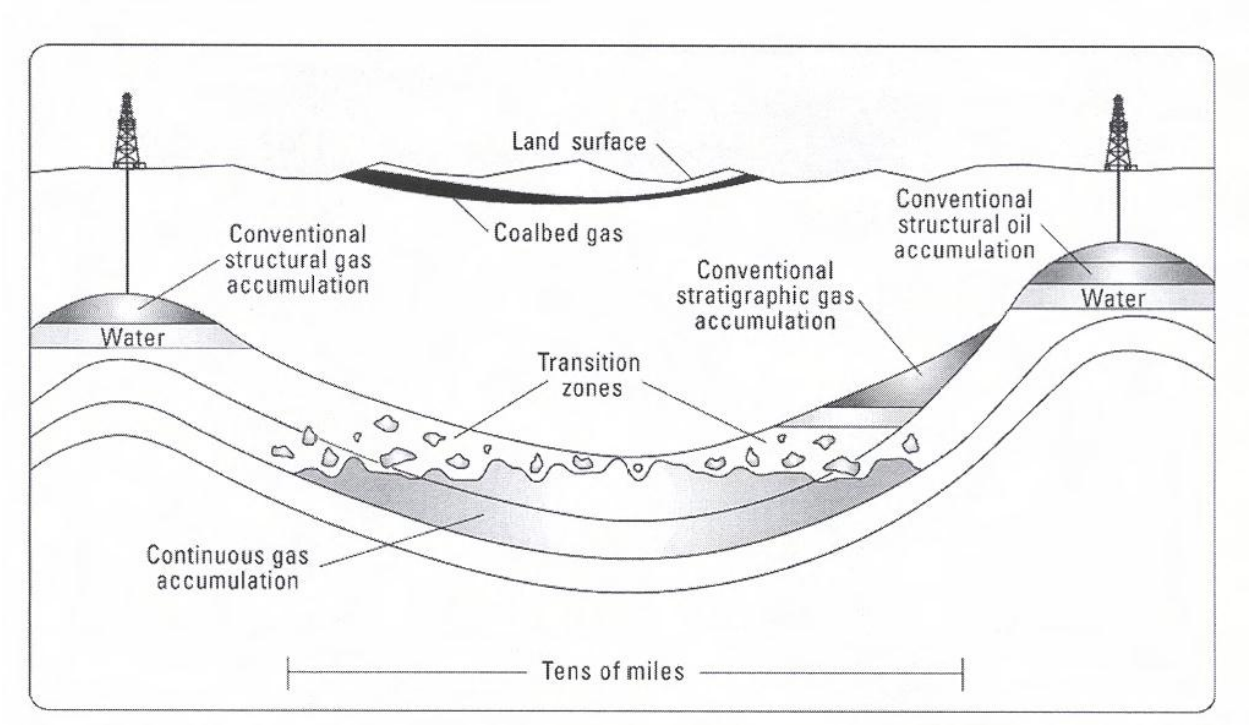

Figure 1. Schematic diagram showing the types of oil and gas resources in USGS assessment.

For the purposes of this RFD, a homogeneous distribution of resources within a play boundary is assumed because of the lack of more geologically specific information. However, gas resources are generally not distributed homogeneously within a play. This is particularly true for conventional accumulations but less so for continuous accumulations. Despite the assumption of homogeneity, various oil and gas densities can be mapped due to play stacking. Following is a discussion of the plays with AU and TPS that pertain to the Piceance Basin.

Piceance Tertiary Conventional Play

This play includes conventional sandstone reservoirs in the Tertiary Green River and Wasatch Formations. This play is included in the Piceance Green River Conventional Oil and Gas AU, located in the extreme western part of the CRVFO. Gas from the Green River Formation is considered to be sourced from the Green River TPS, and gas produced from the Wasatch Formation is considered to be sourced from the Mesaverde TPS. Approximately 11% of the mapped AU is actually mapped within the CRVFO boundary, mostly within the RPPA. In the Piceance Basin, the Green River Formation overlies and inter-fingers with the Wasatch Formation and was deposited in lacustrine environments of the Eocene Lake Uinta. The Green River Formation near the center of the basin is more than 5,000 feet thick. Most of the gas produced from this formation, originating from marginal lacustrine (lake-deposited) rocks or basal transgressive (marine) beds, has been produced in the central part of the basin. Source rocks appear to be from the underlying Mesaverde Group and from organic rocks within the Green River Formation itself. Traps are primarily stratigraphic and structural-stratigraphic. Seals are enclosing shale, mudstone, and siltstone.

Gas produced from the Wasatch Formation is sourced from the underlying Mesaverde Group also. Some oil production also occurs from the Green River Formation, despite the low maturity of the lacustrine source rocks there. Although there are producing wells, the fields are small. This play has been only moderately explored despite being penetrated by numerous wells drilled to Mesaverde objectives. The

Tertiary gas reservoirs are under-pressured, mostly fluvial sandstone, and many of these shallow gas reservoirs may have been bypassed. Due to the higher Mesaverde gas-per-well recoveries, these wells are completed first in the Mesaverde and, after depletion, possibly recompleted in the Wasatch Formation. Green River Formation produces minimal oil or gas within the RPPA. Gas production from the Wasatch Formation, mostly the G Sand, can be found in nearly 200 wells, most of which are located within or near the mapped AU boundary. The USGS expects that 12 more nonassociated gas accumulations will be found within this AU and that a maximum of 65 such accumulations may exist. Within the CRVFO, it is expected that one more field will be discovered, and a maximum of seven fields may exist.

Mesaverde Continuous Gas AU

This AU is defined as that area of the Piceance Basin where a basin-centered continuous gas accumulation developed from the generation and predominantly vertical migration of gas from thermally mature coal and carbonaceous shale source rocks in the lower part of the Mesaverde Group. The boundary of the assessment unit is defined solely by the isoreflectance line being Ro=1.10 percent (Ro = vitrinite reflectance in oil). Stratigraphically, the AU extends vertically from the base of the Cameo coal zone in the Mesaverde Group (Williams Fork Formation) to the base of the Green River Formation. Fluvial channel sandstones in the Mesaverde Group and Wasatch Formation are the primary gas reservoirs. Gas accumulations are sealed by relatively impermeable mud-rock that surrounds many of the sandstone units and by the process of capillary seal within the basin-centered accumulation (Dickinson, and Law). Much of the established production is from fields within valleys cut by the Colorado River and its tributaries. Unloading of overburden because of this down cutting and erosion may have increased permeability by opening up pore throats and fractures (Dickinson, and Law).

Gas production from fields, in this AU, within the CRVFO is primarily from the Williams Fork Formation at total depths ranging from 6,000 to 9,000 feet. Initial production in new wells using modern hydraulic fracturing techniques ranges from 800 one thousand cubic feet (MCF) of gas per day to 1,400 MCF/day on 10-acre spacing. Mesaverde wells usually produce a minor amount of condensate and the USGS determined that average amount to be about 4,324 barrels per well over the life of the well. Only small amounts of water are produced with the gas. Gas is trapped in a 1,700- to 2,400-foot interval of stacked, very low permeability, highly discontinuous fluvial sandstones that are part of a large, basin-centered gas accumulation where the lower two-thirds of the Williams Fork Formation is continuously gas-saturated down dip of water-bearing sandstones.

A widespread, thin shale interval in the upper part of the Williams Fork may have been important as a top seal for overpressuring of the basin-centered gas accumulation. This interval ties closely with a seismic reflector that can be correlated over much of the Piceance Basin. Outcrop and subsurface studies indicate that the typical size of the Williams Fork sandstone reservoirs is small, with typical lateral extents of 500 to 800 feet. In general, the small size of these sandstones is the result of deposition as point bars by meandering streams. Seismic data and well control indicate early movement of Laramide structures. This movement has effected deposition of the Iles and Williams Fork strata.

Many attempts to produce this vast basin-centered resource were unsuccessful until modern hydraulic-fracturing technology made it possible to produce wells at economic rates. Natural fracturing is the primary control of well productivity, and 3D seismic can be used to identify structurally favorable areas. A combination of natural fractures and man-made factures is what makes this play economic. Areas within the Mesaverde Continuous Gas AU that contain gas resources but have little natural fracturing may not be economic to produce even with current hydraulic fracturing techniques. The low permeability and highly lenticular nature of the fluvial sandstones require 20-acre or denser well spacing to drain the Williams Fork reservoir (Cumella and Ostby).

Wasatch reserves are second in size only to the Mesaverde reserves. The Wasatch Formation consists of multiple, lenticular, sandstone lenses interbedded with bentonitic, varicolored shales and siltstones. The sands of the Wasatch were deposited as channels cut into the shales and siltstones. The sands, which usually contain high clay content, are considered tight with low permeability. Most of the Wasatch production is expected to be derived from stratigraphic traps in the G Sand of the Molina Member. Production has been established in the G Sand in several fields within the CRVFO. Much like the Williams Fork, the best production from the Wasatch is dependent on natural fractures as well as induced fracturing. In this area, the Wasatch has been developed at depths between 2,000 and 3,000 feet, with initial well productions of 200 to 300 MCF/day on 160-acre spacing. The Wasatch wells do not produce condensate

It is likely that reserves growth will be experienced within most of the fields portions of in this AU within the CRVFO from improved drilling and completion techniques and from additional infill drilling. Expansion of existing fields will also occur with drilling in untested areas that have geologic characteristics similar to those in the existing fields. New fields may be discovered as a result of new drilling and completion techniques in untested areas. These areas may or may not have the significant natural fracturing that is critical to economic production today. Future fracturing techniques may be able to unlock gas even in areas without significant natural fractures.

Mesaverde Transitional Gas AU

This AU surrounds the Mesaverde Continuous Gas AU and is defined as the area in the Piceance Basin where strata in the Mesaverde TPS include and overlie source rocks in the lower part of the Mesaverde Group, with Ro values between 0.75 percent and 1.10 percent. The AU extends stratigraphically from the base of the Cameo coal to the base of the first significant lacustrine shale in the Green River Formation. Gas accumulations are thought to result primarily from vertical migration of gas from underlying thermally mature coal and carbonaceous shale. Gas saturation is probably less complete than in the Mesaverde Continuous Gas AU because some of the source rocks high in the Mesaverde units are less mature. Consequently, a higher percentage of water-saturated sandstone reservoirs are anticipated in this AU. Reservoir pressures vary from being moderately overpressured in the lower part of the AU to being normally pressured or under pressured in the upper part. Some of the gas-charged reservoirs may have conventional permeability (>0.1 mD) as well as gas-water contacts, particularly in upper stratigraphic intervals of the Mesaverde TPS.

Within the CRVFO, much of the gas production is from the Divide Creek and Parachute fields. Most production is from fluvial channel sandstones in the Mesaverde Group Formations, with lesser production from fluvial channel reservoirs in the Wasatch Formation. Because this AU overlies thermally mature source rocks, gas can be found throughout the entire extent of the AU. However, the number of fields to be discovered could be limited in number and size because of incomplete gas saturation and the increased chance of penetrating water-wet reservoirs. Future fields may be best found in areas where structures can enhance gas migration and accumulation. The USGS predicts that additional reserves in the next 20 years will be found primarily in existing fields.

Mesaverde Group Coalbed Natural Gas AU

This AU represents areas where the Williams Fork Formation in the Piceance Basin contains significant coalbeds at depths estimated to be 7,000 feet or less. The depth cutoff was extended to 7,000 feet in the Piceance Basin in order to include all coalbed natural gas production (CBNG) in the Grand Valley and Parachute fields. The top of the Rollins Sandstone Member of the Iles Formation, which marks the base of the Cameo coal group in the lower part of the Mesaverde Group, was used to define the location of the 7,000-foot depth cutoff. More than 5,000 feet of erosion and down cutting in the Colorado River drainage in the Piceance Basin has decreased the drilling depths to higher rank (more thermally mature) coalbeds.

Thermally mature coal in the Williams Fork Formation is present in a belt as much as 10 miles wide along the southwestern margin of the Piceance Basin and in an area as much as 7 miles wide on the northeastern flank of the Divide Creek Anticline. Unfortunately, much of the coal has low permeability.

Total net coal thickness in the Cameo coal group varies from near zero in the extreme southeastern part of the Piceance Basin to greater than 180 feet in the northeastern corner. Throughout most of the basin, however, the zone contains from 20 to 80 feet of total net coal; in the southwestern part of the basin, total net coal thickness near the Utah-Colorado border decreases to less than 20 feet (Kirschbaum and Hettinger). Coalbed gas content is approximately 600 standard cubic feet per ton (SCF/ton) at depths of 7,000 feet and may be as high as 765 SCF/ton at 7,100 foot depths (Johnson and Rice).

Coalbed natural gas wells have been drilled within the CRVFO. Wells completed in the Cameo coals within the Great Divide field have high water production. Individual wells have reported as much as 3 million barrels of water produced within a 6-year period while producing 1,200 MCF/day. Water within the Great Divide field averages around 9,000 milligrams per liter (mg/L) of total dissolved solids (TDS). This does not meet State surface discharge standards and, as a result, injection of the water into the deeper Cozzette Sandstone is being considered. Analysis of the Cameo coals, in areas where coalbed natural gas is considered viable, show excellent gas saturation.

Many wells today have production from the Cameo coal zone commingled with production from adjacent sandstones. This is evident in the Parachute and Grand Valley fields. According to PI Dwights Production Data, the Parachute field has more than 700 wells of which 29 are classified as CBNG wells. The same database show the Grand Valley field with more than 1000 producing wells and 40 of these wells being classified as CBNG wells. The perforation zones range from 200 to more than 500 feet, which is much thicker than the coals zones and encompasses many gas sands as well.

Because of the lack of progress in solving the problems in producing commercial quantities of coalbed gas in the Mesaverde Coalbed Gas AU during the past, it is difficult to estimate how much of the included area has potential for additions to reserves over the next 20 years. This AU is largely untested but has the potential for new discoveries of coalbed gas. In the future, coalbed gas production may result largely from recompleting existing gas wells after depletion of the gas resource in associated sandstone reservoirs. Recompletion in existing wells is far cheaper than drilling new wells and may make coalbed gas economically viable. Additional sweet spots may be found in untested areas that will augment coalbed gas production from recompleted wells in established fields, and new advanced recovery techniques could increase the productivity, especially in areas of thick coal accumulation. If disposal of produced water becomes successful and economical, then increased interest in future coalbed gas exploration and drilling will occur. Currently, operators in the area have been experimenting with water quality improvement processes. If successful in the future, these may lead to acceptable surface discharge scenarios that may be more economical than underground injection.

Mancos/Mowry Continuous Gas AU

This AU includes three groups of reservoirs: (1) a lower group consisting of units in the Morrison Formation (including Salt Wash and Brushy Basin Members), and Dakota Sandstone; (2) a middle group consisting of units in the Frontier Formation, Mancos Shale, and Mancos B; and (3) an upper group consisting of units in the Sego Sandstone, Morapos Sandstone Member, and sandstones of the Iles Formation or equivalents (Corcoran, Cozzette, and Rollins Sandstone Members), all within the Mancos/Mowry TPS. Reservoirs in this AU are usually tight and may be overpressured. Production is dependent on fracture permeability. Locally non-associated gas is produced from the Cozzette, Corcoran, and Dakota Sandstones and in two Morrison Formation wells within the Shire Gulch field located just west of the CRVFO boundary. Several wells with some Mancos production are also present in the Grand Valley and Rulison fields.

The total area that has potential for additions to reserves in the next 20 years is most likely in areas of current production and mostly limited to the lower (Morrison and Dakota) and upper (Iles sandstones) reservoir groups. The best potential comes from (1) isolated sweet spots in the Rulison, Divide Creek, Baldy Creek, Grand Valley, and Mamm Creek fields; (2) areas where there are porous and permeable sandstones in the Morrison and Dakota; and (3) infill drilling and recompletions from the upper group of reservoirs of the Iles and its equivalents. New fields developing resources within this AU are likely.

Plays Identified by Industry

The plays discussed below are the Industry submissions and do not represent all potential plays within the CRVFO. Many of the operators/lessees with interests in the CRVFO were not part of this process. Some declined invitations to participate. As a result, not all current and future plays are discussed here. Some of the USGS plays discussed above are also discussed here because they are the plays most likely to be explored and developed.

Mesaverde Gas Play

Most of the major oil and gas operators in the CRVFO area are interested in this play, which includes all production from the Mesaverde Group, including the Corcoran, Cozzette, and Rollins Sandstone Members of the Iles Formation and the Williams Fork Formation. The latter includes the Cameo coal zone. The large majority of the oil and gas reserves within the RPPA are associated with this play, which extends across the entire area. It is assumed that this play will continue to be developed on 10-acre spacing using multi-well pads.

Wasatch Gas Play

This play is second in reserves only to the Mesaverde play. Most of the production is expected to be from the G Sand of the Molina Member. Infill drilling will continue in the sweet spots such as the Rulison, Parachute, and Grand Valley fields. Much of the future production will be from existing wellbores through recompletions when the Mesaverde gas is depleted. New drilling will also occur outside the established production areas and spacing is assumed to be at 160 acres. The number of wells to be drilled specifically to exploit the Wasatch has not been identified by Industry, but some of the projected wells for the Mesaverde Gas Play will have multiple completions in the Mesaverde and Wasatch.

Niobrara Gas Play

Five Niobrara wells are currently producing within the RPPA boundary. The Niobrara is ultimately a small member within the larger Mancos marine shale. This play is mostly for gas. It is hoped that the Niobrara has significant natural fracturing within the indurated shales that will act as secondary, not primary, porosity. Ultimate spacing has not been determined at this time.

Past and Present Oil and Gas Exploration Activity

Although it has been known for decades that the Williams Fork Formation contains significant gas resources, very low permeability of the sandstones made it difficult to complete wells that would produce at economic rates. With the advent of advanced completion techniques, true dry holes are now rare. For the most part, the lower two thirds of the Williams Fork is gas saturated.

Production from the Williams Fork was established in the Rulison field in the 1960s, and repeatable commercial production from the Williams Fork first occurred in the mid-1980s. The Grand Valley field was discovered in 1984. In 1981, the Department of Energy (DOE) performed a multi-well experiment in the Rulison field. This experiment involved three wells being drilled on a tight pattern of 100 to 200 feet of each other. A horizontal DOE well was also drilled in the same section in the Cozzette Member of the

Iles Formation. These experiments have greatly expanded the knowledge about the tight gas sand reservoirs within the southern Piceance Basin. Better completions as a result of this knowledge have increased estimated ultimate recoveries (EUR) of previously drilled wells in this area from as little as 0.15 billion cubic feet (BCF) to wells drilled in 1994 that have maximum EURs of 1.9 BCF.

Further experimentation by operators drilling and producing from the Williams Fork Formation has shown field growth reserves can be expanded considerably by drilling on 10-acre spacing. This spacing has been proven effective in draining a vast majority of the reservoir that was not occurring at greater spacing intervals. This tight spacing coupled with improved completion techniques has led to the expansion of existing fields and the development of new fields producing from the Williams Fork Formation.

Other new fields being developed today involve coalbed natural gas from the Cameo coal zone such as is present in the Divide Creek field. The Cameo coals' gas content exceeds 750 SCF/ton and was classified as world class. These coals produce a lot of marginally fresh water. If the produced water can be disposed in an economical way, new fields in areas of known Cameo coal gas reserves will also be developed.

Presently the Niobrara Formation is being drilled with hopes of producing natural-fracture gas reservoirs. These fractures are a result of the indurated shales being stretched and folded over the point of greatest flexure on anticlinal fold axis. The fractures act as the primary porosity for the gas, and the reservoir is sealed by a more fissile shale layer above.

Past and Present Oil and Gas Development Activity

Leasing Activity

The BLM issues two types of leases for oil and gas exploration and development on lands owned or controlled by the Federal Government: competitive and noncompetitive. Congress passed the Federal Onshore Oil and Gas Leasing Reform Act of 1987 to require that all public lands that are available for oil and gas leasing be offered first by competitive leasing. Noncompetitive oil and gas leases can only be issued after the lands have been offered competitively at an oral auction and not received a bid. The maximum competitive lease size is 2,560 acres in the lower 48 States and 5,760 acres in Alaska. The maximum noncompetitive lease size in all States is 10,240 acres. Since passage of the Energy Policy Act of 1992, both competitive and noncompetitive leases are issued for a 10-year period. Both types of leases continue for as long thereafter as oil or gas is produced in paying quantities.

Currently almost all of the BLM Federal mineral estate is leased as seen in Figure 23 on page 44. The total acres of BLM mineral estate is 73,730 acres. Approximately, 54,630 acres of the leases in the RPPA are suspended due to ongoing litigation. These leases will be analyzed under the BLM's SEIS. Lands remaining available to be leased include approximately 3,540 acres. Most of the unleased land is located in the northeastern corner of the RPPA. No United State Forest Service (USFS) or Colorado State mineral estate is located within the RPPA boundary. The majority of the federal minerals are below federal surface as seen in Figure 22 on page 43. Only 9.4% of the federal mineral acreage is split estate (private surface underlain by federal mineral estate). The total private mineral estate is 53,270 acres. The different acreages are summarized in

Table 1.

Table 1. Current leasing in the RPPA.

Mineral Ownership	Total Mineral Estate (acres)	Leased Lands (acres)	Lands Available for Lease (acres)
BLM (split estate)	6,950	6,140	910
BLM (surface & mineral)	66,780	64,160	2,630
BLM (total)	73,730	70,300	3,540
Fee	53,270	-	-

Unit Agreements

The objective of unitization is to proceed with a program that will adequately and timely explore and develop all committed lands within the unit area without regard to internal ownership boundaries. Exploratory units normally embrace a prospective area that has been delineated based on geological and/or geophysical inference. Exploratory unit agreements normally encompass all oil and gas interests in all formations within the unit area and provide for the allocation of unitized production to the committed lands that have been reasonably proven productive of unitized substances in paying quantities on the basis of the surface acreage included within the controlling participating area. By effectively eliminating internal property boundaries within the unit area, unitization permits the most efficient and cost-effective means of developing the underlying oil and gas resources.

The BLM approves a unit agreement when appropriate in the interest of conserving the natural resources and when it is determined to be necessary or advisable in the public interest. When such a determination is made and lands are committed to the unit, the BLM has a responsibility to ensure that unit development proceeds in a way that continues to serve the public interest, regardless of whether the Federal lands comprise only a small fraction or a major part of the unit area. Currently, the RPPA does not contain a unit agreement.

Communitization Agreements

When a lease or a portion thereof cannot be independently developed and operated in conformity with an established well spacing or well development program, the BLM may approve drilling agreements or communitization of such lands with other lands, upon a determination that it is in the public interest.

Communitization is widely used within the RPPA. Currently 87 Communitization agreements (CA) involving approximately 23,080 acres are in effect. The physical acreage is smaller than the total CA acreage. Since CAs are formation specific, there can be multiple CAs at the same location. Refer to Figure 24 on page 45 for a plat of the existing CAs in the RPPA. Currently, 42 of the CAs in the RPPA communitize gas production from the Mesaverde, 14 CAs in the RPPA communitize production from the Williams Fork Formation, and 31 CAs in the RPPA communitize production from the Wasatch Formation.

Spacing Requirements

The current State of Colorado spacing requirement is 40 acres (600-foot setbacks from the lease line) for wells greater than 2,500 feet in depth, but this spacing can be increased or decreased depending on geology and reservoir characteristics and has been greatly modified in the Piceance Basin. The Colorado Oil and Gas Conservation Commission (COGCC) use the term “default spacing” with modification

occurring through Cause Orders. These adjustments are meant to maximize production of the resource while minimizing surface disturbance and expense. In the case involving production from the Williams Fork Formation, 10-acre spacing has been justified and approved. Currently, the Wasatch Formation is being drained on 160-acre spacing in selected areas. New spacing regulations may be necessary to accommodate new drilling and production techniques in the RPPA. Future production from previously undeveloped plays such as the Niobrara play in the Mancos Formation may also require spacing changes. Tight sands, compartmental geology, and reservoir characteristics may increase the demand for tighter spacing in the future in reservoirs other than the Williams Fork Formation.

Drilling and Completion Statistics

The current drilling and production within the RPPA exists in the Southern and Western areas below the rim of the Roan Plateau. The current surface hole locations for all the wells in the RPPA are shown in Figure 23 on page 44.

As of September 2013, there are approximately 2,800 wells within the RPPA based on surface hole location. Well data was pulled from the COGCC's public database and IHS Enerdeq, a private company's database for global energy data and information. According to IHS Enerdeq, there are 2,766 active wells in the RPPA and according to COGCC data there are 2,661 active wells in the RPPA. This difference is possibly due to data entry lag. According to BLM's Automated Fluid Mineral's Support System, 890 of these wells are federal wells. Using the COGCC well data, the completion dates for wells in the RPPA were determined and broken out by year in Table 2 (COGCC Library: Production and Prices).

Table 2. Wells spudded in the RPPA based on COGCC data.

Year	Wells Spudded above the Roan's Rim	Wells Spudded below the Roan's Rim	Total Wells Spudded in the RPPA
1960-1970	0	6	6
1970-1980	0	5	5
1980-1990	2	84	86
1990-2000	4	172	176
2000	0	39	39
2001	0	73	73
2002	0	106	106
2003	0	59	59
2004	0	182	182
2005	3	237	240
2006	3	337	340
2007	22	428	450
2008	29	369	398
2009	5	134	139
2010	9	154	163
2011	5	150	155
2012	0	44	44
Total:	**82**	**2579**	**2661**

Of the current wells, 47 of the wells are plugged and abandoned. The other wells are either producing gas wells or currently shut-in or temporarily abandoned. The wells in the RPPA are all classified as gas wells with some associated natural gas liquids (NGL). More than 2,600 RPPA wells are reported producing from the Mesaverde Formation. Approximately 90 wells are reported producing from the Wasatch Formation and 5 wells from the Mancos Formation (IHS Enerdeq). Current development is occurring below the plateau with some fee development above the rim using directional drilling.

Directional and New Technology Drilling Practices

Directional drilling in the RPPA and surrounding area occurs in the large majority of new wells, as it allows access to reservoirs from locations that are not directly over the reservoir, as well as the concentration of wells, facilities, roads, and associated surface disturbance in a single (and often smaller) area. Steep slopes or canyon (riparian) bottom areas may necessitate directional drilling to locate wells on mesa tops. Lease line locations and spacing may also force a directional drilling situation. Directional drilling is used extensively in the entire area. While new well pads are still being constructed, extensive use of directional drilling to multiple downhole locations from existing pads is also occurring. According to IHS Enerdeq (2013), 2,181 wells out of the 2,766 wells in the RPPA are s-curve directional wells and only 578 wells in the RPPA are vertical wells.

Operators in the CRVFO have directionally drilled as many as 52 wells from one pad (Webb). Many wells before the year 2000 were drilled vertically, but with the advent of more advanced completion techniques and with bottom hole densities at 10 acres for the Williams Fork Formation, the future will involve multi-well directional drilling from a single pad. Encana Oil & Gas (USA) Inc. proposed 60 wells on the WF H15 596 pad (DOI-BLM-CO-N040-2011-0110-EA). In the north Parachute field area, lateral reaches of the bottomhole location from the surface hole location are able to approach 4,877 feet (Webb). This kind of offset is dependent on the geology and reservoir characteristics, and most of the directional drilling within the CRVFO has a lateral reach around 2,500 feet. Economics is a major consideration—since directional drilling is generally more costly than drilling vertically, gas reserves need to be significant enough to recover costs in a reasonable amount of time and at a reasonable rate of return.

Slim-hole (diameter < 6”) drilling and completion, coiled tubing applications, high-energy gas fracturing, and new methods of well stimulation are currently being used within and around the RPPA and may play a part in an increased number of wells being drilled. These technologies make it more practical to explore in moderate- to high-risk wildcat areas. Slim holes cost less than large-diameter wells because the smaller rigs require less transportation and site preparation. In addition, the smaller wellbores record faster drilling times and have less expensive drilling tools, casing, and cement jobs.

Horizontal Drilling Practices

Currently horizontal drilling is still in the exploratory phase in the RPPA. Only seven (0.25%) of the wells in the RPPA are horizontal wells. According to IHS Enerdeq, six horizontal exploratory wells were drilled into the Mesaverde Formation group in the RPPA and one horizontal well was drilled into the Mancos Formation in the RPPA. Operators have since determined that horizontal drilling in the Mesaverde Formation group is not appropriate based on the Mesaverde geology. Refer to the Mesaverde geology description in the Description of Geology section for more information on the Mesaverde group.

To the west and south of the RPPA, operators have begun drilling horizontal wells into the Mancos formation. In general, the operators drill horizontal wells with one-mile horizontal legs that produce significant amounts of natural gas. The development is still exploratory and operators are attempting to determine the best drilling and completion practices for horizontal Mancos development.

Oil, Gas, and Water Production by Formation

Production within the RPPA is profiled by three producing gas horizons: the Mesaverde Formation, the Wasatch Formation, and the Mancos Formation. As of September 2013, the Mesaverde Formation was the most prolific with 1.74 TCF (96.7% of the total), while the Wasatch Formation totaled 56.17 BCF (3.1% of the total) and the Mancos Formation totaled 2.83 BCF (0.2% of the total). Rate verses time for the production of gas, oil, and water is illustrated for the Mesaverde Formation in Figure 2, Figure 3, and Figure 4. Figure 5, Figure 6, and Figure 7 illustrate the production history for the Wasatch Formation. Figure 8, Figure 9, and Figure 10 illustrate the production history for the Mancos Formation. The slight dip towards the end of each production curve reflects a partial year's production. The production data used to generate the production curves were retrieved from IHS Enerdeq Browser and created using PowerTools version 9.2 from IHS.

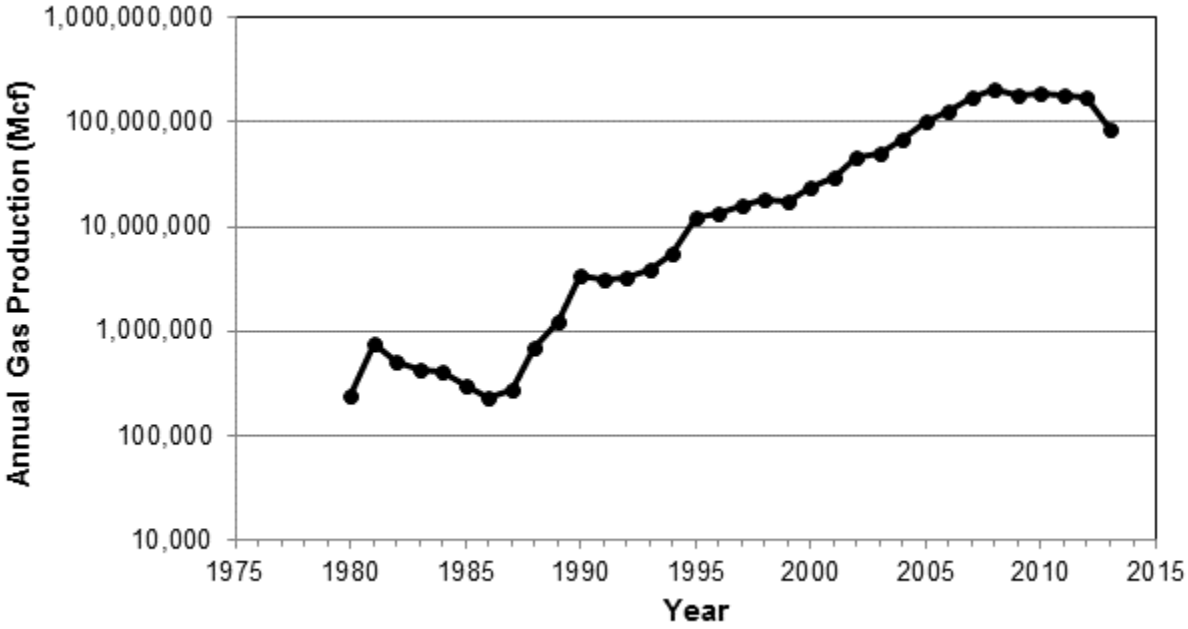

Figure 2. RPPA Mesaverde gas production history.

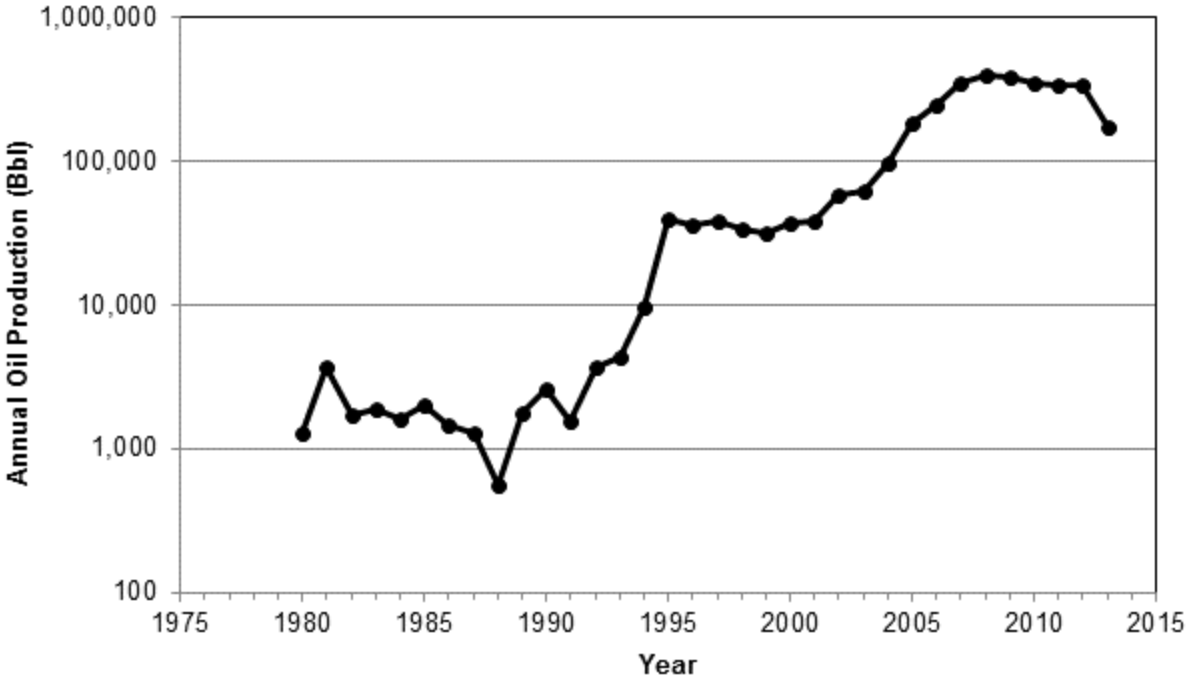

Figure 3. RPPA Mesaverde oil production history.

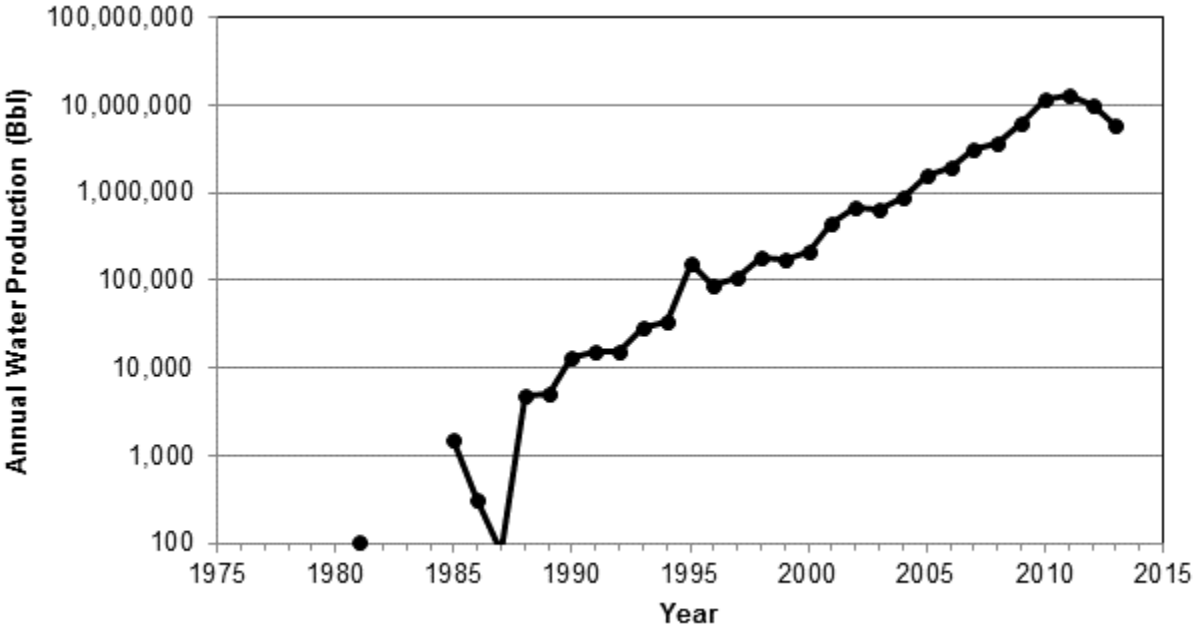

Figure 4. RPPA Mesaverde water production history.

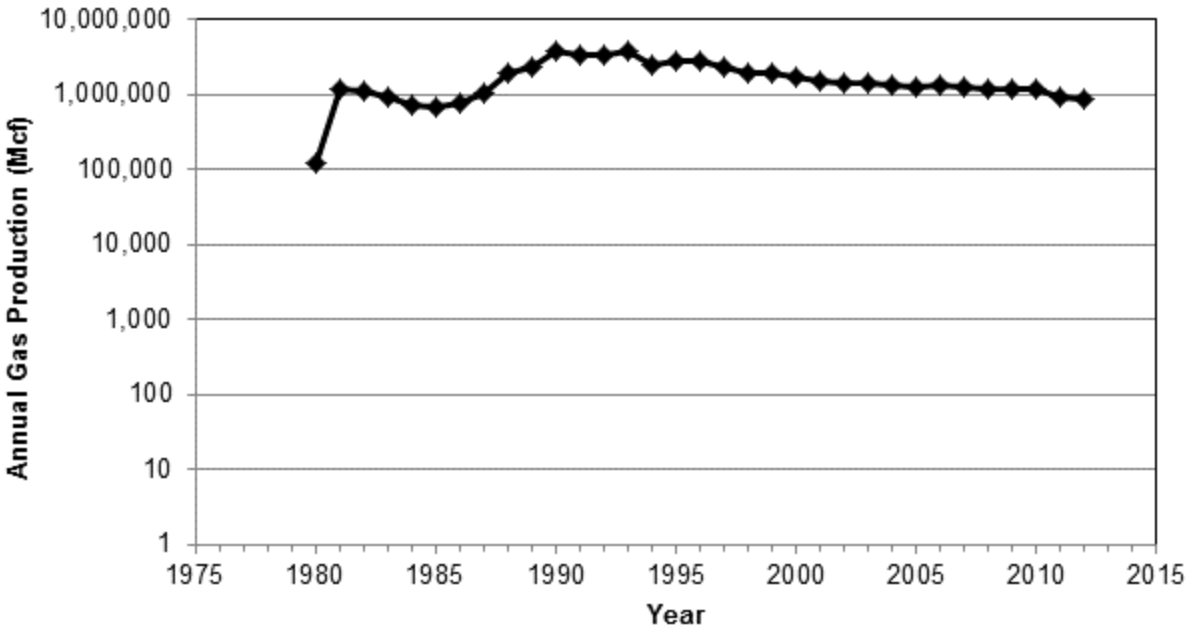

Figure 5. RPPA Wasatch gas production history.

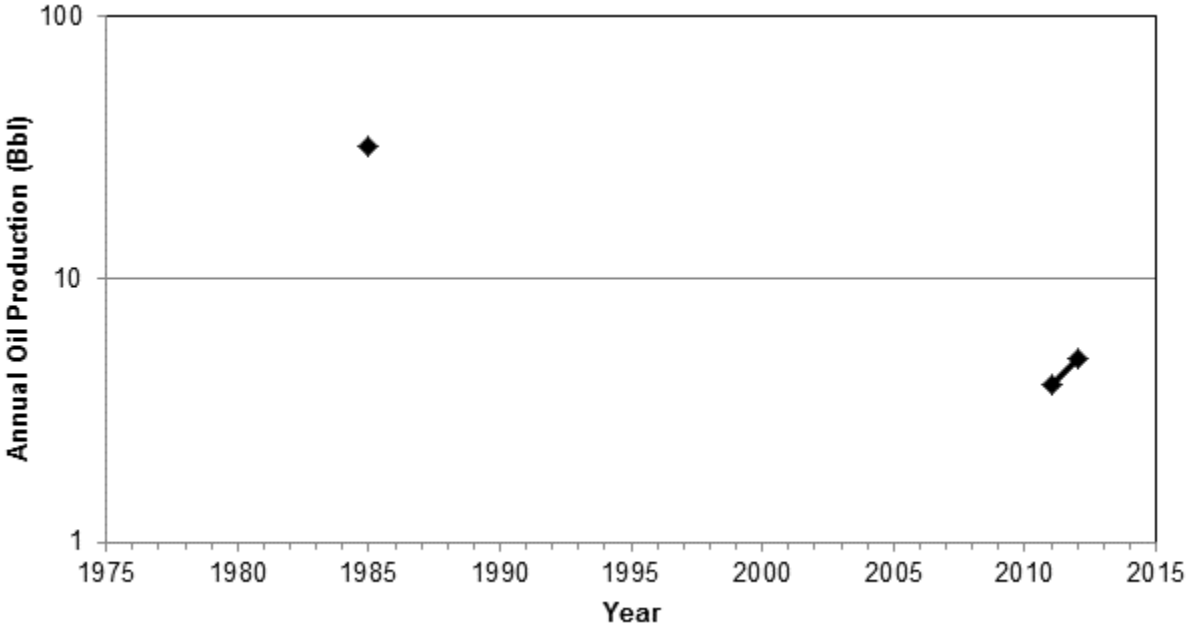

Figure 6. RPPA Wasatch oil production history.

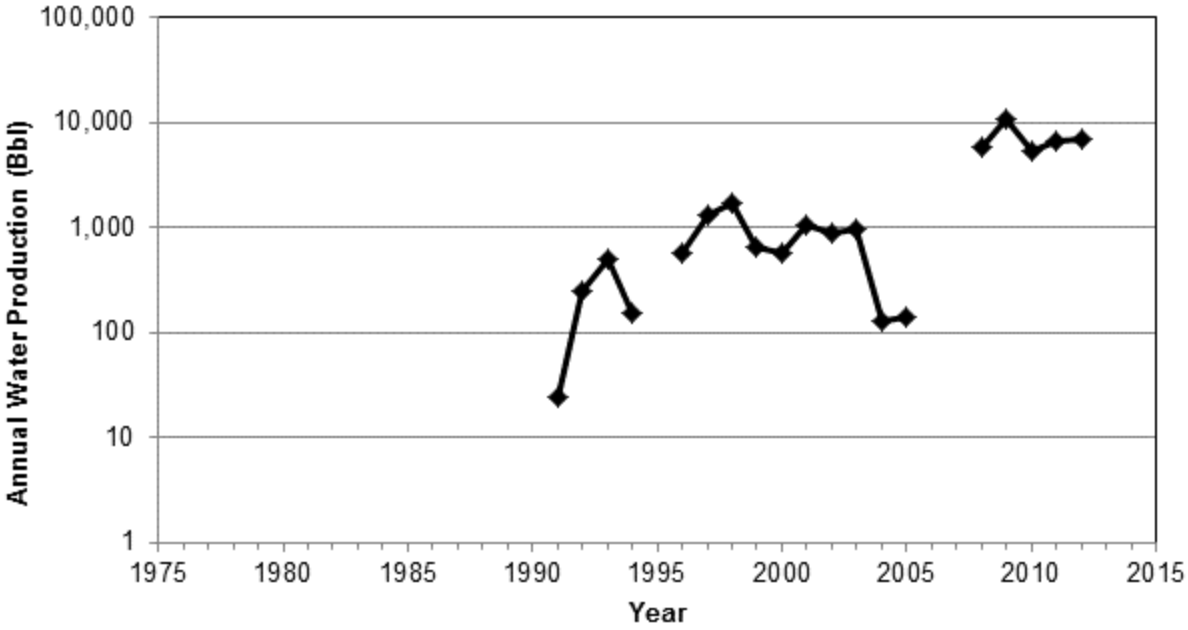

Figure 7. RPPA Wasatch water production history.

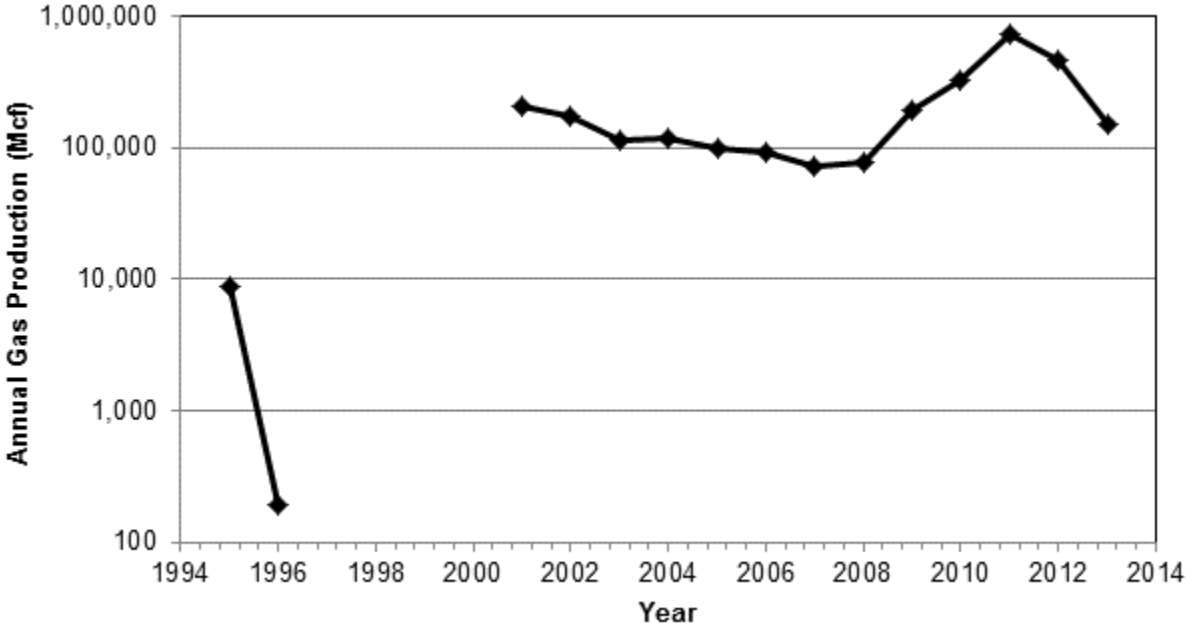

Figure 8. RPPA Mancos gas production history.

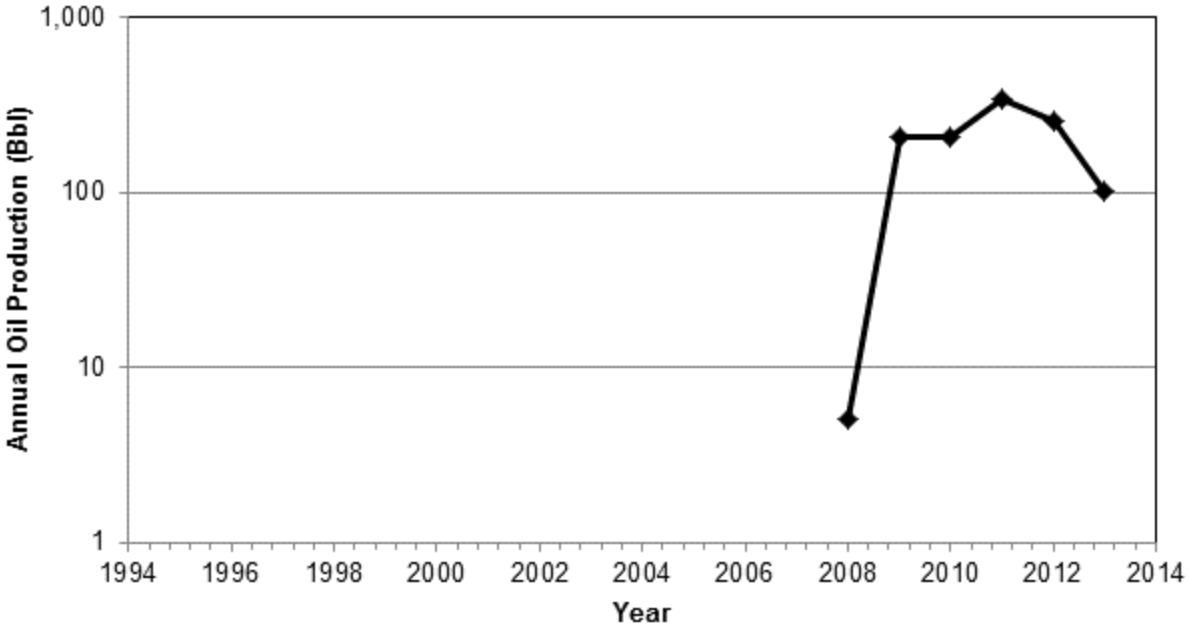

Figure 9. RPPA Mancos oil production history.

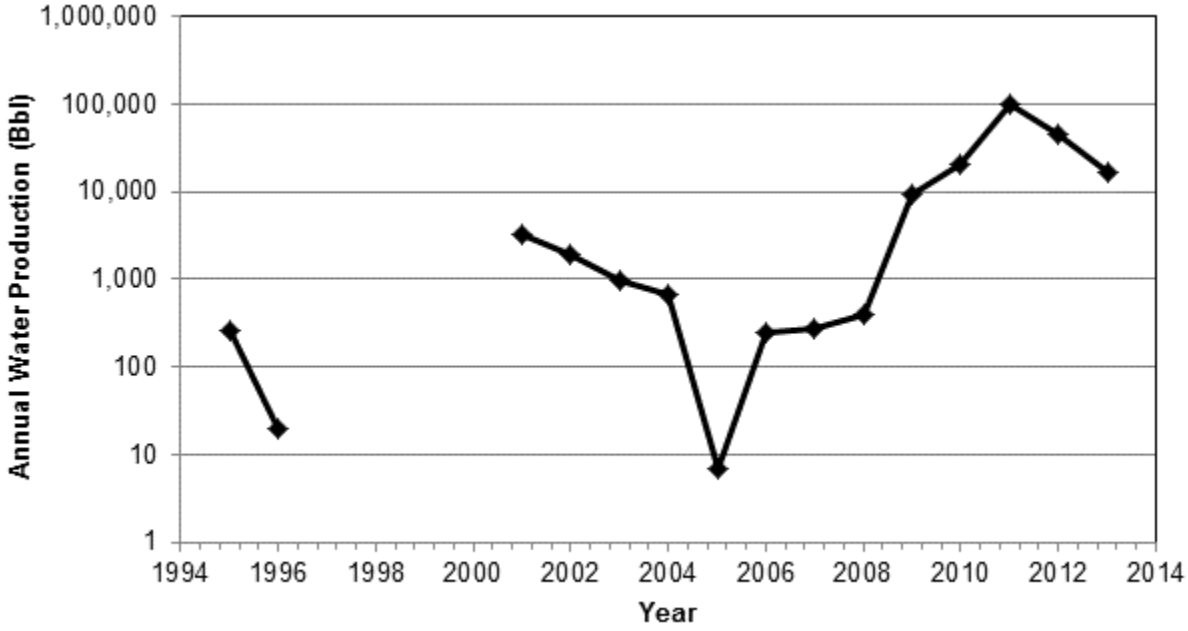

Figure 10. RPPA Mancos water production history.

Production Profiles

A normalized decline curve was generated using PowerTools analytical software to estimate the gas production rates for a typical well in the Mesaverde Formation within the RPPA. Gas production from approximately 2,670 Mesaverde wells was analyzed to generate a normalized production decline curve in Figure 11. The gas production rates were plotted versus time on a semi-logarithmic scale.

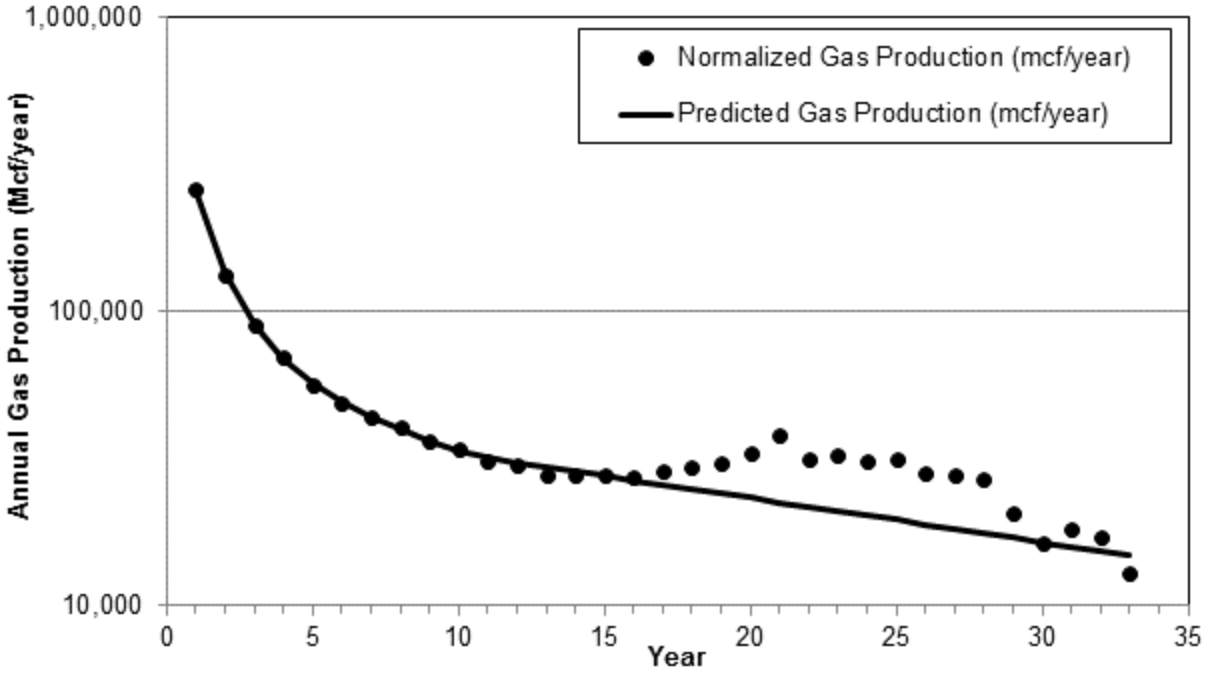

Figure 11. The normalized Mesaverde natural gas production decline curve.

It is believed the increase around year 16 in the normalized gas production is due to recompleting wells in additional productive zones in the Mesaverde Formation. Few of the Mesaverde wells in the RPPA are older than 15 years; therefore, the data past year 15 is generated by a smaller pool of wells and is less accurate. Year one used approximately 2,600 wells to determine the average production and year fifteen used an average of 106 wells. The gas production curve in Figure 11 approximates what a typical Mesaverde gas well might produce based on the expert and best fit method in PowerTools.

The decline curve shows a typical Mesaverde well has an initial natural gas production of approximately 260,000 MCF/year (712 MCF/day) and a final abandonment production of 16,500 MCF/year (45 MCF/day) in the thirty-third year. The gas production curve follows a hyperbolic decline for the first 9 years then an exponential decline for the rest of the well's life. PowerTools analysis shows an initial hyperbolic decline of 46.28%. After the ninth year, PowerTools estimates the production could decline at an exponential rate of 3.40%. The Reservoir Management Services and Gordon Engineering Inc. researched the low permeability wells in the Piceance Basin and determined that the Mesaverde well's production in the Piceance Basin is characterized by a sharp initial decline and then a slower exponential decline (Stright Jr. and Gordon). The decline curve generated in PowerTools matches the previous research.

Using these parameters, a typical Mesaverde well may ultimately recover approximately 1.35 BCF. Adjacent Reasonable Foreseeable Development Scenarios (RFD) have similar production values. The CRVFO office wide RFD estimated 1.15 BCF ultimate recovery and the Roan RFD from November 2005 estimated 1.17 BCF.

Similar to the natural gas production, the water and condensate production from the Mesaverde Formation were also analyzed in PowerTools. Both productions follow a similar decline path as the natural gas. Figure 12 displays the normalized Mesaverde water production and the best-fit decline curve from PowerTools. The water production rates were plotted versus time on a semi-logarithmic scale.

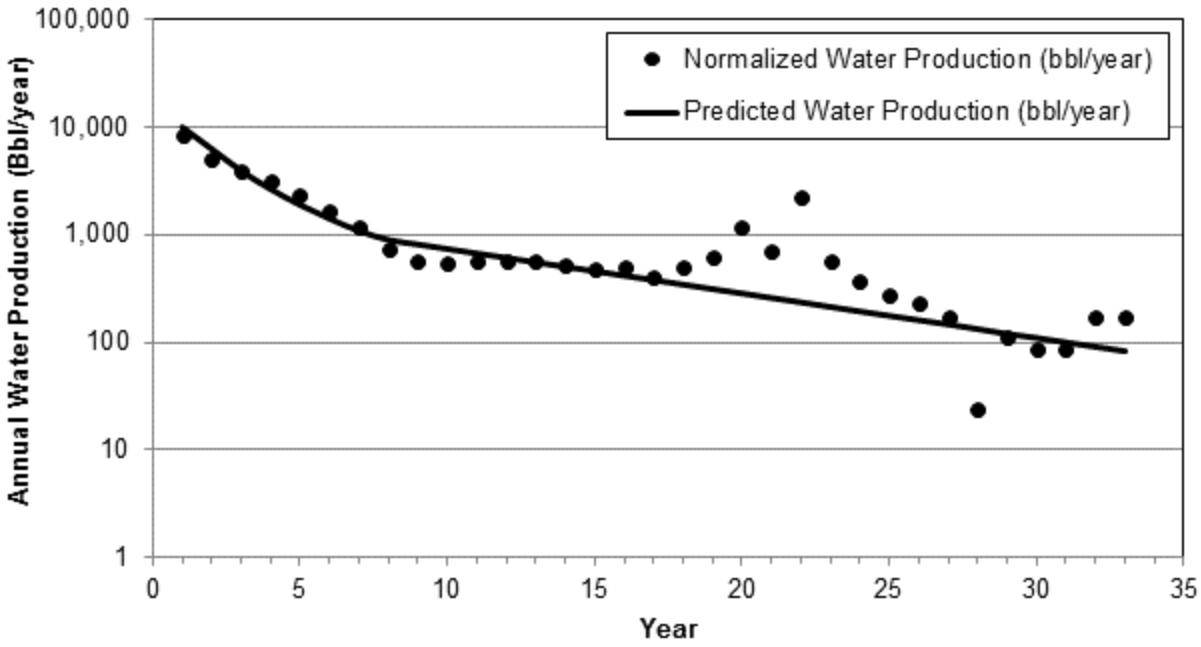

Figure 12. The normalized water production from the Mesaverde Formation.

The water production has an initial hyperbolic decline and an exponential decline after eight years. It is expected that a typical well producing from the Mesaverde Formation could produce approximately 38,000 barrels. The initial water production rates are projected to be an initial 8,500 barrels of water per year (bbl/year) that could fall off to around 100 bbl/year at the end of the well's life in year 33.

Although the Mesaverde Formation primarily produces natural gas, some condensate is also produced from the Mesaverde Formation in the RPPA. In the first year, a typical Mesaverde well could produce 550 barrels of condensate per year. By the end of the well's life, very little condensate production could remain. It is expected that a typical Mesaverde well could produce approximately 2,000 barrels of condensate by the end of the well's life. The oil and natural gas liquids produced from a typical well in the Mesaverde Formation is shown in Figure 13.

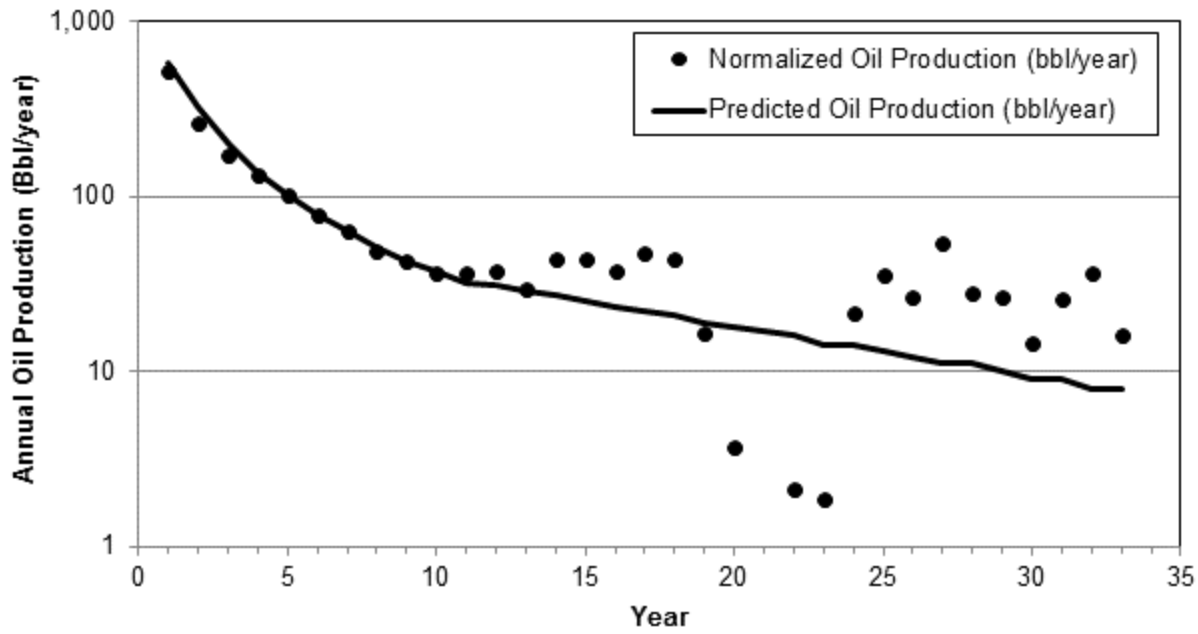

Figure 13. The normalized Mesaverde oil and NGL production decline curve.

Similar to the Mesaverde wells, the gas production from the 90 wells in the Wasatch Formation inside the RPPA was analyzed to generate a normalized production decline curve in Figure 14. The gas production rates were plotted versus time on a semi-logarithmic scale.

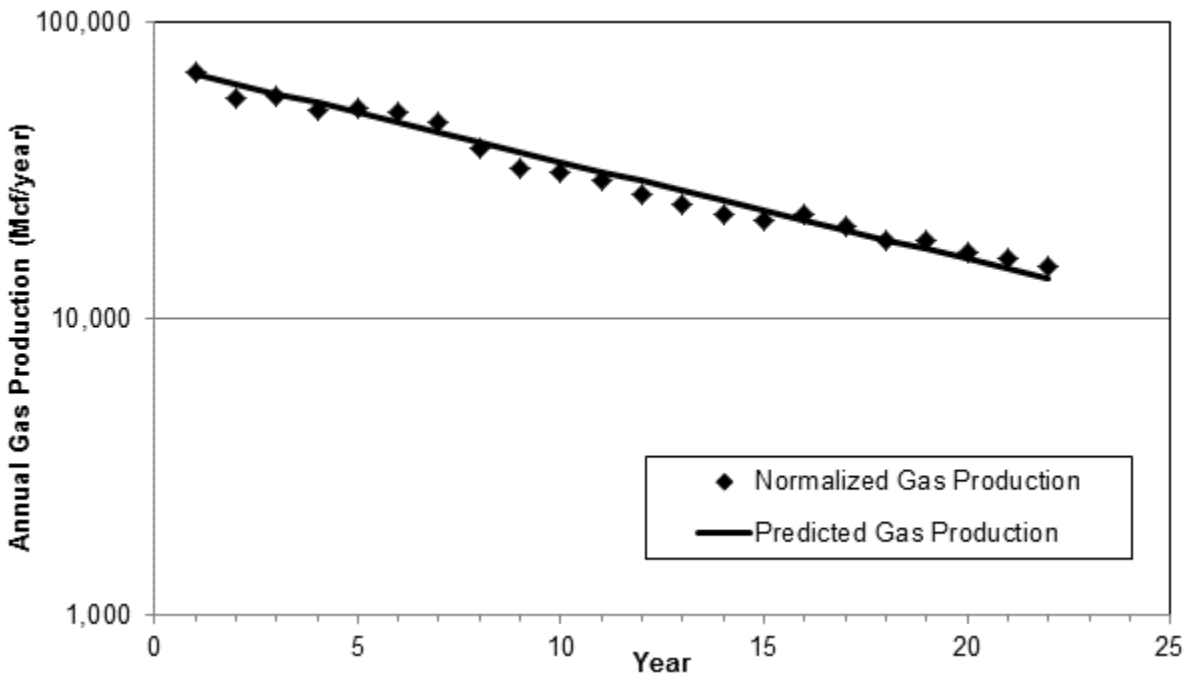

Figure 14. The normalized Wasatch production decline curve in the RPPA.

The decline curve shows a typical well in the Wasatch Formation has an initial production of approximately 67,000 MCF/year (183 MFC/day) and a final abandonment production of 15,000

MCF/year (41 MCF/day) in the twenty-second year. The gas production curve follows an exponential decline of 7.29%. Based on these parameters, a typical Wasatch well may ultimately recover approximately 0.74 BCF. The CRVFO office wide RFD had a similar estimate of 0.7 BCF.

The water production and condensate production were also reviewed in PowerTools. The Wasatch Formation produces a minimal amount of water. The normalized water production curve for the Wasatch Formation produces an average of 23 barrels of oil per year. The Wasatch Formation has little condensate production.

Not enough data was available to create a production profile for a typical well in the Mancos Formation. However, the surrounding fields suggest that decline curve for a well in the Mancos Formation could follow a similar decline path as the Mesaverde decline curve. Since the Mancos wells are usually horizontal wells, the Mancos wells produce more than the Mesaverde production but have a larger spacing requirement (Proctor).

Oil and Gas Prices, Finding and Development Costs

The price of oil and gas is dependent on the market. The industry standard is the New York Mercantile Exchange, Inc. (NYMEX), the world's largest physical commodity futures exchange and the preeminent trading forum for energy and precious metals. The NYMEX natural gas commodities contract is widely used as a national benchmark price. The price for natural gas is volatile and fluctuates with supply and demand and economic and political news. On September 24, 2013, posted prices ranged from $3.49 to $3.83 per million British thermal units (MMBTU) based on delivery at the Henry Hub in Louisiana. Based on data from the United States Energy Information Administration (EIA), Figure 15 shows the historical daily price trend from 2000 to 2013 and the future predicted prices (Annual Energy Outlook 2013).

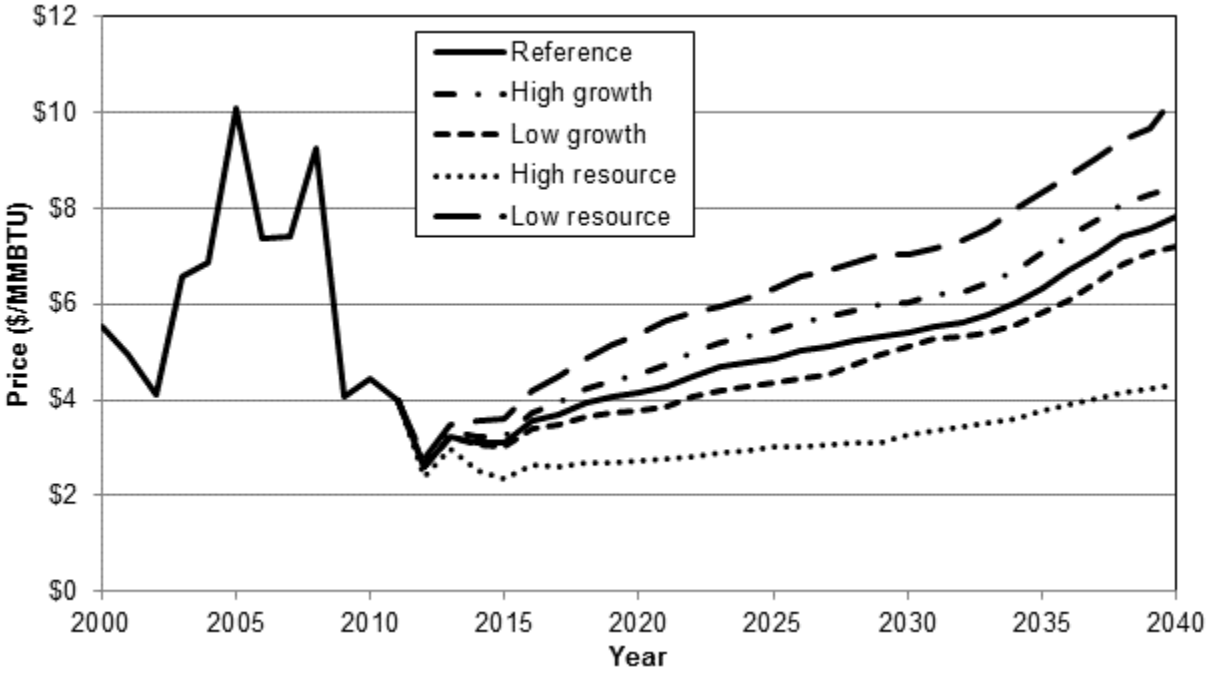

Figure 15. The natural gas spot and futures prices (NYMEX).

Based on the CRVFO field-wide RFD, the cost of finding and development natural gas and oil is about $125 per foot for drilling and $100 per foot for completion.

Two of the major cost items in the direct field operating cost are produced water disposal and gas processing. The estimated direct field operating cost in the RPPA would be similar to the CRVFO area and is estimated to be $0.33 per MCF (before taxes).

Gathering, Processing, Compression, and Transmission Costs

The RPPA has similar costs to the CRVFO field-wide RFD; therefore, these costs were pulled directly from CRVFO RFD. An average of $0.90 per MCF is typical based on in-field processing and compression. Upfront costs could increase on the plateau in the RPPA. The plateau‘s infrastructure is limited and has only supported hunters and range activities in the past. Pipelines exist on the western edge (fee surface) of the plateau, but the federal surface on the plateau would require pipelines for development to occur.

Field Production Equipment and Field Operation Practices

The field production equipment and operation practices are the same between the RPPA and the CRVFO field-wide RFD; therefore, the below discussion of practices were pulled directly from the CRVFO field-wide RFD.

For a multi-well pad, construction and reclamation costs are estimated at $100,000. The size and configuration of the well pad may cause this estimation to vary. The cost to equip a single well to produce to a sales line averages $70,000. This includes three-phase separation equipment (natural gas, condensate, and water), metering hookup, liquid storage tanks, and labor.

The natural gas from each well is individually measured after passing through the separation equipment on the well pad and then transported by pipeline to a processing plant. Associated condensate is collected and gauged in storage tanks, then trucked to an offsite sales collection facility. A portion of the gas is used at the facility to operate fired vessels, control systems, pumps, compressors, gas-lift systems, etc. Sometimes, the gas may be flared or vented.

Gas Transportation Pipelines

After gas is individually treated, separated and measured, it travels through a 4-inch to 8-inch diameter steel line (line pressures range: 100 psi to 1,000 psi) from the well pad to field compression facilities and then to a buried cross-country trunk pipeline. Trunk pipelines in the area have diameters between 12 and 36 inches and can cost as much as $2,000,000 per mile for a 36-inch line. The trunk pipelines carry wet, unprocessed gas-to-gas treatment facilities. After processing, the dry gas is transported to local markets or out of the Piceance Basin in one of several 24-inch lines

Gas Compression Facilities

Typically, two types of gas compression facilities are used in the area. Gas-driven compression can either be a permanent or temporary installation, whereas electric-driven compression is normally a permanent installation. A major variance is the lack of emissions with the electric driven compressors. The limitations of electric-driven compressors are power supply requirements and installation costs. These costs are typically 30% higher than gas-driven compressors.

Electrical Power Lines, Generators, and Roads

The need for electrical power on a well pad is minimal in the area, as power is typically supplied by natural gas generators. The majority of the field compressors are natural gas driven; however; as stated above, electric-driven compressors have recently been introduced.

Roads used for oil and gas operations require an average 35-foot-wide right-of-way. Below the rim, the RPPA has extensive oil and gas roads and infrastructure in place; however, above the rim, there is only a small amount of oil and gas development on the fee surface of the RPPA. The federal surface on the plateau in the RPPA has roads used for grazing and hunting. The average road width is around 15-feet. The road on the federal surface above the rim would require upgrades before drilling can occur. The amount of roads needed would depend on the well spacing, the amount of use of multi-well pads, terrain, environmental constraints, land ownership patterns, and existing road infrastructure. The topography of the area has an impact on the length of road needed and the cost. Hilly terrain would need a road to fit the terrain and cut-and fill construction to meet slope requirements.

The CRVFO requires that oil and gas operators use existing roads and two-tracks where possible to minimize surface disturbance. Flat blading is allowed and crowned, and ditched roads are not always required for wildcat wells (except on National Forest lands) to encourage minimal disturbance to the surface estate. The reasoning is that if the well is a dry hole, reclamation is more efficient and cost effective. If a wildcat well proves to be productive, the road must be upgraded to an all-weather road and meet more stringent construction standards.

Conflicts with Other Mineral Development

Saleable minerals such as sand and gravel are plentiful in northwest Colorado and are widely scattered throughout the CRVFO. These small mining operations can easily be avoided by oil and gas operators and, as a result, conflicts do not exist. Conflicts between oil and gas and coal typically do not occur but, if they were to occur, they would be governed by a No Surface Occupancy (NSO) stipulation (Stip. Code: CO-01) listed in the Record of Decision (1991) for the Oil and Gas Development and Leasing EIS.

Future conflicts between oil shale development and gas development on the Roan Plateau could arise. The existing leases on the plateau in the RPPA, which are currently under suspension, contain stipulations that limit drilling opportunities. According to these stipulations, only 1% of the top of the plateau can be in a disturbed condition due to un-reclaimed oil and gas activities. Therefore, current restrictions will not allow for both the extraction of natural gas and oil shale from the surface. However, if new technologies allow oil shale to be economically developed using underground mining or in-situ techniques versus extraction from the surface, this may allow oil shale extraction to be performed in conjunction with gas development.

Oil and Gas Occurrence Potential

Review of RFD Prepared for Areas Adjacent to the Study Area

Management plans and/or RFDs for BLM's White River Field Office, Grand Junction Field Office, and the Colorado River Valley Field Office were reviewed. This review provided information helpful in looking at adjacent oil and gas exploration and development that may affect the RPPA RFD. In addition, basin-wide studies performed by the National Petroleum Council and the USGS, and the Energy Policy and Conservation Act (EPCA) study were reviewed to enhance the quality of the RPPA RFD. CRVFO staff members also review RMPs from surrounding field offices and look for consistencies,

inconsistencies, and new approaches or ideas to mitigate impacts from oil and gas exploration and development activities. This should facilitate consistency by BLM in managing oil and gas resources across field office boundaries.

Resources, Plays, and Oil and Gas Assessments

The DOE prepared two reports that discussed reserves, development potential and geology for the Naval Oil Shale Reserves (NOSR) 1 and 3. The first is entitled, "Naval Oil Shale Reserves 1 and 3 Oil and Gas Reserves Evaluation" and the second is entitled, "Naval Oil Shale Reserve No. 3 Commercial Development Study". Both were prepared in July 1998. Geologic studies were also conducted in 1988 and 1990as part of the Department of Energy's Multi Well Experiment (MWX), which characterized the Mesaverde low permeability reservoirs and developed technology for their production. In addition, Ron Gunnufson, BLM Colorado State Office Geologist, prepared a report on the geologic potential of the area on October 14, 1999 and Brian Macke (Director of the Colorado Oil and Gas Conservation Commission) prepared a related report on August 26, 2005. The USGS prepared an oil and gas assessment report in 2003 for the Piceance Basin. The following discussion incorporates information from those reports, except where otherwise noted. For greater discussion on AUs, see the Description of Geology section.

Williams Fork Formation

The principal drilling objective in the RPPA is the gas-bearing fluvial sand section present in the Williams Fork Formation of the Mesaverde Group. This includes the Cameo Member found directly above the prominent Rollins Sandstone at the base of the Williams Fork. The Williams Fork is approximately 3,600 feet thick (Rulison Field), of which the lower 2,400 feet is gas saturated in the Rulison Field, and lower 1,500 feet in the Grand Valley Field. In the lower plateau, depth to the base of the Williams Fork (Rollins Sandstone) is about 7,000-8,000 feet. On the upper plateau, depths are about 3,000 feet greater.

The fluvial section in the Williams Fork Formation consists almost totally of lenticular channel sandstones and fine-grained flood plain deposits, which were deposited on a coastal plain behind the retreating Late Cretaceous coastline. (Lorenz) best described this section as consisting of meander belt river-channel sandstones inter-bedded with muddy flood plain, levee and swamp deposits. Lorenz stated that the average meander-belt width for the fluvial section of the Williams Fork Formation is 1,500 feet but within that meander-belt width are numerous point bar deposits, with each sandstone body generally not exceeding 700-800 feet in width. The point bar sand bodies are stacked vertically throughout the thickness of the formation. Studies show that the point-bar reservoirs are layered, do not communicate vertically, are naturally isolated from each other, have an asymmetric drainage pattern based on natural fracture distribution, and that drainage from a well is limited to the aerial extent of the point bar sand bodies. This explains why wells that penetrate the fluvial section encounter 10 to 25 + different, individual sandstone reservoirs that are tight and lenticular with very limited extent. These discontinuous and compartmentalized sand bodies have a very limited aerial extent, which requires that wells be drilled closer together in order to adequately recover the gas and associated hydrocarbons and prevent resource waste.

The lenticular nature of the fluvial sandstone reservoirs forms the major trapping mechanism at Rulison, Parachute and Grand Valley Fields with regional extension fractures enhancing this production. The source rocks for the fluvial section are the Cameo Coals and associated carbonaceous shales.

Production rates from the sands are highly variable and are a function of depth, porosity and permeability, continuity of individual sands, degree of natural fracturing, number of sands penetrated and other geologic factors, which vary from well to well. The Williams Fork gas wells produce some associated

condensate but little water. Initial well production for Williams Fork wells averages 1,360 MCF/day. During an April 2001, spacing hearing before the Colorado Oil and Gas Conservation Commission, Williams estimated Mesaverde reserves to be 1.25 -1.86 BCF/Well.

Geologically, there is little risk in extending the existing Grand Valley, Parachute and Rulison Fields into NOSR-1. It is expected that the Williams Fork gas saturated zone will probably underlie most of the plateau. Very few dry holes have been drilled in the Grand Valley, Parachute and Rulison Fields due to the nature of the play. Risks are minimized because the wells are drilled into a pre-dominantly gas saturated section encompassing an enormous area. Gas sand reservoirs may lack continuity and may not be correlative between closely spaced wells, but each well will penetrate numerous productive reservoirs, unique to that well. There are smaller risks related to the geologic and engineering heterogeneities (such as permeability, porosity, faults, fracture systems, structural irregularities, etc.) that are unique to each well, which is evidenced by the large range in production rates.

Wasatch Formation

The DOE report considered the Wasatch reserves as second only to Mesaverde potential. The Wasatch Formation is Eocene to Paleocene in age and consists of multiple, lenticular sandstone lenses interbedded with bentonitic varicolored shales and siltstones. The sands of the Wasatch were deposited as channels cut into the shales and siltstones. The sands that usually contain high clay content are considered "tight" with low permeability.

It is expected that most of the Wasatch production in the RPPA to originate from the G Sand of the Molina Member. Production has been established in the G Sand in the Rulison, Parachute and Grand Valley Fields. Due to the heterogeneous make-up of this formation, trapping mechanisms are normally stratigraphic in nature. Economic gas production rates and recoveries are highly dependent on natural and induced fracture systems within the reservoirs. Below the rim, the Wasatch Formation is found from the surface down to a depth of about 3500 feet. Most production from this formation has been derived from depths between 2,000-3,000 feet. Wasatch reserves are estimated to be about 0.7 BCF/Well and initial well production averages 270 MCF/day.

One factor affecting potential Wasatch development could be the relatively deep drilling depths required to reach the "G Sand" and the other reservoirs of the Wasatch on top of the plateau since the top is about 3,000 feet higher than the majority of the producing wells situated to the south. In December of 1990, Barrett Resources Corporation completed a Wasatch G Sand well only 1179 feet from the southern boundary of NOSR-1. The Allen Point #1-8-95 was completed between the depths of 5887-5933 feet and had an initial well production of 230 MCF/day with no oil and no water. The ground surface elevation of this well was 8,516 feet. If the Wasatch G Sand approaches a depth of nearly 6,000 feet near the southern boundary of NOSR-1 (and structurally the regional dip underlying much of this area is to the northeast) then depths to the G Sand could be in excess of 7,000 feet. Traditionally, in many areas of northwestern Colorado, the Wasatch has been developed at depths between 2,000-3,000 feet with typical initial well productions of 200-300 MCF/day.

Coalbed Natural Gas

The Cameo Coal Zone is the basal member of the Williams Fork Formation, and the coalbeds represent a potential reservoir component within the Mesaverde Group. This section reflects a paludal (swamp) depositional environment landward of the prograding Rollins paleoshoreline. In the Grand Valley Field, the Cameo coal zone is about 470 feet thick and contains 50 to 70 feet of net coal with the thicker coals occurring near the base of the zone. The zone thickens regionally from the Grand Valley Field to the Parachute Field.

While CBNG exists in the Cameo coals, they lack the well-developed natural fracture permeability associated with prolific water and gas flows exhibited in some areas of the northern San Juan Basin and on the Divide Creek anticline in the eastern Piceance Basin. Well test data from the Parachute Field indicate that in situ coal permeability ranges from 0.02 to 0.2 mD. In the Grand Valley Field, the absence of well-developed cleat systems and the lack of abundant open fractures are probably related to the depth of rock overlying the coals and to the lack of faulting in the area. With the exception of any structurally impacted areas on top of the plateau, coalbeds could be subjected to even less fracturing, with greater thicknesses of overburden, resulting in less developed cleat and fracture systems, which would equate to less gas production.

The CBNG potential was also evaluated in several studies that concluded that permeability in coals is significantly reduced with depth. At a depth around 7,000, the permeability would be so low that coalbed methane could not flow in economic quantities. The USGS geologic assessment of oil and gas (2003) delineated a coalbed natural gas area in the Grand Valley and Parachute fields to a depth of 7,000 based on Barrett Resources completing 51 wells in the coalbeds to near that depth between 1989 and 1992. However, USGS noted that most of the wells were dual coalbed and sandstone completions, and that the coalbeds were contributing only small amounts of gas to the overall production. The DOE's Coalbed Methane Primer (2004) noted that due to the depth of Piceance Basin coals, permeability is reduced, thereby hindering extraction.

It should be noted that the Cameo coals in the White River Dome area in the northeastern part of the Piceance Basin are productive at deeper depths. CBNG production has occurred down to a depth of 8,140' (Olson). The coals have low permeability, but higher than the sandstones. Coal permeability is derived from the cleats and natural fractures. Although there are current problems associated with commercial development of CBNG within the RPPA, the actual potential is unknown.

Iles Formation

The Iles Formation underlies the Williams Fork Formation and comprises the lowest part of the Mesaverde Group. The Rollins, Cozzette, and Corcoran Sandstone Members reflect distributary channel, and beach (shoreline and offshore bar sands) depositional environments. Significant gas production from the Cozzette and Corcoran Sandstones occurs in other fields to the south and west, but is minimal within the RPPA. Therefore, the actual potential of this resource is unknown.

Mancos Shale, Dakota Sandstone

The DOE report states that hydrocarbons could exist in the Upper Cretaceous Mancos Shale in fractured reservoirs, in the Lower Cretaceous Dakota Sandstone and Cedar Mountain-Burro Canyon Formations, Jurassic Morrison Formation and in Paleozoic strata. With the possible exception of the Mancos Shale, all of the above formations would probably occur at depths in excess of 15,000 feet, which significantly reduces their importance as viable objectives in this area. In addition the Cedar Mountain-Burro Canyon Formations are actually stratigraphic lateral equivalents, and the Cedar Mountain component present in portions of northwestern Colorado may actually be absent in the NOSR-1 area.

Rationale for selecting values of occurrence potential and certainty

The rationale for selecting values of occurrence potential and certainty is discussed below. The classification was modified from the BLM Handbook H-1624-1, dated May 7, 1990, and derived from a variety of sources; such as the EPCA inventory resource density polygons, reserve estimates from PI Dwight's Digital Well Data and Production Data, USGS TPS and AU maps, and USGS geologic maps.

- High – Demonstrate existence of source rock, thermal maturation, reservoir strata possessing suitable permeability and porosity, and traps. Demonstrated existence is defined by physical evidence or documentation in the literature. The high potential occurs in areas inside total petroleum systems and geologic basins with extensive Cretaceous and Tertiary sediments such as the Piceance Basin within the CRVFO boundary.

- Medium – Geophysical or geological indications that the following may be present: source rock, thermal maturation, reservoir strata possessing suitable permeability and porosity, and traps. Geologic indication is defined by geological inference based on direct and/or indirect evidence. Occurs in the Eagle Basin, which is known to be marginal for the economic occurrence for oil and gas, areas of thick sediment that contain some lower Mesozoic sediments along with Paleozoic sediments, and areas where existing well data show some evidence of hydrocarbons.

- Low – Specific indications that one or more of the following may not be present: source rock, thermal maturation, or reservoir strata possessing permeability and porosity, and traps. Occurs in areas outside USGS petroleum system and productive basin margins, where little or no hydrocarbon resources are indicated by existing well data. Also in areas where the basin sediments are less than 5,000 feet thick and consist mostly of Jurassic and older rocks as evidenced by existing well data.

- No Known Potential – Demonstrate absence of source rock, thermal maturation, reservoir rock, and traps. Demonstrated absence is defined by physical evidence or documentation in the literature. Occurs in areas outside the EPCA resource boundaries and USGS TPS and productive basin margins. Also in areas of Cambrian and Precambrian igneous and metamorphic rocks, not overlying favorable sedimentary environments. These areas may be unconformably overlain by thin younger sediments.

Note: Inclusion of an area in a USGS oil and gas play defined in the 2002 national assessment should be considered in determining potential for oil and gas occurrence. However, because the USGS assesses speculative plays, play definition alone should not be the only criterion for determining occurrence potential.

Oil and Gas Development Potential

The high potential area for natural gas includes all acres in the RPPA. Operators expressed a high degree of interest in the federal minerals in 2007 and 2008. At today's natural gas prices, interest has waned; however, natural gas prices will likely return to a higher rate in the future, which would increase the pace of development in the area.

RFD Scenarios for Plan Revisions

Three BLM field offices and one national forest share similar geology and oil and gas potential with the RPPA, since all four are located within the southern Piceance Basin. The White River Field Office (WRFO) manages the federal minerals north of the RPPA and finalized an RFD in 2007. The WRFO RFD estimates 17,800 wells to be drilled in the next 20 years. The Grand Junction Field Office (GJFO) finalized a RFD in June 2012. The GJFO estimates 8,403 wells to be drilled in the next 20 years. The CRVFO office wide RFD estimates 14,792 wells to be drilled in the next 20 years. These numbers include both fee and federal wells. The White River National Forest, which is a large part of the surface area within the CRVFO, the GJFO, and the WRFO, is working closely with both the CRVFO and the

GJFO to revise their estimated oil and gas activity. There should be no conflict of estimates for future development potential between the BLM and USFS offices.

Values of Development Potential

The future development for the RPPA is based on past development seen in the RPPA and surrounding areas. The main criteria for future development are the area's geology, current technology, and estimated future natural gas prices. The area's geology has already been established as high potential throughout the RPPA and the current technology was discussed previously in the section on Past and Present Oil and Gas Development Activity. The critical aspect for operator's to drill a well is therefore the natural gas prices. Combining Table 2 and Figure 15, the price of natural gas and the number of wells spud is graphed per year in Figure 16.

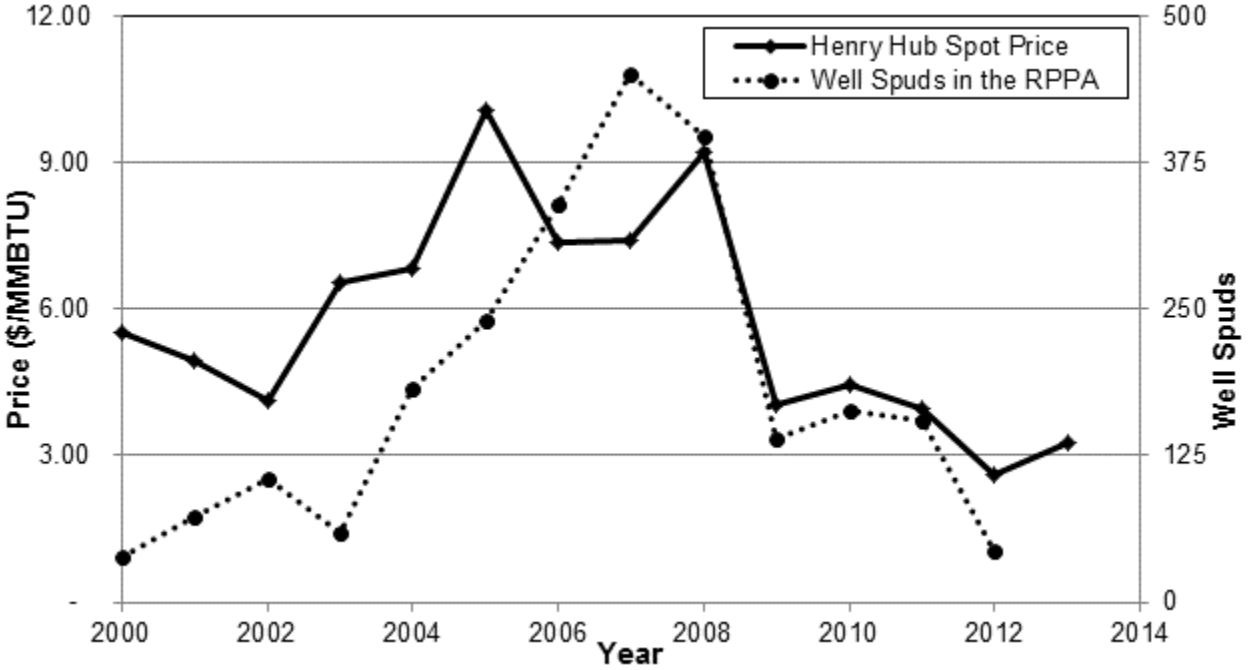

Figure 16. A comparison of the number of RPPA well spuds and the price of natural gas.

The number of spudded wells per year trends with the price of natural gas. Initially the wells lag behind the change in price, which might be due to the lack of infrastructure needed to produce all the wells. Based on this relationship, a trend line can be created to model future development based on the predicted price of natural gas. Since the cost to drill a well is higher when above the rim, the price of natural gas and the number of wells spud were modelled for two geographic areas: below the rim in the RPPA and above 8,000' in and around the RPPA. A scatter plot of the price versus the wells spud below the rim in the RPPA is created between 2006 and 2012 in Figure 17 with a trend line.

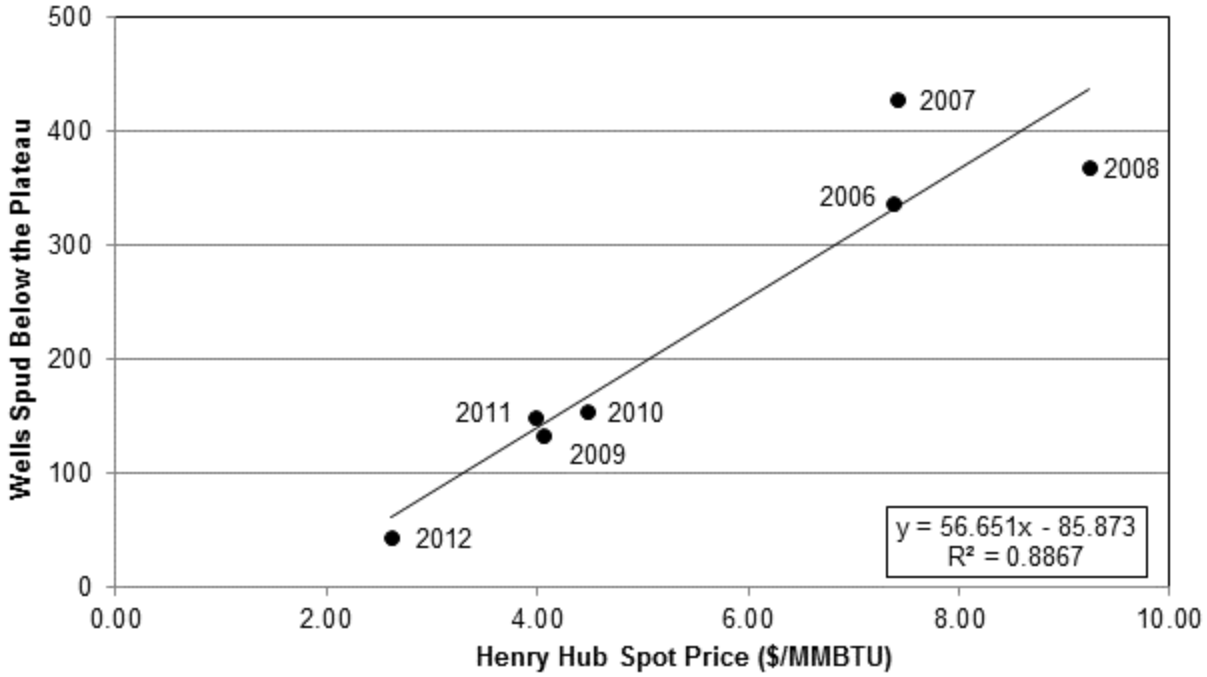

Figure 17. Number of well spuds below the plateau versus the price of natural gas.

The trend line in Figure 17 represents a historical relationship between the price of natural gas and the number of wells spud in the RPPA and below the rim each year. Using the trend line and the predicted natural gas prices in Figure 15 from NYMEX, the potential number of wells to be drilled below the plateau in the RPPA is determined. The average reference price between 2016 and 2035 is $4.89/MMBTU which is approximately 190 wells/year based on the trend line from Figure 17.

Little past development has occurred atop the plateau in the RPPA. Only 82 wells have been spud on top of the plateau, which is an insufficient data set to determine an accurate relationship between past and future development. Wells drilled into adjacent lands with similar elevation, topography, and geology were included to analyze the future potential development atop the plateau in the RPPA. The top of the plateau, which is between 7,500 and 9,300 feet above sea level, has greater drilling depths then below the rim, considering the lowest point in the RPPA below the rim is 5,100 feet above sea level at the confluence of Parachute Creek with the Colorado River. Refer to Figure 21 on page 42 for the topography in the RPPA. For this reason, the criteria used to pull the well data included: wells above 8,000' in elevation and wells east of Township 5 South Range 98 West and Township 5 South Range 97 West. West of the barrier, the geology begins differing from the RPPA. The area described above is shown in Figure 26 on page 47.

Using ArcMap and COGCC well data, 1,189 wells were determined to have similar characteristics as future wells atop the plateau in the RPPA. The majority of the wells were located in the Book Cliffs area between Debeque and Parachute. A graph was then generated to determine the relationship for wells drilled in areas similar to the plateau in the RPPA as seen in Figure 18. Years before 2008 were not modelled since there was significant lag between a change in price and development until 2008.

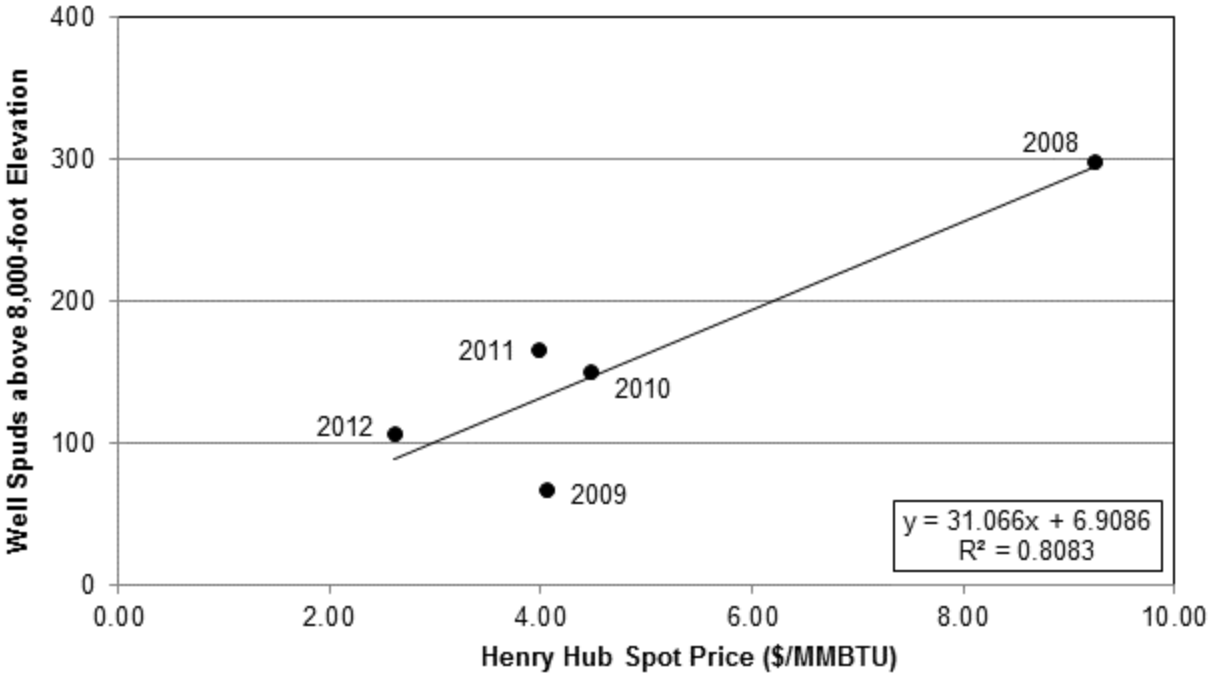

Figure 18. Number of well spuds above the 8,000-foot elevation versus the price of natural gas.

Since the 8,000-foot elevation area includes lands outside the RPPA, a ratio was used to determine the potential development on the plateau. The 8,000-foot area includes 135,327 acres; however, 33,000 of the acres are leased but under suspension and no development could occur. The plateau in the RPPA has 54,525 acres. Therefore, the equation based on the trend line was divided by 102,327 acres and then multiplied by 54,525 acres to create an equation able to approximate future development on the plateau in the RPPA. The new equation is $y = 16.55x+3.68$ where y equals the potential wells to be drilled atop the plateau in the RPPA and x equals the Henry Hub Spot Price. The average reference price between 2016 and 2035 is $4.89/MMBTU which is approximately 85 wells/year based on the new equation.

Using the two relationships, the potential number of well spuds is determined for the RPPA based on the price of natural gas. Figure 19 was created to show the different development possibilities in the RPPA based on the price of natural gas predicted in Figure 15. Years 2014 through 2016 estimate a lower number of wells on the plateau in the RPPA. Since the federal leases are still under suspension, development would only occur on the fee estate and federal minerals leased prior to 2008. This is approximately 72,260 acres.

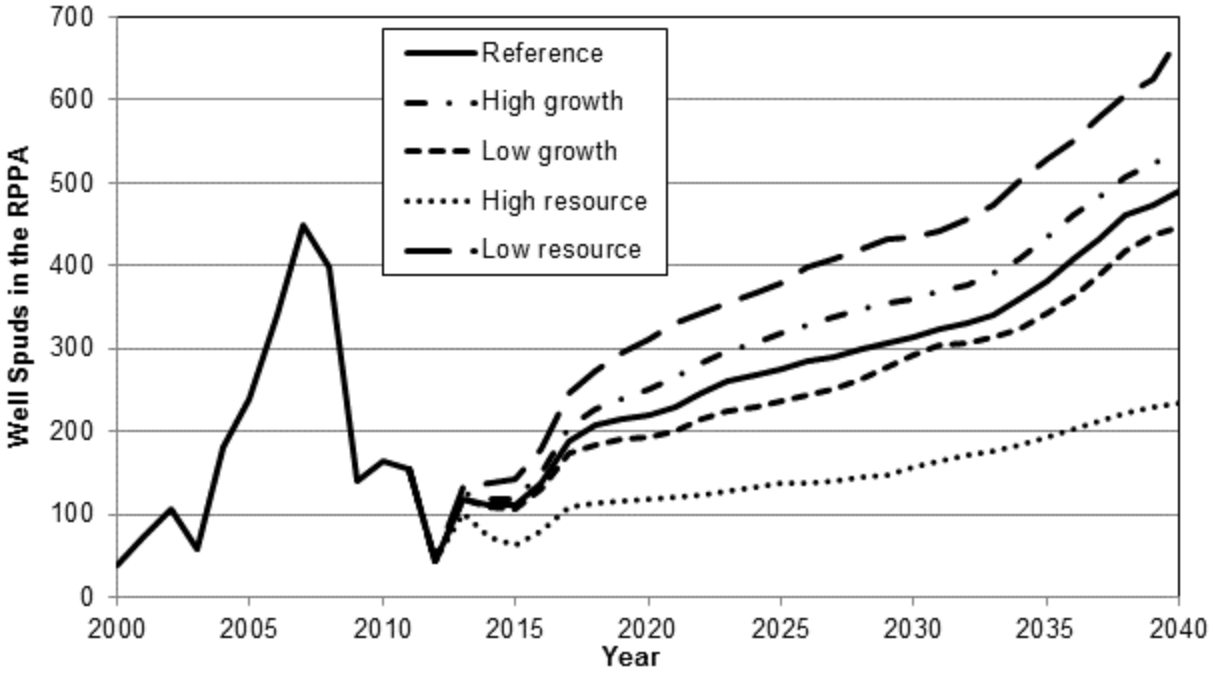

Figure 19. Potential future wells based on the NYMEX price of natural gas.

The reference natural gas price predictions were used to determine future development in the RPPA. Between 2016 and 2035, the equations estimated 3,820 wells below the plateau and 1,650 wells on the plateau in the RPPA. Based on the existing mineral acreage and existing wells, the potential wells were split between the federal and fee minerals in the RPPA. Table 3 breaks down the well numbers over the next 20 years for the RPPA.

Table 3. Well spuds potential within the RPPA between 2016 and 2035.

Location	Potential Well Spuds ('16-'35)	Mineral Ownership	Mineral Estate Acres	Current Wells	Undeveloped Acreage	Acreage Ratio	Potential Future Wells
Above the Rim	1650	Federal	34,990	0	34,990	65%	1,070
		Fee	19,640	82	18,820	35%	580
Below the Rim	3820	Federal	38,740	890	29,840	64%	2,450
		Fee	33,630	1,689	16,740	36%	1,370
Total Federal	-	Federal	73,730	890	64,830	-	3,520
Total	5470	-	127,000	2,661	100,390	-	5,470

Based on the undeveloped acreage, 3,520 potential wells could be drilled into the federal mineral estate between 2016 and 2035: 1,070 wells into the federal minerals above the rim and 2,450 wells into the federal minerals below the rim.

Reserves

Estimated ultimate recovery (EUR) is the total volume of gas that can reasonably be extracted from a well or a reserve. This RFD evaluates the possible reserves to be recovered in the 20-year planning horizon from the two proven formations: the Mesaverde and the Wasatch formations.

Based on Figure 11, a typical well drilled into the Mesaverde Formation in the RPPA could produce approximately 1.35 BCF over its life. The EUR for the existing 2,600 producing Mesaverde wells is approximately 3.5 TCF. The EUR for the 5,470 potential future wells is 7.4 TCF. Therefore, the total EUR for this RFD of 10.9 TCF for existing wells and potential wells for Mesaverde production is approximately 63% of the 17.1 TCF of the EUR within Mesaverde Formation inside the RPPA boundary.

Based on Figure 14, wells drilled into the Wasatch Formation could produce 0.74 BCF over the well's life. Due to the increased production from Mesaverde wells, none of the wells in the next 20 years are expected to be Wasatch wells. The EUR for the existing 90 Wasatch wells is 65 BCF. This is approximately 11% of the 0.6 TCF estimated to exist within the Wasatch Formation inside the RPPA. Refer to Table 4 for the total EUR in each area of the RPPA and the potential recovered by the current and future wells.

Table 4. Summary of EUR for current and potential future wells.

Formation	Location	Mineral Ownership	Mineral Estate Acres	Reserve EUR (BCF)	Current Wells	Potential Future Wells	EUR for Current and Future Wells (BCF)	Percent Depleted
Wasatch	Above the Rim	Federal	34,990	160	0	0	0	0%
		Fee	19,640	90	5	0	5	6%
	Below the Rim	Federal	38,740	180	30	0	20	11%
		Fee	33,630	155	55	0	40	26%
	Wasatch Total		127,000	585	90	0	65	11%
Mesaverde	Above the Rim	Federal	34,990	4,725	0	1,070	1,445	31%
		Fee	19,640	2,650	77	580	885	33%
	Below the Rim	Federal	38,740	5,230	860	2,450	4,470	85%
		Fee	33,630	4,540	1,634	1,370	4,055	89%
	Mesaverde Total		127,000	17,145	2,571	5,470	10,855	63%
Total Federal			73,730	10,295	890	3,520	5,935	58%
Total			127,000	17,730	2,661	5,470	10,920	62%

Wells drilled into the Mancos Formation were not included in the estimate of future production. Currently the Mancos Formation is still in the exploratory stage of its development in the RPPA and the potential Mancos reserves cannot be accurately determined. For purposes of predicting the EUR for the RPPA in Table 4, all of the potential 5,470 wells were considered Mesaverde wells. This will probably not be the case. Likely, a percentage of the potential 5,470 well number would be wells drilled into the Mancos Formation. However, there is not enough data on the Mancos/Niobrara shale wells to determine reasonable estimates on the amount of development that might occur in the RPPA. In addition, appropriate well spacing is undetermined, which is a critical aspect in determining the development required to extract the resource. The BLM anticipates increased Mancos/Niobrara exploration but cannot reasonably estimate potential future development, in contrast to Mesaverde development for which there

are clear trends. The RFD assumes that the increased development in the Mancos formation would be offset by decreased development in the Mesaverde formation.

The mineral reserves underlying the RPPA contain an estimated 17.7 TCF of gas within the Wasatch and Mesaverde Formation. Combining the EUR in the Wasatch and Mesaverde formation, the current wells and potential wells that could be drilled in the next 20 years could drain around 62% of the EUR for the RPPA.

Leased Acreage

Based on the acreage and predicted gas prices, the 3,520 potential wells could be drilled on 73,730 acres of federal minerals in the next 20 years. On the 70,190-leased BLM acres, 890 wells have already been drilled into federal minerals. The combined well number of potential and pre-existing wells, 4,410 wells, could potentially drain 5.9 TCF. The EUR for the leased-federal minerals in the RPPA is 10.3 TCF. Combining the potential wells in the next 20 years and current wells, the RFD estimates 58% of the total wells needed to drain the leased acreage could be drilled. This is based on the expectation that development would occur on 10-acre spacing in the Mesaverde Formation and 160-acre spacing in the Wasatch Formation. More wells might be needed to drain Mancos Formations.

RFD Baseline Scenario Assumptions and Discussion

The baseline for projecting an accurate RFD for the life of the Resource Management Plan (RMP) is based on all potentially productive areas being open for leasing under the standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation, or executive order. None of the federal minerals is currently closed to leasing, but 31 leases in the Roan Plateau Planning Area (RPPA) are suspended due to ongoing litigation. The RFD analyzed the federal minerals without regard to leased or unleased federal minerals and assumed all federal minerals within the RPPA were open to leasing. A summary of the current and future development is shown in Table 5.

Table 5. Summary of well spud potential.

Mineral Ownership & Location	Mineral Estate Acres	Leased Acres	Suspended Acres	Current Wells (9-2013)	Potential Future Wells	Percent of New Activity
Federal above the Rim	34,990	34,380	33,000	0	1,070	19.6%
Fee above the Rim	19,640	-	-	82	580	10.6%
Federal below the Rim	38,740	35,920	21,630	890	2,450	44.8%
Fee below the Rim	33,630	-	-	1,689	1,370	25.0%
Total Federal	73,730	70,190	54,630	890	3,520	64.4%
Total	127,000	-	-	2,661	5,470	100.0%

Oil and gas development is dependent on the operator's ability to profit from the development; therefore, the potential well numbers are tied to predictions in natural gas prices from NYMEX and the EIA. The reference predictions for the Henry Hub Spot Price were selected as the rationale price prediction to model future development in the RPPA. Other RFDs have based development on current rig activity or industry estimates. Rig activity and industry estimates are based on current gas prices; therefore, the gas price is the key independent variable for oil and gas development in the RPPA. Large changes from the predicted Henry Hub Spot natural gas price can increase or decrease the potential development. In

addition, a change in drilling and completion technology may lower the cost of oil and gas development. This would allow operators to economically drill at lower natural gas prices and could increase the potential well numbers in the RFD. At this time, the well numbers for the next 20 years are the best estimate of development.

Surface Disturbance Due to Oil and Gas Activity on All Lands

It is estimated that 5,470 fee and Federal wells could be drilled over the next twenty years. This is an average of approximately 274 wells per year over the planned life of the RMPA. This is only an average, and it is more likely that an uneven distribution of wells could be drilled each year, depending on market forces, lands available for leasing, and political constraints. All wells are predicted to be gas wells (both coalbed natural gas and conventional natural gas), and many would have associated natural gas fluids (condensate) and, in some cases, produced water. However, over time and with an increase in exploring marginal USGS plays, some primary oil wells may also be developed. Tables 6 through 12 present estimates of current and future surface disturbance associated with well pads, access roads (including collocated pipelines, and central facilities. Data presented includes gross disturbance (including both temporary and long-term), reclamation (including both interim and final), and net disturbance (gross disturbance minus reclamation). Interim reclamation is conducted following completion of a wellpad and reduces the disturbed footprint to the amount needed for ongoing production and periodic workover operations. Final reclamation occurs after a pad no longer has producing wells.

Assumptions used in preparing Table 6 through Table 12 are based on BLM experience from historical exploration and development in the CRVFO and from Industry input and are as follows:

- Existing pads are assumed to average 5 wells per pad of gross disturbance.
- Plugged & Abandoned numbers are assumed to be one well per 3 acre pad.
- Plugged and abandoned reclamation assumes 75% reclaimed (pad and road), but final abandonment notice (FAN) not approved.
- Existing multi-well pads and future wells pad averaging 20 wells per pad are assumed to be 5 acres in size.
- Existing roads average .40 miles per pad for existing well pads. This number was derived by using a ratio of existing roads to existing well pads. Road acres per well pad are approximated from the following calculation. .40 x 5,280 feet x 75 feet (road width) ÷ 43,560 square feet per acre ≈ 3.6 acres of road per pad.
- It is assumed that the .40 average will apply to future road and well pad development. Therefore, approximately 117 miles out of 146 miles of existing BLM unimproved roads (not associated with oil and gas development) would be upgraded /improved in order to support future development. However, after interim reclamation (IR) the roads would be reduced by 67% (see below), which would ultimately result in no net gain.
- Central facilities are assumed to average 10 acres per facility. It is assumed that the number of central facilities would double over the life of the RPPA SEIS Revision. Since 36% of the projected wells are Federal, it is assumed that 36% of the central facilities would service Federal wells. The central facilities are expected to be developed on private land.
- Gross disturbance well numbers include wells of all status including producing, temporary abandoned, abandoned, service, and drilling.
- Treatment facility surface disturbance is included in the well pad figures.
- Pipelines, gathering lines, and power lines that are approved as a lease or unit action are included in this RFD surface disturbance acreage and are largely included in the access road corridor. Pipelines that require right-of-way approvals are realty actions not oil and gas operations; as a result are not included in this RFD.

- As a result of drilling multiple wells per pad, future well pads and access roads are assumed to not be affected if a well is plugged and abandoned or drilled and abandoned. Hence, future dry hole reclamation acreage is not considered.
- Interim reclamation assumes that 2.5 acres of the original 6 acres is reclaimed (42% reclamation factor) and that the access road right of way is reclaimed down to 25 feet from 75 feet (67% reclamation factor).
- Final abandonment assumes 100% reclamation and FAN approved. Abandoned Fee wells are assumed to be final abandoned

Table 6. Existing surface disturbance for federal wells.

Component	Gross Disturbance	Reclaimed to Date				Net Disturbance (Gross Disturbance - Reclaimed to Date)
		Plugged and Abandoned	Final Abandoned	Interim Reclamation	Total Reclamation	
No. Wells	882[1]	8	0	882	-	
No. Pads	186[2]	-	-	178[7]	-	
Acres of Disturbance						
Well Pads	1,092[3]	18[5]	0	445[8]	463	629
Access Roads	670[4]	19[6]	0	429[9]	449	221
Central Facilities	0	0	0	0	0	0
Total	1,762	37	0	874	912	850

Table 7. Existing surface disturbance for non-federal wells.

Component	Gross Disturbance	Reclaimed to Date				Net Disturbance (Gross Disturbance - Reclaimed to Date)
		Plugged and Abandoned	Final Abandoned	Interim Reclamation	Total Reclamation	
No. Wells	1,740[10]	39	0	1,740	-	
No. Pads	389[11]	39	-	350	-	
Acres of Disturbance						
Well Pads	2,217	88	0	875	963	1,254
Access Roads	1,400	94	0	844	938	462
Central Facilities	30[12]	0	0	0	0	30
Total	3,617	182	0	1,719	1,901	1,746

Table 8. Existing surface disturbance for all wells.

Component	Gross Disturbance	Reclaimed to Date				Net Disturbance (Gross Disturbance -
		Plugged and Abandoned	Final Abandoned	Interim Reclamation	Total Reclamation	

No. Wells	2,622	47	0	2,622	-	**Reclaimed to Date)**
No. Pads	575	47	-	524	-	
			Acres of Disturbance			
Well Pads	3,309	106	0	1,311	1,417	1,892
Access Roads	2,070	113	0	1,265	1,348	692
Central Facilities	30	0	0	0	0	30
Total	5,379	219	0	2,576	2,765	2,614

Table 9. Estimated future surface disturbance from BLM wells.

Component	Count	Acres per site	Gross Disturbance	Interim Reclamation	Net Disturbance (Gross-Interim)
Well Pads	176[13]	5	880[14]	440[16]	440
Access Roads	176	4	634[15]	425[17]	209
Central Facilities	0	0	0	0	0
Total	352	9	1,514	865	649

Table 10. Estimated future surface disturbance for all wells.

Component	Count	Acres per site	Gross Disturbance	Interim Reclamation	Net Disturbance (Gross-Interim)
Well Pads	274	5	1,368	684	684
Access Roads	274	4	985	660	325
Central Facilities	3	10	30	0	30
Total	550	19	2,382	1,343	1,039

Table 11. Combined existing and future net surface disturbance from BLM wells.

Component	Existing Net Disturbance	Future Net Disturbance	Total
Well Pads	629	440	1,069
Access Roads	221	209	430
Central Facilities	0	0	0
Total	850	649	1,499

Table 12. Combined existing and future net surface disturbance from all wells.

Component	Existing Net Disturbance	Future Net Disturbance	Total
Well Pads	1,883	684	2,567
Access Roads	683	325	1,008
Central Facilities	30	30	60
Total	2,596	1,039	3,635

[1] wells - P&A wells
[2] existing active pads + single P&A pads
[3] ((existing active pads - single P&A pads) x 6 acres/pad) + (single P&A pads x 3 acres/pad)
[4] (existing active pads + single 3 acre pads) x 3.6 acres of road/pad
[5] (single P&A pads x 3 acres/pad) x .75 reclamation factor
[6] (single P&A roads x 3.6 acres/road) x .67 reclamation factor
[7] existing active pads - single P&A pads
[8] existing active pads x 2.5 acres/pad
[9] (existing active pad roads x 3.6 acres/road) x .67 reclamation factor
[10] wells - P&A wells
[11] existing active pads + single P&A pads
[12] 3 existing central facilities x 10 acres/facility
[13] future wells ÷ 20 wells/pad
[14] future well pads x 5acres/pad
[15] future well pad roads x 3.6 acres/road
[16] existing active pads x 2.5 acres/pad
[17] (existing active pad roads x 3.6 acres/road) x .67 reclamation factor

Produced Water Disposal

Currently, the BLM surface lands do not have permitted surface discharge, only contained produced water disposal in approved pits or tanks or approved trucking of produced water to approved disposal facilities. Both the BLM and the State of Colorado have jurisdiction over surface discharge (retention ponds, skimmer pits and equipment, tanks, and any additional surface disturbance) and approves surface discharge permits. Operations from the point of origin to the point of discharge are under the jurisdiction of the BLM. Operations from the point of discharge downstream are under the jurisdiction of the State of Colorado. The State of Colorado approves the underground injection of water into the disposal wells. Water quality has to meet their minimum standards for fresh water (<3,500 mg/L TDS) before it is allowed to be surfaced discharged. Water quality within the CRVFO ranges in quality from potable to well over 25,000 mg/L of total dissolve solids (TDS). In the Rulison field, produced water from the Williams Fork Formation is around 3,000 mg/L TDS; in the Parachute field it is around 4,200 mg/L TDS; and in the Grand Valley field it is around 21,400 mg/L TDS. Typically the deeper the formation and the closer to the basin center, the poorer the quality of water. Formations in these areas usually contain connate water, marine in origin and very briny (>10,000 mg/L TDS). If the water is lacustrine or fluvial in origin, it is somewhat fresh (1,500 to 10,000 mg/L TDS). Shallow formations, formations near the basin margin recharge zones, and formations with conduits for fresh water recharge (i.e., faults) can contain very fresh to potable meteoric water (<1,500 mg/L TDS). Nearly 10 million barrels of water have

been produced within the CRVFO. Much of the future produced water may come from fee CBM wells. Fortunately most of the gas wells in the CRVFO do not produce a lot of water. Other methods of water disposal used within the CRVFO are reinjection, disposal into evaporation pits, and trucking to approved disposal facilities.

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Appendix A: RPPA Maps

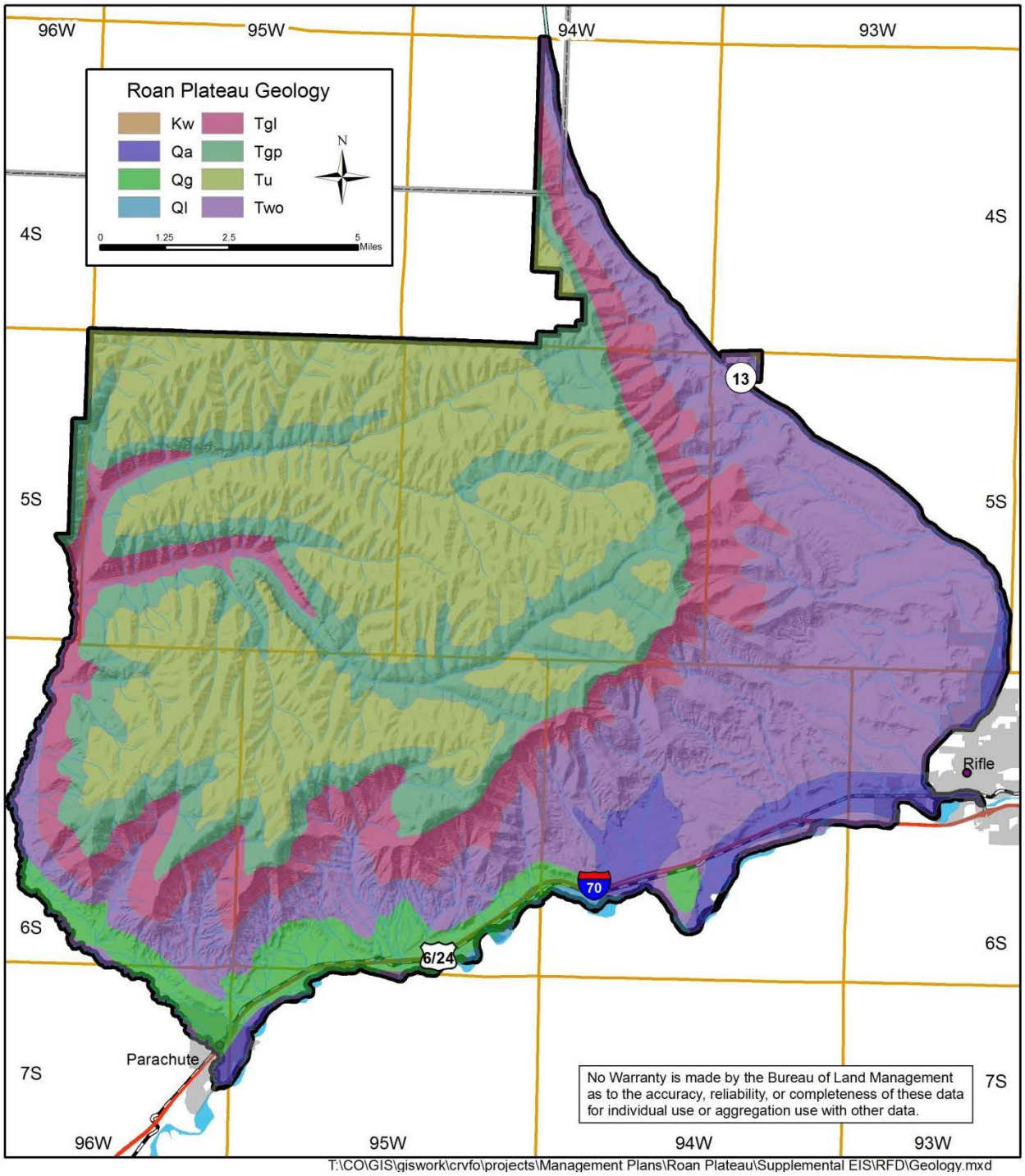

Figure 20. The geology in the RPPA.

Kw is the Williams Fork Member of the Mesaverde Formation, Tgi is the Jackrabbit Ridge member of the Green River Formation , Qa is Quaternary Alluvium Deposits, Tgp is the Parachute Creek member of the Green River Formation, Qg is Quaternary Gravel Deposits, Tu is the Uintah Formation, Ql is Quaternary Loess, and Two is the Shire member of the Wasatch Formation..

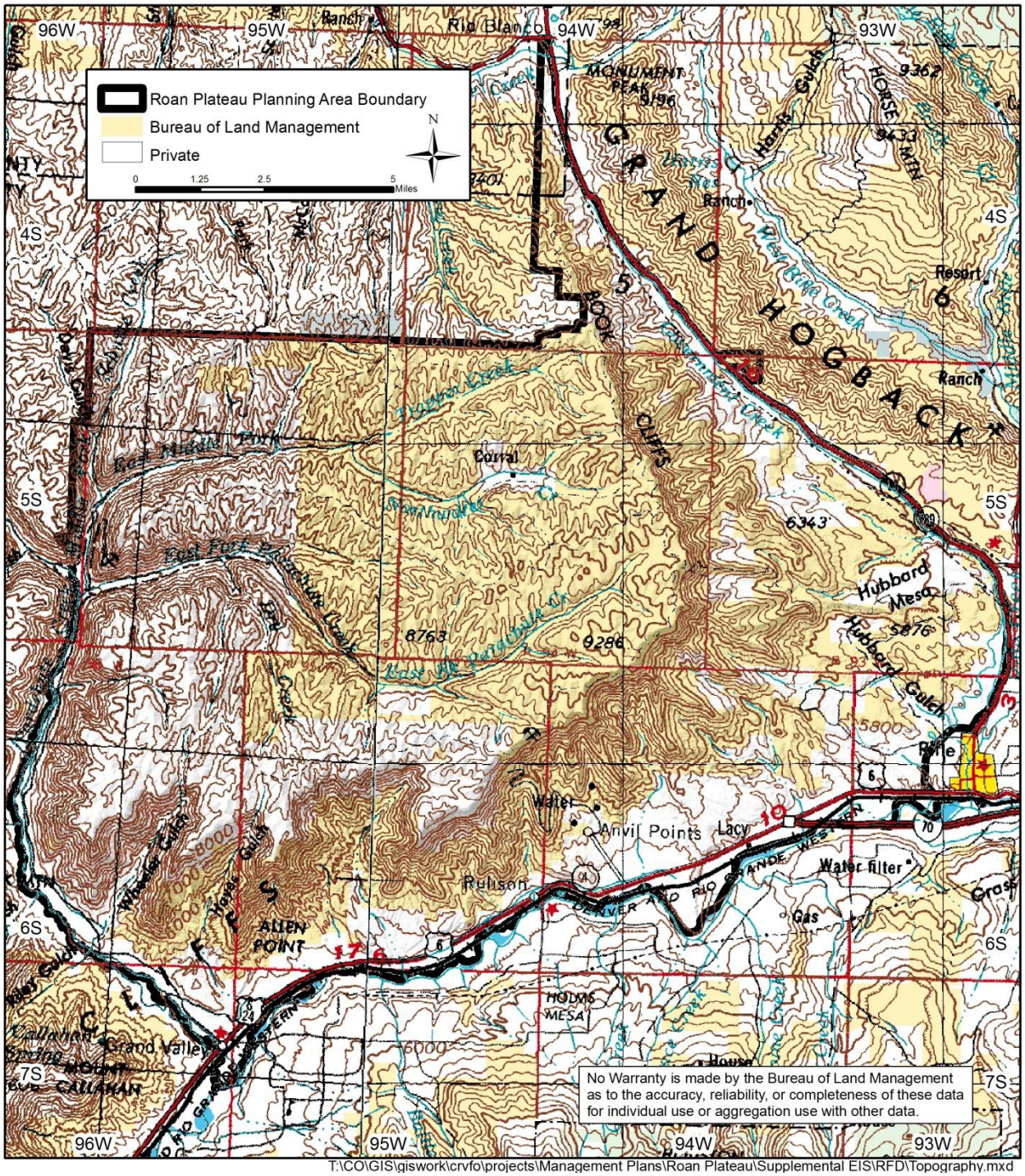

Figure 21. Topography in the RPPA.

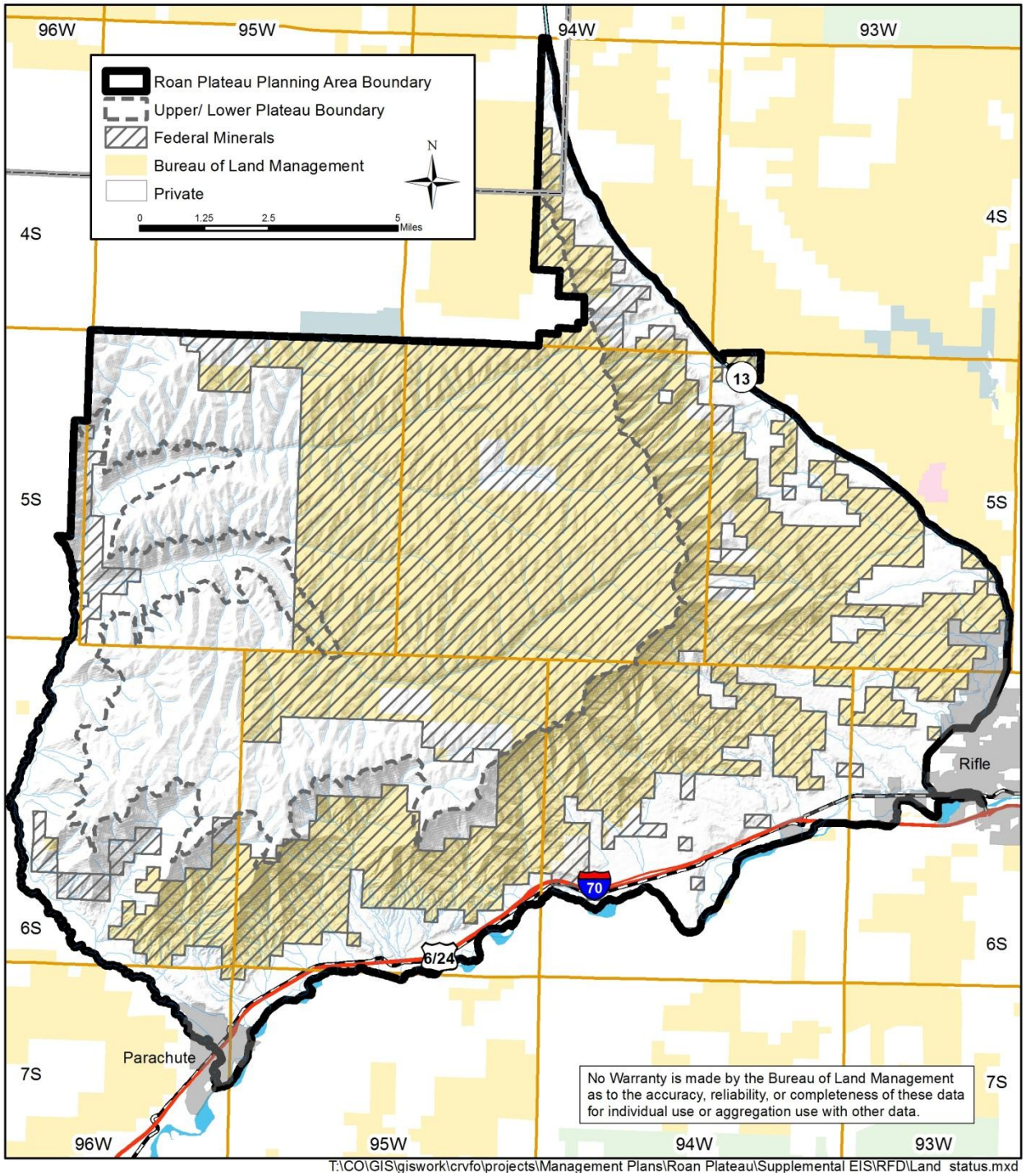

Figure 22. Federal minerals in the RPPA.

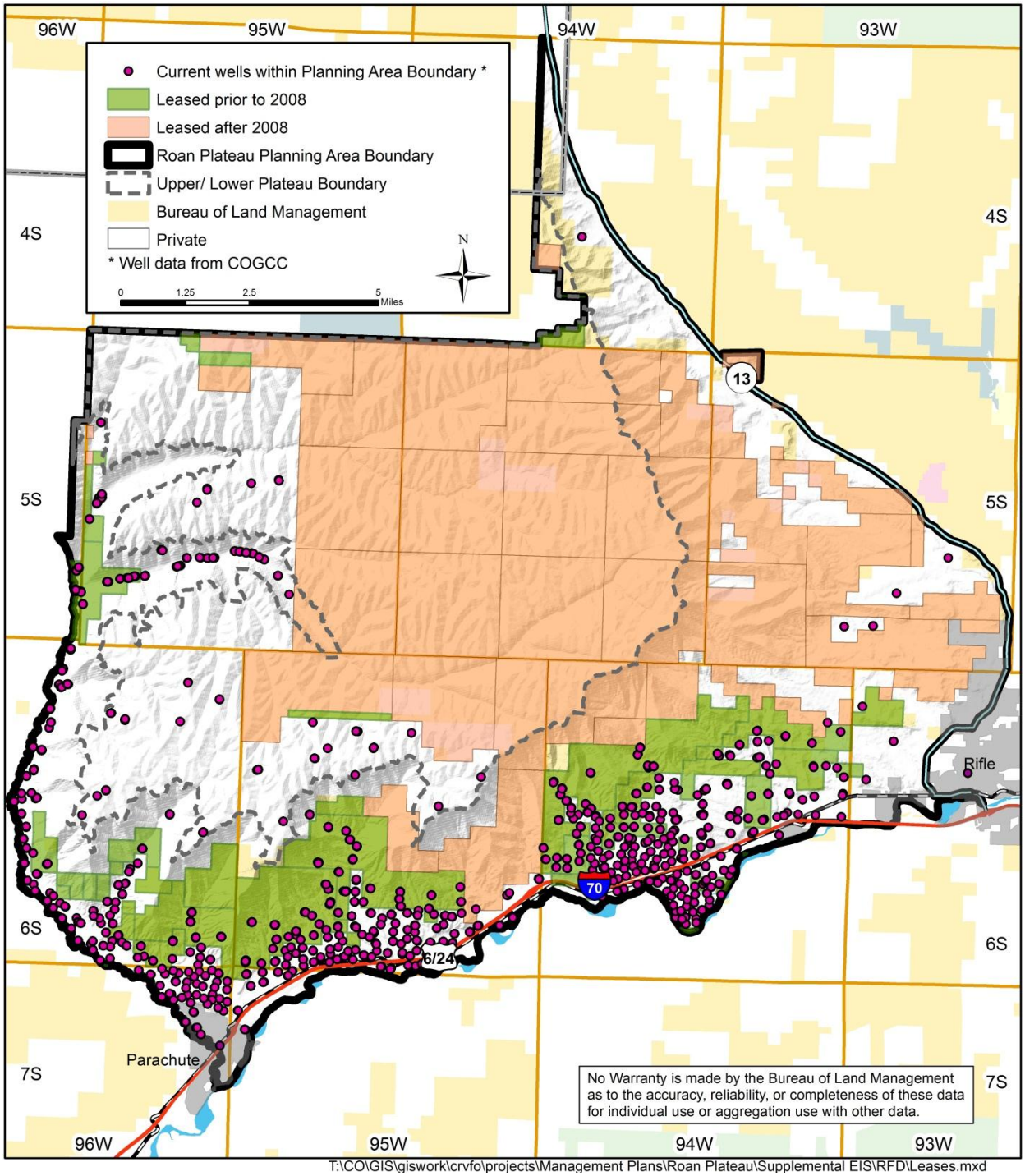

Figure 23. Leases and current well locations in the RPPA

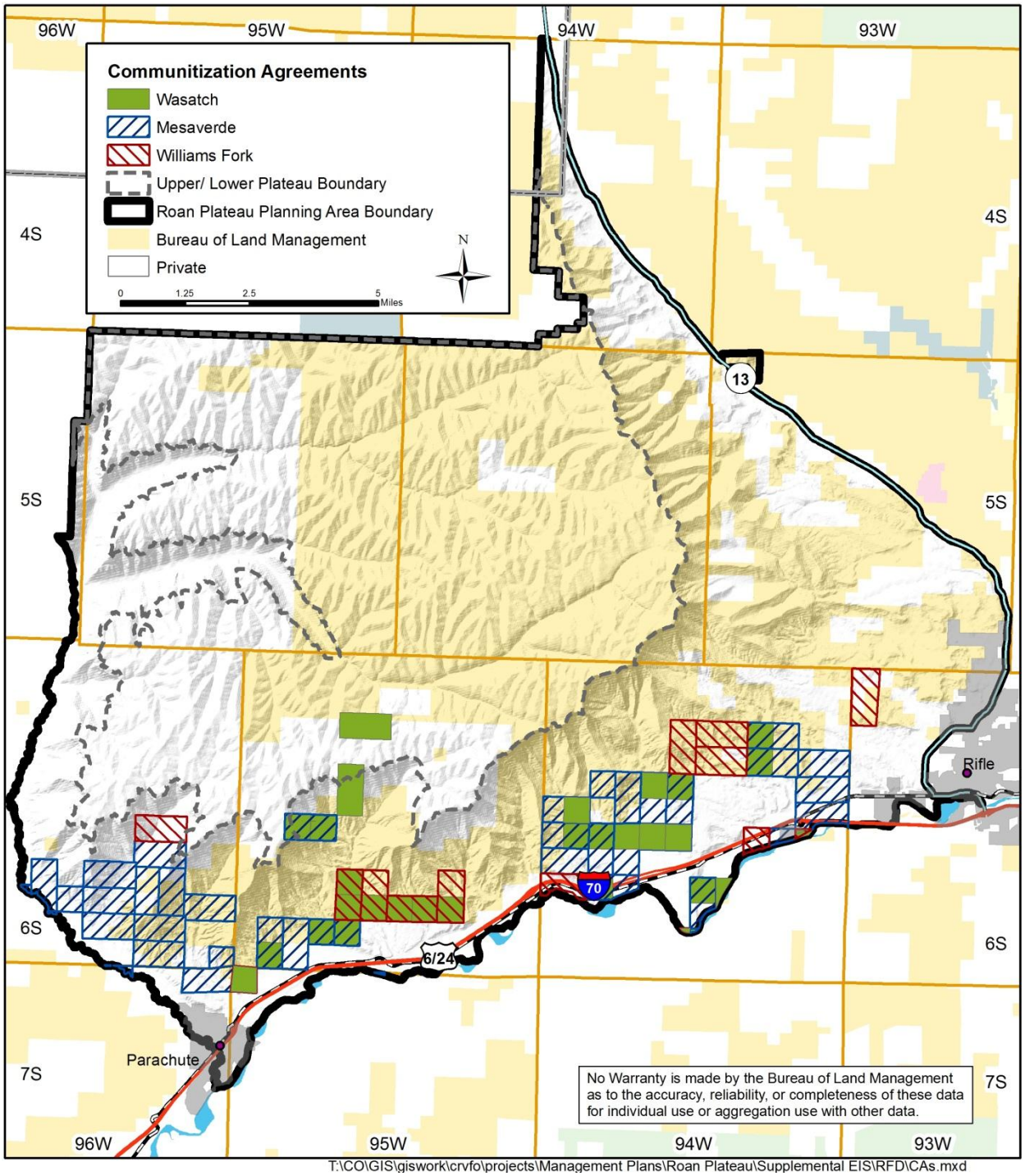

Figure 24. Current Communitization Agreements in the RPPA.

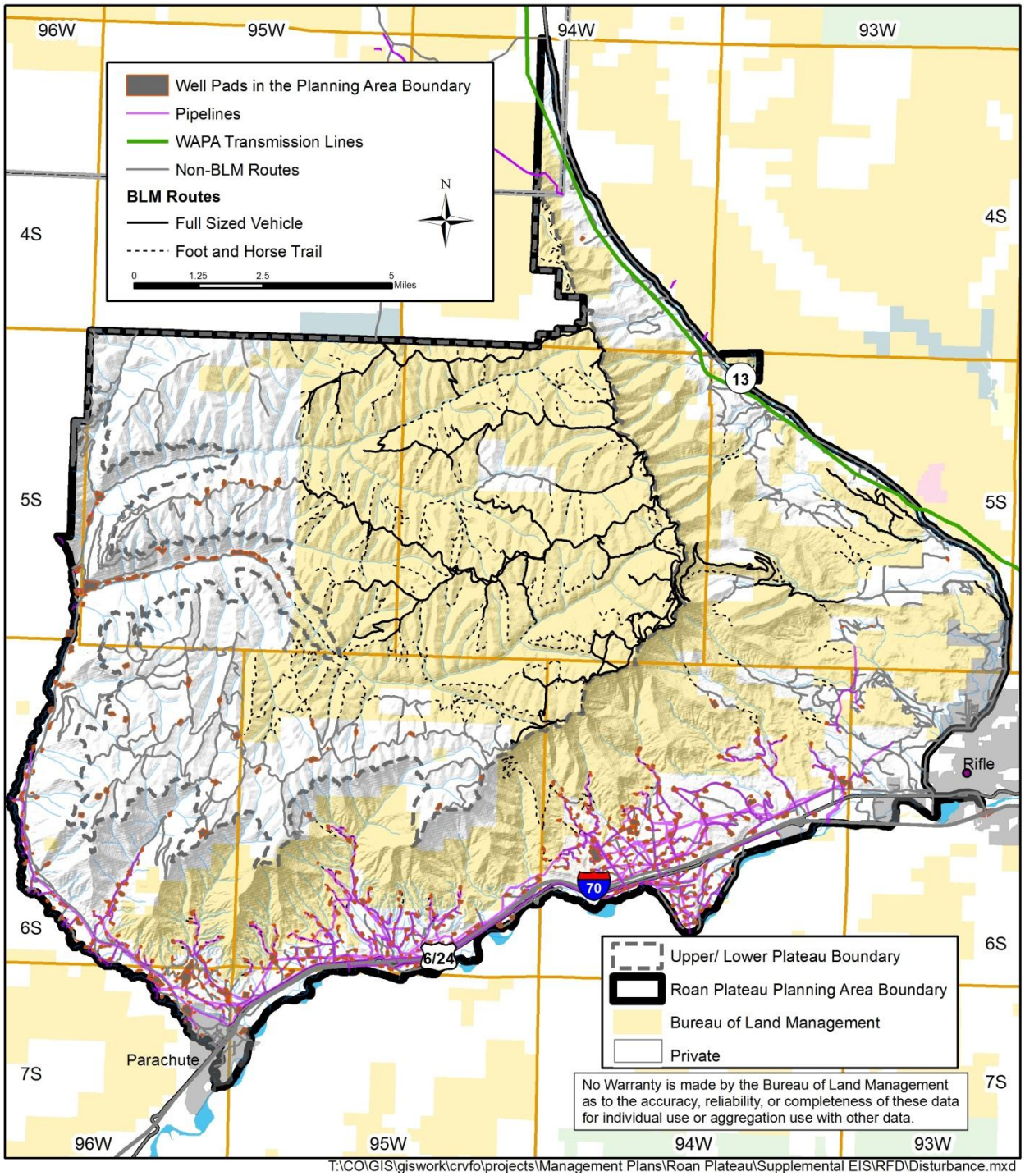

Figure 25. Current surface disturbance in the RPPA.

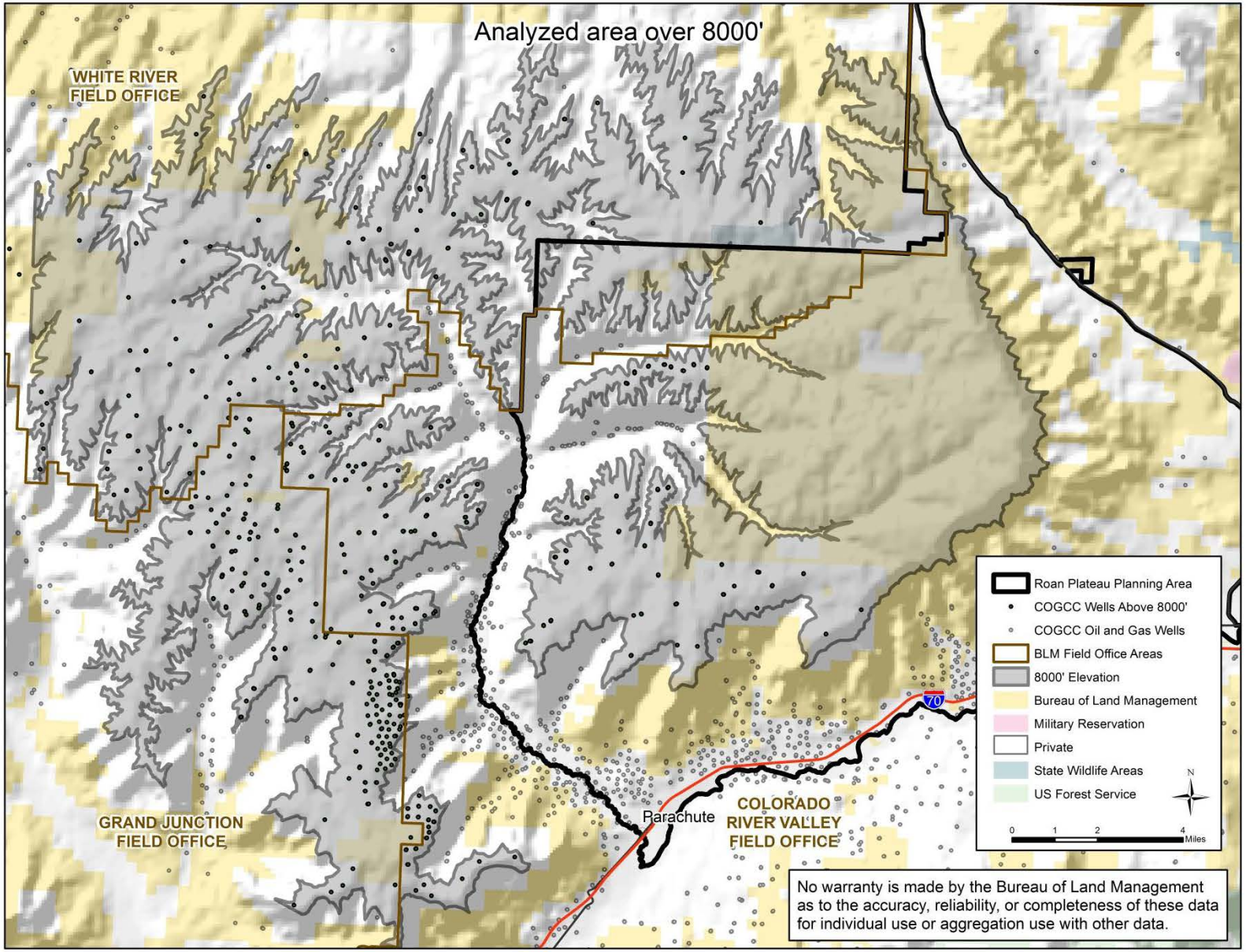

Figure 26. Wells pulled with similar activity as future development on the plateau in the RPPA.

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Appendix H

Best Management Practices (BMPs)

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BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are innovative, dynamic, and economically feasible mitigation practices that are applied on a site-by-site basis to reduce, prevent, or avoid adverse environmental or social impacts of development activities (BLM 2004). A number of BLM BMPs for oil and gas development are incorporated into the general oil and gas development requirements in the Proposed Plan. These include minimizing the number of pads by utilizing multiple well designs and directional drilling, minimizing road footprints, utilizing centralized support facilities such as tank batteries, collocating utilities and pipelines in common corridors and aligning them along roadways, and implementing interim reclamation practices. The BMPs identified in this Appendix represent the kinds of activities which may be required; actual BMPs required during the permitting process to mitigate impacts may vary. BMPs and specific methodologies associated with them are expected to change over time to reflect the results of monitoring and ongoing adaptive management efforts. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments, but would likely be analyzed as part of the NEPA analysis associated with the permitting process. Monitoring and adaptive management practices will be used to refine and clarify needed practices consistent with the goals and objectives of this plan.

The following or similar BMPs will be applied to all long-term ground-disturbing activities, as appropriate to each site and activity. This list is not all inclusive, but is presented to aid the reader in understanding BMPs.

Physical Site Protection/Water Quality Controls

- Employ dust suppression to minimize impacts to air, water, vegetation, and wildlife.
- Install silt fences to protect riparian areas, wetlands, and open water.
- Use closed compressor buildings or mufflers to minimize noise.
- Install catalytic converters to minimize emissions.

Air Quality Protection

- Implement the Comprehensive Air Resource Protection Protocol (CARPP); as part of the CARPP, and in addition to the CARPP, the following may be applicable as needed:
    - Apply best available control technology to minimize air pollutant emissions in order to comply with applicable local, state and federal laws, statutes, regulations, standards and implementation plans.
    - Adaptively manage air quality through baseline assessment, continuous monitoring, re-evaluation, and adjustment as necessary.
    - Cooperate in an interagency process to conduct regional air quality modeling and develop a comprehensive strategy to protect regional air quality.
    - Utilize regional air modeling and project-specific modeling to develop air resource protection strategies.
    - Consider the following factors to identify pollutants of concerns and the appropriate level of air analysis, monitoring and reporting for a proposed activity: magnitude of potential air emissions; duration of proposed activity and phases; proximity to Class I areas, Sensitive Class II areas, population centers, or other sensitive receptors; proximity to non-attainment or maintenance area; meteorological and geographic conditions; existing air quality data; intensity of existing and projected regional development; and issues identified during scoping.

- As an operator, conduct one year of pre-construction baseline air quality monitoring within or adjacent to a proposed development area during the year immediately preceding the proposed project submittal. This includes siting, installing, operating, and maintaining the required air quality monitors.
- As an operator, conduct air quality monitoring for the life of the development project.
- Publicly disclose air monitoring data.
- As an operator, conduct project-specific air quality modeling for the pollutant(s) of concern in the absence of sufficient data to ensure compliance with laws and regulations or to determine the effectiveness of mitigation options.
- Manage the timing, pace, place, density, and intensity of leasing and development to meet air quality goals.
- As an operator, provide an emissions inventory as part of an application for a permit to drill.
- As an operator, obtain an air permit from the Air Pollution Control Division for the site as a whole or cover individual equipment under one of Colorado's general permits for oil and gas operations.
- If a project may cause a significant adverse air quality impact or exceed an air quality standard, develop an emissions reduction plan.
- Respond to monitored exceedances of the National Ambient Air Quality Standards (NAAQS) by: reviewing the metadata for quality assurance and quality control (QA/QC) and meteorological data for exceptional atmospheric events; and, if validated, conducting a screening analysis to determine the likely cause, source, and origin. Consult with appropriate agencies, mitigate the exceedance(s) and enforce compliance with the NAAQS.
- Prepare and publish an annual air quality summary report.
- Post and enforce reduced speed limits to decrease fugitive dust from vehicular traffic on unpaved roads.
- Reduce unnecessary vehicle idling to reduce combustion emissions, ozone formation, visibility impacts, and fuel consumption.
- Surface or stabilize roads and disturbed areas where soils are susceptible to wind erosion.
- Restrict surface-disturbing activities to periods when wind speeds are less than 25 miles per hour.
- Keep soil moist while loading into trucks.
- Keep soil loads below the freeboard of trucks.
- Minimize drop heights when loaders dump soil into trucks.
- Tighten gate seals on trucks.
- Cover truck loads before traveling on public roads.
- Cover construction materials and stockpiled soils if sources of fugitive dust.
- Train workers to handle construction materials and debris to reduce fugitive emissions.
- Centralize or consolidate gas processing facilities, liquids gathering systems (condensate and produced water), and water and/or fracturing liquids delivery systems to reduce volatile organic compound (VOC) and greenhouse gas (GHG) emissions from individual dehydration/separator units and to reduce vehicle emissions.
- Utilize dust suppression techniques on unpaved surfaces to prevent fugitive dust from vehicular traffic, equipment operations, and wind. Dust suppression techniques may include watering, applying BLM-pre-approved chemical suppressants, and adding gravel, particularly during the construction and well development phases.
- Initially apply at least six inches of compacted gravel to upgraded roads.
- Reduce trucking and service traffic through car pools, innovative work schedules, and centralized collection facilities in order to minimize fugitive dust and tailpipe emissions.
- Improve engine technology (Tier 2 or better) for diesel drill rig engines, as well as all mobile and non-road diesel engines, to reduce nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO) and VOC emissions.

- With regard to drill rig, hydraulic fracturing, and completion-related engines, comply with EPA Non-Road Tier II Emissions Standards in order to achieve compliance with short-term nitrogen dioxide (NO_2) air quality standards.
- Instead of diesel engines, utilize natural-gas-fueled engines to reduce NO_x emissions and reduce the formation of visibility-impairing compounds and ozone.
- Utilize ultra-low-sulfur diesel (e.g., in engines, compressors, construction equipment) to reduce emissions of PM and sulfates.
- Utilize closed-loop drilling systems to reduce VOC and methane emissions.
- Implement directional and horizontal drilling to reduce construction-related emissions and surface disturbance, thereby minimizing the road network, as well as dust and emissions from truck traffic and construction activities.
- Utilize "green completions" when feasible.
- Utilize "green workovers" to reduce VOC and methane emissions.
- Utilize enclosed tanks instead of open top tanks or pits to reduce VOC and GHG emissions.
- Confine fracturing fluids and condensates to lined pits or tanks.
- Utilize and maintain proper hatches, seals, and valves to minimize VOC emissions.
- Replace wet compressor seals with dry seals or use mechanical seals to reduce gas venting and decrease power requirements. Utilize a degassing recovery system for centrifugal compressors with wet seals.
- Utilize electricity or renewable power sources (e.g., solar panels) for wellhead compressors, pumps, and monitoring equipment to reduce truck trips, engine emissions, methane emissions from gas pneumatic pumps, and local fossil fuel combustion emissions.
- Utilize compressed air or nitrogen instead of natural gas for engine starting to reduce methane and VOCs emissions.
- Frequently replace rod packing to reduce emissions.
- Ideally, utilize flareless technology to reduce VOC and methane emissions; if not feasible, flaring the natural gas is preferable to venting.
- Improve capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units.
- Replace intermittent or continuously burning flare pilots with electrical sparking flare ignition devices.
- Reduce miscellaneous fugitive VOC emissions by: installing plunger lift systems with smart automated control systems to reduce methane emissions from well blowdowns; installing and maintaining low VOC-emitting seals, valves, and hatches on production equipment; initiating an equipment leak detection and repair program (e.g., including FLIR infrared cameras, grab samples, organic vapor detection devices, and/or visual inspection); installing or converting gas-operated pneumatic devices to electric, solar, or instrument (or compressed) air-driven devices/controllers; utilizing "low" or "no-bleed" gas-operated pneumatic devices/controllers; utilizing a closed-loop system or thermal combustion for gas-operated pneumatic pump emissions; installing or converting gas-operated pneumatic pumps to electric, solar, or instrument (or compressed) air-driven pumps; and installing vapor recovery units on truck loading/unloading operations at tanks.
- Optimize glycol circulation and install a flash tank separator to capture and recycle methane, thereby reducing VOCs and methane emissions.
- Install selective catalytic reduction systems to convert NO_x into nitrogen and water vapor.
- Improve capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion to reduce VOC, HAP, and GHG emissions.
- Utilize zero-emissions dehydrators or desiccants dehydrators to reduce VOC, HAP, and GHG emissions.
- Improve capture and control of produced water, crude oil, and condensate tank emissions to reduce VOC and GHG emissions.

- Utilize inert gases and pigs to purge pipelines rather than vent natural gas to the atmosphere.
- Install a dedicated vapor recovery system to recover gas from pipeline pigging operations.
- Where underground cast iron or unprotected steel distribution pipelines cannot be replaced with plastic pipe (e.g., bridge crossings), utilize flexible plastic insert liners.
- Replace burst plates with secondary relief valves to reduce emissions of methane, VOCs and HAPs.
- Install excess flow valves to minimize emissions.
- Utilize pressurized storage/transport of condensate to avoid venting methane, VOCs, and hazardous air pollutants (HAPs) to the atmosphere.
- During condensate loading, flare or recover the low-pressure gas in the natural gas liquids storage tank to avoid methane emissions.
- Utilize telemetry and automation of wellhead equipment to remotely control and monitor production thereby reducing vehicle traffic and associated emissions.
- Adhere to manufacturers' equipment operation and maintenance requirements.
- Track and record the utilization of hazardous chemicals.
- Regularly inspect and maintain wells and facilities, including pressure safety valves, excess flow valves, compressor stations, flowlines, gas processing plants and booster stations.
- Prior to reclamation, either adequately treat potentially hazardous materials to remain onsite or dispose of them at an approved disposal area.
- Reclaim disturbed areas as soon as possible.

Noise Management

- Apply best available control technology to minimize noise in order to comply with applicable local and state laws, statutes, regulations, standards and implementation plans.
- Implement and enforce the Colorado Oil and Gas Conservation Commission's (COGCC's) day and nighttime noise level standards.
- Manage the timing, pace, place, density, and intensity of leasing and development to manage noise.
- Centralize or consolidate well pads, facilities, and systems to reduce the amount of disturbance and overall area impacted by elevated noise levels.
- Design and locate disturbance activities to minimize noise impacts to wildlife, livestock and the public.
- Design wells, drill pads, compressors, roads, and facilities with auditory buffers or screens (topography, vegetation, distance).
- Design road networks and manage road use (through car pools, innovative work schedules, and centralized collection facilities) to minimize traffic and reduce noise.
- Prohibit the utilization of horns, bells, or other-noise-making devices other than for safety measures.
- Post and enforce "no jake brake zones."
- Reduce unnecessary vehicle idling to reduce noise.
- Monitor noise levels of drilling, cementing, and completion activities.
- Between a noise source and a receptor, construct engineered sound barriers (tightly-spaced wooden fences, concrete fences, earthen berms, walls, sheds).
- Utilize electric-powered equipment rather than diesel-powered equipment to reduce noise.
- Utilize drilling rigs with noise dampening equipment.
- Utilize pneumatic pumps that produce little or no noise.
- Utilize "green completions" when feasible to reduce noise levels.
- Utilize telemetry and automation of wellhead equipment to remotely control and monitor production thereby reducing vehicle traffic and associated noise.
- Install suitable mufflers on all internal combustion engines and certain compressor components.

- Decrease continuous noise levels by installing multi-cylinder pumps and hospital-grade mufflers, carefully selecting the placement of exhaust systems, enclosing engines, and installing additional muffler exhaust suppression.
- Install suitable mufflers or otherwise control exhaust noise from pump jacks and compressors in order to not exceed 49 dB at 30 feet from the source.
- Implement compressor and pump-jack noise abatement (hospital-grade mufflers, design retrofits on older equipment, equipment location, high-grade mufflers on exhausts, electric power rather than diesel, progressive cavity pumps or other quiet-running artificial lift equipment instead of conventional pump jacks, enclosures with insulation).
- Adhere to manufacturers' equipment operation and maintenance requirements to minimize noise.
- Install monitoring devices where compressors are built within ¼ mile of sensitive receptors.
- Apply buffers and abide by timing restrictions to reduce noise impacts on bald eagles, owls, raptors, sage grouse, and songbirds.
- Limit noise to less than 10 dB above ambient levels (typically 20 to 24 dB) from two hours before until two hours after sunrise at the perimeters of a sage grouse lek during the active lek season.
- Utilize noise shields when drilling during the lek, nesting, brood-rearing, and wintering seasons.

Soil Management

- Protect soils and native vegetation by minimizing their disturbance.
- Consider site-specific soil and vegetative characteristics and reclamation potential in a project design and layout. To reduce soil disturbance, consider mowing or brush beating of vegetation for parts of the well location or access road where excavation is not necessary.
- Consider topography and landforms when proposing surface disturbance. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Cluster surface disturbance (rights-of-way will be shared, structures and facilities will be grouped, etc.).
- Avoid disturbance in areas with erodible soils, steep slopes, fragile soil (areas with erodible soils and slopes greater than 30 percent), saline soil, rugged terrain, sparse vegetation, previous mass wasting and unstable geologic conditions prone to mass wasting. If unavoidable, create and get approval of a specific development plan (covering erosion control, GIS modeling, and engineered survey and design) to minimize erosion and maintain productivity.
- Avoid disturbance in areas with cut slope challenges, surface or subsurface water issues, inadequate fill material, or reclamation limitations (e.g., little to no topsoil, saline soils).
- Design and construct each oil and gas pad in the shape of a tear-drop to maximize interim reclamation and minimize bare soils. Cluster infrastructure appropriately on the pad to facilitate the smallest disturbance footprint.
- Post and enforce reduced speed limits to decrease erosion on unpaved roads. Restrict surface-disturbing activities to periods when wind speeds are less than 25 miles per hour.
- Drive only on established routes.
- Stabilize slopes with retaining structures (loose rock, gabions, reinforced concrete, piles, crib walls, soil nails, mechanically stabilized soil walls with facings of geotextile/welded wire/timber/concrete blocks, etc.), buttresses, brush layering and drainage.
- Where applicable, cover entrances to construction locations with gravel to prevent sediment and weed seeds from being tracked in and out.
- Follow the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (commonly referred to as "The Gold Book") when conducting surface-disturbing activities associated with the development of fluid minerals.
- Following the initial clearing of large trees and salvaging of certain vegetation, etc., include all growth medium present at a site in topsoil stripping, as indicated by color or texture. The stripping and storage depth may be specified during the onsite inspection. Salvage, segregate, and store all

stripped topsoil/growth medium in a stable manner that extends biological viability and mitigates erosion. Replace topsoil and all growth medium prior to seedbed preparation.

- Segregate and store topsoil separate from subsurface materials. Segregate thin or rocky topsoil from other topsoil.
- Stockpile, shred, and salvage with topsoil the cleared vegetation smaller than four inches in diameter. Scatter cleared vegetation larger than four inches in diameter over disturbed areas. Excessive vegetation larger than four inches in diameter may be removed from public land or shredded in place to be salvaged with topsoil. A wood cutting permit may be purchased from the BLM to remove material.
- Avoid surface disturbance near drainages and saline soils; however, if surface disturbance in sensitive areas is unavoidable, the disturbance will be minimized to the greatest extent practicable.
- Strip and salvage topsoil to a minimum depth of six inches at disturbance sites. An exception to this practice will be in disturbance areas infested with noxious weeds or other undesirable plants species, where deep burial of the infested topsoil may be preferable.
- To ensure successful vegetative growth, salvage topsoil during construction and re-spread to the greatest degree practical on cut slopes, fill slopes, and borrow ditches prior to seeding. Consider applying weed-free mulch or other erosion control measures to increase surface roughness and decrease erosion. Only utilize mulch when its potential benefits exceed its inherent risk of introducing undesirable plant species.
- Conduct stripping in stages to avoid topsoil compaction, beginning with a leading edge and moving in one consistent direction for subsequent loads.
- Prohibit the placement of soil and other material within floodplains.
- Prohibit the stripping or segregating of topsoil when saturated or frozen below the stripping depth unless a Winter Construction Plan is submitted and approved by the BLM Authorized Officer, thereby authorizing a Notice to Proceed with construction activities in frozen soils.
- Stockpile topsoil where no vehicle traffic will cross topsoil mounds. Protect stockpiles from wind and water erosion through the use of suitable weed-free mulch, weed-free seeding with native species appropriate to the site's native plant community, and other measures as necessary. Only utilize mulch when its potential benefits exceed its inherent risk of introducing undesirable plant species.
- Ensure stockpiles have appropriate heights and slopes to prevent wind and water erosion.
- As topographically appropriate (not on steep slopes or on minimally sized pads), windrow topsoil around the perimeter of the surface disturbance area to create a berm (no higher than five feet) that extends the viability of the topsoil, as well as limits and redirects storm water runoff. Windrow, segregate, and store topsoil along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Promptly seed topsoil berms with native species appropriate to the site's native plant community to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
- Compact fills to minimize subsidence or slope failure. If excess material is present after fill areas are at grade, stockpile the excess material at approved locations.
- Prohibit the placement of drill rigs, tanks, heater-treaters, and other production equipment on uncompacted fill material.
- Locate mud tanks, generators, mud storage, and fuel tanks in areas with a slight slope or utilize a suitable alternative, such as ditching, to provide surface drainage from the work area to the pit.
- Prohibit the utilization of snow or frozen soil in fill areas, dikes, or berms.
- With the exception of active work areas, stabilize (as approved by the BLM) disturbed soils that remain exposed, unprotected, or un-reclaimed for longer than one month. Soil stabilization may include seeding with native seed or application of a covering, such as mulch, matting or hydromulch. Utilize certified weed-free mulch, and apply it only to sites where its potential benefit outweighs its inherent risk of introducing undesirable plant species.

- Utilize erosion reduction techniques, such as silt fencing, diversion terraces, rip-rap, matting, biodegradable mulch/hydromulch/netting/soil stabilizers, sediment traps, and water bars.
- Implement mitigation measures for sedimentation, erosion, slippage, settlement, and subsidence on moderate to steep slopes that are disturbed.
- Design roads with gradients of eight percent or less (except for pitch grades no longer than 300 feet) to minimize erosion. Obtain approval for roads with gradients greater than eight percent but not exceeding 16 percent.
- Build and maintain all routes to BLM Manual Section 9113 standards for road shape and drainage features, BLM Manual Section 9112 standards for bridges and major culverts, or BLM Manual Section 9115 standards for primitive roads. For drainage crossings, size culverts for the 25-year storm event or greater without development of a static head at the pipe inlet. Install culverts of at least 24 inches in diameter and in the bottom and middle of the natural channel. Site-specific conditions may warrant the BLM to require designs for larger events (e.g., 75-to-100-year storm events). (Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year storm event per the U.S. Army Corps of Engineers [USACE].) On perennial and intermittent streams, design culverts to allow for passage of aquatic biota.
- In areas where all-weather access is necessary, construct and maintain routes per BLM Manual Section 9113 standards. Apply gravel or other appropriate surfacing material to reduce environmental resource damage and provide safe all-weather access on “soft” road sections, steep grades, erosive soils, and clay soils.
- Initially apply at least six inches of compacted gravel to upgraded roads.
- Utilize and consider upgrading existing roads when feasible to minimize disturbance. Consider following topographic contours when designing and constructing new roads to minimize soil erosion.
- Utilize specialized low-surface-impact equipment (wide- or balloon-tired vehicles, all-terrain vehicles) or helicopters for activities in off-road areas to protect fragile soils or other resource values.
- Confine or route drainage (with ditches, berms or waterbars above cut slopes) from disturbed areas in order to minimize erosion, particularly within 100 feet of a waterway. Route runoff, including that from roads, through a sediment-trapping mechanism (native vegetation, anchored weed-free bales, catchments, sediment fences) prior to discharging into a waterway.
- Extend culvert outlets at least one foot beyond the toe of any slope. Utilize culvert outlet erosion control techniques (e.g., properly sized rip-rap) to slow water velocity and prevent soil erosion.
- Regularly inspect and maintain roads (compaction, dust abatement, etc.) and road drainage features (ditches, drainage dips, ditch turnouts, culverts, inslopes, etc.).
- Halt construction activities when saturated soil conditions exist on access roads or on location, or when road rutting becomes deeper than six inches, until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations.
- Prohibit the placement of fill on a frozen foundation.
- Utilize closed-loop drilling systems or line reserve pits with impermeable liners (synthetic, bentonite, clay) to prevent soil contamination.
- Locate and construct reserve pits in cut material and outside of natural watercourses, avoiding areas with shallow groundwater or with porous soils over fractured bedrock aquifers. Install a leak detection system or utilize self-contained mud systems with drilling fluids, mud, and cuttings disposed at approved disposal areas.
- Return shot-hole cuttings to the hole, or submit an alternative plan to the BLM for approval.
- After cessation of drilling and completion operations, remove and properly dispose of any visible or measurable oil in the reserve pit.

- Design and construct secondary containment to hold 110% of the largest single tank capacity and to be impervious to oil, glycol, produced water or other toxic fluid for 72 hours. To prevent seepage of a spill, construct earthen berms with fine material and compact them.
- Design and construct secondary containment with a sturdy corrugated metal wall, heavy impervious poly liner, and gravel surface. Install small plastic hoppers at all loadout connections to catch drips and small leaks.
- On tanks with a capacity of ten barrels or greater, label or post signage with the name of the Operator; Operator's emergency contact telephone number; tank capacity; tank contents; and National Fire Protection Association (NFPA) label. For each container with a capacity of less than ten barrels, label its contents and ensure the appropriate NFPA label is also visible.
- Only utilize topsoil for reclamation, and not for fill or for pipe bedding/padding during backfilling.
- Prohibit the placement of topsoil when in a frozen or muddy condition, when the subgrade is excessively wet (i.e., equipment creates ruts greater than six inches), or when the condition may otherwise be detrimental to proper grading or proposed sodding or seeding.
- Utilize best available science and technology to protect natural resources from undue degradation during interim and final reclamation.
- Maintain healthy, biologically active topsoil through timely reclamation (temporary, interim, final), and by adequately segregating and stockpiling topsoil (designed to maximize surface area to minimize microbial impacts). Stockpiles remaining less than two years facilitate microbial survival and native seed viability.
- Reclaim disturbed areas as soon as possible. Promptly reapply topsoil, prepare a seedbed (to retain moisture and foster vegetative growth), apply weed-free native seed of species appropriate for the site's native plant community, and utilize weed-free mulch for erosion control and soil moisture retention at lower elevation sites. Utilize straw mulch only in areas where potential benefits outweigh the potential risks of introducing undesirable plant species.
- Regularly monitor and adaptively manage soil stabilization measures and revegetation.
- Test soil samples to determine reclamation potential.
- During reclamation, amend the topsoil as necessary to foster native vegetative growth, thereby providing soil stability.
- Store chemicals and hazardous materials in a manner that does not allow contact with soil or exposure to weather. Properly label all containers. Keep containers closed when not being utilized; provide secondary containment.
- Utilize bioremediation techniques (e.g., landspreading, in-situ biotreatment, landfarming, compostion) to treat contaminated soil. Optimize soil conditions (pH, nutrients, moisture, aeration) for microorganisms.
- With regard to contaminated soil, either treat or remove to an appropriate disposal site.

Water Resource Management

- Avoid the alteration of natural hydrologic function and condition in source areas for springs, seeps, wetlands, or other water bodies by relocating surface-disturbing activities.
- Avoid soil compaction or surface-disturbing activities in recharge areas that could impair the natural function of springs or seeps.
- Document the baseline characteristics of a stream channel or wetland/riparian area prior to disturbance.
- Direct overflow from water developments to a natural drainage in a manner that does not facilitate erosion or modify riparian habitats.
- Time construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g., buried pipelines, culverts) to avoid high-flow conditions. When construction disturbs a flowing stream, utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

- Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year event per USACE.
- Bore/bury pipelines installed beneath stream crossings a minimum depth of four feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, return the channel grade and substrate composition to pre-construction conditions. Apply the minimum width for rights-of-way where pipelines cross streams or riparian areas.
- Prohibit the permanent impairment of floodplain function as a result of surface-disturbing activities.
- Maintain appropriate vegetative/riparian buffers (at least 325 to 500 feet) around water features to slow runoff, trap sediments and protect water quality.
- Manage and manipulate invasive stands of brush and weeds on forest, range, and pasture land by mechanical, chemical, or biological means or by prescribed burning to improve watershed function and condition.
- Limit consumptive water use from Federal point source water rights on public lands that are not sustainable and/or would jeopardize discharge to streams, springs, seeps, wetlands, or downstream senior water rights.
- Utilize/establish off-stream watering facilities when possible (e.g., stock tanks, stock ponds, nose pumps). Where feasible, place grazing stock tanks and other watering facilities at least 400 meters (¼ mile) from riparian zones.
- Exclude livestock and vehicles from spring sources and riparian areas where on-site evaluation and/or monitoring data indicate degrading conditions or potential to degrade spring or riparian function.
- Implement range improvements in conformance with BLM Manual H 1740-2 and subsequent updates.
- Provide livestock with feed, salt, molasses and other supplements on uplands at least 400 meters (¼ mile) from riparian and wetland areas and on gently sloping land to encourage cattle to graze the uplands and move out of riparian areas. Locate supplementation sites at least 800 meters (½ mile) apart. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)
- Limit surface disturbance near drainage features and minimize surface disturbance on steep slopes, fragile soils, saline soils, and Mancos-shale-derived soils.
- Consider topography and landforms when proposing surface disturbance. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Cluster surface disturbance (rights-of-way will be shared, structures and facilities will be grouped, etc.).
- Follow the “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development” (commonly referred to as “The Gold Book”) when conducting surface-disturbing activities associated with the development of fluid minerals.
- Build and maintain all routes to BLM Manual Section 9113 standards for road shape and drainage features, BLM Manual Section 9112 standards for bridges and major culverts, or BLM Manual Section 9115 standards for primitive roads. For drainage crossings, size culverts for the 25-year storm event or greater without development of a static head at the pipe inlet. Install culverts of at least 24 inches in diameter and in the bottom and middle of the natural channel. Site-specific conditions may warrant the BLM to require designs for larger events (e.g., 75-to-100-year storm events). (Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year storm event per the U.S. Army Corps of Engineers [USACE].) On perennial and intermittent streams, design culverts to allow for passage of aquatic biota.
- When designing protective/mitigative measures, consider the changes that may occur in the watershed hydrology and sedimentation over the design life of the measure. Moreover, design and construct roads that are self-maintaining and consider using road surfacing, such as gravel, when year-long access may be necessary.
- Initially apply at least six inches of compacted gravel to upgraded roads.

- Avoid cutting the toe of cut slopes when grading roads or pulling ditches.
- Grade road surfaces only as often as necessary to maintain a stable running surface and to retain the original surface drainage.
- Design and construct surface pipelines at drainage crossings at an adequate height above possible flood levels. Bore/bury pipeline crossings below the surface deep enough to remain undisturbed by scour and fill processes typically associated with peak flows. Complete a hydraulic analysis during the pipeline design phase to avoid repeated maintenance of such a crossing and eliminate costly repairs and potential environmental degradation associated with pipeline breaks at stream crossings. Utilize horizontal directional boring techniques below perennial water bodies and/or wetland complexes when environmental circumstances allow.
- X-ray pipeline welds within 100 feet of a perennial stream to prevent leakage into the stream. Where pipelines cross streams that support Federal or State-listed threatened or endangered species or BLM-listed sensitive species, utilize additional safeguards (such as double-walled pipe, and remotely-actuated block or check valves) on both sides of the stream.
- Prior to surface disturbance at a pad, access road, or facility, have an approved surface drainage plan with minimal clearing and grading, protection of waterways, phased activities to limit soil exposure, immediate stabilization of exposed soils, protection of steep slopes and cuts, installation of perimeter control to filter sediments, advanced sediment settling controls, contractor certification and training, site waste control, and inspection and maintenance of adaptive BMPs (e.g., run-on/run-off controls, such as surface pocking or re-vegetation, ditches or berms, and basins). Install pre-construction drainage BMPs as appropriate.
- Minimize crossing streams and wetlands/riparian areas with vehicles, heavy machinery and facilities.
- When activity in streams, wetlands, or riparian areas is unavoidable, first employ best available technology, such as eco-matting, to reduce impacts. Then restore modified or damaged areas as close as practicable to natural conditions to protect banks and wetlands, as well as to re-establish native riparian vegetation.
- Subject to BLM approval, professionally engineer (design, construct, and maintain) stream crossings affecting perennial streams or streams supporting riparian habitat.
- Avoid the placement of roads or facilities immediately adjacent and/or parallel to streams. If unavoidable, design and construct crossings perpendicular to streams in straight sections of stable reaches to handle (at a minimum) the 25-year flood and allow aquatic organism passage, and have the route immediately exit the riparian buffer zone.
- Maintain to the greatest extent practicable natural flow rates and chemical and physical properties of surface and groundwater during work within stream channels, floodplains, and/or riparian areas.
- Utilize low-water crossings where an access road crosses a small drainage or intermittent stream not requiring a culvert. Dip the road to the original streambed elevation of the drainage, and prevent blockage or restriction of the existing channel. Stockpile material moved from the banks of the crossing nearby for later use in reclamation. Gravel, riprap, or concrete bottoms may be required.
- Conduct activities in wetlands and watercourses during low-flow or no-flow conditions (e.g., prior to spring runoff or during late summer/early fall) and in a manner consistent with BMPs for biological resources. Note that high flows occur during late summer/ early fall as a result of high-intensity convective thunderstorm events.
- Armor low-water stream crossings, place properly sized culverts, and span streams as appropriate to protect riparian areas.
- Place energy dissipaters (e.g., rock piles and logs) where necessary at the downstream end of ditch relief culverts to reduce erosion and sedimentation.
- Regularly inspect and maintain drainage features. Keep road inlet and outlet ditches, catchments, and culverts free of obstructions, clean dips and cross-drains, repair ditches, and mark the location of culvert inlets, particularly before and during spring runoff. Minimize routine machine-cleaning of

ditches during wet weather. Leave disturbed areas in a condition that provides drainage with no additional maintenance.

- Remove and reclaim temporary stream crossings immediately after utilization. Install cross-ditches at the ends of routes or rights-of-way to mitigate erosion/sedimentation from disturbed areas.
- Locate residue piles (e.g., sawdust, field chipping residue, disposal ponds) away from drainages where runoff may wash residue into water bodies or wetlands.
- Within 200 feet of a water body, prohibit activities using chemical processes (except for vegetation management) or pollutants. This includes equipment maintenance and the use of staging equipment for refueling. Prohibit the placement of staging areas for refueling, maintenance equipment, materials, operating supplies, and well borings in wetland/riparian areas.
- Confine or route drainage (with ditches, berms or waterbars above cut slopes) from disturbed areas in order to minimize erosion, particularly within 100 feet of a waterway. Route runoff, including that from roads, through a sediment-trapping mechanism (native vegetation, anchored weed-free bales, catchments, sediment fences) prior to discharging into a waterway.
- Avoid water courses when locating pipelines and flowlines; utilize road corridors wherever possible to minimize surface disturbance and provide better leak detection and access for installation and repair activities.
- Prohibit the pipeline construction from blocking, damming, or changing the natural course of a drainage.
- Test pipelines and flowlines for leak before backfilling trenches. Compact pipeline trenches during backfilling. Regrade cut-and-fill slopes to conform to adjacent terrain, and reclaim them.
- Avoid placing well pads near 100-year floodplains.
- Reduce the potential of water resource contamination where the environmental risk of a drilling fluid spill is heightened. Areas of heightened environmental risk include a ¼-mile buffer around the following: mapped alluvial, colluvial, and glacial deposits; springs and perennial water sources; Source Water Protection Areas, and Municipal Watersheds. In these areas, conduct the following:
    - utilize closed-loop drilling systems;
    - utilize gas-blocker additives during the cementing process;
    - store flowback and stimulation fluids in tanks on the well pad with secondary containment;
    - install secondary containment beneath and around crude oil, condensate and produced water storage tanks;
    - collect baseline water quality data from downstream fresh water sources prior to drilling or the storage of potentially harmful substances (Parameters to be analyzed will be determined on a site-specific basis. A list of parameters will be submitted to and approved by the BLM prior to sampling.);
    - identify potentially impacted Public Water Systems within 15 miles downstream;
    - develop and submit to the BLM an emergency spill and response program, which requires approval prior to surface-disturbing activities.
- Locate and construct reserve pits in cut material and outside of natural watercourses, avoiding areas with shallow groundwater or with porous soils over fractured bedrock aquifers. Install a leak detection system or utilize self-contained mud systems with drilling fluids, mud, and cuttings disposed at approved disposal areas.
- When constructing dikes for pits or impoundments with fill embankment, excavate a keyway or core trench to a minimum depth of two to three feet below the original ground level. Then construct the core of with compacted, water-impervious material.
- Locate mud tanks, generators, mud storage, and fuel tanks in areas with a slight slope or utilize a suitable alternative, such as ditching, to provide surface drainage from the work area to the pit.
- Within portions of municipal watersheds and source water protection areas available for fluid minerals development, develop and implement a watershed protection plan that includes characterization and monitoring of baseline hydrologic/hydrogeologic conditions (such as, but not

limited to, water quality, water quantity, groundwater flow patterns, connectivity between geologic formations, and communication between surface and ground water). Collaborate with all watershed stakeholders regarding the development and implementation of the watershed protection plan.

- When conducting oil and gas drilling operations within municipal watersheds, source water protection areas, or locally important fresh water aquifers, utilize methods and materials to prevent the degradation of underlying groundwater. This may include practices such as surface and intermediate casing through potential fresh water zones, gas blocker additives in cement, green fracturing fluids, and closed-loop drilling. Document the utilization of "green" fracturing fluids in the form of Material Safety Data Sheets (MSDSs) to be reviewed by the operator for compliance prior to use. Keep the MSDSs on-site at all times such chemicals are present.
- Utilize anti-backflow devices when drafting fresh water from streams, springs, reservoirs and wells.
- Prohibit the utilization of hazardous substances in drilling, testing, or completion operations, as well as in the reserve or cuttings pit. Confine fluids to pits or tanks. Pits that may contain liquids will be lined to protect groundwater. Liners will be maintained in good condition, with no tears or holes, until they are removed when the reserve pit is closed.
- Substitute less toxic, yet equally effective products, for conventional drilling products.
- Design and construct pits to eliminate drainage into them. Maintain fluid levels at least two feet below the lowest point of containment.
- Subject to BLM approval, dispose of produced water by subsurface injection, pits, surface discharge into channels or impoundments or other methods, including beneficial use, in accordance with the requirements of Onshore Order No. 7, Disposal of Produced Water, and other Federal and State regulations.
- At pits, water impoundments, and surface discharges that present a potential hazards to humans, livestock, wildlife and other resources, install appropriate mitigation, such as fencing, netting, caging, or covers.
- Prohibit shot-hole seismic testing near aquatic habitats.
- Dispose of spoil material from clearing, grubbing, and channel excavation in a manner that will not interfere with the function of the channel and in accordance with all local, state, and federal laws and regulations. Prohibit the casting of fill material over hilltops and into drainages.
- Locate stockpiles outside of active floodplains.
- Prohibit concentrated flows of surface water (natural drainage ways, graded swales, downspouts) on the face of cut or fill slopes.
- Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet conditions.
- With regard to the discharge of surface and ground water to surface drainages, comply with the Federal Water Pollution Control Act (as amended through P.L. 107–303, November 27, 2002), obtain a pre-approval by the BLM, and meet the following criteria:
    - discharge operations will not negatively impact downstream beneficial uses;
    - discharge soil/water interactions will not facilitate the mobilization of water quality contaminants (e.g., salt, selenium [typically associated with Mancos-shale-derived soils], sediment, metals) above natural rates in surface and/or ground water;
    - discharge will be limited to well-defined major channels (away from major erosional features), to reduce the potential of discharged water dissolving and transporting salts from the stream channel and to reduce the concentration of salts in alluvium;
    - discharge will be limited to a volume no greater than the naturally occurring mean annual peak flow (which is roughly equivalent to a two-year, 24-hour storm peak) conveyed by the natural channel under anticipated conditions;
    - discharge points will be located in stable channels or reservoirs away from any downstream head-cuts or other major erosional features as determined by the BLM (The outfall design

may include discharge aprons and downstream stabilization of channel side slopes to prevent erosion and provide energy dissipation.);
  - subject to BLM approval, establish and monitor water-quality thresholds for both surface and ground water during discharge operations and cease operations if thresholds are exceeded;
  - monitor surface- and ground-water quantity and quality during discharge operations and for at least two years following the cessation of discharge operations (The monitoring locations will be subject to BLM approval.).
- Prohibit the utilization of subsurface explosives and vibrosis buggies within 0.25 miles of all spring sources and perennial streams.

Riparian and Wetland Habitats Management

- Minimize surface disturbance in areas prone to flooding and near wetland edges, lowland bottoms, drainages, open water, wetlands, riparian areas, and sensitive habitats.
- Establish staging, refueling, and storage areas outside of areas prone to flooding, wetland edges, lowland bottoms, drainages, open water, wetlands, riparian areas, and sensitive habitats.
- Mitigate activities that degrade wetlands or riparian areas.
- Avoid the alteration of natural hydrologic function and condition in source areas for springs, seeps, wetlands, or other water bodies by relocating surface-disturbing activities.
- Conduct activities in wetlands and watercourses during low-flow or no-flow conditions (e.g., prior to spring runoff or during late summer/early fall) and in a manner consistent with BMPs for biological resources. Note that high flows occur during late summer/ early fall as a result of high-intensity convective thunderstorm events. Particularly in cold-water systems, maintain a minimum flow.
- Avoid soil compaction or surface-disturbing activities in recharge areas that could impair the natural function of springs or seeps.
- Manage vegetation in riparian areas to provide wildlife habitat, adequate shade, sediment control, bank stability, and recruitment of wood into stream channels.
- Restrict disturbance of riparian habitat within ½ mile of owl and bald eagle habitat.
- Phase the size and timing of vegetation removal treatments within riparian areas to reduce soil and water temperatures, maintain bank and soil stability, and retain adequate wildlife habitat for cover and nesting.
- Phase the size and timing of vegetation removal treatments on uplands immediately adjacent to riparian areas, and buffer treatment boundaries away from riparian areas to reduce sedimentation and erosion in riparian zones. Allow for at least one year between vegetation removal treatments in uplands and in riparian/wetland areas.
- Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States.
- Maintain appropriate vegetative/riparian buffers (at least 325 to 500 feet) around water features to slow runoff, trap sediments and protect water quality.
- Document the baseline characteristics of a stream channel or wetland/riparian area prior to disturbance.
- Prohibit disturbance in areas adjacent to streams containing Colorado River cutthroat trout.
- Avoid riparian areas and wetlands when designing and constructing roads and trails (off-highway vehicle, horse, bicycle, hiking). If unavoidable, the roads and trails will be designed and constructed in accordance with “Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments”.
- Direct overflow from water developments to a natural drainage in a manner that does not facilitate erosion or modify riparian habitats.

- Utilize low-stress methods of stockmanship (e.g., herding, movements between pastures) to encourage cattle grazing away from riparian areas. Turn cattle out away from riparian areas when entering new pastures or allotments. Also guide cattle to appropriate bedding areas.
- Utilize/establish off-stream watering facilities when possible (e.g., stock tanks, stock ponds, nose pumps). Where feasible, place grazing stock tanks and other watering facilities at least 400 meters (¼ mile) from riparian zones.
- Cull individually identified cattle from the herd that congregate or preferentially graze a riparian area for extended periods of time.
- Avoid late summer or early fall grazing in areas with declining willow populations. If grazing during these time periods must occur, allow for at least one full year between grazing rotations.
- Utilize riparian pastures as appropriate to manage grazing activities in riparian areas by varying the timing, duration, and frequency of riparian pasture grazing. Actively move cattle to and from riparian pastures or pastures containing riparian habitat. Do not allow cattle to drift between pastures.
- Exclude livestock and vehicles from spring sources and riparian areas where on-site evaluation and/or monitoring data indicate degrading conditions or potential to degrade spring or riparian function.
- Prohibit the placement of fences on the immediate edge of riparian areas. Place fences away from riparian/wetland areas to decrease impacts of trailing along fences.
- Provide livestock with feed, salt, molasses and other supplements on uplands at least 400 meters (¼ mile) from riparian and wetland areas and on gently sloping land to encourage cattle to graze the uplands and move out of riparian areas. Locate supplementation sites at least 800 meters (½ mile) apart. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)
- Minimize crossing streams and wetlands/riparian areas with vehicles, heavy machinery and facilities.
- Install bridges and culverts in accordance with BLM Manual Section 9112.
- Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year event per the USACE.
- Bore/bury pipeline crossings below the surface deep enough to remain undisturbed by scour and fill processes typically associated with peak flows. Apply the minimum width for rights-of-way where pipelines cross streams or riparian areas.
- When activity in streams, wetlands, or riparian areas is unavoidable, first employ best available technology, such as eco-matting, to reduce impacts. Then restore modified or damaged areas as close as practicable to natural conditions to protect banks and wetlands, as well as to re-establish native riparian vegetation.
- Subject to BLM approval, professionally engineer (design, construct, and maintain) stream crossings affecting perennial streams or streams supporting riparian habitat.
- Avoid the placement of roads or facilities immediately adjacent and/or parallel to streams. If unavoidable, design and construct crossings perpendicular to streams in straight sections of stable reaches to handle (at a minimum) the 25-year flood and allow aquatic organism passage, and have the route immediately exit the riparian buffer zone.
- Avoid stripping riparian canopy or stream bank vegetation. Crush or shear streamside woody vegetation rather than completely removing it.
- Segregate hydric topsoil from spoil.
- Maintain to the greatest extent practicable natural flow rates and chemical and physical properties of surface and groundwater during work within stream channels, floodplains, and/or riparian areas.
- Armor low-water stream crossings, place properly sized culverts, and span streams as appropriate to protect riparian areas.

- Within 200 feet of a water body, prohibit activities using chemical processes (except for vegetation management) or pollutants. This includes equipment maintenance and the use of staging equipment for refueling. Prohibit the placement of staging areas for refueling, maintenance equipment, materials, operating supplies, and well borings in wetland/riparian areas.
- On stream banks (lotic areas), maintain a minimum six-inch stubble height for the key specie(s) of the riparian area by the end of October or the winter grazing rotation. If the riparian system stability is dependent upon key riparian grasses and forbs, maintain an adequate stubble height to dissipate energy from spring runoff.
- In wet meadows (lentic areas), maintain a minimum four-inch stubble height for the key specie(s) of the riparian area by the end of October.
- Avoid placing well pads near 100-year floodplains.
- Prohibit shot-hole seismic testing near aquatic habitats.
- Locate residue piles (e.g., sawdust, field chipping residue, disposal ponds) away from drainages where runoff may wash residue into water bodies or wetlands.
- Relocate existing roads away from riparian areas as feasible during the requested permitting or authorization of routes. Reclaim abandoned portions of relocated roads back to natural conditions. Recontour routes to natural slopes as feasible, rip compacted soils (except for in close proximity to desirable trees), and seed disturbed areas.
- Regularly monitor seeps and springs near disturbance areas.
- Regularly monitor erosion, degradation and riparian health.

Reclamation

The objectives of temporary or interim reclamation are to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize loss of habitat, forage, and visual resources.

The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, standards will be enforced to meet objectives for site stability, visual quality, hydrological function, and vegetative productivity.

- Maintain healthy, biologically active topsoil through timely reclamation (temporary, interim, final), and by adequately segregating and stockpiling topsoil (designed to maximize surface area to minimize microbial impacts). Stockpiles remaining less than two years facilitate microbial survival and native seed viability.
- As topographically appropriate (not on steep slopes or on minimally sized pads), windrow topsoil around the perimeter of the surface disturbance area to create a berm (no higher than five feet) that extends the viability of the topsoil, as well as limits and redirects storm water runoff. Topsoil will also be windrowed, segregated, and stored along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Topsoil berms will be promptly seeded with native species to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
- Implement dust abatement measures during reclamation.
- Reclaim disturbed areas as soon as possible. Promptly reapply topsoil, prepare a seedbed (to retain moisture and foster vegetative growth), apply native weed-free seed of species appropriate for the site's native plant community, and utilize weed-free mulch for erosion control and soil moisture retention at lower elevation sites. Utilize straw mulch only in areas where potential benefits outweigh the potential risks of introducing undesirable plant species.

- Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site-specific soil evaluation, including depth, chemical and physical characteristics. Identify stockpiles with appropriate signage.
- Seed soils to be stored more than one growing season with native weed-free seed of species appropriate for the site's native plant community.
- Protect salvaged soil from erosion, degradation and contamination.
- Prior to reclamation, either adequately treat potentially hazardous materials to remain onsite or dispose of them at an approved disposal area.
- Only utilize topsoil for reclamation, and not for fill or for pipe bedding/padding during backfilling.
- Recontour cut-and-fill slopes to the approximate original contour or consistent with the adjacent topography to maintain the approximate drainage pattern, profile, and dimension of nearby stable naturally functioning drainages.
- Thin and feather existing vegetation in areas where dense vegetation has been removed, and salvage/redistribute cleared trees, debris, and rock over recontoured cut-and-fill slopes or along linear features to: help mitigate the contrast of recontoured slopes; emulate the color, texture, and form of the natural landscape; and foster microclimates that encourage vegetative growth. Material should be placed so that it appears to be naturally deposited.
- Reduce compaction (e.g., ripping) prior to redistributing topsoil.
- Prohibit the placement of topsoil when in a frozen or muddy condition, when the subgrade is excessively wet (i.e., equipment creates ruts greater than six inches), or when the condition may otherwise be detrimental to proper grading or proposed sodding or seeding.
- Test soil samples to determine reclamation potential.
- During reclamation, amend the topsoil as necessary to foster vegetative growth, thereby providing soil stability.
- Redistribute soil materials in a manner that resembles the predisturbance soil profile.
- Prepare a seedbed to provide suitable surface and subsurface physical, chemical and biological properties to support the long-term establishment and viability of the desired plant community.
- Apply BLM-approved native weed-free seed of species appropriate for the site's native plant community.
- Protect the seed and seedling establishment by managing weeds, restricting livestock and wildlife activities through grazing management or fencing/cattleguards/gates, and restricting human activities.
- Minimize erosion and sedimentation on or adjacent to the reclaimed area by: minimizing surface disturbance; minimizing the duration of bare soils; surface roughening for moisture retention; applying mulch; revegetating; constructing/installing water bars/dips, mats/blankets, check dams, sediment basins, silt fences, etc.; and/or phasing reclamation.
- Regularly monitor reclamation success utilizing standard quantitative vegetation sampling protocols, with an adequate sample size to accurately assess plant cover by species across the site.
- Remove temporary BMPs once site stabilization and reclamation efforts have been deemed successful by the BLM.
- Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Realize that seeding or planting native plants may need to be repeated until deemed successful.
- Develop vegetation objectives that include desired plant composition, canopy and ground cover prior to conducting vegetation treatments or revegetation efforts.
- Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).
- Close and rehabilitate roads quickly when they are no longer needed.
- Build roads to the appropriate standard, no higher than necessary for use and safety, and utilize primitive or two-track roads rather than constructing new roads where feasible.

- Pipelines (and electrical power lines when possible) shall be placed within road corridors to minimize disturbance.
- Minimize disturbance to soil and native vegetation as much as possible.
- Stockpile topsoil for use in final reclamation. Topsoil shall be stored separately from other fill materials.
- When timely natural regeneration of the native plant community is not likely to occur, carefully select species that will not compete with or exclude native botanical resources for revegetation efforts. Bare sites shall be seeded as soon as appropriate to prevent establishment of undesirable plant species.
- Utilize appropriate sagebrush species/subspecies and important understory plants relative to site potential in seedings.
- Ensure that seed used for revegetation as well as straw and hay bales used for erosion control are certified free of noxious weeds.
- Monitor the long-term success of revegetation efforts (according to the Reclamation Plan or Vegetation Objectives of the vegetation treatment plan) to ensure successful establishment of desired species and detect any noxious weed infestations. If revegetation is unsuccessful, continue efforts to establish desired species in disturbed sites.
- In Salt Desert Shrub communities with biological soil crusts, require reclamation that includes, but is not limited to: broadcasting bacterial inoculants, planting native grass, forbs, and shrub seedlings, and installing exclosure fences.
- Road and pipeline reclamation, including seedbed prep and seeding of temporarily disturbed areas will be completed within 30 days following completion of construction.
- In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plats, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
- Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines, and of topsoil piles and berms, shall be completed within 30 days following completion of construction. Any such area on which construction is completed prior to December 1 shall be seeded during the remainder of the early winter season instead of during the following spring, unless BLM approves otherwise based on weather. If road or pipeline construction occurs discontinuously (e.g., new segments installed as new pads are built) or continuously but with a total duration greater than 30 days, reclamation, including seeding, shall be phased such that no portion of the temporarily disturbed area remains in an unreclaimed condition for longer than 30 days. BLM may authorize deviation from this requirement based on the season and the amount of work remaining on the entirety of the road or pipeline when the 30-day period has expired.
- All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability.
- If requested by the project lead NRS for a specific pad or group of pads, the operator shall contact the NRS by telephone or email approximately 72 hours before reclamation and reseeding begin. This will allow the NRS to schedule a pre-reclamation field visit if needed to ensure that all parties are in agreement and provide time for adjustments to the plan before work is initiated.
- For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed

preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

- Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding, and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.
- Interim reclamation includes recontouring and revegetating the entire portion of the disturbed area except that part of the well pad needed for production activities.
- It will be completed within six months following completion of the last well planned for the pad or after a year has passed with no new wells drilled on the pad. All areas unnecessary to production activities will be revegetated, including the area within the remaining rig anchors. In special cases, an exception to this will be requested.
- Before interim reclamation is scheduled, the operator will meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to it.
- All parts of the area unnecessary for long-term operations will be reshaped to blend with natural topography, covered evenly with topsoil and a seedbed prepared.
- For cut-and-fill slopes, initial reclamation will typically consist of moving fill material back into cuts, back-filling and reshaping to achieve the configuration specified in the reclamation plan. Compacted areas will be well ripped in two passes at perpendicular directions. In fragile or loose soils, compaction techniques such as tread-walking may be necessary to prevent high erosion hazard. Topographic contours will be reshaped to blend with natural topography. These may include berms and swales to manage water drainage, support revegetation, mitigate visual impacts and maximize natural appearances.
- Seedbed Preparation. Good seedbed preparation is key to soil stabilization, moisture infiltration, and improving the chances for revegetation success.
- Following contouring, backfilled or ripped surfaces will be covered evenly with topsoil.
- Within 24 hours of broadcast seeding, the spread topsoil will be roughened by a method such as pitting, raking or harrowing before seeding, to break up any crust that has formed and ensure good seed-to-soil contact.
- To control erosion and enhance vegetative establishment on slopes steeper than 3:1, or to create a more natural looking landscape in areas of visual sensitivity, or if directed by the BLM, the operator shall implement measures following seedbed preparation (when broadcast-seeding or hydroseeding is to be used) to create small depressions to enhance capture of moisture and establishment of seeded species. Depressions shall be no deeper than 1 to 2 inches and shall not result in piles or mounds of displaced soil. Excavated depressions shall not be used unless approved by the BLM for the purpose of erosion control on slopes. Where excavated depressions are approved by the BLM, the excavated soil shall be placed only on the downslope side of the depression.
- Requests to use soil amendments, including fertilizer and soil conditioners, will be submitted to the BLM for approval. Submittal will include basic information on the amendment and the purpose of its use.
- If directed by the BLM, the operator shall conduct soil testing prior to reseeding to identify if and what type of soil amendments may be required to enhance revegetation success. At a minimum, the soil tests shall include texture, pH, organic matter, sodium adsorption ratio (SAR), cation exchange capacity (CEC), alkalinity/salinity, and basic nutrients (nitrogen, phosphorus, potassium [NPK]). Depending on the outcome of the soil testing, the BLM may require the operator to submit a plan for soil amendment. Any requests to use soil amendments not directed by the BLM shall be submitted to the CRVFO for approval.

- Seed Mixes. Seed mixes will typically consist of native, early-succession species, or species with the ability to establish quickly in disturbed soil areas. Non-native species shall not be used, except under rare circumstances and with prior written approval from the BLM.
- Seed mix composition will be calculated based on the number of Pure Live Seed per pound rather than percentage by weight. Seeding rate in pounds per acre will be based on the total number of Pure Live Seeds per square foot.
- Weed free seed will be used. It will contain no prohibited or restricted noxious weed seeds and no more than 0.5 percent by weight of any other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. To maintain quality, purity, germination, and yield, only tested, certified seed for the current year, with a minimum germination rate of 80 percent and a minimum purity of 90 percent will be used unless otherwise approved by BLM in advance of purchase. Seed shall be viability-tested in accordance with State law(s) and within nine months before purchase.
- Seed mixes for temporary use must contain only native species, except under rare circumstance and with prior written approval from the BLM.
- For private surfaces, the operator shall use a BLM-approved native seed mix unless specified otherwise by the private landowner.
- Seed tags or other official documentation of the seed mix will be supplied to the BLM for approval at least 14 days before the date of proposed seeding. Seed that does not meet the above criteria will not be applied to public lands. A Sundry Notice describing the completed work, the weed-free certification, and the seed tag(s) will be submitted BLM within 30 days after seeding.
- Seeding Procedures:
- Seeding will be conducted no more than 24 hours following completion of final seedbed preparation (see Seedbed Prep).
- Where practical, seed will be planted by drill-seeding to a depth of 0.25 to 0.5 inch along the contour of the site. Drill seeding will be followed by culti-paction to enhance seed-to-soil contact and prevent losses of both. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover. An exception to these seeding requirements shall be made for seeding of sagebrush. Sagebrush seeding shall occur prior to winter snowfall, or on top of snow. Sagebrush may be sown either by broadcast seeding, or, if not on snowpack, by placing the seed in the fluffy seed box of a seed drill, with the drop tube left open to allow seed to fall out on the ground surface.
- Hydro-seeding and hydro-mulching may be used in temporary seeding or in areas where drill-seeding or broadcast-seeding/ raking are impracticable. Hydro-seeding and hydro-mulching must be conducted in two separate applications to ensure adequate seed-to-soil contact.
- If interim revegetation is unsuccessful, reseedings will be repeated annually until satisfactory vegetative cover has been achieved. Requirements for reseeding of temporary areas will be considered on a case-by-case basis. Seeding will be considered successful when the site is protected from erosion and revegetated with a vigorous, self-sustaining, and diverse cover of native (or otherwise approved) plant species. BLM shall not require reseeding during periods that have proven less than optimal.
- Mulch shall be applied within 24 hours following completion of seeding in project areas within pinyon-juniper, sagebrush shrubland, and/or salt desert shrub habitat types. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil. Mulch shall not be used within mountain shrub or spruce-fir forest habitat types, unless requested or approved by the BLM.
- Hydro-mulching may be used in areas of interim reclamation where crimping is impractical, in areas of interim reclamation that were hydroseeded, and in areas of temporary seeding regardless of seeding method.

- Mulch will not be applied in areas where erosion potential necessitates use of a biodegradable erosion-control blanket (straw matting).
- Cut and fill slopes will be protected against erosion by contour grading, microbasins or other measures approved by the BLM. Well anchored BMPs such as biodegradable matting, weed-free bales or wattles may also be used on cut-and-fill slopes and along drainages to protect against soil movement.
- The reclaimed pad will be protected from disturbance by a fence to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. Seeded species will be considered firmly established when perennial grass and forb species are at least 80% cover of that of the surrounding or reference area.
- Monitoring. Because weed and reclamation management activities are components of a long-term process, monitoring and reporting are integral to and long-term commitment to land health.
- The operator shall conduct annual monitoring surveys of all sites categorized as "operator reclamation in progress" and shall submit an annual monitoring report of these sites, including a description of the monitoring methods used, to the BLM by December 31 of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM
- Monitoring shall be performed using a standard quantitative vegetation sampling protocol, with a sampling pattern and sufficient to represent the vegetative diversity across the site. Sampling shall include percent canopy cover by plant species, as well as percent bare ground.
- All sites considered as "operator reclamation in progress" will be routinely monitored for reclamation success. Reports will be submitted to the BLM by December 1 of each year. Annual reports will include whether accomplishment of objectives appears likely and of not, what corrective actions are proposed.
- All sites will be routinely monitored for the presence of noxious weeds or other undesirable plant species as set forth in the joint BLM/US Forest Service Noxious and Invasive Weed Management Plan for Oil and Gas Operators. Pesticide Use Proposals will be approved by the BLM before application of herbicides. Annual weed monitoring reports shall be submitted to the BLM by December 1. They will include weed species found (listed by common names), total acres infested with weeds, total acres treated, treatment methods, and total pounds of active ingredient of pesticides applied. All Noxious Weed Inventory and Pesticide Application records for that year will be included with the report. Weed reports shall include BLM Pesticide Application Records (PARs) for all weed treatments, as well as GPS data with data fields for all weed treatments sufficient to meet the requirements of the BLM NISIMS database.
- To the extent practical, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. Cleared trees and rocks may be salvaged for redistribution over reshaped cut-and-fill slopes or along linear features.
- Above-ground facilities will be painted a non-reflective natural color selected to minimize contrast with adjacent vegetation or rock outcrops. Colors may be specified by the BLM on a project-by-project basis.
- Adaptive management techniques may be applied before or after construction to mitigate straight-line visual contrast effects of pad margins, cut and fill slopes, pipeline alignments or other cleared vegetation. This could include additional tree removal along contrasting edges, to create irregularly shaped openings or more natural-looking mosaic patterns, or treating surfaces to mitigate visual contrasts in color or surface texture.

- Trees and vegetation will be left along the edge of surface disturbance whenever feasible to provide screening.
- To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, debris, and rock over recontoured cut and fill slopes.
- To reduce the view of project facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (such as ridgelines and hilltops).
- Project facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum recontouring of cut and fill slopes.
- All long-term above ground structures will be painted in a non-reflective finish to blend with the environment. Colors will be selected (from the BLM "Standard Environmental Colors") in the field at the proposed project location, considering viewer's likely observation points and the time of year with the greatest number of viewers. Selected colors will be one to shades darker than those naturally occurring in the background landscape.
- Projects should be located to take advantage of existing vertical features, such as landforms or existing stands of vegetation to provide visually screening.
- Projects should not be located in visually exposed locations, such as ridgelines and hilltops.
- Projects should be located in areas that will minimize the amount of cut-and-fill needed to meet natural grade.
- Linear disturbances (roads and pipelines) should follow the natural contours of the landscape as much as possible.
- Project design should take into consideration any existing vegetation surrounding the project that can be used for visual screening. Care should be taken to preserve the integrity of the vegetation and the vegetation should remain standing and undamaged when the cut-and-fill slopes are recontoured.
- Thinning and feathering of existing vegetation may also be used in areas where clearing within dense vegetation is required. Thinning and feathering will reduce the hard line between new construction and existing vegetation and will emulate the forms of natural clearings.
- Project facilities should be placed to maximize recontouring of the cut-and-fill slopes and interim reclamation. Facilities should be oriented in the direction that is least visually obtrusive and should be clustered to reduce the overall impact and the area that will need to be visually mitigated. Facilities should be located away from the cut-and-fill slopes and, if possible, near a road to maximize the total surface area that can be reclaimed.
- Cut-and-fill slopes should be recontoured to the approximate original contour or consistent with the adjacent topography so that the reclaimed landscape features blend into the natural surroundings.
- Berms may be utilized to provide visual screening, but should be used only when it makes sense when viewing the surrounding natural environment and should blend with the adjacent topography.
- Cleared vegetation and rocks salvaged during construction should be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features to emulate the color and texture closer to that of the natural landscape and to help create microclimates to encourage vegetation growth. The material should be placed so that it appears to be naturally deposited.

Site Stabilization, Reclamation and Monitoring

- During interim reclamation contour land forming will be used to create a visual barrier to the permanent structures location on the site.
- Re-topsoil and revegetate access road cut & fill slopes, backslopes and road shoulders, and borrow ditches. Also, revegetating the travel surface of surfaced roads and turnarounds, where practical. With low traffic roads, this will result in a hardpan, two-track road that is stable and requires less maintenance.

- Reclamation plans would contain specifics such as elevation, pre-disturbance plant community species and habitat type, soil type, soil testing, topsoil management, seed mix and/or container stock species, mulch, site preparation, soil amendments including fertilizer, mycorrhizal and/or bacterial inoculum, organic material and/or carbon amendments, etc.
- Require that all mulch used in reclamation activities be certified weed free.

Special Status Species – General

- The CRVFO will consult agency species management plans and other conservation plans as appropriate to guide management and devise mitigation measures when needed. Examples of these plans include, but are not limited, to the Colorado Wildlife Action Plan, Colorado Sagebrush: A Conservation Assessment and Strategy, National, range-wide, statewide and local working group conservation plans for Gunnison and greater sage grouse, Sharing the land with pinyon-juniper birds, Birds in a sagebrush sea: managing sagebrush habitats for bird communities, North American Landbird Conservation Plan, North American Waterbird conservation Plan, National and Colorado Partners in flight Bird Conservation Plans, Colorado Gunnison's and White-tailed Prairie Dog Conservation Strategy and Recovery plans for federally listed species, and Colorado Rare Plant Conservation Initiative's Recommended Best Management Practices for Plants of Concern.
- Lessees will be notified when a lease parcel contains potential habitat for threatened, endangered, proposed, candidate or BLM sensitive plants, fish and wildlife.
- Limit flaring operations when well pads are within 100 m of occupied special status species habitat.
- Surveys for raptor nests, sensitive plant and animal species and cultural resources will be conducted prior to construction activities following BLM survey standards. Survey results will be submitted to the BLM for analysis and recommendations before project approval.

Special Status Species – Plants

- Prior to approving any ground-disturbing activities, suitable habitat for special status plants will be identified based on existing plant location records, soil or geological mapping, USFWS Section 7 range maps, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work. Surveys will be performed in compliance with the latest CRVFO survey protocols.
- For surface-disturbing activities with the potential to affect special status species, surveys in core habitat for T&E species will generally extend at least 200 meters (656 feet) beyond the edge of disturbance and at least 100 meters (328 feet) beyond the edge of disturbance outside of core habitat. For linear features such as roads and pipelines, surveys will extend at least 100 meters (328 feet) beyond the edge of the proposed ground disturbance along each side of the right of way. If special status plants are found within the survey area, the contractor will endeavor to determine the complete areal extent of the occurrence and the approximate number of individuals within the occurrence.
- For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of current or historically occupied plant habitat wherever possible and where geography and other resource concerns allow. (Historically occupied habitat is habitat where plants were known to occur within the past 15-20 years and a viable seedbank may remain). Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.
- For BLM sensitive species surface-disturbing activities will be avoided within 100 meters of occupied plant habitat wherever possible and where geography and other resource concerns allow.

Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

- Where surface-disturbing activities are allowed within 100 meters of occupied habitat for special status plant species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.
- Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but it is unlikely that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).
- Transplantation of potentially affected plants will not be used as a rationale to defend a “not likely to adversely affect” or a “no effect” determination for listed plant species.
- Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).
- Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Reclamation seeding within special status plant habitat should consist of native species only. If possible, seeds will be from locally collected genotypes. Realize that seeding or planting native plants may need to be repeated until deemed successful by the Authorized Officer.
- Rigorously monitor and control all infestations of noxious weeds and other non-native invasive plant species in and adjacent to occupied habitat for special status plants.
- Control noxious weeds using integrated techniques. Limit chemical control in areas with special plant species to avoid damage to non-target species. Mechanical or chemical control in and near special status plant habitat shall only be implemented by personnel familiar with the rare plants.
- Broadcast spraying of herbicides, either by ground or aerial methods, shall comply with the Conservation Measures from the Biological Assessment for the Vegetation EIS. The conservation measures are specific to the herbicide to be used, the desired mode of application, and the conditions of the site. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to listed or proposed plant species in the vicinity. Additional precautions during spot treatment of vegetation within these buffers shall be employed to avoid pesticide drift in those cases.
- Prevent plumes of dust and particulate matter from impacting special status plants. While new roads should not be built within 200 meters of special status plants, preexisting roads with an expected increase in traffic should be graveled (or paved) in these areas. The operator is encouraged to apply water for dust abatement to such areas during the flowering period. Magnesium chloride or other additives should not be used in special status plant habitat.
- The use of deicers and dust suppressants, other than water, within 100 meters of roadside occurrences of special status plant species will require prior approval from the BLM.
- Prohibit collection of rare plants or plant parts, except as permitted by the BLM Authorized Officer for scientific research.

- When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.
- Surface disturbances (including wildfire and prescribed fires) within lower-elevation salt desert shrub and pinyon-juniper woodland habitat should review the need for cheatgrass control and/or restoration seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.
- Protection of T & E plant occurrences from use of non-native seed with a 1 km restriction buffer around TES plant occurrences where native seed is required
- Limit flaring operations when well pads are within 100m of occupied special status plant habitat.
- Surface disturbances (including wildfire and prescribed fires) within potential habitat for listed or proposed plant species (i.e. salt desert shrub and Wyoming big sagebrush habitat west of Rifle) should review the need for cheatgrass control and/or seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.
- Prior to approving any ground-disturbing activities, suitable habitat for special status plants will be identified based on existing plant location records, soil or geological mapping, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work.
- For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of occupied plant habitat1 wherever possible and where geography and other resource concerns allow. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.
- Where development is allowed within 100 meters of occupied habitat for listed, proposed, candidate or BLM sensitive species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.
- Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but we do not expect that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).
- Transplantation of potentially affected plants will not be used as a rationale to defend a “not likely to adversely affect” or a “no effect” determination for listed plant species.
- Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).
- When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

- All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (June 2007).
- Within mapped occupied and suitable habitat for Colorado hookless cactus, DeBeque phacelia or Parachute penstemon, wildland fire management actions will be conducted in the following manner:
    - Minimize surface disturbance by using retardant, water, engines/wet lines, etc in known habitat rather than dozers or hand crews.
    - Unless firefighter safety is jeopardized, construct fire line outside the perimeter of known cactus populations.
    - Avoid cross-country use of motorized vehicles and mechanical equipment within known populations of federally listed or proposed plants.

Visual Resource Management

- Limit surface disturbance to the minimum area necessary
- Use natural features such as trees, rock formations, or terrain, to conceal disturbed areas. Constructed berms that blend with the terrain may be useful for concealment.
- Minimize contrast of the structure or activity with the surrounding terrain by using the visual resource management principles of form, line, color, and texture.
- Paint structures a color that blends with the surrounding vegetation.
- Remove unnecessary equipment, structures, and debris from the site that are not necessary for daily operation.
- All new surface-disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations during project design as a reasonable attempt to meet the Visual Resource Management (VRM) class objectives for the area and minimize the visual impacts of the proposal. Visual design considerations will be incorporated by:
    a. Using the VRM contrast rating process (required for proposed projects in highly sensitive areas, high impact projects, or for other projects where it appears to be the most effective design or assessment tool), or by
    b. Providing a brief narrative visual assessment for all other projects that require an environmental assessment or environmental impact statement.
    c. Measures to mitigate potential visual impacts could include the use of natural materials, screening, painting, project design, location, or restoration (See Appendix H; BLM Handbook H-8431-1, Visual Resource Contrast Rating; or online at http://www.blm.gov/nstc/VRM/8431.html, for information about the contrast rating process).

- All new roads will be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use. Roads will follow the contour of the land where practical. Existing oil and gas roads that are in eroded condition or contribute to other resource concerns will be brought to BLM standards within a reasonable period of time.
- Impacts to dark night skies will be prevented or reduced through the application of specific mitigation measures identified in activity level planning and NEPA level review. These measures may include directing all light downward, using shielded lights, using only the minimum illumination necessary, using lamp types such as sodium lamps (less prone to atmospheric scattering), using circuit timers, and using motion sensors.
- Any facilities authorized will use the best technology available to minimize light emissions
- Any new permits/authorizations, including renewals, will be stipulated to use the best technology available to minimize light emissions as compatible with public health and safety.
- Restrict visual intrusion in VRM Class I and II areas and within 0.25-mile of historic trails.
- Screening facilities from view and avoiding placement of production facilities on steep slopes, hilltops, and ridgelines.

- Paint all facilities a color that best allows the facility to blend with the background (Operator-committed BMP).
- Gravel of road color shall be similar to adjacent dominant soil colors.
- Reduce impacts on visual resource management class II and class III areas.
- Bury distribution powerlines and flow lines in or adjacent to access roads.
- Repeat form, line, color, and texture elements to blend facilities with the surrounding landscape
- All aboveground facilities including power boxes, building doors, roofs, and any visible equipment will be painted a color selected from the latest national color charts that best allows the facility to blend into the background.
- Perform final reclamation recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.
- To the extent opportunities are practicable, extreme visual contrast created by past management practices or human activities will be minimized. Examples include right-of-way amendments, mineral material sites, abandoned mines, and areas impacted by unauthorized off-road driving.
- Reclaim unused well pads within one year.
- Final reclamation of all oil and gas disturbance will involve re-contouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography and revegetating all disturbed areas
- The use of submersible pumps will be strongly encouraged, especially in VRM Class I, II or III areas or any area visible by the visiting public.
- The use of partial or completely below-grade wellheads will be strongly encouraged in high visibility areas as well as VRM Class I, II or III areas.
- The placement of production facilities on hilltops and ridgelines will be prohibited where they are highly visible.

Livestock Management

- Implement management tools such as fencing, stock ponds, and salt licks to manage livestock distribution as needed, and discourage grazing in unwanted areas such as riparian vegetation and sensitive wildlife habitat.
- Adjust livestock grazing in heavily used areas to allow native vegetation a period of recovery.
- Restoring temporarily disturbed areas, using native species, planting woody species, or use a biodegradable erosion-control fabric to enhance germination and seedling establishment
- Drill-seed at a rate of Pure Live Seeds per square foot as needed to establish healthy vegetation (rate may be double for broadcast-seeding or hydroseeding) and be preceded by adequate site preparation, including decompaction of soil and control of annual or biennial weeds
- Fence revegetated areas to exclude livestock for at least two full growing seasons
- Use culverts or hardened crossings for use of roads that cross streams
- Use erosion control devices around culverts as needed to reduce erosion and gulley formation.
- Construct fences and gates to ensure that livestock do not enter areas being protected for another resource that would be diminished by grazing or trampling
- Construct alternative water sources to disperse livestock use and reduce dependence on natural streams and riparian corridors

Noxious and Invasive Weed Management

- Rehabilitation disturbed sites as quickly as possible following interim or final rehabilitation guidelines as appropriate.
- Allow on supplementary livestock feed and revegetation mulches that are certified weed free.
- Clean vehicles regularly using water or air spray to reduce the chance of transporting weed seed from affected areas to non-affected areas.

- All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (June 2007).

Pre-Project Planning

- Environmental analyses for projects, vegetation treatments, and maintenance programs should assess weed risks, analyze high-risk sites for potential weed establishment and spread, and identify prevention practices.
- Determine site-specific restoration and monitoring needs and objectives at the onset of project planning.
- Inventory all proposed projects for weeds prior to ground-disturbing activities. If weeds are found, they should be treated (if the timing is appropriate) or removed (if seeds are present) to limit weed seed production and dispersal.
- Wash vehicles and other equipment to reduce the spread of noxious weeds from weed-contaminated areas to non-contaminated areas. Portable wash stations would be ideal in areas of heavy oilfield traffic and in areas where noxious weeds are an issue.
- Locate and use weed-free project staging areas. Avoid or minimize travel through weed infested areas, or restrict travel to periods when spread of disseminules is least likely.
- Identify sites where equipment can be cleaned. Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts should be collected and incinerated when possible.
- If certified weed-free gravel pits become available in the county, the use of certified weed-free gravel will be required wherever gravel is applied to public lands (e.g., roads).
- Maintain stockpiled, non-infested material in a weed-free condition. Topsoil stockpiles should be promptly revegetated with native species to maintain soil microbial health and reduce the potential for weeds.
- Use native seed mixes appropriate to the ecological site and those species that are demonstrated to be best at inhibiting weed establishment, except when other resource values dictate a less-competitive mix.
- A certified seed laboratory shall test each seed lot according to the Association of Official Seed Analysts standards (which include an all-state noxious weed list) and provide documentation of the seed inspection test. The seed shall contain no prohibited or restricted noxious weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of “other crop” seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended.

Project Implementation

- Minimize soil disturbance. To the extent practicable, native vegetation should be retained in and around project activity areas, and soil disturbance kept to a minimum.
- If a disturbed area must be left bare for a considerable length of time, cover the area with weed barrier until revegetation is possible.
- Clean all equipment before leaving the project site when operating in weed infested areas.
- Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal means bagging and incinerating seeds and plant parts or washing equipment in an approved containment area.
- Require pressure-washing or an equivalent seed removal process on all vehicles and equipment prior to entry of all ground-disturbing project areas, and upon exit of project areas infested with noxious weeds.
- Revegetate disturbed soil where appropriate to optimize plant establishment for that specific site. Define revegetation objectives for each site. Revegetation may include topsoil replacement, planting,

seeding, fertilization, and certified weed-free mulching as necessary. Native materials should be used except under rare circumstances and with prior written approval from the BLM.

- Monitor sites where seed, hay, straw, or mulch has been applied. Eradicate weeds before they form seed. In contracted projects, contract specifications could require that the contractor control weeds for a specified length of time.
- Inspect and document all ground-disturbing activities in noxious weed infested areas for at least three growing seasons following completion of the project. For ongoing projects, continue to monitor until reasonably certain that no weeds are present. Plan for follow-up treatments based on inspection results.

Roads and Utilities - Pre-Project Planning

- Communicate with contractors, local weed districts or weed management areas about projects and best management practices for prevention.
- Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts shall be collected and incinerated when practical, or washed off in an approved containment area.
- Avoid acquiring water for road dust abatement where access to water is through weed-infested sites.
- Treat weeds on travel rights-of-ways before seed formation so construction equipment doesn't spread weed seed.
- Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. When it is necessary to blade weed-infested roadsides or ditches, schedule the activity when disseminules are least likely to be viable.

Roads and Utilities - Project Implementation

- Retain shade to suppress weeds by minimizing the removal of trees and other roadside vegetation during construction, reconstruction, and maintenance; particularly on south aspects.
- Do not blade or pull roadsides and ditches infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure weeds remain onsite. Blade from least infested to most infested areas.

Roads and Utilities - Post-Project

- Clean all equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before leaving the project site if operating in areas infested with weeds. Seeds and plant parts shall be collected and incinerated when possible.
- When seeding has been specified for construction and maintenance activities, seed all disturbed soil (except travel route) soon after work is completed.
- Use a certified weed-free seed mix suitable for local environmental conditions that includes fast, early growing native species to provide quick revegetation. Consider applying weed-free mulch with seeding in salt desert shrub, sagebrush, and pinyon-juniper woodland habitat types.
- Periodically inspect roads and rights-of-way for noxious weeds. Train staff to recognize weeds and report locations to the local weed specialist. Follow-up with treatment when needed.
- When reclaiming roads, treat weeds before roads are made impassable. Inspect and follow up based on initial inspection and documentation.
- To avoid weed infestations, create and maintain healthy plant communities whenever possible, including utility rights-of-ways, roadsides, scenic overlooks, trailheads, and campgrounds.

Recreational Activities

- Inspect and clean mechanized trail vehicles of weeds and weed seeds.
- Wash boots and socks before hiking into a new area. Inspect and clean packs, equipment, and bike tires.

- Avoid picking unidentified "wildflowers" and discarding them along trails or roadways.
- Maintain trailheads, campgrounds, visitor centers, boat launches, picnic areas, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. Consider high-use recreation areas as high priority sites for weed eradication.
- Sign trailheads and access points to educate visitors on noxious and invasive weeds and the consequences of their activities.
- In areas susceptible to weed invasion, limit vehicles to designated, maintained travel routes. Inspect and document travel corridors for weeds and treat as necessary.
- Encourage use of pelletized feed for backcountry horsemen and hunters. Pelletized feed is unlikely to contain weed seed.

Outfitting / Recreation Pack and Saddle Stock Use

- Allow only certified weed-free hay/feed on BLM lands.
- Inspect, brush, and clean animals (especially hooves and legs) before entering public land. Inspect and clean tack and equipment.
- Regularly inspect trailheads and other staging areas for backcountry travel. Bedding in trailers and hay fed to pack and saddle animals may contain weed seed or propagules.
- Tie or contain stock in ways that minimize soil disturbance and prevent loss of desirable native species.
- Authorized trail sites for tying pack animals should be monitored several times per growing season to quickly identify and eradicate new weeds. Trampling and permanent damage to desired plants are likely. Tie-ups shall be located away from water and in shaded areas where the low light helps suppress weed growth.
- Educate outfitters to look for and report new weed infestations.

Wildlife Habitat Projects

- Incorporate weed prevention into all wildlife habitat improvement project designs.

Watershed Management

- Frequently and systematically inspect and document riparian areas and wetlands for noxious weed establishment and spread. Eradicate new infestations immediately since effective tools for riparian-area weed management are limited.
- Promote dense growth of desirable vegetation in riparian areas (where appropriate) to minimize the availability of germination sites for weed seeds or propagules transported from upstream or upslope areas.
- Address the risk of invasion by noxious weeds and other invasive species in watershed restoration projects and water quality management plans.

Grazing Management

- Consider prevention practices and cooperative management of weeds in grazing allotments. Prevention practices may include:
    - Altering season of use
    - Minimizing ground disturbance
    - Exclusion
    - Preventing weed seed transportation
    - Maintaining healthy vegetation
    - Revegetation
    - Inspection
    - Education
    - Reporting

- When authorized, provide certified weed-free supplemental feed in a designated area so new weed infestations can be detected and treated immediately. Pelletized feed is unlikely to contain viable weed seed. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)
- If livestock may contribute to seed spread in a weed-infested area, schedule livestock use prior to seed-set or after seed has fallen.
- If livestock were transported from a weed-infested area, annually inspect and treat entry units for new weed infestations.
- Consider closing infested pastures to livestock grazing when grazing will either continue to exacerbate the condition or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.
- Manage the timing, intensity (utilization), duration, and frequency of livestock activities to maintain the competitive ability of desirable plants and retain litter cover. The objective is to prevent grazers from selectively removing desirable plant species and leaving undesirable species.
- Exclude livestock grazing on newly seeded areas with fencing to ensure that desired vegetation is well established, usually after 2-3 growing seasons.
- Reduce ground disturbance, including damage to biological soil crusts. Consider changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.
- Inspect areas of concentrated livestock use for weed invasion, especially watering locations and other sensitive areas that may be particularly susceptible to invasion. Inventory and manage new infestations.

Fire Management Plans

- Prescribed fire plans should include pre-burn invasive weed inventory and risk assessment components as well as post-burn mitigation components.
- Integrate prescribed fire and other weed management techniques to achieve best results. This may involve post-burn herbicide treatment or other practices that require careful timing.
- Include weed prevention and follow-up monitoring in all prescribed fire activities. Include in burn plans the possibility for post-burn weed treatment.
- For prescribed burns, inventory the project area and evaluate potential weed spread with regard to the fire prescription. Areas with moderate to high weed cover should be managed for at least 2 years prior to the prescribed burn to reduce the number of weed seeds in the soil. Continue weed management after the burn.
- Ensure that a weed specialist is included on a Fire Incident Management Team when wildfire or prescribed operations occur in or near a weed-infested area. Include a discussion of weed prevention operational practices in all fire briefings.
- Use operational practices to reduce weed spread (e.g., avoid weed infestations when locating fire lines).
- Identify and periodically inspect potential helispots, staging areas, incident command posts, and base camps and maintain a weed-free condition. Encourage network airports and helibases to do the same.
- Develop a burned-area integrated weed management plan, including a monitoring component to detect and eradicate new weeds early.

Fire-Fighting

- Ensure that all equipment (including borrowed or rental equipment) is free of weed seed and propagules before entering incident location.
- When possible, use fire suppression tactics that reduce disturbances to soil and vegetation, especially when creating fire lines.

- Use wet or scratch-lines where possible instead of fire breaks made with heavy equipment.
- Given the choice of strategies, avoid ignition and burning in areas at high risk for weed establishment or spread.
- Hose off vehicles on site if they have traveled through infested areas.
- Inspect clothing for weed seeds if foot travel occurred in infested areas.
- When possible, establish incident bases, fire operations staging areas, and aircraft landing zones in areas that have been inspected and are verified to be free of invasive weeds.
- Cover weed infested cargo areas and net-loading areas with tarps if weeds exist and can't be removed or avoided.
- Flag off high-risk weed infestations in areas of concentrated activity and show weeds on facility maps.
- If fire operations involve travel or work in weed infested areas, a power wash station should be staged at or near the incident base and helibase. Wash all vehicles and equipment upon arrival from and departure to each incident. This includes fuel trucks and aircraft service vehicles.
- Identify the need for possible fire rehab to prevent or mitigate weed invasion during fire incident and apply for funding during the incident.

Post-Fire Rehabilitation

- Have a weed specialist review burned area rehabilitation reports to ensure proper and effective weed prevention and management is addressed.
- Thoroughly clean the undercarriage and tires of vehicles and heavy equipment before entering a burned area.
- Treat weeds in burned areas. Weeds can recover as quickly as 2 weeks following a fire.
- Schedule inventories 1 month and 1 year post-fire to identify and treat infestations. Eradicate or contain newly emerging infestations.
- Determine soon after a fire whether revegetation is necessary to speed recovery of a native plant community, or whether desirable plants in the burned area will recover naturally. Consider the severity of the burn and the proportion of weeds to desirable plants on the land before it burned. In general, more severe burns and higher pre-burn weed populations increase the necessity of revegetation. Use a certified weed-free seed mix.
- Inspect and document weed infestations on fire access roads, equipment cleaning sites, and staging areas. Control infestations to prevent spread within burned areas.
- Seed and straw mulch to be used for burn rehabilitation (e.g., for wattles, straw bales, dams) shall be certified weed-free.
- Prevent seeded species from being grazed during the first two growing seasons (>18 months) following seeding, or until site-specific analysis and/or monitoring data indicates that vegetation cover, species composition and litter accumulation are adequate to support and protect watershed values, meet vegetation objectives and sustain grazing use.

Recreation

- Special Recreation Permits will contain noxious weed management stipulations (e.g., pre-event inventories to avoid infested areas, event management to avoid or isolate activities that could cause weed introduction or spread, monitoring and treatment of infestations exacerbated by the activity, and other appropriate noxious weed management stipulations).
- Promote the seven standard principles of Leave No Trace outdoor ethics through print and electronic media, and through personal communications with recreationists participating in non-motorized recreation activities on BLM-managed public lands. (www.lnt.org)

- Promote the principles of Tread Lightly outdoor ethics through print and electronic media, and through personal communications with recreationists participating in recreation activities on BLM-managed public lands. (www.treadlightly.org)
- Apply Recreation Management Guidelines to Meet Public Land Health Standards on BLM Lands in Colorado. Website: http://www.blm.gov/co/st/en/BLM_Information/newsroom/2000/recguidefnr/guide_final.html.
- Apply Guidelines for a Quality Built Environment. Website: http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images/national_programs/VRM.Par.62809.File.dat/GQBE_WEB.pdf.
- Route design, construction and maintenance will follow: BLM guidelines, guidelines established in the Gold Book (BLM 2007) and technical recommendations of partner groups (e.g. International Mountain Bicycling Association (IMBA), Volunteers for Outdoor Colorado - Crew Leader Manual, Backcountry Horsemen, National Off-Highway Vehicle Conservation Council (NOHVCC)).

Lands and Realty

- Power lines shall be constructed in accordance to standards outlined in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (Avian Power Line Interaction Committee 2006). Right-of-way applicants shall assume the burden and expense of proving that proposed pole designs not shown in the above publication are “raptor safe.” Such proof shall be provided by a raptor expert approved by the BLM Authorized Officer.
- Rights-of-way and other lands and realty authorizations, including power lines, pipelines, transmission corridors, energy development sites and related development, and gravel pits, will contain noxious and invasive plant management terms or stipulations for all ground-disturbing actions. These will include conducting a pre-disturbance noxious weed inventory, designing to avoid or minimize vegetation removal and weed introduction or spread, managing weeds during the life of the right-of-way or authorization to prevent or minimize weed introduction or spread, abandoning the right-of-way or authorization to establish competitive vegetation on bare ground areas, and monitoring revegetation success and weed prevention and control for a reasonable number of years.
- Rights-of-way will be constructed to avoid physical damage to range improvements and rangeland study areas.
- No signs or advertising devices shall be placed on the premises or on adjacent public lands, except those posted by or at the direction of the BLM Authorized Officer.
- The Holder shall promptly remove and dispose of all waste caused by its activities. The term “waste” as used herein means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, petroleum products, ashes, and equipment. No burning of trash, trees, brush, or any other material shall be allowed.
- The Proponent shall notify all existing right-of-way holders in the project area prior to beginning any surface-disturbance or construction activities. The Holder shall obtain an agreement with any existing right-of-way holders or other parties with authorized facilities that cross or are adjacent to those of the holder to assure that no damage to an existing right-of-way or authorized facility will occur. The agreement(s) shall be obtained prior to any use of the right-of-way or existing facility.
- The Holder shall participate in the formation of a Road User’s Association for the road if new rights-of-way are granted for use of the existing road. All new users will be required to join the association.
- The Holder will provide a performance bond for the authorized facility, acceptable to the BLM Authorized Officer, in the amount of $(_) that must be maintained in effect until restoration of the right-of-way has been accepted by the BLM Authorized Officer. The bond shall be furnished by the holder within 30 days of signing the grant (_) and shall be applied to all additional authorizations associated with the project as necessary.

- Incorporate conditions of approval and mitigation measures from the Final Programmatic EIS on Wind Energy Development on BLM-administered Lands in the Western US, as applicable (BLM 2005).
- Incorporate conditions of approval and mitigation measures from the Solar Energy PEIS, as applicable (pending completion of Solar PEIS).
- All construction activities shall be confined to the minimum area necessary. The exterior boundaries of the construction area shall be clearly flagged prior to any surface-disturbing activities.
- Existing roads will be used wherever possible. Additional roads shall be kept to the minimum. Route locations must be approved by the BLM prior to construction.
- When blasting is necessary, the following precautions will be used:
    - In areas of human use, blasting blankets will be used.
    - Landowners or tenants in close proximity to the blasting will be notified in advance of the blasting so that livestock and other property can be removed adequately protected.
    - Access to the blasting area will be restricted by construction personnel stationed at each end of the area to be blasted.
    - Blasting within 0.25-mile of federally-owned or controlled springs and flowing water wells must be approved in writing by the area manager.
    - No blasting will be permitted within 0.25-mile of historic trails, natural areas, identified archaeological sites, and recreation areas.
    - Powder magazines will be located out of sight or at least 0.5-mile from roads. Loaded shot holes will not be left unattended. Approval from the area manager will be obtained for the magazine locations.
- Roads will be constructed and maintained to BLM road standards (BLM Manual 9113 [BLM 2012]). All vehicle travel will be within the approved driving surface.

Best Management Practices for Pipeline Projects

- A preconstruction field conference shall be requested by the grantee at least five working days prior to any construction activities unless otherwise agreed upon by the BLM Authorized Officer.

- Once the pipeline is constructed, the grantee/operator shall restore the existing roadway to meet or exceed conditions prior to construction. The preconstruction width of the driving surface shall also be restored and erosion control structure installed subject to approval of the BLM Authorized Officer. The grantee/operator shall be responsible for road maintenance from the beginning to completion of operations. This may include, but not be limited to, blading the roadway, cleaning ditches and drainage facilities, dust abatement, or other requirements as directed by the BLM Authorized Officer.
- Construction width shall include the existing road. The pipeline shall be located two to three feet from the edge of the ditch along the existing road. The existing road shall be on the working side of the trench.
- The grantee shall accomplish the crossing of the pipeline owned by (company name) in accordance with an agreement between the grantee/operator.
- Pipeline location warning signs shall be installed within five days of construction completion. Each sign shall be permanently marked with the right-of-way serial number.

Geophysical Exploration

- The operator will furnish a map with the Notice of Intent showing approximate line to be used. A map will also be filed with the Notice of Completion showing the completed line. The map will be of a minimum scale of 0.5-inch equals 1.0 mile.
- Rehabilitation of disturbed areas is to be done concurrent with the geophysical operations.

- Blasting or vibrating within 0.25-mile of federally-owned or controlled springs and flowing water wells or cultural resource sites must be approved in writing by the area manager.
- Plugging of drill holes will conform to the Colorado Reclamation Standards Abandoned Drill Holes Act. Drill hole cuttings will be returned to the hole. LR
- No blading or other dirt work will be allowed without written permission from the area manager.
- Standard Terms and Conditions described in BLM Handbook H-3150-1: Onshore Oil and Gas Geophysical Exploration Surface Management Requirements (BLM 1994 Rev. 2007).
- Coordinate with the Colorado Parks and Wildlife early in the sale process on proposals to sell public land encumbered by a small capacity wildlife water development.

Wildlife, Aquatic

- Consider the following options regarding erosion control to limit sedimentation into
    - perennial, ephemeral, and intermittent drainages:
    - Placement of straw waddles
    - Construction of silt fencing
    - Placement of geo-textile matting/fabrics
    - Timely and appropriate reseeding methods and species
    - Hydro-mulching
    - Topsoil stockpiling
    - Recontouring slopes at a minimum of 2:1 to facilitate revegetation
    - Hay bales
    - Sediment retention dams
    - Water dips

- Avoid direct discharge of pipeline hydrostatic test water to any reservoir, lake, wetland, or natural perennial or seasonally flowing stream or river.
- When constructing stream crossings or other in-channel structures, divert water around the construction site to minimize sedimentation.
- Avoid low water crossings of live streams, but if done, armor crossings with appropriate sized native substrate to limit sedimentation and maintain water depths for fish passage.
- For perennial stream crossings use professional engineering to design and consider using bridges or appropriately sized culverts of at least bank-full flow width.
- When possible, design road crossings of streams and riparian corridors at right angles and preferably along straight, stable stream reaches to minimize the area and amount of disturbance. However, when needed, place culverts in alignment with natural stream sinuosity.
- Address aquatic organism passage and appropriate life-stage requirements of target species when designing new or modifying existing road/stream crossings.
- Identify and protect access to ephemeral/temporary pools and ponds to provide breeding, aestivating, and hibernating habitat for amphibians.
- To avoid spread of aquatic nuisance species and disease vectors clean and disinfect all equipment and gear used in water by one of the following methods:
    - by spraying with 409, bleach, or a similar germicide solution and let equipment thoroughly dry.
    - wash/spray equipment and gear with hot tap water > 140 degrees Fahrenheit for 10 minutes and then drain onto the ground, not down a drain or into another water body.
- Improve stream conditions associated with past, ongoing, and future planning, construction, and maintenance actions in the I-70 mountain corridor as per Stream and Wetland Ecological Enhancement Program (SWEEP) MOU.
- Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications (e.g., Rosgen). Upon identification of limiting factors,

prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings, tamarisk removal), or by changing management of other program activities (e.g., changing livestock grazing season of use) to achieve desired future condition.

- Identify in-channel features (e.g., culverts, water diversion structures) that block aquatic organism movement and/or impair stream connectivity and replace, modify, or remove these impediments as they are identified and as opportunities allow. Consider and address aquatic organism passage and appropriate life-stage requirements when designing new or modifying existing stream crossings. Where in-channel barriers are needed to protect native fish species from competitive species and/or disease vectors, consider placement in coordination with CPW Aquatic Biologists and BLM staff.

- Minimize the spread of aquatic nuisance species including but not limited to zebra mussels, New Zealand mud snails, quagga mussels, and rusty crayfish, as well as disease vectors including whirling disease, and chytrid fungus when working in water and do the following:

    - Before leaving a particular water or entering a new water body, inspect and clean equipment and gear used in the water, including heavy equipment, watercraft (boats, canoes, kayaks, rafts, etc.), trailers, oars, nets, waders, wading boots, sandals, and life jackets. Remove vegetation, mud, grit, algae, etc. and drain water from boats and other gear.

Fire Management:

- In wildland fire situations work with the Fire Resource Advisor(s) during suppression efforts in the CRVFO to address water use and spread of aquatic nuisance species and disease vectors:
    - If possible, avoid the use of these water sources for use in fire suppression actions (i.e., helicopter bucket dips, water pumps, etc.). If these waters are used for fire suppression, screen water pump intakes with ¼ inch mesh to avoid entrainment of fish.
    - Clean and disinfect all fire suppression equipment including water hoses, water pumps, pumpkins, blivets, helicopter buckets, etc. between suppression incidents to avoid the transfer of aquatic nuisance species and disease vectors into the Colorado River and ponds, reservoirs, and lakes within 0.5 miles of the river.
    - Do not release unused water from water tenders, fire engines, or aircraft into the Colorado River or ponds, reservoirs, or lakes within 0.5 miles of the river. Discharge unused water on upland habitats away from these water sources to avoid possible spread of aquatic nuisance species and disease vectors.
- Avoid dropping fire retardant or foam within 300 feet of water bodies and avoidlocating staging, fire retardant chemicals, refueling sites, or other chemicals within 300 feet of these waters.
- When fighting fires within 300 feet of occupied stream/lake drainages containing conservation populations of cutthroat trout, use water located from within the drainage for all suppression efforts..
- When obtaining water from the Colorado River the following actions should be taken:
    - The best method to avoid entrainment of fish is to pump from off-channel locations (e.g., ponds, lakes, and diversion ditches), not directly connected to the mainstem streams or rivers even during high spring flows.
    - If the pump head must be located in the river channel where larval fish are known to occur, the following measures apply:
        - do not situate the pump in a low-flow or no-flow area as these habitats tend to concentrate larval or young-of-year fishes. Instead place the pump into fast moving/riffle habitat;

        - limit the amount of pumping, to the greatest extent possible, during that period of the year when larval fish may be present (June 1 to August 15); and avoid pumping, to the greatest extent possible, during the pre-dawn hours (two hours prior to sunrise) as larval fish drift studies indicate that this is a period of greatest daily activity.
        - Screen all pump intakes with ¼" or finer mesh material.
    - Report any fish impinged on any intake screens to the Fish and Wildlife Service (970.243.2778) or the Colorado Parks & Wildilfe Department:
      Northwest Region
      711 Independent Ave., Grand Junction, CO 81505
      Phone: (970.255.6100)
- Require spill Prevention Plans for all pipeline companies and fluid mineral companies
- and their sub-contractors who haul or transport hazardous substances.
- Require Spill Contingency Plans for all pipeline companies and fluid mineral companies and their sub-contractors who haul or transport hazardous substances.
- When developing or improving water sources, consider development designs such as water wells and guzzlers, rather than surface impoundments, to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.
- Pro-actively manage special status species aquatic habitats. Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications. Upon identification of limiting factors, prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings) or by changing management of other program activities (e.g., changing livestock grazing season use) to achieve desired future condition.

Transportation

- Oil and gas development roads will be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards [USDI and USDA 2007] as outlined in BLM Manuals 9113, Roads Design Handbook [BLM 2011a] and 9113-2, Roads National Inventory and Condition Assessment Guidance and Instructions Handbook [BLM 2011b].
    - All vehicle travel will be within the approved driving surface.
    - All construction activities will be confined to the minimum area necessary.
    - The exterior boundaries of the construction area will be clearly staked or flagged prior to any surface-disturbing activities.
    - If requested by the BLM representative, the operator will schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that construction plans and/or any unresolved issues are fully addressed prior to initiation of surface-disturbing activities.
    - Initial gravel application shall be a minimum of 6 inches.
    - The operator shall provide timely year-round road maintenance and cleanup on the access roads.
    - A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement.
    - When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.

- Other BLM resource roads that do not serve oil and gas development or do not serve as primary (collector) roads within the transportation system will be designed, constructed, and maintained as outlined in BLM Manual 9115-1, Primitive Road Handbook [BLM 2012a] and 9115-2, Primitive

Roads National Inventory and Condition Assessment Guidance and Instructions Handbook [BLM 2012b].

- All vehicle travel will be within the approved driving surface.
- All construction activities will be confined to the minimum area necessary.
- The exterior boundaries of the construction area will be clearly staked or flagged prior to any surface-disturbing activities.
- If requested by the BLM representative, the operator or proponent will schedule a pre-construction meeting, including key representative(s) and contractor personnel, to ensure that construction plans and/or any unresolved issues are fully addressed prior to initiation of surface-disturbing activities.

- In order to ensure public access and safety, CRVFO shall continue an active road maintenance program including, but not limited to, road redesign or realignment, blading, brush or tree removal for sight distance and safety concerns, scarification, graveling, water barring, low water crossings, spur ditching, seeding and installation or cleaning of culverts and cattleguards. Such road maintenance work will adhere to standards and guidance outlined in appropriate BLM Road Handbooks

Wildlife

Planning

- Design plans of development to consolidate activity during wildlife sensitive times into geographic areas approved by the regulatory agencies in order to minimize impact.
- Where possible, develop existing or previously disturbed surface locations to reduce impacts on undisturbed areas and minimize impact to wildlife habitat.
- Design power lines to minimize raptor attraction.
- Install perch guards on utility lines to reduce risk of raptor electrocution and discourage raptor perching on utility poles by the use of anti-perching devices, or bury new utility lines.
- Minimize noise by using appropriate noise reduction devices.
- Require all refuse containers employ a bear-proof design and be emptied on a regular basis.
- Initiate an education program that reduces bear conflicts
- Adjust tower changes, material deliveries, and all other recurring transportation activity to and from the well pad to occur between 9:00 am and 4:00 pm and between 9:00 pm and 4:00 am, excluding emergencies.
- Use carpooling for activities like crew rotations and shift changes.
- Monitor and enforce speed limits using multiple techniques.
- Implement dust control BMPs in a timely manner.
- Reinforce wildlife training of employees and contractors at worksite tailgate meetings, monthly safety meetings, and the Environmental Health and Safety (EHS) hazard identification program, and through the use of signs.
    - Prohibit pets on all locations.
    - Prohibit possession of firearms by all employees and contractors on all locations.

Drilling

- Implement drilling technology improvements, such as directional and horizontal drilling, to maximize resource recovery and minimize environmental impacts.
- Use natural gas drilling rigs to reduce emissions.
- Use dual-fuel natural gas/diesel engines, reducing diesel delivery to the well site by as much as 70%.
- Implement closed-loop drilling systems on all active rigs with only a small cuttings mixing area on each location.
- Conduct pre-rig move meetings with all parties to discuss access and concerns to reduce impacts to environment and landowners, to ensure a safe and efficient rig move.
- Net all oil and gas reserve and permanent pits to exclude birds; enclose pits within an 8-foot-high fence to exclude ungulates; enclose pits within a 2-foot solid barrier buried 6 inches into the soil to exclude small mammals and reptiles, and lined to prevent infiltration to groundwater.

Completions

- Restrict venting of natural gas to the atmosphere during new well completions.
- Require secondary spill containment for pump trucks on all active completions operations (e.g., portable containment, not earthen berms).
- Use permanent buried or temporary surface water delivery lines to reduce truck traffic.
- Optimize completion operations to minimize impact. Techniques include:
    - Use simultaneous drilling and completion operations (SIMOPS) to minimize the operating time on the well pad.
    - Remote completion operations using nearby existing well pads minimizes overall surface disturbance.
- Recycle all water used in completion activities to meet water needs for completion of subsequent wells on location; this will reduce fresh water consumption and reduce truck traffic.

Production

- Reduce visits to well sites through remote monitoring (i.e., SCADA) and the use of multi-function contractors.
- Use solar panels as an alternative energy source for on location production equipment, to limit trips to the location for production maintenance.
- Monitor wildlife as needed to document impacts of planned development on population dynamics or behavior; and develop and implement mitigation based on the results of monitoring.
- All stacks, vents, or openings must have screens to prevent wildlife entry.

Well Pad Construction and Reclamation

- Use advanced reclamation techniques to reclaim pads and pipeline construction within 6 months or less after completion activities are finished to establish desirable vegetation more effectively. Advanced reclamation techniques include:
    - Hydraulic erosion-control mulch on topsoil and wind-row perimeter control

  - Landform grading and hydraulic erosion-control mulch on steeper slopes
  - Use of crimped straw mulch on shallower slopes

- Use integrated vegetation management techniques to simultaneously control weeds while developing successful reclamation.
- Construct well pads prior to onset of winter to minimize additional displacement of wildlife utilizing the area
- Use the Colorado Parks and Wildlife recommendations for wildlife friendly fence whenever fencing is required.
- If appropriate, employ habitat enhancement in suitable areas to offset habitat loss or fragmentation caused by the planned development.
- Prepare third party Biological Assessment Reports (BAR) completed for all new disturbances to customize the reclamation plan and to optimize the topsoil segregation, seed mix, and soil amendments to improve reclamation success.

Pipelines

- Expand the water distribution system to efficiently move water in pipelines, reducing truck traffic for drilling and completion activities.
- Install gathering lines adjacent to roads wherever possible.se multiple gathering lines placed in a single trench to minimize disturbance and construction costs.
- Install trench plugs (sloped to allow wildlife or livestock to exit the trench should they enter) at known wildlife or livestock trails to allow safe crossing on long spans of open trench.
- Install pipeline crossings at right angles to the drainages, wetlands, and perennial waterbodies.
- Install equipment bridges for pipeline construction made from either clean rock and flume pipes or timber equipment mats with flume pipes.
- Use horizontal directional boring techniques under perennial waterbodies and/or wetland complexes.
- Enforce all In-stream construction activity to 24-hour periods for waterbodies less than 10 feet wide and to 48 hours for waterbodies greater than 10 feet wide at locations where horizontal boring is not possible.
- Maintain a minimum of 5 feet of soil cover between the pipeline and the lowest point of any drainage or water body channel.
- Restrict refueling equipment within 100 feet of a drainage, stream, or wetland during pipeline construction and employ secondary containment (e.g., portable containments).

Roads

- Use existing roads instead of new construction segments wherever feasible.
- Create topsoil windrows on all new facility construction for perimeter control to divert to terminal discharge points.
- Strategically apply fugitive dust control measures to reduce coating of vegetation and deposition in water sources, including enforcing speed limits on BLM and private roads.

- Install toe berms of adequate size on all fill slopes facing and or adjacent to potential water to contain any erosion from the fill slope.
- Implement stormwater perimeter control(s) on all new facility construction adequate to contain a 100-year storm event.
- Use hydraulic erosion control mulch or armoring on all exterior slopes adjacent to waterways.
- Seed all access roads and facilities other than well pads seeded in a timely manner after construction has been completed and seeding of all topsoil on pad construction.

Cultural Resources

- The operator/holder/applicant is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
- If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator/holder/applicant will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator/holder/applicant, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.
- Pursuant to 43 CFR 10.4(g), the operator/holder/permittee/applicant must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), and the operator/holder/permittee/applicant must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.

Appendix I

Disturbed Site Reclamation Standards

and

Implementation, Monitoring, and Evaluation
(from Colorado River Valley Field Office Proposed Resource Management Plan (PRMP)/Final Environmental Impact Statement (FEIS))

http://www.blm.gov/style/medialib/blm/co/field_offices/crvfo/crvfo_proposed_rmp.Par.0827.File.dat/35%20Appendix%20S%20Monitoring.pdf

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DISTURBED SITE RECLAMATION STANDARDS, MONITORING AND SUCCESS CRITERIA

1.0 INTRODUCTION AND SUCCESS CRITERIA

The goal of the following reclamation standards and success criteria is to mitigate anticipated impacts to vegetation, soil and water resources from ground-disturbing activities by re-establishing a self-sustaining, diverse vegetation community composed of species native to the region in sufficient species density and diversity to closely approximate natural, undisturbed vegetation potential.

This Appendix supplements the discussion found in "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (BLM 2006), commonly referred to as "The Gold Book". All ground-disturbing activities will be subject to these reclamation standards and monitoring requirements. These include resource improvements initiated by BLM, as well as permitted activities such as fluid and solid mineral development activities, including oil and gas development.

BLM is responsible for implementing these standards and compliance with monitoring requirements. Project proponents for all permitted activities will typically perform the reclamation work, and effect on-the-ground implementation. Projects must meet both interim and final reclamation objectives in order to retrieve any associated bonds, or for reclamation to be considered successful. For oil and gas development activities within the Federal Unit atop the plateau, five-year interim criteria must be met in order to have areas released from the total maximum disturbance area for the unit, or in order to move to the next development area. Interim reclamation objectives and success criteria have been split into short- term (two-year) and long-term (five-year) groupings. Two-year criteria are to be met in two or fewer years, while five-year criteria must be met in five or fewer years. For example, five-year criteria may be met in a little as two years, but must be met within five years for reclamation to be considered successful.

1.1 Short-Term (Two Year) Interim Reclamation Objectives and Success Criteria

Interim reclamation refers to those actions taken immediately after cessation of ground-disturbing activities. Interim actions are typically taken to stabilize a portion of a site that is no longer undergoing disturbance while activities simultaneously continue to disturb other portions of the same area. For example, interim reclamation may be conducted in perimeter areas of a natural gas well site when the larger footprint required for the development is reduced in area to that necessary for production. The following interim reclamation success requirements will be used to determine success after two years (two complete growing seasons):

a. Re-grade the site to approximate pre-disturbance topography to the extent practicable, in order to minimize disturbance, and lessen erosion potential.
b. Stabilize disturbed soil surface areas to reduce erosion and runoff to or below naturally occurring levels.
c. With the exception of active work areas, all disturbed soils that remain exposed, unprotected, or unreclaimed for longer than one month will be stabilized as approved by BLM. This may be done through the use of a BLM approved native seed appropriate for the site's native plant community, or application of a covering such as mulch or matting,
d. Establish and maintain a healthy and diverse composition of the species which are or should naturally grow on the site, according to the Ecological Site Description or reference site plant community, which will provide for natural plant and community succession.
e. Prevent establishment of noxious weeds and undesirable plants on the disturbed areas and expansion onto adjacent uninfected areas.

f. Restore wildlife habitat and livestock forage.
g. Reduce visual contrast to meet established visual resource management objectives in all reclaimed areas.

1.2 Long-Term (Five Year) Interim and Final Reclamation Objectives and Success Criteria Final reclamation will occur when no more ground-disturbing activities are expected to occur. The following reclamation success requirements will be used to determine success after five years (five complete growing seasons):

a. Stabilize the disturbed soil surface to reduce erosion and runoff to or below natural background levels. Flow pattern development will not have resulted in rills deeper than three inches, or spaced closer than on adjacent undisturbed hillsides. Activities do not contribute to pre-existing gullies actively down cutting or head cutting. No slumping or subsidence will occur as a result of surface disturbing activities.
b. With the exception of active work areas, all disturbed soils that remain exposed, unprotected, or unreclaimed for longer than one month will be stabilized as approved by BLM. This may be done through the use of a BLM approved native appropriate for the site's native plant community, or application of a covering such as mulch or matting.
c. Re-grade the site to approximate pre-disturbance topography to the extent practicable, in order to minimize disturbance, and lessen erosion potential.
d. Achieve or exceed the pre-disturbance cover and diversity of native species on the site. Total cover will be at least 80 percent of the reference area and have a similar composition of trees, shrubs, grasses, and forbs. Frequency of the most dominant species will be at least 80 percent of their relative contribution on the reference site. Vegetative composition and density will include the following: 1) Grass and forb species, by percent cover, 2) Litter accumulation as determined by percent ground cover, 3) Bare ground as determined by percent ground cover, 4) Noxious weed species, by percent cover (with a treatment objective of zero percent relative cover) 5) Other non-native and invasive species (with a treatment objective of actual cover of less than five percent), and 5) Soil surface stability as determined by the absence or limited degree of surface erosion and plant pedestals.
e. State of Colorado A, B, or C listed noxious weeds or other undesirable plant species will be absent (including kochia and Russian-thistle), with an exception for cheatgrass. It may be necessary to treat adjacent infestations of noxious and undesirable species prior to disturbance. If cheatgrass is present adjacent to the disturbed area in overall concentrations of less than 50 percent vegetative cover, the percentage vegetative cover of cheatgrass on the reclaimed site will not exceed five percent. In areas where adjacent lands have greater than 50 percent cheatgrass cover, the percentage cover on reclaimed lands will not exceed 20 percent.
f. Restore visual quality, reduce visual contrast and enhance aesthetic values to meet visual resource management objectives on all areas of surface disturbance.

2.0 RECLAMATION PLANS

Reclamation plans will be submitted for BLM review and approval prior to surface disturbing activities. Reclamation plans will be considered as COAs for oil and gas leases and reviewed and approved through activity or project specific planning for other resource management activities. Reclamation plans will address the following requirements in sufficient detail to demonstrate an understanding of the potential reclamation site and activities required to achieve the stated success criteria. These plans will incorporate the following reclamation topics and fully develop appropriate site-specific BMPs for each permitted action and location.

2.1 Site-specific Baseline Information:

a. Pre-disturbance terrain and contour
b. Pre-disturbance land use
c. Seasonal weather patterns
d. Topsoil depth and other limitations to plant root growth
e. Vegetation type, dominant species cover, density, and productivity by strata

2.2 Reference Site Selection and Documentation:

a. Appropriate reference sites will be assessed, selected, and characterized following Ecological Site Inventory (ESI) methods and standards, or an approved equivalent system (see Attachment A for an example).
b. Reference sites will be approved by BLM prior to a permitted disturbance.

2.3 Site-specific Revegetation Plan:

a. Size of disturbed versus reclaimed area
b. Proposed surface finish and grades
c. Proposed topsoil handling and treatment
d. Proposed seed mix (seeding rate, species, and variety)/container stock planting (container size and off- center spacing)
e. Treatment of noxious and undesirable species
f. Proposed seeding/mulching techniques
g. Ongoing maintenance activities expected
h. Monitoring plan

2.4 Bond Agreement Information (if applicable), or Conditions for Future Activity

Bonds to be held against achievement of reclamation success criteria will be negotiated on a site-by-site basis. In general, the amount of a bond will be considered a percentage of the total reclamation costs for a project sufficient to ensure reclamation success. These costs will be demonstrated in the reclamation plan. Documentation of compliance with bonding requirements sufficient to assure reclamation will also be included as part of the approved reclamation plan.

Future associated development activities may be precluded until successful reclamation is achieved for a given area or project.

3.0 RECLAMATION PRACTICES AND STANDARDS

The following practices and standards are intended to be applied simultaneously to all appropriate BMPs to all reclamation sites. Some standards are only appropriate for interim or final reclamation, while others will be used in either situation. Practices and standards are intended to provide direction and clarify BLM's intent for reclamation activities. The intent of BLM's land use planning (RMP) process is to identify standards and objectives to be met on public lands. Specific methodologies are considered to be activity or implementation level planning decisions and not RMP decisions. As such, practices are provided to clarify BLM's intent for reclamation activities. The following list is not considered to be all- inclusive, but rather is presented to provide a sense of the minimum requirements that will be required to produce acceptable reclamation outcomes. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments. Monitoring and adaptive management practices will be used to refine and clarify needed actions consistent with the goals and objectives of this plan. Reclamation practices and standards are listed below.

3.1 Interim Reclamation Practices and Standards

a. Limit surface disturbance to the minimum area necessary by avoiding development of roads, pipelines, and well pads on steep slopes; minimize the potential for surface disturbance through careful planning; grouping facilities to the extent possible; and sharing rights-of-way such as burying pipelines along roadways.

b. Stockpile topsoil when possible and prudent (not in areas of seleniferous or erosive soils, or in areas with noxious weed populations), following all topsoil salvage and storage BMPs; or if directed by BLM plan for salvage, direct-haul, and application (live handling) of topsoil from a disturbance site to a site undergoing concurrent revegetation.

c. Minimize the area necessary for construction activities; determine the minimal area needed to facilitate necessary activities, and initiate interim reclamation as quickly as practicable after construction.

d. Silt fencing will be necessary in areas in proximity to water features such as streams, ponds, and wetlands or in other situations where wind or water erosion may otherwise move sediments into sensitive or valuable surrounding habitat.

e. Interim reclamation will include recontouring of the disturbed surface to blend with surrounding terrain, spreading salvaged or stockpiled topsoil evenly on areas to be reclaimed, and revegetating with native plants.

f. Use BLM approved seed mixes containing native, early-successional species, or species with ability to readily establish quickly in recently-disturbed soil areas. In areas subject to occasional vehicle travel, interim revegetation will include species selected to accommodate occasional activity such as vehicle travel, vehicle parking, or temporary staging areas.

g. Drill seed the disturbed area with a seed mix of species native to the local area at a rate sufficient to achieve site stabilization and achieve desired cover based on reference sites (rate would be doubled for broadcast or hydroseeding where drill seeding is impracticable) following adequate soil preparation that includes removal of weeds and undesirables species, decompaction ("fluffing") of compacted soil, and harrowing to prepare the seedbed. If the seed mix contains sagebrush or small seeded species, this seed will be broadcast sown rather than drill seeded. Planting of containerized stock may also be required.

h. Mulching will be required to stabilize soil, maximize moisture infiltration, and improve the chances for revegetation success. Mulch seeded areas in salt desert shrub, sagebrush, and pinyon-juniper habitats with certified weed-free native hay or straw, or with hydromulch, at a rate sufficient to achieve site stabilization and establish native species. If physical conditions preclude use of straw or hay mulch, such as on steep slopes, apply appropriate hydromulch with a non-asphalt tackifier. Hay or straw mulch should not be used in mountain shrub or subalpine sites, but hydromulch may be used in these habitats on steep slopes.

i. Control and eradicate all State of Colorado A-, B-, and C-listed noxious weeds and undesirable species within reclaimed areas, with the exception of cheatgrass in areas where cheatgrass is a component of the adjacent undisturbed vegetation. One aspect of reducing the potential for noxious weed establishment is consideration of the sequence and timing of revegetation.

j. Fencing will be required to limit wildlife and livestock grazing for a minimum of two growing seasons or until plants are sufficiently established to persist under some physical disturbance. Seeded species will be considered established when at least 50 percent of plants are producing seeds. Fencing will be installed after dirtwork, grading, and seeding are completed and prior to livestock turnout on the allotment. The use of less-palatable grasses and forbs or fencing will be used as approved by BLM to limit wildlife and livestock presence along roadways, pipelines, or

other disturbed areas.

3.2 Long-Term (Five Year) Interim and Final Reclamation Practices and Standards

a. Remove all equipment, debris, and surface structures that are not necessary for the intended use of the site. Remaining structures will blend in to the extent possible with the surrounding terrain. At final reclamation, all structures will be removed. Consider the use of natural features such as trees, rock formations, terrain, or berms to conceal roads, pipelines, and well pads. Paint structures a color that blends with the surrounding vegetation.

b. Recontour all disturbed areas to blend with the surrounding terrain to the extent practicable. Areas that have received heavy equipment use such as roads and well sites will be ripped to a depth sufficient to accommodate the establishment of native vegetation similar to the surrounding undisturbed area.

c. As soon as practicable, spread salvaged or stockpiled topsoil to a uniform depth across all disturbed areas. The surface must blend with the surrounding non-disturbed area. (A rough surface will accommodate broadcast seeding better than a smooth surface.)

d. Revegetate with BLM approved native plant species similar in mix and kind to the appropriate reference plant community, including grasses, forbs, and shrubs. The type of cultural material (seeding or planting) used will depend on the attributes of the site and revegetation goals. As needed, utilize a combination of seeding and containerized nursery stock planting.

e. Drill seed the disturbed area with a seed mix of species native to the local area at a rate sufficient to achieve site stabilization and achieve desired cover based on reference sites (rate would be doubled for broadcast or hydroseeding where drill seeding is impracticable) following adequate soil preparation that includes removal of weeds and undesirables species, decompaction ("fluffing") of compacted soil, and harrowing to prepare the seedbed. If the seed mix contains sagebrush or small seeded species, this seed will be broadcast sown rather than drill seeded.

f. Seed disturbed areas in fall or early winter (depending on elevation) to exploit elevated moisture normally available in winter and spring as an aid in germination and seedling establishment, or as approved by BLM.

g. Mulching will be required to stabilize soil, maximize moisture infiltration, and improve the chances for revegetation success. Mulch seeded areas in salt desert shrub, sagebrush, and pinyon-juniper habitats with certified weed-free native hay or straw, or with hydromulch, at a rate sufficient to achieve site stabilization and establish native species. If physical conditions preclude use of straw or hay mulch, such as on steep slopes, apply appropriate hydromulch with a non-asphalt tackifier. Hay or straw mulch should not be used in mountain shrub or subalpine sites, but hydromulch may be used in these habitats on steep slopes.

h. State of Colorado A-, B-, or C-listed noxious weeds or other undesirable plant species will be absent (including kochia and Russian-thistle), with an exception for cheatgrass. It may be necessary to treat adjacent infestations of noxious and undesirable species prior to disturbance. If cheatgrass is present adjacent to the disturbed area in concentrations of less than 50 percent vegetative cover, the percentage vegetative cover of cheatgrass on the reclaimed site will not exceed five percent. In areas where adjacent lands have greater than 50 percent cheatgrass cover, the percentage cover on reclaimed lands will not exceed 20 percent.

i. Plant containerized native shrubs and trees (as appropriate based on the surrounding plant community) when conditions warrant following successful noxious weed control, in natural-appearing groups at a spacing that approximates the structure of local plant communities.

j. Fencing will be required to limit wildlife and livestock grazing for a minimum of two growing

seasons or until plants are sufficiently established to persist under some physical disturbance. Seeded species will be considered established when at least 50 percent of plants are producing seeds. Fencing will be installed after dirtwork, grading, and seeding are completed and prior to livestock turnout on the allotment. The use of less-palatable grasses and forbs or fencing may be required or approved by BLM to limit wildlife and livestock presence along roadways, or other disturbed areas.

4.0 MONITORING

Annual monitoring and reporting of results will be required for all reclaimed areas. Monitoring will occur annually for either a minimum of five years or until performance standards are achieved, whichever is longer. Monitoring methods and reporting standards will be included in reclamation plans and approved by BLM prior to disturbance. Current monitoring methods are outlined below. Required monitoring methodology may change over time in accordance with changes in CRVFO monitoring protocols. An example of a potential foreseeable change would be implementation of the BLM's new Assessment, Inventory, and Monitoring Program (AIM) monitoring protocols.

4.1 Methods

Monitoring methods will be approved as part of a site reclamation plan, prior to site disturbance. In general, methods must be used that will yield appropriate quantitative measures by which to address success criteria parameters against a reference site.

a. Plant species composition and cover will be sampled using either point intercept transect or plot sampling at a sufficiency to demonstrate statistical adequacy at the 85 percent level.
b. Woody species (tree and shrub) density and survivorship will be assessed using plot or belt transect sampling.
c. Fixed photo points (location to be determined and used during baseline conditions sampling).

4.2 Monitoring Reports

Reports of annual monitoring efforts will be submitted annually to BLM for approval. Each report will address the results of the monitoring in terms of each success criterion and compared to the same parameters for the reference site. Additionally, each report will address the following items:

a. Text and data to illustrate trends in terms of site conditions against each of the agreed-upon success criteria
b. Tabulated woody (tree and shrub species) containerized planting survivorship
c. Quantitative percent cover data by species for all plant species present on the

site, including planted and seeded species, native volunteer species, non-native

species, and noxious weeds

d. Annotated photographs from fixed photo points illustrating conditions before and after mitigation activities are completed
e. A figure showing locations of fixed photo points and data sampling locations
f. A brief discussion of the overall mitigation success, incorporating monitoring data. Problem areas identified during the monitoring session will be discussed and adaptive management remediation activities will be recommended, as necessary.
g. A description of any adaptive management activities performed since the previous annual report for the site as well as planned actions to be taken if plant establishment efforts are sub-standard or completely fail. For these circumstances, the cause of failure must be stated and how corrective actions will mitigate these causes.

ATTACHMENT
A:
Alternative Approach to ESI Reference Sites
Example of a Quantitative Success Sampling Assessment Tool

FLORISTIC QUALITY INDEX

I. Floristic Quality Indices (after Taft et al., 1997)

1. For the reference species list, assign an index based on the affinity to "natural areas". Individual species assignment range from 0-10 with "10" being considered the highest fidelity to natural areas. This index is termed the coefficient of conservatism (C). General categories for species assignments consist of the following:

X 0-1: Taxa that are adapted to severe disturbance, particularly anthropogenic. Disturbance occurs so frequently that often only brief periods are available for growth and reproduction. Generally considered ruderal species/opportunistic invaders.

X 2-3: Taxa within this category are associated with more stable, though degraded habitat. Generally considered ruderal-competitive species, found in a variety of habitats.

X 4-6: Taxa that have a high consistency of occurrence within a given community type and will include many dominant or matrix species for several habitats. Species will persist under moderate disturbance.

X 7-8: Taxa associated mostly with natural areas but can persist where the habitat has been somewhat degraded. Increases in the intensity or frequency of disturbance may result in reduction in population size, or taxa may be subject to local extirpation.

X 9-10: Taxa exhibiting a high degree of fidelity to a narrow range of synecological parameters. Species within this category are restricted to relatively intact natural areas.

Assignment of the "C" value should be based upon field experience of principal investigators (A-Team), consultation with local or regional plant ecologist/ taxonomists, description of habitat preferences in floristic manuals or published synecological or autecological studies. Values to be assigned should be considered in the context of the defined reference domain (geographic distribution) and range of variability (disturbance gradient) within the HGM subclass of interest.

2. Calculation of the Floristic Quality Index

X Determine the mean coefficient of conservatism ($\bar{C}$) by summarizing all coefficients in the inventory unit (reference site or sample within the reference site) and dividing by the number of taxa (N), or $\bar{C} = \Sigma C/N$.

X Multiply the mean coefficient of conservatism ($\bar{C}$) by the square root of the total number of taxa. The floristic quality index is then indicated by:

$$FQI = \bar{C} (\sqrt{N})$$

From:

Taft, J.B., G.S. Wilhelm, D.M. Ladd, and L.A. Masters. 1997. Floristic quality assessment in Illinois; a method for assessing vegetation integrity. Erigenia 15:3-95

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Appendix J

Comprehensive Air Resource Protection Protocol

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July 2015

COLORADO BUREAU OF LAND MANAGEMENT

COMPREHENSIVE AIR RESOURCE PROTECTION PROTOCOL (CARPP)

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CARPP Change History

Section	Revision	Date
III.D.1	Amended paragraph to reflect final approved LN language.	2/11/2014
III.B	Added summary language for newly developed guidance appendix	5/5/2015
App. A	Added appendix A (Air Resources Oil and Gas NEPA Analysis Process)	5/5/2015
I.A	Clarified scope language (living doc) and added website reference	7/6/2015

COMPREHENSIVE AIR RESOURCES PROTECTION PROTOCOL (CARPP)

SECTION I – PURPOSE, SCOPE, AND RESPONSIBILITIES

This Comprehensive Air Resources Protection Protocol (CARPP) describes the process and strategies the BLM will use when authorizing activities that have the potential to adversely impact air quality within the state of Colorado. This protocol also outlines specific measures that may be taken to address BLM-approved activities with the potential to cause significant adverse impacts to air resources (via the generation of significant quantities of air emissions) within any planning area (as determined on a case by case basis). Further, the purposes of this protocol are to address air quality issues identified by the Bureau of Land Management (BLM), or public scoping, in its analysis of potential impacts on air resources for BLM Colorado Resource Management Plans and Environmental Impact Statements (RMP/EIS); and clarify the mechanisms and procedures that BLM will use to achieve the air resources goals, objectives, and management actions set forth in BLM Colorado RMPs.

I.A CARPP Scope

The CARPP is not a decision document, but rather a strategy to address air quality concerns throughout BLM-managed lands and resources in Colorado. Because the CARPP is not a field office specific management tool, it may be modified as necessary to comport or comply with changing laws, regulations, BLM policy, or to address new information and changing circumstances without maintaining or amending any specific Field Office RMP (see reference version date on the cover page).

However, changes to the goals, objectives, or management actions set forth in any Colorado Field Office RMP/EIS as a result of the changes in the CARPP (or more specifically, any subsequent analysis based on such changes) would require an amendment of the specific RMP being affected.

The CARPP is designed to be a living document; ergo readers should always refer to the BLM's Air Resources Webpage at to ensure they are viewing the most up to date version (http://www.blm.gov/co/st/en/BLM_Information/nepa/air_quality.html).

I.B BLM Responsibilities under FLMPA and MLA

The BLM has the authority and responsibility under the Federal Land Policy and Management Act (FLPMA) to manage public lands in a manner that will protect the quality of air and atmospheric values [FLPMA Sec. 102(a)(8)]. The FLPMA also provides that the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands and includes provisions for implementing the Mining and Minerals Policy Act of 1970 [FLPMA Sec. 102(a)(12)]. The BLM has the responsibility under the Mineral Leasing Act (MLA) to

implement the decisions of any RMP/EIS in a manner that recognizes valid and existing lease rights[1].

Further, the FLPMA provides that "In the development and revision of land use plans, the Secretary shall provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans;" [FLPMA Sec. 202(c)(8)][2].

SECTION II – INTERAGENCY AIR RESOURCES COLLABORATION

The Bureau of Land Management is firmly committed to working with federal, state, tribal, and local air resource management partners to address complex and often cross-jurisdictional air quality issues. As a federal agency, we have a role to provide leadership in addressing known air quality issues within our authority and domain, while upholding our responsibility to manage the public lands for multiple-use under the FLPMA. We also recognize that the State of Colorado, specifically the Colorado Department of Public Health and Environment (CDPHE), has the primary responsibility and authority delegated by the EPA to regulate and maintain air quality standards within Colorado in accordance with the Clean Air Act. Interagency collaboration is the key to management of air quality, as no single agency has all the necessary tools to solve these complex issues alone. We must act together.

To that end the BLM will work collaboratively with other local, state, federal, and tribal agencies involved in the management of air resources to develop a comprehensive strategy to protect air resources from potentially significant adverse impacts resulting from BLM approved activities in Colorado.

II.A National Air Quality MOU

When making oil and gas implementation decisions, the BLM will consider or apply, as appropriate, the provisions of the *Memorandum of Understanding Among the US Department of Agriculture, US Department of the Interior, and US Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the NEPA Process*, signed June 23, 2011.

SECTION III – ACTIONS TO ANALYZE & PROTECT AIR QUALITY

[1] H-1601-1 - LAND USE PLANNING HANDBOOK: A plan-level decision to open the lands to leasing represents BLM's determination, based on the information available at the time, that it is appropriate to allow development of the parcel consistent with the terms of the lease, laws, regulations, and orders, and subject to reasonable conditions of approval. When applying leasing restrictions, the least restrictive constraint to meet the resource protection objective should be used.

[2] Note: Where sources of air pollution emissions are regulated by an entity/agency (Federal, State, Tribal, Local), the BLM shall not craft alternatives with features or conditions that interfere with a proponents ability to comply with such laws or standards. IBLA has held that the meaning of "providing for compliance" does not require that the BLM has any obligation to ensure compliance where another agency holds such responsibility [*Wyoming Outdoor Council, et al*176 IBLA 15, 27 (2008); Powder River Basin Resource Council, 183 IBLA 83, 94-95 (2012)]. However, the BLM should appropriately analyze such sources (as well as non-regulated sources) within the applicable NEPA context to disclose potential impacts, determine significance, and provide for mitigation as necessary and within our authority for any specific finding.

The following sections describe actions the BLM will take to ensure an adequate analysis and subsequent protection for air quality resources within Colorado. Appropriate air resources protection requires the BLM to manage its authorized activities and actions at broad spatial and temporal scales that are dynamic and thus subject to change. The BLM will accomplish this through an adaptive management approach, which includes establishing baseline conditions, monitoring, reevaluation, and adjustment as necessary. Adaptive management therefore contemplates regular review and adjustment of management approaches during the authorization of emissions generating activities commensurate with changing circumstances.

III.A MONITORING

Ambient air monitoring provides valuable data for determining current and background concentrations of air pollutants, describing long term trends in air pollutant concentrations, and evaluating the effectiveness of air control strategies. The BLM's comprehensive air resource protection protocol includes the ambient air monitoring measures described in this section.

III.A.1 – Air Monitoring Network

The BLM will participate in a cooperative effort with industry, CDPHE, Forest Service, National Park Service, EPA, local counties, and other entities as appropriate, to establish, operate, and maintain a comprehensive air monitoring network within the planning areas where a need for monitoring has been identified (contingent upon available funding). The BLM will cooperate in the sharing of air monitoring data collected by the air monitoring network with other agencies and the public.

III.A.2 – Pre-Construction Air Monitoring

The BLM may request proponents of projects with the potential to generate significant air emissions, to submit pre-construction air monitoring data from a site within or adjacent to the proposed development area. The purpose of this air monitoring is to determine baseline air quality conditions prior to development at the site. The need for monitoring will be determined by the BLM based on the availability or absence of existing representative air monitoring data and the factors listed in Section III.D of this protocol. If the BLM determines that pre-construction monitoring is necessary, the project proponent must provide a minimum of one year of representative ambient air monitoring data for the pollutants of concern. The project proponent will be responsible for siting, installing, operating, and maintaining any new air monitoring equipment needed to fulfill this requirement in the absence of existing representative air monitoring data.

III.A.3 – Life of Project Air Monitoring

The BLM may require proponents or operators of Federal mineral development projects, or proponents of other potentially significant emission generating projects, to conduct air monitoring for the life of the project based on the availability or absence of representative air monitoring data and the factors listed in Section III.D of this protocol. The purpose of this air monitoring is to

measure impacts potentially attributable to the project over time and to determine the effectiveness of emissions control measures required for the project. The project proponent will be responsible for siting, installing, operating, and maintaining any new air monitoring equipment needed to fulfill this requirement in the absence of existing representative air monitoring data.

III.A.4 – Monitoring Data Transparency

Project-specific monitoring data may be used by the BLM in subsequent NEPA analysis required for project approvals. Thus public disclosure of such data is assured via the NEPA process, if used. Additionally, the BLM will ensure that ambient air monitoring data collected as a COA for any BLM authorized activity will be made publicly available within the body or our annual report required under Section V of this protocol.

III.B EMISSIONS INVENTORIES

The BLM will request the proponent of an oil and gas development activity (as proposed in a permit application, plan of development, or Master Development Plan) to submit a comprehensive inventory of anticipated direct and indirect emissions associated with the proposed project. The emissions inventory will include estimated emissions of regulated air pollutants from all sources related to the proposed activity, including fugitive emissions and greenhouse gas emissions, for each year or distinct project phase over the life of the project. The BLM will review the emissions inventory to determine its completeness and accuracy. In most cases the BLM will accept inventory data reported to other agencies for the purposes of meeting this requirement. For example BLM would accept copies of actual emissions data for criteria pollutants, volatile organic compounds, hazardous air pollutants, and greenhouse gases that are submitted to CDPHE as required for applicable air permitting or APEN requirements, or submittals to COGCC in the form of drilling and production data reports, and data to EPA under the Greenhouse Gas Reporting Rule (40 CFR Part 98 Subpart W) for the authorized action.

The BLM COSO developed guidance for the purposes of improving the adequacy, consistency, and efficiency of the Bureau of Land Management (BLM) Colorado air resources analysis. The guidance provides the CO BLM field offices with: 1) a standardized process to follow for completing air resource analysis for project specific O&G development, 2) field office specific air resource NEPA sections of the affected environment and cumulative impacts (to be updated as required, but not less than annually by COSO Air Resource Specialists), and 3) tools to enable field office staff and project proponents to adequately develop the information necessary to analyze and disclose potential air resource impacts within NEPA documents.

In brief, the guidance requires a project level emissions inventory for ALL oil and gas projects that utilizes the COSO air resource specialists (ARS) developed Emissions Inventory Tool. Once the inventory has been completed, BLM staff will follow the analysis framework (found in Appendix A) to compare the emissions inventories and project parameters against in order to determine the level of NEPA analysis required.

III.C MODELING

Air dispersion and photochemical grid models are useful tools for predicting project-specific impacts on air quality, predicting the potential effectiveness of control measures and strategies, and forecasting trends in regional concentrations of air pollutants. The BLM will use regional air modeling and project-specific modeling, in conjunction with other air analysis tools, to develop air resource protection strategies consistent with our responsibilities under FLPMA. Further, the BLM will provide appropriate disclosure for any modeling of direct, indirect, and cumulative impacts of proposed actions during the required NEPA analysis.

III.C.1 – Project-specific Modeling

The BLM may require project-specific air quality modeling, consistent with the Air Resources MOU to analyze potential impacts from a proposed Federal mineral development project or other proposed activity that has the potential to emit significant quantities of a regulated air pollutant and the effectiveness of any air emission control measures. Project proponents may submit results from other modeling analyses that include activities similar to the proposed project for BLM's review and approval, and if approved, those modeling results may be used in lieu of new project-specific modeling. The decision as to whether to require air quality modeling will be based on factors listed in Section III.D of this protocol. The BLM will not require an air modeling analysis when it can be demonstrated that the project will not cause a substantial increase in emissions of the pollutants of concern.

III.C.2 – Modeling Protocol

The BLM will determine the parameters required for a project-specific modeling analysis through the development of a modeling protocol for each analysis. When conducting a regional model or EIS level project specific oil and gas air modeling analysis, the BLM will adhere to the *Memorandum of Understanding Among the US Department of Agriculture, US Department of the Interior, and US Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the NEPA Process*, signed June 23, 2011.

III.C.3 – Regional Air Modeling

The BLM will support and participate in regional modeling efforts through multi-state and/or multi-agency organizations such as Western Governors' Association – Western Regional Air Partnership (WRAP) and the Federal Leadership Forum (FLF). In addition, BLM will, contingent upon available funding, conduct and facilitate regional air modeling as needed. Currently, the BLM is facilitating the Colorado Air Resources Management Modeling Study (CARMMS). CARMMS is a BLM funded regional air quality modeling study of expected impacts on air quality from projected increases in oil and gas development across Colorado and certain upwind adjacent states.

- The CARMMS modeling protocol/study will be developed by the BLM with involvement from appropriate local, state, federal, and tribal agencies

involved in the management of air resources and the authorization and regulation of oil and gas development.

- The CARMMS results will include the predicted impacts from all projected federal and non-federal oil and gas development within the region.
- The CARMMS results and analysis will be made available to the public.

III.C.4 – Evaluation of Modeling Results

The BLM will cooperate in an interagency process to develop a comprehensive strategy to manage air quality impacts from future oil and gas development within the region. As part of that strategy, the local, state, federal, and Tribal agencies involved in the regulation of air quality and the authorization of oil and gas development would evaluate modeling results from CARMMS or other future modeling studies and identify potential air quality concerns and necessary reductions in air emissions. If the modeling predicts significant impacts, these agencies would use their respective authorities to implement appropriate enhanced emission control strategies, operating limitations, equipment standards, and/or pacing of development.

III.C.5 – Future Modeling Studies

Future iterations of the CARMMS, or a similar regional modeling study of expected impacts from oil and gas development, may be conducted through a collaborative interagency management mechanism and interagency / industry funding mechanism.

III.D PERMITTING

As part of the NEPA process and prior to the authorization of any Federal mineral development activity the BLM will conduct an air analysis to determine the potential impacts on air quality based on the estimated emissions from the activity being authorized. The BLM may conduct such an analysis for other authorized activities with the potential to generate significant emissions of a regulated pollutant. The BLM will consider the following factors to identify pollutants of concern and make decisions regarding the appropriate level of air analysis, monitoring, and reporting requirements for the proposed activity.

- magnitude of potential air emissions from the proposed activity
- duration of proposed activity and distinct phase considerations
- proximity to a federally mandated Class I area, sensitive Class II area (as identified on a case-by-case basis by CDPHE or a federal land management or tribal agency), population center, or other sensitive receptor
- location within or adjacent to a non-attainment or maintenance area
- meteorological and geographic conditions

- existing air quality conditions including measured exceedances of NAAQS or CAAQS and measured adverse impacts on air quality related values (AQRVs) at Class I and sensitive Class II areas
- intensity of existing and projected development in the area
- issues identified during project scoping

III.D.1 – Statewide Lease Notice

The following Lease Notice language will be incorporated into all new leases.

Due to potential air quality concerns, supplementary air quality analysis may be required for any proposed development of this lease. This may include preparing a comprehensive emissions inventory, performing air quality modeling, and initiating interagency consultation with affected land managers and air quality regulators to determine potential mitigation options for any predicted significant impacts from the proposed development. Potential mitigation may include limiting the time, place, and pace of any proposed development, as well as providing for the best air quality control technology and/or management practices necessary to achieve area-wide air resource protection objectives. Mitigation measures would be analyzed through the appropriate level of NEPA analysis to determine effectiveness, and will be required or implemented as a permit condition of approval (COA). At a minimum, all projects and permitted uses implemented under this lease will comply with all applicable National Ambient Air Quality Standards and ensure Air Quality Related Values are protected in nearby Class I or Sensitive Class II areas that are afforded additional air quality protection under the Clean Air Act (CAA).

III.E MITIGATION

Many activities that the BLM authorizes, permits, or allows generate air pollutant emissions that have the potential to adversely impact air quality. The primary mechanism to reduce air quality impacts is to reduce emissions via project design features and mitigation. Appropriate emission reduction measures are best identified and required at the project authorization stage, when the temporal and spatial characteristics and technological specifications of the proposed action have been defined. The project-specific information available at that stage allows for the development of an emissions inventory and impact analysis that can be used to identify effective mitigation options for predicted adverse impacts. Section IV, Emissions Reduction Strategies and Best Management Practices, provides some emission reduction technologies and strategies as an example. The list in Table VI-1 is not intended to be all inclusive or preclude the use of other effective air pollution control technologies that may be proposed.

The BLM will ensure implementation of reasonable mitigation, control measures, and design features through appropriate mechanisms, including lease stipulations identified in RMPs, notices to lessees, and conditions of approval (permit terms and conditions) as provided for by law and consistent with lease rights and obligations. In the absence of, or in addition to effective control technologies, the BLM may manage the pace, place,

density, and intensity of leasing and development to meet air quality goals and objectives as defined under any applicable RMP.

III.E.1 – Emissions Reduction Planning / Minimizing Air Emissions

The BLM will request proponents of oil and gas development projects that have the potential to significantly adversely impact air quality or predicted to exceed an air quality standard to provide an emissions reduction plan where air quality has been identified as a resource of concern in applicable NEPA analysis. Plans shall include a detailed description of operator committed measures to reduce project related air pollutant emissions including greenhouse gases and fugitive dust. All projects are required to comply with all applicable state and federal regulations.

III.E.2 – Project-specific Mitigation

If the project-specific air quality analysis predicts future impacts on NAAQS or CAAQS (i.e. exceedances) or adverse impacts to AQRVs in Class I or sensitive Class II areas, the BLM will analyze air quality mitigation measures for emission sources. Further, if the regional air quality modeling study conducted under Section III.C.3 predicts significant cumulative impacts on air resources from expected oil and gas development in the region, the BLM may require the proponent of an oil and gas development project to apply reasonable mitigation including but not limited to best management practices (see Section VI), emissions offsets, and other control technologies or strategies identified in the project-specific air quality analyses.

Where identified and analyzed mitigation measures cannot be reasonably implemented for a particular proposed action due to the overall project design, or substantial technical or economic barriers, the BLM will work with project proponents during the NEPA process to develop operator-committed measures or acceptable emissions offsets that would be included as conditions of approval (COA). Any operator committed measures would be required to provide an air quality benefit sufficient in type, scale, location, and timing to avoid the anticipated adverse impact or at a minimum, to reduce it to an acceptable level for the specific area and pollutant(s) analyzed.

III.F Protocol Implementation

The BLM will ensure that air resource protection strategies and mitigation measures are implemented by including project-specific COAs (operator-committed and/or required mitigation) for each authorized action. Any COAs applied to projects as a result of this process shall be clearly consistent with the applicable RMP management decisions and/or subsequent analysis of new or previously unavailable information upon which the BLM can reasonably rely.

SECTION IV – ADAPTIVE MANAGEMENT PROCESSES FOR AIR RESOURCES

Adaptive management incorporates the principles of monitoring current conditions, predicting future impacts, and adapting management strategies to account for changing conditions. An adaptive management strategy for air quality resources allows the BLM to comply with NEPA and complete an appropriate analysis to ensure that activities approved by the BLM minimize adverse impacts to air quality; while allowing for development of important domestic energy resources.

The BLM will implement an adaptive management strategy to account for changing air quality conditions and to minimize adverse impacts to air resources from BLM-authorized activities. The strategy includes evaluating air quality on an on-going basis, and if necessary, implementing appropriate mitigation measures to meet the identified objectives and targets for any applicable Colorado RMP. The adaptive management strategy is intended to be transparent and as such the process includes an annual reporting component that will be made available to the public, as well as case by case incorporation of specific plan elements within individual project approvals. Components of this adaptive management strategy include the following:

IV.A Establish Baseline Air Quality Conditions

Existing air quality conditions will be established and continuously updated on an annual basis. To establish a periodic baseline, data must be compiled and analyzed such that air quality value trends (NAAQS & AQRVs for Class I and sensitive Class II areas) can be established or evaluated for the purpose of predicting future impacts from BLM-authorized activities. Sources of data for this analysis may include raw air quality monitoring station data, air quality monitoring reports prepared by others (CDPHE, EPA, NPS or USFS), and/or appropriate regional modeling results.

In addition to monitored or predicted background data, regional emissions inventories will be continuously or periodically updated to reflect the annual mass of pollutants added to the atmosphere. The data will provide an understanding between mass emissions and monitored/modeled air quality conditions and provide a reasonable basis from which to evaluate impacts from future projects or actions.

The last component of the baseline analysis includes providing a brief synopsis of the current meteorological conditions that exist for any planning area such that exceptional events and historical deviations in atmospheric values can be documented to provide additional context for the observed/reported air quality values.

IV.B Emissions Tracking

To provide for the periodic baseline the BLM will use the project-specific information used in its NEPA analyses as a mechanism to track emissions of criteria pollutants, volatile organic compounds, hazardous air pollutants, and greenhouse gases from BLM authorized oil and gas activities within each field office planning area. (NOTE: the BLM may incorporate emissions inventories for other authorized activities with significant emissions to provide for an appropriate cumulative inventory, where such sources are not already included as a Colorado Air Pollution Emissions Notice, or National Emissions Inventory component). The BLM will use emissions data from APDs to inform iterative elements of our adaptive management strategy, including modeling inputs and any

subsequent prescriptive or comparative project tiering from any applicable modeling results.

IV.C Prescriptive Model Validation

Prescriptive model validation includes comparing the annual NEPA emissions data from BLM authorized oil and gas activities within the planning areas to emission levels analyzed in the CARMMS modeling study (or the most recent BLM or interagency air impacts analysis conducted in accordance with the provisions of the modeling Section III above). Emissions data will include specific oil and gas indicators, such as the number of wells drilled, number of producing wells, production data, compressor stations installed, centralized liquids gathering stations, and gas treatment facilities constructed. The actual emissions levels and new baseline air quality observations will be correlated against the modeled parameters to determine the reasonableness of the model for predicting impacts and its continued appropriateness as a reference for any subsequent project analysis.

If during the course of our annual analysis it is determined that the model has not demonstrated a reasonable correlation of predicted impacts (for modeled emissions inventory levels) compared against the actual emissions recorded for a planning area, the BLM will investigate the potential sources of the discrepancy to determine a potential cause, such as meteorological factors (ex: winter time ozone, which cannot be modeled at this time), or fee mineral development (i.e. non-BLM authorized actions). If a probable cause for the discrepancy cannot be established, then the BLM will initiate interagency coordination with our regulatory partners to determine if a new modeling analysis is potentially warranted.

IV.D Responding to Monitored Exceedances of the NAAQS

If during the course of a year a Federal Reference or Equivalent air monitor within any planning area records a validated exceedance of any NAAQS (excluding any non-attainment areas) the BLM will review the available data to determine if any BLM authorized activity caused or significantly contributed to the exceedance event. The review will encompass the following steps.

IV.D.1– QA/QC

The BLM will ensure the validity of the monitored data by: (a) reviewing Quality Assurance/Quality Control (QA/QC) metadata to ensure against false high readings, and (b) reviewing meteorological data to determine if an exceptional atmospheric event such as stratospheric ozone intrusion occurred. The BLM may contact CDPHE for technical consultation and concurrence regarding possible exceptional events.

IV.D.2 – Screening Analysis

If the monitoring data are validated, the BLM will conduct a screening analysis to determine the likely cause, source, or origin of the exceedance and whether any BLM authorized source(s) within or adjacent to the planning area caused or contributed to the monitored exceedance. If the screening analysis indicates

BLM-authorized sources did NOT cause or significantly contribute to the exceedance, then no further action will be taken by the BLM. The data, analysis, and conclusions will be included in the annual public report described under I.C above.

IV.D.3 – Enforcement

Should the results of the screening analysis indicate that a BLM authorized source(s) caused or significantly contributed to the monitored exceedance, the BLM will review the COA from the authorization for the source(s) to determine if all the COA were implemented as required. Where it is determined that operators did not comply with the conditions of approval for their authorized activities, and did not submit an appropriate sundry notice for approved deviations from such conditions, BLM may issue a notice of incident of noncompliance or take other appropriate enforcement action.

IV.D.4 – Contingency Planning

If, after review the BLM determines that an authorized source(s) caused or significantly contributed to the monitored exceedance, the BLM will initiate consultation with CDPHE, EPA, and any other applicable local, state, federal, and tribal agencies with responsibility for managing air resources to address appropriate responses to the monitored exceedances. Responses to monitored exceedances may include employing more stringent mitigation measures within the agencies' respective authority to reduce projected future emissions and performing additional modeling and analysis to determine the overall effectiveness of such mitigation measures.

Additionally, the BLM may implement reasonable temporary measures that have been included in a project specific authorization as conditions of approval, which could limit drilling operations, completions or well stimulations, blowdowns, or other non-essential operations during specified time periods (i.e. a timing limitation). Other actions the Bureau may take would include limiting the number of annual APD approvals issued for the affected area until such time that updated regional modeling can be conducted to provide an appropriate assessment of the expected impacts from a reasonable level of development.

IV.E Evaluating Projected Future Development/Emissions

Periodically, but not less than every three years, the BLM will evaluate the available or reasonably foreseeable oil and gas development projections for each planning area for the following three to five year period, and compare these projected levels to the level of predicted future development analyzed in the CARMMS modeling study (or the most recent BLM or interagency air impacts analysis conducted under the provisions of the modeling section(s) III.C.3 or III.C.5 above). The BLM will use the projected development/emissions data to determine whether the modeling analysis remains appropriate as a reference for any subsequent project analyses.

Section V – Annual Summary Report

Annually, the BLM will prepare a comprehensive summary report (from actual project data and analysis). This report will be made available to the public. The BLM will use this annual review to evaluate whether current air resources protection strategies are meeting the goals and objectives established within the BLM Colorado RMPs. If the analysis shows that the strategies are not achieving our defined air resource protection goals, the BLM will collaborate with CDPHE and the EPA to develop or modify air resource protection strategies as necessary to effectively protect air resources within any deficient planning area. Should this result in changes to RMP goals and objectives, additional planning level analyses will be required.

Section VI – Oil and Gas Development Emissions Reduction Strategies & BMPs

Table VI-1 displays some emission reduction measures, their potential environmental benefits and liabilities, and feasibility. The table is not meant to be exhaustive in terms of available or acceptable emissions reduction/control technologies or techniques, but provides a baseline or starting point from which to construct design features and mitigation options for project specific or regional analyses.

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Control Strategies for Drilling and Compression			
Multi-well pad directional or horizontal drilling.	When compared to single pad vertical drilling, reduces construction related emissions, decreases surface disturbance, reduces trip frequencies, and reduces habitat fragmentation.	Could result in higher air impacts in one area with longer sustained drilling times.	Depends on geological strata, topography, and other physical constraints.
Improved engine technology (Tier 2 or 4) for diesel drill rig engines.	Reduced NOx, PM, CO, and VOC emissions.		Dependent on availability of technology from engine manufacturers and, potentially differentials in cost for small operators..

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Selective Catalytic Reduction (SCR) for drill rig engines and/or compressors.	NO_x emissions reduction, potential decreased formation of visibility impairing compounds and ozone. NOx control efficiency of 95% achieved on drill rig engines. NOx emission rate of 0.1 g/hp-hr achieved for compressors.	Potential NH3 emissions and formation of visibility impairing ammonium nitrate. Regeneration/disposal of catalyst can produce hazardous waste.	Not applicable to 2-stroke engines.
Non-selective catalytic reduction (NSCR) for drill rig engines and/or compressors.	NOx emissions reduction, potential decreased formation of visibility impairing compounds, and ozone. NOx control efficiency of 80-90% achieved for drill rig engines. NOx emission rate of 0.7 g/hp-hr achieved for compressor engines greater than 100 hp.	Regeneration/disposal of catalysts can produce hazardous waste.	Not applicable to lean burn or 2-stroke engines.
Natural Gas fired drill rig engines.	NOx emissions reduction, potential decreased formation of visibility impairing compounds, and ozone.	May require construction of infrastructure (pipelines and/or gas treatment equipment). May require onsite gas storage. May require additional engines to supplement needed torque.	Requires onsite processing of field gas.
Electrification of drill rig engines and/or compressors	Decreased emissions at the source. Transfers emissions to more efficiently controlled source (EGU).	Displaces emissions to EGU. Temporary increase in emissions with construction of power lines.	Depends on availability of power and transmission lines.
Improved engine technology (Tier 2, 3 or 4) for all mobile and non-road diesel engines.	Reduced NOx, PM, CO, and VOC emissions.		Dependent on availability of technology from engine manufacturers.

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Reduced emission (a.k.a. "green") completions.	Reduction in VOC and CH4 emissions. Reduces or eliminate flaring and venting and associated emissions. Reduces or eliminates open pits and associated evaporative emissions. Increased recovery of gas to pipeline rather than atmosphere.	Temporary increase in truck traffic and associated emissions due to delivery of onsite equipment or due to construction of infrastructure.	Need adequate pressure and flow. Need onsite infrastructure (tanks/dehydrator). Availability of sales line. Green completion required where feasible per COGCC Rule 805(b)(3) and NSPS 40 CFR 63 OOOO.
Flaring of completion emissions	Reduces methane, VOC, and some HAP emissions. Converts CH4 to CO2.		
Minimize/eliminate venting and/or use closed loop process where possible during "blow downs".	Reduces methane, VOC, and some HAP emissions		
Eliminate evaporation pits for drilling fluids.	Reduces VOC and GHG emissions. Reduces potential for soil and water contamination. Reduces odors.	May increase truck traffic and associated emissions. May increase pad size.	Requires tank and/or pipeline infrastructure.
Electrification of wellhead compression/ pumping.	Reduces local emissions of fossil fuel combustion and transfers to more easily controlled source.	Displaces emissions to EGU.	Depends on availability of power and transmission lines.
Wind (or other renewable) generated power for compressors.	Low or no emissions.	May require construction of infrastructure. Visual impacts. Potential wildlife impacts.	Depends on availability of power and transmission lines.
Compressor seals – replace wet with dry or use mechanical seal.	Reduce gas venting (VOC and GHG emissions).		May be costly or not mechanically feasible.
Compressor rod packing system – use monitoring and replacement system.	Reduce gas leaks (VOC and GHG emissions).		Requires establishing a monitoring system and doing replacements.

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Control Strategies Utilizing Centralized Systems			
Centralization (or consolidation) of gas processing facilities (e.g., separation, dehydration, sweetening).	Reduces vehicle miles traveled (truck traffic) and associated emissions. Reduced VOC and GHG emissions from individual dehydration/ separator units.	Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.	Requires pipeline infrastructure, infeasible for highly dispersed or exploratory wells.
Liquids Gathering systems (for condensate and produced water).	Reduces vehicle miles traveled and associated emissions. Reduced VOC and GHG emissions from tanks, truck loading/unloading, and multiple production facilities.	Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.	Requires pipeline infrastructure . May be infeasible for highly dispersed or exploratory wells, difficult terrain, or patchy surface ownership.
Water and/or fracturing liquids delivery system.	Reduced long term truck traffic and associated emissions.	Temporary increase in construction associated emissions. Higher potential for pipe leaks/groundwater impacts.	Requires pipeline infrastructure. May be infeasible for highly dispersed or exploratory wells, difficult terrain, or patchy surface ownership.
Control Strategies for Tanks, Separators, and Dehydrators			
Eliminate use of open top tanks.	Reduced VOC and GHG emissions.		
Capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units.	Reduces VOC and GHG emissions.	Pressure buildup on older tanks can lead to uncontrolled rupture.	
Capture and control of produced water, crude oil, and condensate tank emissions.	Reduces VOC and GHG emissions.		95% VOC control required by COGCC in some areas and by CDPHE statewide with applicability thresholds

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion.	Reduces VOC, HAP, and GHG emissions.		90% VOC control required by COGCC in some areas and by CDPHE statewide with applicability thresholds
Use zero emissions dehydrators or use desiccants dehydrators.	Reduces VOC, HAP, and GHG emissions.	Requires desiccants (salt tablets and forms a brine solution that must be disposed of.	Can be as effective as Triethylene glycol (TEG) dehydration.
Control Strategies for Misc. Fugitive VOC Emissions			
Install plunger lift systems to reduce well blow downs.	Reduces VOC and GHG emissions.		Can be more efficient at fluids removal than other methods; must have adequate pressure.
Install and maintain low VOC emitting seals, valves, hatches on production equipment.	Reduces VOC and GHG emissions.		
Initiate equipment leak detection and repair program (e.g., including use of FLIR infrared cameras, grab samples, organic vapor detection devices, and/or visual inspection).	Reduction in VOC and GHG emissions.		
Install or convert gas operated pneumatic devices to electric, solar, or instrument (or compressed) air driven devices/controllers.	Reduces VOC and GHG emissions.	Electric or compressed air driven operations can displace or increase combustion emissions.	
Use "low" or "no bleed" gas operated pneumatic devices/controllers.	Reduces VOC and GHG emissions.		Required by COGCC and by CDPHE in non-attainment areas.
Use closed loop system or thermal combustion for gas operated pneumatic pump emissions.	Reduces VOC and GHG emissions.		

Table VI-1 Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development

Emission Reduction Measure	Potential Environmental Benefits	Potential Environmental Liabilities	Feasibility
Install or convert gas operated pneumatic pumps to electric, solar, or instrument (or compressed) air driven pumps.	Reduces VOC and GHG emissions.	Electric or compressed air driven operations can displace or increase combustion emissions.	
Install vapor recovery on truck loading/unloading operations at tanks.	Reduces emissions of VOC and GHG emissions.	Pressure build up on older tanks can lead to uncontrolled rupture.	
Control Strategies for Fugitive Dust and Vehicle Emissions			
Unpaved surface treatments including watering, chemical suppressants, and gravel.	20% - 80% control of fugitive dust (particulates) from vehicle traffic.	Potential impacts to water and vegetation from runoff of suppressants.	
Use remote telemetry and automation of wellhead equipment.	Reduces vehicle traffic and associated emissions.		Not possible in some terrain.
Speed limit restrictions on unpaved roads.	Reduction of fugitive dust emissions.		
Reduce commuter vehicle trips through car pools, commuter vans or buses, innovative work schedules, or work camps.	Reduced combustion emissions, reduced fugitive dust emissions, reduced ozone formation, reduced impacts to visibility.		
Miscellaneous Control Strategies			
Use of ultra-low sulfur diesel (e.g., in engines, compressors, construction equipment).	Reduces emissions of particulates and sulfates.		Fuel not readily available in some areas.
Reduce unnecessary vehicle idling.	Reduced combustion emissions, reduced ozone formation, reduced impacts to visibility, reduced fuel consumption.		
Reduced pace of (phased) development.	Peak emissions of all pollutants reduced.	Emissions generated at a lower rate but for a longer period. LOP, duration of impacts is longer.	May not be economically viable or feasible if multiple mineral interests.

Appendix A Air Resources Oil and Gas NEPA Analysis Process / Methodology

1) Develop emissions scenarios. The Bureau of Land Management (BLM) field office (FO) staff should encourage proponents to use the BLM Colorado's Emissions Tool to develop the emissions scenarios for the Proposed Action and Alternatives (if applicable & proponent proposed). BLM FO staff or Air Resource Specialists (ARS) may have to develop Alternative emissions inventories for scenarios proposed by the government or public. Both proponents and BLM FO staff can contact Colorado State Office (COSO) ARS for help using the Emissions Tool.

The tool is based on Google's Apps Script technology (a web scripting framework) and therefore works best with the Chrome browser. Google's website indicates that the technology is also supported by the latest two browser editions for all of the other major modern browsers (e.g., Microsoft Internet Explorer 10 & 11). The BLM currently uses Internet Explorer 9, which will NOT render the tool.

2) Evaluate the emissions inventories, including the underlying parameters, specifications, and any assumptions to ensure they are reasonable and comprehensive to fully account for the emissions generating activities and sources of the Proposed Action and Alternatives (if applicable). Example: If an oil & gas proposal called for fracking during completion and proposed pipeline construction in the Surface Use Plan of Operation (SUPO), but the emissions inventories lack estimates from these operations, the inventory would be deemed incomplete and not representative of the proposal/alternative.

3) Compare the emissions inventories and project parameters against the cases below to determine the level of NEPA analysis required.

> Case 1: The estimated annual emissions of any single criteria pollutant (PM_{10}, $PM_{2.5}$, CO, NO_X, SO_X) are less than 2 tons per year. This project is not likely to cause impacts to air quality. The 2 ton threshold is what the State of Colorado requires for Air Pollutant Emission Notice (APEN) submissions and thus anything less than 2 tons is something that air quality regulators have deemed to be negligible (AQCR 3.II.D.I). For all practical purposes the BLM Colorado shall consider these sources to be of a similar nature with respect to NEPA impacts.
>
> NEPA analysis: Dismiss air quality as an issue for further analysis due to the project not having a potential for significant impacts. Incorporate the following language into the issues considered but eliminated from detailed analysis:
>
> *"As required for all oil and gas projects seeking to develop federal minerals administered by the BLM CO, an emissions inventory was prepared for the proposed action (and alternatives, if applicable) which provided the basis for dismissing air quality as an issue to be carried forward for further analysis. The resulting inventories indicate that the proposed action will result in not more than 2 tons per year of emissions (1 ton for non-attainment or maintenance area pollutants) for any criteria pollutant. The BLM has adopted the Colorado Department of Public Health and Environments Air Pollution Emissions Notice thresholds as the basis for which the BLM would not consider additional analysis when emissions are below the threshold. Sources or activities that emit less than a threshold level of pollutants per year are considered negligible for their potential to impact air quality."*

No further analysis or air quality discussion is required, i.e. no affected environment, environmental consequences, or cumulative impacts sections should be present in document.

Case 2: The specific project parameters and associated emissions were previously analyzed (to current standards/thresholds) as part of a larger NEPA analysis (i.e., a parent document), such that the information can be tiered to and incorporated by reference. An example of a parent document might be a master development plan that provided for an analysis (total or portions thereof) that a site specific APD EA could reference.

NEPA analysis: Identify which portions of the previous analysis (affected environment, environmental consequences, and cumulative impacts) are relevant to the current project and incorporate by reference in accordance with the NEPA handbook procedures (H-1790 NEPA Handbook pg. 27). Disclose the emissions inventory results and how they are covered by the previous analysis.

Case 3: The project parameters and associated emissions match those from a previously completed and applicable analysis, such that the information can be incorporated by reference. Case three is different from case two in that the analysis that describes the impacts from your matching project may be from another field office or state (i.e., the analysis is not a direct descendant of an overall parent project document). COSO ARS will assist in collating this data into a repository with descriptions of the emissions, analysis, and results to aid FO staff in finding and applying these analyses as they become available (future tool development).

NEPA analysis: Identify which portions of the previous analysis (affected environment, environmental consequences, and cumulative impacts) are relevant to the current project and incorporate by reference in accordance with the NEPA handbook procedures (H-1790 NEPA Handbook pg. 27). Disclose the emissions inventory results and how they are covered by the previous analysis. In many cases the ARS developed descriptions describing the referenced analysis will provide the basis for drafting the correlations for how the projects are similar and thus why the previous analysis would be applicable and appropriate for disclosing impacts for the current action being considered.

Case 4: The project parameters and associated emissions do not fit within the previous three cases, such that some level of "new" analysis is required.

Tier I Analysis: Run the ARS developed Dispersion Screening Tool to evaluate site specific receptor impacts (emissions inputs are derived from the Emission Tool results). This may be accomplished by FO personnel or with the assistance of COSO ARS staff. If the impacts at "sensitive receptor distances" are acceptable and the project parameters meet the requirements for using the Tier I method, then:

- Obtain the most recent version of the affected environment (derived from annual BLM CO CARPP report - Section V) for your FO from the internal ARS website and paste it into your NEPA document or incorporate the information by reference

(the same data will be available to the public on our external site). The section will contain the most recent annual analysis for air resources indicator values, trends, and issues relevant for the project area.

- Obtain the screening tool methodology and language for acceptable results (basis) from the internal ARS website, and paste it into the environmental consequences section of your NEPA document along with the emissions inventory and screening tool results.

- Obtain the most recent version of the cumulative impacts analysis (derived from the annual CARPP report) for your FO from the internal ARS website and paste it into your NEPA document or incorporate the information by reference (the same data will be available to the public on our external site). The section will contain the most recent annual analysis for cumulative FO development and its relationship to one of the three Colorado Air Resource Management Modeling Study (CARMMS) modeled scenarios (low, medium, high) for Colorado. The section will contain language for the impacts expected under the matching scenario and any required mitigation as a result of those impacts that can be incorporated directly into the FO's cumulative NEPA analysis.

Tier II Analysis: The Tier II method is essentially the same as the Tier I, except that the results at "sensitive receptor distances" are NOT acceptable (i.e., they are above a threshold of concern). Contact the COSO ARS to discuss options.

Tier III Analysis: The project is of significant size or duration (typically an EIS) such that the project parameters do not lend themselves to being adequately analyzed by the methods described in analysis Tier I. Contact COSO ARS staff to discuss site specific analysis or refined modeling options.

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Appendix K

Settlement Agreement

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Nos. 12-1322 & 12-1339

UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

CONSERVATION COLORADO EDUCATION FUND, et al.,
Plaintiffs-Appellees/Cross-Appellants

SALLY JEWELL, in her official capacity as Secretary of the Department of the Interior, et al.,
Defendants-Cross-Appellees

BILL BARRETT CORPORATION,
Intervenor-Appellant/Cross-Appellee, and

OXY USA INC., et al.,
Intervenors-Cross-Appellees.

On Appeal from the United States District Court for the District of Colorado
Civil Action No. 1:08-cv-01460-MSK-KLM
The Honorable Marcia S. Krieger, District Judge

STIPULATED SETTLEMENT AGREEMENT

Plaintiffs-Appellees/Cross-Appellants Conservation Colorado Education Fund, Colorado Mountain Club, Colorado Trout Unlimited, Rocky Mountain Wild, Rock the Earth, Natural Resources Defense Council, National Wildlife Federation, Sierra Club, The Wilderness Society, and Wilderness Workshop (collectively, "Plaintiffs"); Intervenor-Appellant/Cross-Appellee Bill Barrett Corporation ("BBC"); former Defendant-Intervenor, Vantage Energy Piceance LLC ("Vantage"); Intervenors-Cross-Appellees WPX Energy Rocky Mountain, LLC ("WPX"), OXY USA, Inc. ("OXY"), and Ursa Piceance, LLC ("Ursa") (Intervenor-Appellant/Cross-Appellee, former Defendant-Intervenor, and Intervenors-Cross-Appellees collectively, "Defendant-Intervenors" or "Lessees"); and Federal Defendants-Cross-Appellees (collectively, "BLM" or "Federal Defendants") (collectively, the "Parties") hereby enter into this Settlement Agreement for the purpose of settling this lawsuit without further judicial proceedings. The Parties hereby state as follows:

WHEREAS, Vantage originally purchased the leases identified in Paragraph 2 from the United States;

WHEREAS, Vantage sold a ninety percent interest in the leases identified in Paragraph 2 to BBC on June 12, 2009 and retained a ten percent interest in said leases;

WHEREAS, on July 11, 2008, Plaintiffs filed a Complaint for Declaratory and Injunctive Relief against the Federal Defendants alleging that BLM's 2007 Roan Plateau Record of Decision ("2007 ROD") and 2008 Record of Decision ("2008 ROD") approving the Roan Plateau Resource Management Plan Amendment and BLM's decision to offer oil and gas leases in the Roan Plateau Planning Area (the "Planning Area") violated the National Environmental Policy Act ("NEPA") and the Federal Land Policy and Management Act ("FLPMA");

WHEREAS, on June 22, 2012, the United States District Court for the District of Colorado ruled in Plaintiffs' favor on three issues (the "District Court Order");

WHEREAS, BBC has appealed the District Court Order, and Plaintiffs have filed a cross-appeal, both of which are pending in this Court;

WHEREAS, on January 28, 2013, BLM published its Notice of Intent to Prepare a Supplemental Environmental Impact Statement (the "SEIS") and Resource Management Plan Amendment for the Roan Plateau, Colorado (the "RMPA"), which will provide management direction for the Planning Area and amend two existing resource management plans: the Glenwood Springs Field Office Resource Management Plan ("RMP") and the White River Field Office RMP;

WHEREAS, the Parties, through their authorized representatives, and without any admission or adjudication of the issues of fact or law, have reached a settlement resolving the claims in this case;

WHEREAS, the State of Colorado has provided BLM an acknowledgement and acceptance of the fact that, by operation of law as required by 30 U.S.C. § 1721a, it will be required to reimburse the United States for its percentage of the previously disbursed bonus payments and annual rental payments attributable to the leases that will be canceled pursuant to this Settlement Agreement;

THEREFORE, the Parties enter this Settlement Agreement and stipulate and agree as follows:

A. Effective Date and Stay of Appeal

1. The Effective Date of this Settlement Agreement is the date on which it is executed by the last party to sign this Settlement Agreement. Within 10 days of the Effective Date of this Settlement Agreement, the Parties will file a joint motion for stay of proceedings in this Court, as set forth in the motion and proposed order attached as Exhibit 1.

B. Cancellation of Leases and Refund of Bonus Bids and Rentals

2. The BLM will cancel the following leases pursuant to its authority under 43 C.F.R. 3108.3(d): COC73066, COC73073, COC73074, COC73075, COC73076, COC73077, COC73078, COC73079, COC73080, COC73081, COC73082, COC73084, COC73086,

COC73087, COC73088, COC73089, and COC73090. The BLM will cancel the leases no later than 60 days after the Effective Date of this Settlement Agreement.

3. Upon cancellation of the leases identified in Paragraph 2, BLM shall refund to BBC, pursuant to Section 111A of the Federal Oil and Gas Royalty Simplification and Fairness Act, 30 U.S.C. §1721a, the bonus payments and annual rental payments attributable to the cancelled leases, on condition that, within 30 calendar days following such cancellation, BBC and Vantage jointly submit to the Office of Natural Resources Revenue a request for a refund pursuant to 30 U.S.C. § 1721a(b)(1). BBC and Vantage explicitly waive any claim of interest pursuant to 30 U.S.C. § 1721(h) for the bonus payments and annual rental payments attributable to the cancellation of the leases identified in Paragraph 2, and agree not to request any refund of interest when making the request for a refund herein contemplated.

4. BBC and Vantage agree that the refund of monies referenced in Paragraph 3 of this Settlement Agreement (hereinafter "refund monies") shall be made directly to BBC. BBC warrants that no party, other than Vantage, has an interest in the leases identified in Paragraph 2 or is entitled to the refund of monies based on the cancellation of those leases. BBC and Vantage agree not to appeal or otherwise object to the cancellation of the leases described in Paragraph 2 of this Settlement Agreement or make any claim against the United States related to the cancellation of the leases described in Paragraph 2 of this Settlement Agreement. BBC and Vantage agree that BBC shall be solely responsible for providing Vantage with its share of the refund monies. In the event any entities other than BBC and Vantage are determined to have an ownership interest in the leases described in Paragraph 2, BBC agrees to assume sole liability, and will hold the United States harmless, for any monetary claims asserted by those entities.

C. Resource Management Plan Amendment and Supplemental Environmental Impact Statement

5. BLM agrees that, as part of the SEIS being prepared in response to the District Court Order, it will examine in detail an alternative for the RMPA (the "Settlement Alternative") that includes the following elements:

a. Making the lands covered by the leases described in Paragraph 2 closed to new leasing;

b. Making the lands on top of the Roan Plateau that are presently contained within leases COC73091 and COC73092 ("BBC Retained Leases") open to oil and gas leasing and development, subject to lease notices, stipulations, and standard lease terms and conditions consistent with those for the BBC Retained Leases, except as modified by a new stipulation that incorporates the terms and conditions set forth in Exhibit 2; and

c. Making the lands at the base of the Roan Plateau that are presently contained within leases COC73064, COC73065, COC73067, COC73068, COC73069, COC73070, COC73071, COC73072, COC73083, COC73085, COC73093, and

COC73094 (collectively, the "Base Leases") open to oil and gas leasing and development, subject to lease notices, stipulations, and standard lease terms and conditions consistent with those for the Base Leases, except as modified by a new stipulation that incorporates the terms and conditions set forth in Exhibit 3.

6. BLM agrees that the SEIS will address the following:

a. Impacts to air quality as required by pages 29-37 of the District Court Order;

b. Impacts to greater sage grouse, taking into consideration the analysis in the Environmental Impact Statement for the Northwest Colorado Greater Sage-Grouse Resource Management Plan Amendment, and any resulting decisions;

c. The management of lands having wilderness characteristics consistent with BLM Manual 6320, considering the BLM's most recent inventory of such lands; and

d. Other matters as required by applicable law and policy, including consideration of new information or changed circumstances that may result in significantly different environmental effects from those addressed in the 2006 Environmental Impact Statement prepared by the BLM for the Planning Area.

7. BLM agrees that it will make its best effort to complete the final SEIS and issue a Record of Decision within 24 months of the Effective Date of this Settlement Agreement. The BLM will use information from existing NEPA analyses and other materials, as appropriate, consistent with 43 C.F.R. § 46.120 and 40 C.F.R. § 1502.21.

8. BLM agrees that: (a) pursuant to Onshore Oil and Gas Order Number 1, 72 Fed. Reg. 10308 (Mar. 7, 2007), BLM shall post any Application for Permit to Drill ("APD") or Master Development Plan ("MDP") submitted on leases described in Paragraphs 5.b. and 5.c. for 30 days prior to approval on BLM's Colorado River Valley Field Office APD web page; and (b) before authorizing construction of a new well pad (including wells for exploratory drilling), or centralized development or production facility, when the majority of the pad or facility is located within any portion of a Base Lease that is subject to a no surface occupancy/no ground disturbance ("NSO") stipulation, BLM will prepare a site-specific NEPA analysis of the proposed development.

D. Dismissal of Case and Agreements Not to Sue

9. Within 10 days following the cancellation of the leases identified in Paragraph 2, the Parties will jointly move to withdraw all pending motions filed with the U.S. Court of Appeals for the Tenth Circuit and will stipulate, pursuant to Fed. R. App. P. 42, to the voluntary dismissal of all appeals filed in this case, with each Party to bear its own costs, except as provided in Paragraph 16.

10. Plaintiffs agree that if BLM's final Record of Decision adopts the Settlement Alternative, they will not pursue an administrative protest, petition for state director review,

appeal to the Interior Board of Land Appeals ("IBLA"), or judicial challenge to (1) the Record of Decision for the RMPA, or (2) any approved APD, MDP, geographic area plan, or other plan for oil and gas activities on leases that complies with the applicable requirements of the Settlement Alternative as set forth in Paragraph 5 and Exhibit 2 (for the BBC Retained Leases) or Exhibit 3 (for the Base Leases). Plaintiffs additionally agree to engage as broad a spectrum of the environmental and conservation community as possible not to pursue an administrative protest, petition for state director review, IBLA appeal, or judicial challenge to those decisions.

11. Defendant-Intervenors agree that if BLM's final Record of Decision adopts the Settlement Alternative, they will not pursue an administrative protest, petition for state director review, appeal to the IBLA, or judicial challenge to the Record of Decision for the RMPA. Defendant-Intervenors further agree not to pursue a petition for state director review, appeal to the IBLA, or judicial challenge to any decision by BLM to modify their leases to include the terms and conditions set forth in Paragraph 5 and Exhibits 2 and 3, or to impose applicable terms and conditions from Paragraph 5 and Exhibits 2 and 3 on the approval of any APD, MDP, geographic area plan, or other plan for oil and gas activities on Defendant-Intervenors' leases.

12. Plaintiffs and Defendant-Intervenors further agree that they will not fund any other entity or person not a party to this Settlement Agreement to commence an administrative or judicial challenge that would be barred by this Settlement Agreement if brought by Plaintiffs or Defendant-Intervenors.

13. Except as expressly provided in Paragraphs 10-12 and Exhibits 2 and 3, nothing in this Settlement Agreement is intended to limit or waive Plaintiffs' and Defendant-Intervenors' rights to challenge: (a) the Record of Decision on remand (including a decision not to adopt the Settlement Alternative); or (b) any BLM decision related to oil and gas activities in the Planning Area (including, but not limited to, preserving Plaintiffs' right, subject to Paragraphs 10-12 and Exhibits 2 and 3, to challenge the approval of surface disturbing activities at a location identified in a Base Lease as being subject to an NSO stipulation and the grant of any exceptions, modifications or waivers of lease stipulations).

14. The Parties acknowledge that nothing in this Settlement Agreement affects BLM's discretion to adopt the plan of its choice among the alternatives (or a combination of the alternatives) analyzed in the SEIS.

E. Additional Terms

15. In the event any of the Parties believes a Party has breached its obligations under this Settlement Agreement, the Party alleging breach shall provide the allegedly breaching Party written notice and a reasonable opportunity to cure the alleged breach. The Parties agree that no Party shall be subject to any claim for money damages as a result of a breach of this Settlement Agreement, except for breaches of Paragraphs 3 and 16. The Parties further agree that the obligations set forth in Paragraphs 5 through 8 are not enforceable through a judicial action for breach of contract or other similar claim, and that any challenge to the sufficiency

of the SEIS, including the BLM's compliance with the obligations set forth in Paragraphs 5 through 8, may be brought only in a separate administrative or judicial action challenging the validity of the Record of Decision under the Administrative Procedure Act ("APA"), 5 U.S.C. §§ 551–559.

16. Each Party will bear its own attorneys' fees, costs and other expenses incurred during the entirety of this case, including those related to negotiation of this Settlement Agreement and prior attempts to reach settlement, except as otherwise outlined herein below:

a. BLM agrees to settle Plaintiffs' entire claim for any and all attorneys' fees, expenses, and costs by payment in the amount of $400,000.00.

b. Plaintiffs agree to accept payment of $400,000.00 in full satisfaction of any and all claims for attorneys' fees, expenses, and costs of litigation to which they allege they may be entitled in the above-captioned case, including any all claims, demands, rights, and causes of action pursuant to the Equal Access to Justice Act ("EAJA"), or any other statute, provision, or common law theory.

c. Effective upon Plaintiffs' receipt of payment from Federal Defendants, Plaintiffs herein release the United States, including each named Federal Defendant, from any claims for attorneys' fees, expenses, and costs of litigation in the above-captioned case pursuant to the EAJA, and any other statute, provision, or common law theory, for attorneys' fees, expenses, and costs in the above-captioned case.

d. Federal Defendants agree to submit all necessary paperwork to the appropriate offices of the federal government within 20 business days after all appeals are dismissed, or Plaintiffs provide the necessary information as required by Paragraph 16.e. to facilitate the payment, whichever is later.

e. Federal Defendants' payment will be made by electronic funds transfer of the agreed upon settlement amount into the account of Plaintiffs' attorney. Plaintiffs' attorney is receiving funds in trust for Plaintiffs, and Plaintiffs agree to this procedure. Plaintiffs and their attorneys agree to hold harmless Federal Defendants in any litigation, further suit, or claim arising from the payment of the agreed upon settlement amount pursuant to this Paragraph, other than for an allegation of Federal Defendants' breach of Paragraph 16 of this Settlement Agreement. Undersigned Plaintiffs' attorney shall provide all necessary account information to make the electronic funds transfer(s) including, as necessary: (1) Plaintiffs' counsel's tax identification number; (2) payee account name; (3) routing/transit number; (4) account number; (5) type of account; (6) name and address of banking institution; and (7) any other necessary information needed to make the payment, to the undersigned Federal Defendants' counsel. Thereafter, the Federal Defendants shall submit all necessary paperwork as provided in Paragraph 16.d. Undersigned Plaintiffs' counsel agrees to provide confirmation of the receipt of the agreed upon settlement amount to undersigned Federal Defendants' counsel within 14 days.

f. The Parties agree that Paragraph 16 was negotiated in good faith and it constitutes a settlement of claims for attorneys' fees and costs that were vigorously contested, denied, and disputed by the Parties.

17. This Settlement Agreement was negotiated for the purpose of avoiding further litigation. The Parties agree that this Settlement Agreement has no precedential value and does not represent an admission or waiver by any Party to any fact, claim, or defense relating to any issue in this lawsuit and shall not be admissible as evidence of any fact, claim, or defense in any litigation, other than litigation to enforce the terms of this Settlement Agreement. This Paragraph is not intended to limit or override any specific provisions in this Settlement Agreement.

18. The terms of this Settlement Agreement constitute the entire Settlement Agreement of the Parties, and no statement, agreement, or understanding, whether oral or written, which is not contained herein, shall be recognized or enforced, unless all Parties agree in writing to amend this Settlement Agreement.

19. Nothing contained in this Settlement Agreement shall be construed as a commitment or requirement that the Federal Defendants obligate or pay funds in contravention of the Anti-deficiency Act, 31 U.S.C. § 1341, or other applicable law.

20. Nothing in the terms of this Settlement Agreement shall be construed to limit or deny the power of the federal government to promulgate or amend regulations.

21. This Settlement Agreement applies to the Parties and upon Plaintiffs' and Intervenor-Defendants' successors, agents, and assignees.

22. The undersigned representatives of the Parties certify that they are authorized by the Parties they represent to execute this Settlement Agreement.

Date Signed: November 19, 2014

Sam Hirsch, Acting Assistant Attorney General
Environment & Natural Resources Division
Jason A. Hill, Trial Attorney
Natural Resources Section
Brian Toth, Trial Attorney
Appellate Section

Attorneys for Federal-Defendants/Cross-Appellees

Date Signed: November 19, 2014

Michael S. Freeman
James S. Angell

Attorneys for Plaintiffs-Appellees/Cross-Appellants
Conservation Colorado Education Fund, *et al.*

Date Signed: November __, 2014

Duane Zavadil

Senior Vice President, Government and Regulatory Affairs for Intervenor-Appellant/Cross-Appellee, Bill Barrett Corporation

Date Signed: November __, 2014

Don Simpson

Vice President - Business Development for Intervenor-Cross-Appellee Ursa Piceance, LLC

Date Signed: November __, 2014

Chad Odegard

Vice President – Piceance Asset Team for Intervenor-Cross-Appellee WPX Energy Rocky Mountain, LLC

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Division Manager, Piceance-South Texas for Intervenor-Cross-Appellee OXY USA, Inc.

Date Signed: November __, 2014

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President and Chief Financial Officer for former Defendant-Intervenor, Vantage Energy Piceance LLC

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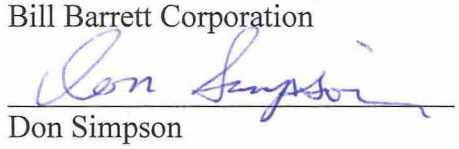
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Date Signed: November 19, 2014

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Thomas B. Tyree, Jr.

President and Chief Financial Officer for former Defendant-Intervenor, Vantage Energy Piceance LLC

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Exhibit 1

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Case Nos. 12-1322, 12-1339

IN THE UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

CONSERVATION COLORADO EDUCATION FUND*, et al.*,
Plaintiffs – Appellees/Cross-Appellants,

v.

SALLY JEWELL,[1] in her official capacity as
Secretary of the Interior, *et al.*,
Federal Defendants – Cross-Appellees,

BILL BARRETT CORPORATION,
Intervenor – Appellant/Cross-Appellee,

and

OXY USA, INC., *et al.*,
Intervenors – Cross-Appellees.

JOINT MOTION FOR A STAY OF APPELLATE PROCEEDINGS

Pursuant to discussions held under Tenth Circuit Rule 33.1, the undersigned have reached a settlement agreement that they expect will eventually result in the dismissal of the appeals with prejudice. The undersigned jointly request that the Court stay the proceedings on

[1] Sally Jewell was sworn in as the Secretary of the Interior while this appeal was pending and is substituted for her predecessor, Kenneth Salazar, pursuant to Fed. R. App. P. 43(c)(2).

appeal for a period of 75 days while the parties carry out their commitments under that agreement that are necessary before they file their stipulation for voluntary dismissal.

Counsel for intervenors/cross-appellees OXY USA Inc. and WPX Energy Rocky Mountain, LLC and counsel for intervenors/cross-appellees Ursa Piceance LLC have been consulted and do not oppose this motion.

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Case Nos. 12-1322, 12-1339

IN THE UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

CONSERVATION COLORADO EDUCATION FUND*, et al.*,
Plaintiffs – Appellees/Cross-Appellants,

v.

SALLY JEWELL, in her official capacity as
Secretary of the Interior, *et al.*,
Federal Defendants – Cross-Appellees,

BILL BARRETT CORPORATION,
Intervenor – Appellant/Cross-Appellee,

and

OXY USA, INC., *et al.*,
Intervenors – Cross-Appellees.

PROPOSED ORDER

In accordance with 10th Cir. R. 33.1 and upon consideration of the parties' joint motion, and the lack of opposition thereto, the proceedings in this appeal are hereby stayed for a period of 75 days.

Entered for the Court,

ELISABETH A. SHUMAKER,
Clerk

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Exhibit 2

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EXHIBIT 2

RETAINED LEASES

Under the Settlement Alternative, the lands contained within the Retained Leases would be open to oil and gas leasing and development, subject to lease notices, stipulations, and standard lease terms and conditions consistent with those for the Retained Leases, except as modified by a new stipulation that includes the following terms and conditions:

A. No more than 7 well pads may be located on the Retained Leases; including pads drilled for either exploration or production activities. Subject to onsite inspection and approval by the Bureau of Land Management ("BLM") and other regulatory agencies, well pads shall be located approximately as depicted in the attached map. Exhibit 2.A.

Each well pad may disturb no more than 10 acres of the surface when drilling operations are occurring, and may be limited to a smaller size if BLM determines 10 acres are not needed for projected drilling operations. Each well pad shall be limited to approximately 3 acres of un-reclaimed surface during production.

There shall be no more than four pads on the Retained Leases at any time that take up more than three acres each of un-reclaimed surface. Those four pads may take up to a total of approximately 40 acres of un-reclaimed surface, with drilling operations occurring on no more than two of the pads at any one time. For purposes of this requirement, surface is considered reclaimed if BLM determines that its interim reclamation requirements have been met.

The Retained Leases are not required to be joined in a federal unit.

B. Primary access shall be limited to designated roads approximately as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval. Operators may not use Cow Creek Road or the Rim Road east of the retained leases for access except in emergencies. For purposes of this requirement, an "emergency" means unforeseeable physical inaccessibility for other routes or an unforeseeable condition creating a significant risk of environmental harm or injury to persons. Limitations on contractual access from the south or west, or foreseeable delays in obtaining access for drilling, site preparation, completion activities, or regularly-scheduled maintenance and other activities, do not represent an emergency. Where an emergency situation exists, access for maintenance of on-going active drilling and completion operations, and service for existing production, is allowed.

C. Pipeline and gathering line infrastructure, water lines, and utility lines, shall be collocated with designated access roads as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval, and may depart from designated access roads if BLM determines that doing so reduces net disturbance or visual impacts. No less than 90 percent of the total pipeline length shall be collocated.

D. Prior to exploration and/or lease development on the Retained Leases, the operator must submit a proposed Master Development Plan ("MDP") identifying projected activity (including well locations, roads, pipelines, facilities and associated infrastructure) and appropriate monitoring and methodologies in conformance with the requirements of the resource management plan as adopted to incorporate the Settlement Alternative.

E. Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's proposed MDP.

F. The following will be required in any approved MDP, and incorporated as conditions of approval for all drilling permits:

a. Road engineering standards to minimize disturbance associated with road improvements;

b. Requirements for removing unnecessary infrastructure as soon as feasible;

c. The required reclamation plan will include reclamation processes that can be reasonably expected to meet the 5 year reclamation standard within 3 growing seasons;

d. Closed-loop drilling systems and/or tanks shall be used instead of pits, except for pits used solely to store fresh water;

e. Telemetry for remote monitoring of producing wells;

f. Wellheads to be subject to appropriate measures for visual impact mitigation;

g. Conveyance by pipeline of drilling water, water used for hydraulic fracturing and completions, and flowback water, to minimize truck traffic;

h. Centralized water management during drilling, completion and production (e.g., not every location will have pits);

i. Recycling of water used during well completions, and recycling of produced water while well completion activities are in progress;

j. Conveyance by pipeline of produced water and condensate to centralized facilities to minimize truck traffic;

k. Utilize centralized compression, storage, separation and dehydration facilities;

l. No more than 3 centralized facilities will be constructed for all centralized management purposes in Paragraphs F.h., F.j. and F.k., and those facilities will be located on three of the potential locations indicated on the attached map, Exhibit 2.A.;

m. Disclosure of all chemicals used during drilling and production activities. Chemicals used during completion activities shall be disclosed pursuant to Colorado Oil and Gas Conservation Commission rules;

n. Tier III equivalent or lower emissions for drill rigs for all wells;

o. Vapor combustors or vapor recovery on all condensate tanks, water tanks and dehydrators, and no/low-bleed control valves on all facilities;

p. Reduced-emission ("green") completions, as defined by 40 C.F.R. § 60.5430; and

q. Utilize liquids lifting practices to limit venting, including plunger lifts or alternative technologies that are at least as effective in limiting venting.

G. Potential conditions of approval identified in the applicable record of decision replace those identified in the 2006 Proposed Resource Management Plan Amendment/Final Environmental Impact Statement and associated records of decision.

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Exhibit 2A

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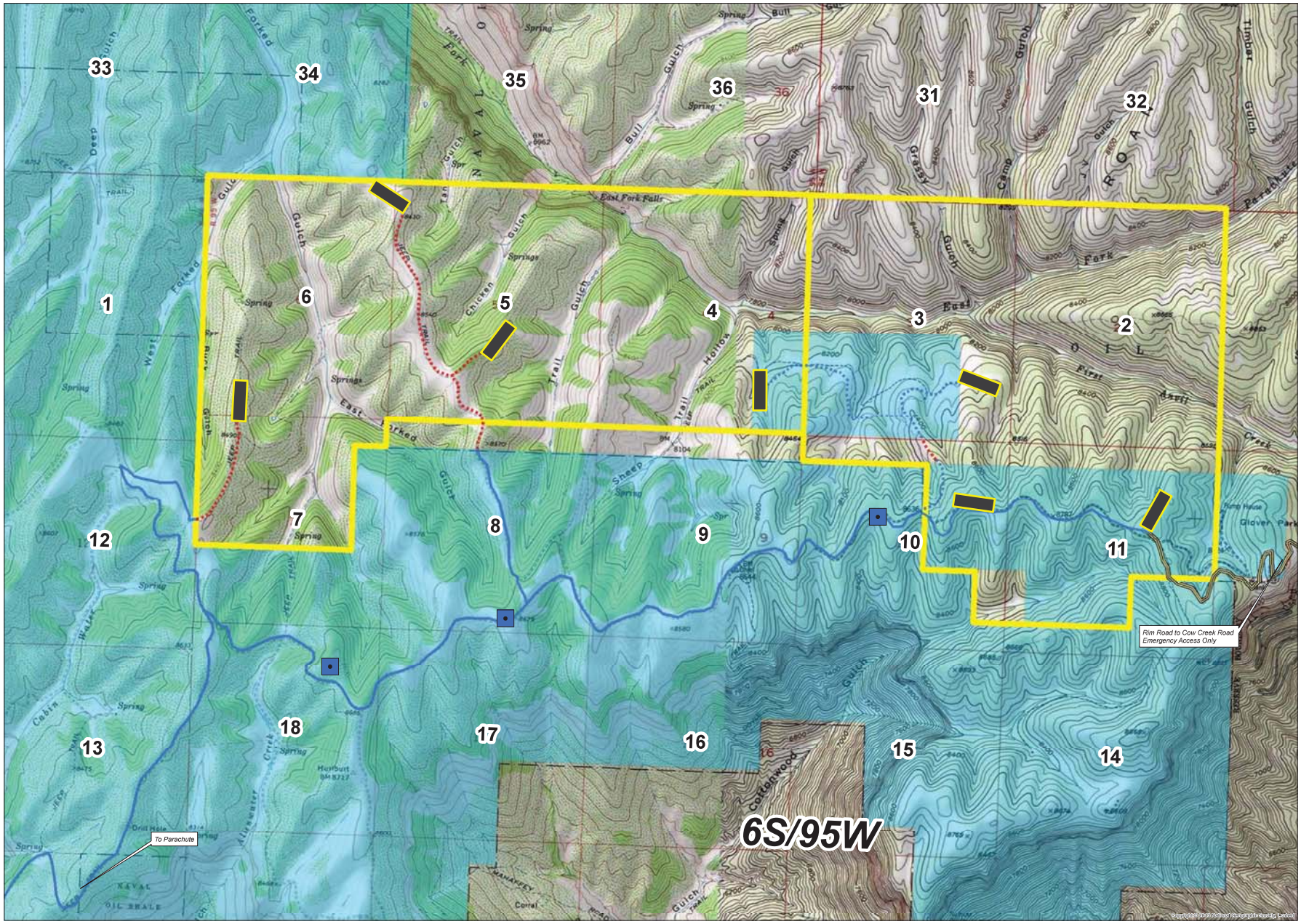

Bill Barrett Corporation

Exhibit 2 - Attachment A
Roan Plateau Retained Leases
Development Plan

Legend

- Potential Central Gathering Facility Locations
- BBC Retained Leases
- BBC Proposed Well Pads

Federal Surface Access Roads

- Existing O&G ROW
- Upgrade of Existing Road

Private Surface Access Roads

- Existing O&G ROW
- Upgrade of Existing Road
- Rim Road to Cow Creek Road
- Private Surface Ownership

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Exhibit 3

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EXHIBIT 3

BASE LEASES

Under the Settlement Alternative, the lands contained within the Base Leases would be open to oil and gas leasing and development, subject to lease notices, stipulations, and standard lease terms and conditions consistent with those for the Base Leases, except as modified by a new stipulation that includes the following terms and conditions:

A. Prior to exploration and/or lease development on it Base Leases, an operator shall submit a proposed master development plan ("MDP") identifying its projected activities. Prior to submitting the MDP, an operator shall consult with the Colorado Division of Parks and Wildlife and Bureau of Land Management to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's MDP.

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Appendix L

Public Comment Report
for the
Draft Roan Plateau Planning Area
Resource Management Plan Amendment and
Supplemental Environmental Impact Statement

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Public Comment Report
for the
Draft Roan Plateau Planning Area Resource Management Plan Amendment and Supplemental Environmental Impact Statement

July 2016

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LIST OF ABBREVIATIONS AND ACRONYMS

BLM	U.S. Department of the Interior, Bureau of Land Management
CEQ	Council on Environmental Quality
CRVFO	Colorado River Valley Field Office
FEIS	Final Environmental Impact Statement
FSEIS	Final Supplemental Environmental Impact Statement
NEPA	National Environmental Policy Act
NOA	Notice of Availability
OHV	Off-highway vehicle
RMPA	Resource Management Plan Amendment
SEIS	Supplemental Environmental Impact Statement

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EXECUTIVE SUMMARY

The U.S. Department of the Interior, Bureau of Land Management (BLM), Colorado River Valley Field Office (CRVFO), released the Roan Plateau Planning Area Draft Resource Management Plan Amendment (RMPA) and Supplemental Environmental Impact Statement (SEIS) on November 20, 2015. The document was made available for public review and comment for 90 calendar days, with the comment period ending on February 18, 2016. This report addresses the results of public collaboration and outreach following release of the Draft RMPA/SEIS. All public comments on the Draft RMPA/SEIS are summarized, and BLM's responses are documented.

BLM received 50,982 comment submissions by the close of the public comment period at midnight, February 18, 2016. The vast majority of these submissions (50,887 submissions, or approximately 99.8 percent) consisted of one of four types of form letters. The remaining 95 comment submissions (approximately 0.2 percent) were unique submissions. Of these, 52 submissions consisted of position statements or opinions rather than substantive comments on the alternatives, information, assumptions, or analysis in the Draft RMPA/SEIS. Non-substantive position statements or opinions tended to express support for Alternative IV as the Proposed Plan, with or without additions from the other alternatives considered in the SEIS, or opposition to leasing or drilling for oil or gas or other mineral resources atop the Roan Plateau.

The remaining 43 unique comment submissions that provided substantive comments were submitted by organizations, individuals, and government agencies. A number of these submissions contained more than a single comment. A total of 237 substantive individual comments were received during the public comment period. The topics or resource areas most frequently commented on included shooting sports (59 comments), climate and air quality (54 comments), and oil and gas leasing and development (40 comments). All other topics/resource areas were commented on fewer than 20 times.

BLM has reviewed and evaluated the information received through these comment submissions and, as appropriate, will incorporate additional information based on these submissions into the Proposed RMPA/ and Final SEIS (FSEIS).

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1 INTRODUCTION

The BLM CRVFO is supplementing the 2006 Roan Plateau Planning Area RMPA and Final Environmental Impact Statement (FEIS). This supplemental planning effort and supporting environmental analysis addresses information and alternatives analyzed in the 2006 RMPA/FEIS, supplemented with additional analyses in response to issues identified by the U.S. District Court for the District of Colorado's Judicial Order and through internal and external scoping for this SEIS.

BLM released the Roan Plateau Planning Area Draft RMPA/SEIS for public review and comment on November 20, 2015. The Draft RMPA/SEIS was made available for public comment for 90 calendar days, with the comment period ending on February 18, 2016. This report summarizes public collaboration and outreach following release of the Draft RMPA/SEIS and documents public comments on the Draft RMPA/SEIS.

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2 DISTRIBUTION AND AVAILABILITY OF THE DRAFT RMPA/SEIS

BLM published the Notice of Availability (NOA) of the Draft RMPA/SEIS in the *Federal Register* on November 20, 2015 (BLM 2015). The NOA provided information on the public comment period and instructions for interested members of the public to provide written comments on the Draft RMPA/SEIS. The *Federal Register* notice summarized BLM's procedure for announcing public meetings during the comment period and indicated the availability of hard copies of the Draft RMPA/SEIS at the BLM CRVFO. In addition, the NOA provided supplementary information on the planning area, the process of developing the Draft RMPA/SEIS, and the alternatives and new information and issues evaluated in the Draft RMPA/SEIS.

In addition to publication in the *Federal Register,* BLM provided announcements of the NOA for the Draft RMPA/SEIS and information regarding public review and comment through a variety of other methods, including a press release, an announcement on the BLM project website, and individual communications. These methods are described below.

The press release and announcement of the availability of the Draft RMPA/SEIS for public review were posted to the BLM project website on November 17, 2015. The press release and announcement summarized the BLM's Preferred Alternative analyzed in the Draft RMPA/SEIS and provided information regarding the public comment period and how comments could be submitted, including an email address for electronic submission of comments. The press release and announcement also provided advance notice of planned public meetings on the Draft RMPA/SEIS.

Beginning on November 17, the entire Draft RMPA/SEIS document, including maps and appendices, was available for download from the BLM project website via higher resolution combined files or separate numbered chapters and appendices.

Postcards announcing the release of the Roan Plateau Draft RMPA/SEIS and the start of the public comment period were mailed to individuals and organizations included on the project mailing list on November 17, 2015. The postcards announced upcoming communications regarding public meetings expected to be held in January 2016 and summarized the ways that interested members of the public could comment on the Draft RMPA/SEIS. In addition, BLM sent emails providing the same information to 22,700 individuals and organizations on the project mailing list on November 17 and 18, 2015.

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3 PUBLIC MEETINGS

Three public meetings were held in communities near the Roan Plateau Planning Area within 60 days of the release of the Draft RMPA/SEIS. The dates, times, and locations of these meetings were announced on the project website and via press release on January 7, 2016, and are listed below.

BLM Colorado River Valley Field Office
Silt, Colorado
Tuesday, January 12, 2016
4 p.m. to 7 p.m.

Grand Valley Recreation Center
Parachute (Battlement Mesa), Colorado
Wednesday, January 13, 2016
4 p.m. to 7 p.m.

Rifle Branch Library
Rifle, Colorado
Thursday, January 14, 2016
4 p.m. to 7 p.m.

Each meeting was held in an open house format. The National Environmental Policy Act (NEPA) process, development of the Draft RMPA/SEIS, and primary topics addressed in the Draft RMPA/SEIS were presented on posters staffed by BLM representatives and subject-matter experts who answered questions regarding the planning process and Planning Area. Fact sheets providing information on alternatives considered in the Draft RMPA/SEIS, the public comment process, management measures for recreational target shooting at Hubbard Mesa, special management designations, oil and gas development, and the project timeline were available for attendees to take. The meeting in Rifle, Colorado, followed a similar format, with BLM representatives and subject-matter experts available to answer questions regarding all the topics mentioned above. However, the focus of the meeting in Rifle, Colorado, was on shooting sports and recreation in the Hubbard Mesa Open off-highway vehicle (OHV) Riding Area.

At scheduled times during each meeting, BLM representatives presented major points addressed in the Draft RMPA/SEIS and answered audience questions.

Hard copy comment forms and maps were provided at each meeting, and attendees had the opportunity to provide written comments at the meetings or to take copies of the comment forms and mail in written comments at a later date.

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4 COMMENT COLLECTION AND ANALYSIS

This section describes the comment collection and analysis process. A summary of the numbers and types of comments received and BLM's responses to these comments is provided in Section 5. As announced in the NOA, BLM accepted written comments on the Draft RMPA/SEIS via a dedicated email address, fax, mail, or during public meetings over the 90-day public review and comment period between November 20, 2015, and February 18, 2016. BLM's announcements and the published NOA of the Draft RMPA/SEIS provided information on how to request confidentiality or the withholding of individual names or addresses from public review.

Comment Collection. Public comments received during the comment period were stored, organized, and addressed using a comment management database designed to allow consistent comment coding and response. Hard copy comments received at the public meetings or via mail were scanned by the CRVFO and converted to electronic format before being entered into the database. Email comment submissions were converted to pdf format and entered into the database. A representative example of each type of form letter was also entered into the database.

Each comment submission entered into the database was auto-assigned a unique identification number. Contact information provided by each unique commenter was manually entered into the database. Because the form letter comment submissions were received from thousands of commenters, individual copies of these submissions were not uploaded into the database, and contact information associated with individual form letters was not recorded. As noted, a representative example of each type of form letter was included in the database. Form letters were reviewed for individual submissions that substantially changed the original meaning of the comment, or included additional substantive comments. Any form letter meeting either criterion was considered a unique comment and entered into the database as such.

Comment Analysis. Within each comment submission, individual substantive comments or non-substantive opinion or position statements that addressed particular topics or issues related to the planning process, Planning Area, or Draft RMPA/SEIS were identified, given a unique identification number, and coded according to a comment category. The methodology by which comments were considered "substantive" or "non-substantive" is detailed on the next page.

A total of 36 comment categories was designated, and these categories are listed on the next page. Individual comments were identified and analyzed based on content. The BLM project team developed draft comment responses, which were provided to BLM subject matter experts, including air quality specialists, biologists and ecologists, and recreation planners, for review. Many substantive comments concerned identical or similar issues. In these cases, collective responses were developed that note where information and analysis related to the issues raised in these comments may be found in the Proposed Plan/FSEIS.

Broadly, the comment categories included:

- Resource areas analyzed in the Draft RMPA/SEIS;
- Sections of the Draft RMPA/SEIS or factors considered in the NEPA analysis such as alternatives or mitigation measures; and
- The broad topics of opinion statements related to the Draft RMPA/SEIS or resource areas.

Substantive and Non-substantive Comments

BLM considered every comment, whether it was provided repeatedly by many people with the same message(s) or by a single commenter raising a technical point or making a personal statement. Analysis of public comments emphasized the content of a comment rather than the number of comments received. According to Council on Environmental Quality (CEQ) regulations for implementing NEPA, BLM is required to identify and formally respond to all substantive public comments (Section 1503.4). On the basis of the CEQ regulations, a substantive comment does one or more of the following:

- Questions, with reasonable basis, the accuracy of information in the NEPA document;
- Questions, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis;
- Presents new information relevant to the analysis;
- Presents reasonable alternatives other than those analyzed in the NEPA document; and/or
- Causes changes to or revisions of the alternatives (BLM 2008).

In contrast, non-substantive comments simply state a position in favor of, or against, an alternative or proposed management action; agree or disagree with a BLM policy or proposal; provide information not directly related to the issues or impact analyses, or otherwise express a personal preference or opinion unsupported by data (BLM 2008).

BLM has reviewed and considered all non-substantive comments received and has provided a collective response. Although non-substantive comments may be considered by the decision-maker as he or she chooses the Proposed Plan for the Roan Plateau Planning Area, they generally will not affect the analysis in the Proposed Plan/FSEIS.

Comment Categories

Alternatives
Areas of Critical Environmental Concern (ACEC)
Biological Resources
Climate and Air Quality
Cultural Resources
Cumulative Impacts
Environmental Justice
Executive Summary
General
Grazing and Rangeland Management
Hazardous Materials
Lands and Realty
Lands with Wilderness Characteristics
Mitigation
Oil and Gas Leasing and Development
Opinion
Opinion – Air Quality
Opinion – Alternatives
Opinion – NEPA Process
Opinion – Oil and Gas
Opinion – Other
Opinion – Shooting Sports
Opinion – Wild and Scenic Rivers
Other
Public Health and Safety
Purpose and Need
Recreation
Shooting Sports
Socioeconomics
Special Status Species
T&E Species
Transportation
Travel Management
Visual Resources
Water Resources
Wild and Scenic Rivers

5 COMMENTS RECEIVED AND COMMENT RESPONSES

BLM received 50,982 comment submissions by the close of the public comment period on February 18, 2016. The vast majority of these submissions (approximately 99.9 percent) were received via email. Less than 0.10 percent were received via the U.S. Postal Service as letters or as handwritten comments submitted during the public meetings. Comment submissions are summarized in Table 1.

Table 1. Total Public Comment Submissions, Roan Plateau Draft RMPA/SEIS

Email	
Unique	80
Form letters	50,887
Total	**50,967**
Mail	
Unique	12
Form letters	-
Total	**12**
Hard Copy (at Public Meetings)	
Unique	3
Form letters	-
Total	**3**
Total Comment Submissions	**50,982**

The largest category of comment submissions (approximately 99.8 percent) was multiple copies of four form letters received via email. A summary of each form letter submission is provided in Table 2. Form Letters 2 and 4 were the most frequently submitted. Most of the individual submissions of these form letters were provided as compiled Rich Text Format (.rtf) files in zipped folders via email, due to the number of submissions of each form letter. BLM requested that the non-governmental organizations soliciting Form Letters 2 and 4 provide the individual submissions of the form letters in batches to prevent individual submissions from shutting down the project email server, potentially preventing other public comments from being received.

Table 2. Summary of Form Letter Submissions

Form Letter Type	*Topic/Resource Areas Addressed*	*Number of Submissions*
Form Letter 1	Supportive of BLM selecting Alternative IV as the Proposed Plan and including management components for lands with wilderness characteristics.	220
Form Letter 2	Against allowing oil and gas development on the Roan Plateau.	24,875
Form Letter 3	Supportive of BLM selecting Alternative IV as the Proposed Plan. Supportive of management components for lands with wilderness characteristics. Requests that the Proposed Plan find that stream segments that are eligible for designation as Wild and Scenic Rivers are suitable for designation.	499
Form Letter 4	Supportive of BLM selecting Alternative IV as the Proposed Plan.	25,293
Total Form Letter Submissions		**50,887**

A total of 95 unique (non-form letter) comment submissions on the Draft RMPA/SEIS were received. Of these, more than half (52 comment submissions) were submissions consisting of position statements or opinions, rather than substantive comments on the alternatives, information, assumptions, or analysis in the Draft RMPA/SEIS. Non-substantive position statements or opinions tended to fall into one of six general categories related to alternatives considered in the Draft RMPA/SEIS or proposed management measures related to oil and gas development, stream segments suitable for designation as Wild and Scenic Rivers, management of lands with wilderness characteristics, or recreation in the Hubbard Mesa Open OHV Riding Area. Table 3 lists and summarizes these types of position statements and/or opinions and provides the numbers of each type of comment submission received.

Table 3. Summary of Position/Opinion Submissions

Comment Summary	*Number of Submissions*
Supportive of BLM selecting Alternative IV, the Settlement Alternative, as the Proposed Plan and preferred alternative in the FSEIS.	9
Supportive of BLM selecting Alternative IV, the Settlement Alternative, as the Proposed Plan and preferred alternative in the FSEIS, with additions, such as designation of suitable stream segments as Wild and Scenic Rivers.	9
Supportive of closing areas of the Hubbard Mesa Open OHV Riding Area to target shooting.	1
Against closing areas of the Hubbard Mesa Open OHV Riding Area to target shooting. These comment submissions generally take the position that existing policies related to managing multiple types of recreational uses need to be enforced.	2
Against leasing or drilling for oil or gas or other mineral resources atop the Roan Plateau. These submissions often cite the need to protect other natural resources atop the plateau, the need to transition away from fossil fuel use and/or to renewable energy sources, or the lack of a need for additional oil or gas development.	20
Supportive of oil and gas development.	1
Against BLM management measures related to natural resources, including biological resources, and land.	4
Supportive of BLM management measures to protect natural resources, including biological resources.	2
Political commentary.	1
Supportive of Alternative III, the Community Alternative.	1
Request that BLM designate areas for target shooting that are closed to some or all other types of recreation.	1
Supportive of other management measures related to shooting sports at Hubbard Mesa.	1
Total Position/Opinion Submissions	**52**

The remaining 43 unique (non-form letter) comment submissions received provided substantive comments on the alternatives, information, assumptions, or analysis in the Draft RMPA/SEIS. A number of these submissions contained more than a single comment and, in total, 237 individual substantive comments were received during the public comment period. These comments are tallied by comment source (individual, organization, or government agency) and topic or resource area addressed in Table 4. The majority of comments were submitted by organizations, followed by individuals, then government agencies. The topics or resource areas most frequently commented on included shooting sports (59 comments), climate and air quality (54 comments), and oil and gas leasing and development (40 comments). All other topics/resource areas were commented on fewer than 20 times.

Table 4. Summary of Substantive Comments by Topic

Issue	Number of Submissions			
	Individuals	Organizations	Government Agency	Total
Alternatives	1	2	1	4
Areas of Critical Environmental Concern (ACEC)	8	2	-	10
Biological Resources	2	12	-	14
Climate and Air Quality	16	29	9	54
Cultural Resources	-	-	-	-
Cumulative Impacts	-	-	-	-
Environmental Justice	-	-	-	-
Executive Summary	2	1	-	3
General	-	-	-	-
Grazing and Rangeland Management	-	-	-	-
Hazardous Materials	-	-	1	1
Lands and Realty	-	-	-	-
Lands with Wilderness Characteristics	8	3	-	11
Mitigation	-	-	-	-
Oil and Gas Leasing and Development	-	40	-	40
Other	-	-	-	-
Public Health and Safety	-	-	-	-
Purpose and Need	-	-	-	-
Recreation	1	2	1	4
Shooting Sports	35	15	9	59
Socioeconomics	-	1	2	3
Special Status Species	-	4	-	4
Threatened and Endangered Species	1	1	-	2
Transportation	-	2	-	2
Travel Management	1	3	-	4
Visual Resources	-	2	-	2
Water Resources	3	3	7	13
Wild and Scenic Rivers	2	5	-	7
Totals	**80**	**127**	**30**	**237**

Unique comments submitted during the public comment period are provided in Attachment A in a table with responses from the BLM. A complete report of full comment submissions, marked with individual comments and comment responses, is available for review on the BLM project website: http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/roan_plateau.html.

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6 REFERENCES

United States Department of Interior, Bureau of Land Management (BLM). 2015. A Notice. "Notice of Availability of the Draft Resource Management Plan Amendment and Supplemental Environmental Impact Statement for the Roan Plateau Planning Area, Colorado." November 20, 2015. *Federal Register*. Available at: https://www.federalregister.gov/articles/2015/11/20/2015-29716/notice-of-availability-of-the-draft-resource-management-plan-amendment-and-supplemental. Accessed on March 21, 2016.

United States Department of Interior, Bureau of Land Management (BLM). 2008. BLM National Environmental Policy Act Handbook H-1790-1. January 30. Available at: http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf. Accessed on March 18, 2016.

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ATTACHMENT A:
COMMENTS AND RESPONSES

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First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Doug	Dennison	Bill Barrett Corporation	0035-1	Alternatives	The Draft RMPA/SEIS needs to be revised to distinguish between current, valid existing lease rights, and future leasing decisions. The RMPA governs future leasing decisions (e.g., when, where and under what terms and stipulations new leases may be offered). The RMPA SEIS and Record of Decision, however, cannot revise or cancel existing leases. For example, Alternative I would require cancellation of nearly all of the remaining federal leases. This action is contrary to long established law and legal precedent, as explained in more detail below. The appropriate scope of Alternative I - the No Action Alternative - is that the status quo for current leases remains and continues. This component of Alternative I, and related textual narrative contained in the Draft RMPA/SEIS, needs to be revised to reflect the applicable legal framework, as well as the proper scope of the District Court decision, and subsequent Settlement Agreement.	As discussed in Section 1.1 of the Proposed RMPA/FSEIS, the original RMPA/FEIS (2006) was remanded. Because the court set aside the RMPA, no comprehensive land use plan exists for the Planning Area, and 2008 leases are subject to BLM's reconsideration. In view of the Court's ruling, BLM determined that a supplemental analysis under NEPA and a new proposed RMPA were warranted. This required evaluating the No Action Alternative from the original RMPA/FEIS as well as a full range of alternatives, even if they conflicted with the terms of the 2008 leases. As stated in Section 2.3.1, because this document supplements the Roan FEIS, Alternative I, the No Action Alternative, represents management of the Planning Area prior to the RODs for the Roan FEIS. Alternative I therefore does not cancel existing leases, but implementation of the No Action Alternative likely would require that BLM cancel leases issued in 2008 for lands within the Planning Area that are not available to lease under this alternative, and take other measures to "unwind" the initial implementation of the 2006 ROD that began before the court's decision. Should the BLM select the No Action Alternative, leases issued based on analysis in the 1999 FEIS and related decisions would remain intact with the same stipulations and COAs.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-20	Alternatives	Based on our review, the EPA is rating Alternative IV, the Preferred Alternative, as Environmental Concerns- Insufficient Information (EC-2). The EC rating is based on the identification of environmental impacts that should be avoided in order to fully protect the environment. The 2 rating means additional information is needed to more fully characterize impacts. Additional information is also needed on proposed mitigation measures.	Noted. Specific EPA comments on information needs and impacts are provided separately throughout this response to comments document.
Grand Valley Audubon Society			0067-2	Alternatives	We also recommend adding additional protections as listed in Alternative III such that eligible stream reaches could be included under the Wild and Scenic River Act to ensure that wilderness characteristics can be maintained within the three wilderness study units.	Alternative IV presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Bryan	Wyberg		0109-3	Alternatives	The preferred and final alternative of the new Resource Management Plan must include undisturbed big game winter ranges at the base of the plateau, intact big game migration corridors, state of the art drilling practices and no development in Colorado River Cutthroat Trout drainages to protect this iconic species.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Janice	Shepherd		0022-13	Areas of Critical Environmental Concern (ACEC)	The proposed shape of the East Fork Parachute Creek ACEC in Alt IV includes 3 small areas that are not contiguous with the rest of the ACEC. There is also a very small triangle within the boundary of the East Fork Parachute Creek ACEC that is not part of the ACEC. Overall the shape of the ACEC is very jagged. The noncontiguous areas, the excluded triangle and the irregular shape of the ACEC are going to add to the complexity of applying ACEC regulations from Table 2.2 and will add significantly to the managing costs for the Planning area. The public will also be confused as to where certain activities are permitted vs prohibited, such as seed collection. A straight boundary is easier to mark, understand and manage than the jagged boundary proposed. Trapper Northwater Creek ACEC is equally jagged, so the same concerns apply to it.	Due to the terms of the settlement agreement, older data were used to define a number of stipulations within the retained leases. Because the ACECs generally overlay the stipulation boundaries that are protective of their relevant and important values, the use of different data sets resulted in the small non-contiguous parcels. The jagged boundary results from the ACEC appropriately following a topographic feature. No changes have thus been made to these boundaries. ACECs are shown on Map 6 (Alternative II), Map 9 (Alternative III), and Map 12 (Alternative IV).

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Janice	Shepherd		0022-14	Areas of Critical Environmental Concern (ACEC)	The map is too small to show the 3rd non-contiguous segment nor the triangle that is excluded from the ACEC. With such tiny maps in the document readers are not afforded sufficient information to effectively comment on the analysis presented. Presumably at least some of the analysis included in the document was based on the maps provided, in which case that calls into question the opportunity for a thorough analysis afforded to the contributing experts.	All analysis was done through a geographic information system (GIS). These GIS files were made available to the public for inspection along with the Draft RMPA/SEIS.
Janice	Shepherd		0022-15	Areas of Critical Environmental Concern (ACEC)	This view shows the three non-contiguous sections of the East Fork Parachute Creek ACEC as proposed in Alternatives II and IV circled in red. The blue circle shows the triangle that is oddly excluded from the ACEC. The ragged nature of the ACEC is also much clearer with this view. In response to this comment, I imagine that the response might be that the circled areas are a mapping error, but that again begs the question of the quality of the analysis in Chapter 4. Many experts contributed to that chapter and yet none of them noted the circled areas.	Due to the terms of the Settlement Agreement, older data were used to define a number of stipulations within the retained leases. Because the ACECs generally overlay the stipulation boundaries that are protective of their relevant and important values, the use of different data sets resulted in the small non-contiguous parcels and non-inclusion of parcels otherwise included under other alternatives. No changes have thus been made to these boundaries.
Janice	Shepherd		0022-24	Areas of Critical Environmental Concern (ACEC)	Proper analysis of the differences between the alternatives with respect to their definitions of each of their ACECs depends on accurate descriptions of those ACECs and maps for those ACECs. The document mentions the expansion to the ACECs on the Page 2-27 when it states: "The proposed Anvil Points ACEC was therefore expanded by 2,100 acres in all action alternatives to include this Critical Habitat as it is a relevant and important value. Other adjustments, due to updated resource mapping and GIS techniques, added another 2,200 acres to proposed ACECs integrated into the action alternatives." The reader would expect then that the ACECs would be the same shape and size among Alternatives II, III and IV. This is consistent with the three descriptions on pages 2-14, 2-21 and 2-24. As in: page 2-14 "Alternative II would designate four ACECs (24,890acres total)" and for Alternative III on page 2-21 "Four ACECs would be designated (24,890 acres total)" and for Alternative IV on page 2-24 "ACECs and WMAs (sic: there is only one WMA in Alt II) would be designated and managed the same as in Alternative II." Yet later on page 2-81 a different total size is given for the ACECs in Alternative IV of 25,010 acres. While the description above mentions adding acres to the ACECs, nowhere does there appear to be an explanation as to why acres were removed from East Fork Parachute Creek ACEC as can be seen in this view where the ACEC for Alternative III is outlined in red and the ACEC for Alternative IV is filled with a transparent white. The areas removed from Alternative III are circled in blue.	Descriptions of the relative area of each proposed ACEC under Alternatives II, III, and IV are located in line 278, Table 2.1, of the Proposed RMPA/FSEIS. These areas are illustrated in Maps 6, 9, and 12, respectively. These relative areas of each ACEC are integrated into the impact analysis of Alternatives II, III, and IV. The statement cited on page 2-24 has been revised to clarify that ACECs under Alternative IV would be “designated and managed the same as in Alternative II, but with a total ACEC acreage of 25,010."
Janice	Shepherd		0022-25	Areas of Critical Environmental Concern (ACEC)	While I believe that it is good to have more acres added to the East Fork Parachute Creek ACEC as was done in Alternative IV, the acres from Alternative III should not be lost but be included as well. These extra areas from Alt III are part of the upper tributaries of East Fork Parachute Creek and were likely expected to be included by the experts providing the analysis in Chapter 4 that concluded that East Fork Parachute Creek ACEC be part of the preferred alternative.	BLM’s process for nominating and evaluating potential ACECs, including the aerial extent of each, involves compiling a list of areas nominated for designation and then evaluating each nominated area in terms of the ACEC relevance and importance criteria. This is process is described in Section 3.5.7.1 of the Draft RMPA/SEIS. Due to the terms of the settlement agreement, older data were used to define a number of stipulations within the retained leases. Because the ACECs generally overlay the stipulation boundaries that are protective of their relevant and important values, the use of different data sets resulted in the small discrepancies from the other alternatives. No changes have thus been made to these boundaries.

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Janice	Shepherd		0022-26	Areas of Critical Environmental Concern (ACEC)	There are two areas in Alternative IV that are both in the proposed East Fork Parachute Creek ACEC and in the proposed Anvil Points ACEC. Since the management rules from Table 2.2 are different between these two ACEC units, there needs to be some indication as to which rules take precedence in these two overlapped areas.	ACECs would be managed under the management prescriptions for constituent relevant and important resources detailed in Table 2.2 of the Proposed RMPA/FSEIS. All uses would thus be subject to all applicable management actions, which would generally be the most stringent in cases where prescriptions differed.
Janice	Shepherd		0022-27	Areas of Critical Environmental Concern (ACEC)	Since the proposed East Fork Parachute ACEC in Alt IV and the Anvil Points ACEC in Alt IV both contain known instances of rare plants it is disturbing that they don't have a consistent set of rules about the treatment of rare plants and rare plant habitat in Table 2.2. For example for Anvil Points ACEC there is the directive to maintain: "Apply NGD/NSO restrictions within occupied habitat, critical habitat, identified suitable habitat, or within the immediately adjacent ecosystem processes that support Federally listed plants." That same directive does not appear in Table 2.2 for East Fork Parachute ACEC. It should. Similarly for East Fork Parachute ACEC there is the extra directive "Prohibit collection of rare plants or plant parts, except for scientific research as approved by USFWS in the case of T&E plants, and with a valid collection permit" but that does not appear for the Anvil Points ACEC. Again, it should.	BLM's process for nominating and evaluating potential ACECs, including the aerial extent of each, involves compiling a list of areas nominated for designation and then evaluating each nominated area in terms of the ACEC relevance and importance criteria. This is process is described in Section 3.5.7.1 of the Draft RMPA/SEIS. Due to the terms of the settlement agreement, older data were used to define a number of stipulations within the retained leases. Because the ACECs generally overlay the stipulation boundaries that are protective of their relevant and important values, the use of different data sets resulted in the small discrepancies from the other alternatives. No changes have thus been made to these boundaries. Under all Action Alternatives in the Draft RMPA, analyzed Draft SEIS, all special status plant species receive a number of protections under BLM's stated objective to manage BLM sensitive and significant plant communities consistent with the Colorado Standards for Public Land Health and with BLM policy on Special Status Species Management (BLM Manual 6840). Additional protections are required for plant species listed as under the Endangered Species Act (ESA) as candidate, threatened, or endangered. This distinction accounts for the difference in language between the management prescriptions for botanical/ecological resources between ACECs. These protections apply to each set of species, regardless of the specific proposed ACEC in which a population may occur. Additional special management prescriptions would also be applied to all relevant and important botanical/ecological resources within the four ACECs.
Janice	Shepherd		0022-28	Areas of Critical Environmental Concern (ACEC)	Many of the directives are repeated verbatim across the four ACECs in Table 2.2. There are a few differences; two examples are noted in the previous paragraph. Instead of having different directives in Table 2.2 for each of the ACEC much of which are duplicated it would be more cost effective to manage and easier to remember for the managing staff if a single set of comprehensive directives were adopted for all four ACECs. Those directives would include each of the directives mentioned in the current Table 2.2. This would greatly simplify the management of the ACECs and reduce unnecessary confusion.	The format of Table 2.2 in the Proposed RMPA/FSEIS accommodates the differences in constituent relevant and important resources within each proposed ACEC.
Michael S	Freeman	Earthjustice	0036-7	Areas of Critical Environmental Concern (ACEC)	At a minimum, BLM should provide more detailed and informative maps specific to management actions for each ACEC.	The Proposed RMPA/FSEIS details proposed management prescriptions for ACECs in Chapter 2, Table 2.2.
Michael S	Freeman	Earthjustice	0036-8	Areas of Critical Environmental Concern (ACEC)	Whichever approach BLM ultimately adopts for designating and managing ACECs in the Roan Plateau planning area, it is critical that management objectives and actions are clearly communicated and mapped in the EIS so that the public and operators understand decisions being made and the agency is able to appropriately administer the ACECs and implement the RMP amendment.	The Proposed RMPA/FSEIS details proposed management prescriptions for ACECs in Chapter 2, Table 2.2.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Janice	Shepherd		0022-5	Biological Resources	Section 4.3.2 does have references to the impacts on mule deer, elk and other wildlife from the presence of humans especially in the winter on pages 4-119 and 4-120. It describes that the impact is applicable to any human presence in snow-covered areas, not just humans on snowmobiles. Yet Alternative III was described as having the same impacts on wildlife as Alternative II even though the Appendix F rule would apply to all three LWC units including the Southeast Cliff Unit and the Northeast Cliff Unit which overlap with the mule deer and elk wintering areas. Since the rule in Appendix F All lands are closed to over-snow travel, (page F-3), as stated, applies equally to motorized and non-motorized travel over snow this would result in significantly less stress to the mule and elk in the winter months.	Appendix F, Proposed Management and Setting Prescriptions for Lands with Wilderness Characteristics in the Draft RMPA/SEIS (page F-3), evaluated in Alternative III, does not specify that Lands with Wilderness Characteristics must be closed to over-snow travel. Appendix F clearly states over-snow travel is a management action or allowable use decision. This requires BLM to decide what the action would be for the RMPA/FSEIS. As stated in Chapter 2, all areas are open to over-snow travel. The analyses are correct.
Janice	Shepherd		0022-6	Biological Resources	Therefore since the bird studies and the studies presented on pages 4-119 and 4-120 clearly indicate the importance of minimizing human disturbance of wildlife in the winter, the LWCs from Alternative III should be included in the final plan. Within the LWCs human disturbance of wildlife will be eliminated. The three LWCs in Alternative III cover areas outside the ACECs proposed in Alternative IV. They thus provide needed protection to the landscape and its resources for those areas. Consider for example the two-track road that starts near N 39 53 13.64 W 107 53 41.43 (WGS84). Under alternative IV that road would stay open but it crosses into the East Fork LWC Unit and is not cherry-stemmed (other routes are) so it would need to be closed. That spot drains into Golden Castle Gulch and JQS Gulch so minimizing human presence there is beneficial to water resources as well as wildlife.	Wildlife populations and habitat in the Planning Area would receive a number of protections from surface disturbing activities under the Proposed RMPA as described in Chapter 2, Table 2.1 in the form of NGDs/NSOs, SSRs/CSUs, and Timing Limitations. The impacts of these protections are described in Chapter 4, Sections 4.3.2 and 4.3.4. Wilderness characteristics do not include wildlife or water resources as a criteria to determine whether wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, wildlife and water resources would indirectly benefit from the management of the area, but there are no specific direct protections for those resources under wilderness characteristics management. The stipulations for wildlife and water resources have direct benefits. The effects of lands with wilderness characteristics management on wildlife are also considered for each alternative (Sections 4.3.2, 4.3.4, and 4.5.8).
Doug	Dennison	Bill Barrett Corporation	0035-17	Biological Resources	On page 4-136 under the subsection titled "Summary of Impacts to Terrestrial and Aquatic Resources from Alternative II", it is stated that the phased and clustered development specified for on top of the plateau under Alternative II would lessen the impact to wildlife as compared to Alternatives III and IV. However, Alternative III does not include any drilling on top of the plateau and the development pattern specified by the Settlement Agreement under Alternative IV is essentially phased and clustered development, which restricts the area for leasing and development. Therefore, the impact to wildlife under these alternatives as compared to Alternative II should be less.	This section was revised for clarity in the Proposed RMPA/FSEIS.
Doug	Dennison	Bill Barrett Corporation	0035-18	Biological Resources	Throughout the analysis of environmental consequences in Chapter 4, there are instances where the comparison of impacts from Alternative II to Alternative IV does not appear to be consistent with the details of each alternative. For example, in Section 4.3.2, Terrestrial and Aquatic Wildlife, the impacts from oil and gas leasing and development from each alternative are indicated to be moderately negative. However, the level of oil and gas development under these alternatives is very different, particularly atop the plateau; therefore, the impact on many of these resources should be less for Alternative IV. As an example, Table 4.3.5 for Alternative II and Table 4.3.9 for Alternative IV indicate the same level of moderately negative impact to deer/elk summer range, however, the estimated summer range habitat loss for each alternative is very different with the loss of summer range habitat under Alternative IV being significantly less (Tables 4.3.4 and 4.3.8).	As discussed in Section 4.1.3, in order to reduce the necessarily complex impact analysis process to readily understandable terms, a qualitative approach for summarizing impacts to specific resources, management actions, and uses is employed throughout the FSEIS. Qualitative terms specific to wildlife impacts are further explained in Section 4.3.2.1, Terrestrial and Aquatic Wildlife, Introduction. Impact summary tables, such as the cited Table 4.3.5 and Table 4.3.9 were developed to summarize all estimated direct, indirect, adverse, beneficial, and cumulative impacts to terrestrial and aquatic wildlife. Elk/Mule Deer habitat loss, estimated in Tables 4.3.4 and 4.3.8, is a part of this summary analysis, but not the entirety. The difference in Elk/Mule Deer summer habitat loss has been analyzed as part of the summary analysis; however, additional direct, indirect, adverse, and cumulative impacts, incorporating additional species, are also analyzed, thus resulting in the "moderate" categorization for both Alternatives II and IV.
Doug	Dennison	Bill Barrett Corporation	0035-19	Biological Resources	Table 4.4.2 incorrectly identifies Alternative IV as Alternative VI.	Table 4.4.2 was revised for clarity in the Proposed RMPA/FSEIS.

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Michael S	Freeman	Earthjustice	0036-14	Biological Resources	In addition, scenic values at East Fork Falls, at hanging garden seeps on East Fork, and in all associated landscapes must be protected. Managing the East Fork LWC unit for protection of its wilderness characteristics could also protect the outstandingly remarkable values of the stream corridor.	The Proposed Plan includes direct protections to the scenic values at East Fork Falls from an NGD/NSO for the East Fork Falls. Indirect protections are also provided by management prescriptions for botanical/ecological resources in the Areas of Critical Environmental Concern (ACEC) and through overlapping surface-use restrictions including plant habitat and the sensitive plants and significant plant communities' stipulations.
Michael S	Freeman	Earthjustice	0036-15	Biological Resources	The Conservation Groups support the comments filed by National Wildlife Federation on the DEIS. In particular, BLM should state unequivocally in the final RMPA that as part of the Master Development Plans (MDPs) required by the Settlement Agreement, BLM will consult with the Colorado Division of Parks and Wildlife before approving any activity impacting wildlife resources and that Best Management Practices (BMPs) to conserve fish and wildlife and their habitat will be a required component of any MDPs and all leases and permits.	Appendix K in the Proposed RMPA/FSEIS contains the full Settlement Agreement. Exhibit 2, Section E, of this document states: *Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's proposed MDP. Under the proposed RMPA, the stipulation that includes this language will be applied to the retained base leases.* Additionally, BLM has discretion to include additional resource-protection requirements as conditions of approval of MDPs and APDs.
Michael S	Freeman	Earthjustice	0036-19	Biological Resources	The DEIS comparison of Alternatives 2 and 3 is flawed in other ways as well. For example, the discussion of impacts to wildlife habitat appears self-contradictory. The DEIS predicts that Alternatives 2 and 3 will have essentially the same level of adverse impacts to big game summer range (as well as habitat for several other species). Compare DEIS Table 4.3.5 (Alternative 2) with id. Table 4.3.7 (Alternative 3). This appears to conflict with the DEIS estimates of effective habitat loss: it predicts a 37 percent loss of big game summer range for Alternative 2, versus only 2.5 percent for Alternative 3.	As discussed in Section 4.1.3, in order to reduce the necessarily complex impact analysis process to readily understandable terms, a qualitative approach for summarizing impacts to specific resources, management actions, and uses is employed throughout the FSEIS. Qualitative terms specific to wildlife impacts are further explained in Section 4.3.2.1, Terrestrial and Aquatic Wildlife, Introduction. Impact summary tables, such as the cited Table 4.3.5 and Table 4.3.9 were developed to summarize all estimated direct, indirect, adverse, beneficial, and cumulative impacts to terrestrial and aquatic wildlife. Elk/Mule Deer habitat loss, estimated in Tables 4.3.4 and 4.3.8, is a part of this summary analysis, but not the entirety. The difference in Elk/Mule Deer summer habitat loss has been analyzed as part of the summary analysis; however, additional direct, indirect, adverse, and cumulative impacts, incorporating additional species, are also analyzed, thus resulting in the "moderate" categorization for both Alternatives II and IV.
Leslie	Robinson	Grand Valley Citizens Alliance	0040-3	Biological Resources	Proposed drilling below the rim, as allowed by Alt. IV, could greatly impact the old growth of Douglas Fir already compromised by beetle kill, and could increase the danger of fire in those areas. Because O&G companies would have to do drastic cutting into the Roan Plateau rip to make roads and level pads, the visual scars would be noticeable for miles. The impression that the Roan Plateau is no longer a "wild" place, because of drilling rigs so apparently graphic, could affect tourism and hunting businesses in the area.	Drilling below the rim was analyzed in all of the alternatives. Under Alternative II, the old growth Douglas Fir would be protected by the Magpie Gulch ACEC. Alternative III provides protection with the Magpie Gulch ACEC and wilderness. Alternative IV, the Settlement Alternative from the Roan Plateau Planning Area Proposed RMPA/FSEIS provides specific protections for old growth Douglas-fir stands from disturbance from oil and gas development activities, as well as all other surface-disturbing activities. These include minimizing impacts through management prescriptions for botanical/ecological resources in the Magpie Gulch Area of Critical Environmental Concern (ACEC) as well as GS-CSU-Roan-12: Habitat for BLM sensitive plant species populations and significant plant communities and the corresponding Site Specific Relocation (SSR) limitation for non-oil and gas development. Similarly, visual resources on the Roan Plateau cliffs and rim are provided protections through GS-NSO-Roan-30:I-70 viewshed (VRM Class II) and corresponding No Ground Disturbance (NGD) limitation for non-oil and gas development as well as GS-CSU-Roan-04: Erosive soils and slopes (>30%) and corresponding SSR. Potential impacts to old growth Douglas-fir and visual resources from all activities in all alternatives were estimated and disclosed in Chapter 4 of the Proposed RMPA/FSEIS. Additionally, please reference Section 4.4.4.5, which states that "Under the terms included in the Settlement Agreement, primary access above the rim would be limited to designated roads, subject to BLM's onsite inspection and approval. Operators would not use Cow Creek Road or Rim Road east of the retained leases for access, except in emergencies. This restriction would require contractual access on across private lands/roads from the south or west." No new roads would be created on the rim under the Proposed Plan.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kathleen C	Zimmerman	National Wildlife Federation	0042-2	Biological Resources	This specifies that a proposed Master Development Plan (MDP) be submitted prior to exploration and/or lease development that includes consultation with Colorado's Division of Parks and Wildlife (CPW) specifically in order to develop provisions that "minimize impacts to wildlife and other resources." Therefore, where the 2014 Settlement is silent on the management of specific resources and resource uses below the rim, NWF maintains that BLM should state unequivocally that it will consult with CPW before conducting any activity impacting such resources and that Best Management Practices (BMPs) to conserve fish and wildlife and their habitat will be a required component of all leases and permits. One wildlife resource at particular risk due to development activities below the rim are mule deer. BMPs to conserve deer and their habitat below the rim must be a component of any approved MDPs. Such BMPs must reduce the surface disturbance in habitats below the rim.	Appendix K in the Proposed RMPA/FSEIS contains the full Settlement Agreement. Exhibit 2, Section E, of this document states: "Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's proposed MDP." Under the Proposed RMPA, the stipulation that includes this language will be applied to the retained base leases. Additionally, the Proposed Plan includes an NGD/NSO for wildlife seclusion areas below rim, a SSR/CSU for big game migration corridor, and a TL for big game winter range as shown in Chapter 2, Table 2.1 of the Proposed RMPA/FSEIS. BLM also has discretion to include additional resource-protection requirements as conditions of approval of MDPs and APDs.
Kathleen C	Zimmerman	National Wildlife Federation	0042-3	Biological Resources	The final RMP for the Roan Planning Area should acknowledge that to "minimize impacts" to wildlife resources on lands below the rim may require the adoption of BMPs effective to reduce the overall footprint of surface disturbance.	The Proposed Plan includes an NGD/NSO for wildlife seclusion areas below rim, a SSR/CSU for big game migration corridor, and a TL for big game winter range as shown in Chapter 2, Table 2.1 of the Proposed RMPA/FSEIS.
Kent	Rider	WPX Energy	0103-26	Biological Resources	Management actions described in Alternative IV appear to be directed towards Greater Sage Grouse (GRSG) habitat and should not be appropriate or practical for application outside of GRSG habitat, such as leases located below the rim. To the extent that it would not conflict with the requirements of the Settlement Agreement, WPX recommends adoption of management objectives from Alternative I in lieu of those included in the proposed Settlement Alternative.	As stated in Chapter 3 Section 3.3.4, Colorado Parks and Wildlife has mapped the top of the Roan Plateau as general habitat for GRSG and a small area of priority habitat (30 acres) which is on private land. Management actions identified for GRSG will be applied based on site-specific habitat suitability during the leasing and development stage. Currently, neither PHMA nor any active leks have been identified on Federal surface in the Planning Area. However, if updated mapping were to include PHMA or an active lek was identified at a later time, additional stipulations and/or management actions would apply.
Kent	Rider	WPX Energy	0103-28	Biological Resources	It is unclear whether undesirable species refers to all species which are considered not desirable or specifically to the two listed species, Russian Thistle and Kochia. WPX suggests removal of this language entirely because lack of clarity can result in inconsistent and unpredictable implementation. Instead, BLM should adopt and incorporate by reference the listed noxious weeds according to the objectives and management recommendations for Colorado A, B, and C list species.	The Disturbed Site Reclamation Standards, Monitoring and Success Criteria is provided in Appendix I of the Proposed RMPA/FSEIS. The stated goal of these standards and criteria are to mitigate anticipated impacts to vegetation, soil and water resources from ground-disturbing activities by re-establishing a self-sustaining, diverse vegetation community composed of species native to the region in sufficient species density and diversity to closely approximate natural, undisturbed vegetation potential. BLM is responsible for implementing these standards and compliance with monitoring requirements. Project proponents for all permitted activities will typically perform the reclamation work, and effect on-the-ground implementation. The standards do specifically incorporate by reference current State of Colorado noxious weeds in Lists A, B, and C. The inclusion of undesirable species is intentional, to allow BLM to address site-specific factors that may impede for future reclamation success against the stated goals. Specific decisions regarding undesirable plant species would be discussed during project-specific planning and formalized in the project-specific reclamation plans.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kent	Rider	WPX Energy	0103-29	Biological Resources	WPX requests that BLM provide clarification in response to the following questions related to management actions for reclamation in the Draft SEIS: Will reclamation plans be required on all projects? Or will this comes as a COA within an APD on sites that may be deemed difficult by the BLM CRVFO? Will containerized stock be required on all BLM projects? How was the statistical adequacy level of 85 percent determined?	As noted in Appendix I of the Proposed RMPA/FSEIS, reclamation plans will be submitted for BLM review and approval prior to surface disturbing activities. Reclamation plans will be considered as COAs for oil and gas exploration and development activities as well as other activities. Specific details for reclamation activities, such as the use of containerized stock, will be included in project-specific reclamation plans. These plans would also specifically address reclamation monitoring, included a statistical basis to demonstrate 85 percent adequacy for plant species composition and cover, sampled either point intercept transect or plot level. The statistical adequacy level of 85% is a standard practice in the BLM Colorado River Valley Field Office and represents the desired future condition for reclaimed areas.
Roslynn	Brain	Utah State University Moab	0010-1	Climate and Air Quality	Oil is listed 90 times in the Roan Plateau SEIS. Should this really be the focus? I recommend all future oil and gas leasing be cut, and current oil and gas projects follow strict air quality emissions (EPA standards) given Utah's well known air quality problem.	BLM requires that oil and gas operators comply with state and Federal standards. The air quality analyses in the SEIS assume that the oil and gas industry will comply with state and Federal standards for all future oil and gas projects, including emission control measures required under state permits. Please refer to Section 4.2.5 of the Proposed RMPA/FSEIS for details.
Doug	Dennison	Bill Barrett Corporation	0035-15	Climate and Air Quality	Table 4.2.15 states that the air analysis performed for the SEIS assumed that there would be 16 wells/pad, however, the remainder of the document assumes that there will be 20-21 wells/pad.	The noted difference in the number of wells per pad is not large enough to affect the emissions levels for the CARMMS planning area specific and cumulative modeling analyses. The number of wells per pad parameter is more important for project-specific near-field modeling analysis that BLM will prepare when reviewing location, timing, well, and equipment information for specific development proposals. See Appendix J (CARPP).
Michael S	Freeman	Earthjustice	0036-25	Climate and Air Quality	The climate and air quality analyses for the DEIS do not adequately analyze the air quality impacts that could occur as a result of the actions authorized under the Roan Plateau DEIS, therefore, failing to comply with the National Environmental Policy Act (NEPA) and the Federal Land Policy Management Act (FLPMA). Specifically; 1) the modeling analysis used in the DEIS does not project emissions for most of the 20-year life of the DEIS, rather, the modeling analysis only extends to 2021, 2) the modeling analysis grossly underrepresents the number of new wells in the Planning Area and therefore air pollution emissions are underrepresented, 3) the DEIS does not include a near-field analysis, 4) the cumulative impacts analysis inadequately demonstrates future impacts from planned projects, and 5) the DEIS does not take into account the already elevated ozone levels near the Roan Plateau.	The climate and air quality analysis contained in the DSEIS adequately analyzes the reasonably foreseeable direct and indirect impacts that may potentially result from implementing the Proposed Plan. The RMPA itself does not authorize nor predict with certainty the level of actual development that will occur for any given resource or allowable use activities. Rather the RMPA analyzes a range of assumptions to inform decision makers of possible impacts so that they can determine whether or not to make the resources BLM manages available, and under what criteria. 1). From an air quality assessment standpoint there are several reasons that a shorter timeframe is more practical than the full 20 year RFD projection analysis that would be of lesser value to well-informed decision makers. The year 2021 was modeled in CARMMS primarily due to the availability of projected 2021 EPA emissions inventories that were developed for planning purposes (SIP - PM2.5 attainment demonstrations). These inventories were the most comprehensive (i.e., for all source categories) and scientifically defensible available at the time the modeling was conducted. No future inventory exists to describe the cumulative atmosphere in 2036. The RMP analysis utilized the assumptions described in the 2014 RFD document (see Appendix G). While the total well counts and the underlying surface disturbance assumptions are appropriate for analyzing most BLM-managed resources (i.e. on the ground impacts), air resources impacts are more directly affected by other variables such as timing, technology, and changes in regulations. Changes in the emissions spectrum resulting from control regulations, standard development practices, and/or dynamic shifts in the economy are not reasonably foreseeable over the lifetime of an RMP. Several changes have already occurred since the development of the CARMMS model such as CDPHE's Methane Rule, EPA's proposed updates to the NSPS OOOO regulations, BLM's draft Venting and Flaring rule, as well as recent changes to the ozone NAAQS. Therefore, it is appropriate to model more frequently over shorter periods of time in order to capture rule changes and variances in the anticipated development (practices or pace) versus trying to model the entire RMP period, which would be too speculative.

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						2.) The CARMMS model used the linear interpolation of the projected RFD to estimate the annual well counts added within the planning area. Under the highest-development alternative (3,511 new wells over 20 years), there could be an additional 176 wells per year over the 20 year timeframe. At this rate there would be 704 new wells in the planning area by 2021 if development were to start in 2018. The high CARMMS scenario by contrast analyzed 675 new wells by 2021. In the context of the emissions analyzed by CARMMS, the apparent deficiency of 29 wells would not equate to a significant difference in air emissions (see next paragraph). CARMMS is an emission-based assessment for which well counts represent only one variable of analysis (and a minor one at that). BLM has extensive expert technical knowledge that emissions from development can vary significantly in any given area due to the type of wells being developed (vertical vs. directional or horizontal), the target formation characteristics, and operator specific practices. The CARMMS emissions calculators attempt to smooth those inconsistencies out over the broader context of a cumulative analysis by analyzing several different well types and development practices (i.e., many wells), such that the 675 CARMMS wells could provide emissions coverage for 704 actual wells. Nonetheless, the contingency in which the CARMMS emissions estimates are too low is accounted for by BLM CO through the CARPP adaptive management strategy (see SEIS sections 4.2.5.2, 4.2.5.8, pg. 4-347, Appendix J). The projected emissions associated with the Federal wells analyzed under CARMMS are provided in Table 4.2.16. In order for the RMP analysis to cover any future development authorizations BLM needs to manage projects within the corresponding emissions budgets analyzed under CARMMS. Nothing in the RMP prevents BLM from providing for mitigation of emissions to ensure that emissions are still within the range of impacts analyzed until a new CARMMS model is in place to provide an updated estimate of emissions from future oil and gas development authorizations as necessary.
						3.) BLM declined to produce a near-field assessment for the RMP. At this stage of oil and gas resource management, speculating on the required information (location, timing, equipment parameter values, etc.), which is not currently known would not provide useful information to decision makers in this process. However, in accordance with the CARPP BLM will conduct near-field analyses as necessary for future oil and gas projects (actual development) when information needed for an adequate analysis is known. 4.) The cumulative air quality impacts described in the SEIS adequately demonstrate future impacts for the emissions analyzed. Adequate and comprehensive cumulative emissions inventories were included in the CARMMS analysis (see CARMMS Report): specifically, the U.S. wide cumulative year 2021 emissions inventories (EPA year 2021 projections described above), comprehensive Rocky Mountain Region oil and gas projections to year 2021, the intercontinental boundaries conditions (i.e. impact contributions from overseas countries), and emissions inventories from adjacent countries (Canada and Mexico). Additionally, the CARPP framework inherently provides for an iterative “plan, do, check, act” approach for assessing air quality impacts at various stages of decision-making and NEPA analysis. The framework includes a project tracking process that allows BLM to provide for adaptive management during future project implementation. Effects to emissions inventories from rule making and significant changes in oil and gas development practices can be captured in future analysis such that the oil and gas context (and subsequent decisions) are well-reasoned and scientifically defensible. The tracking process allows BLM to use the NEPA process to verify our CARMMS assumptions, provide analysis for variances in development, re-evaluate the affected environment, and provide for any mitigation as necessary to meet mission requirements.

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						5.) Section 3.2.5.3 and Table 3.2.16 set the stage for the impacts analysis by describing existing air quality conditions in the region including recently monitored ozone (and other pollutants) concentrations in and around the Planning Area. The CARMMS analysis uses these baseline ozone monitoring concentrations to calculate a relative response factor (RRF) for the absolute modeling results from the corresponding base year. The RRF provides an adjustment for the absolute results if they are too high or too low to "correct" the predictions in a relative manner (i.e., compare the CARMMS base year results to actual monitored conditions and adjust accordingly to make the data fit, which is a standard practice). Future year absolute results get the same application of the RFF to correct for the over or under predictions. Thus the existing ozone concentrations for the region are not ignored, but rather play a very significant role in estimating future concentrations. As shown in the CARMMS Report, most areas of the Rocky Mountain Region (especially populated-urban areas) are expected to see an overall cumulative decrease in ozone for future years.
Michael S	Freeman	Earthjustice	0036-26	Climate and Air Quality	Unfortunately, the air quality modeling analysis (CARMMS) is inherently flawed with respect to the Roan Plateau DEIS in that it only extends to year 2021, using a ten-year time period for projections. Given that it's now 2016, the time period for any "projections" is much shorter. The DEIS states that the RMPA would have an anticipated 20-year life, 2 therefore, the modeling analysis will only cover the first few years of the RMPA being in place. In other words, by the time this DEIS is finalized there will not be many future years left in the modeling analysis. This is a major problem for the air quality analysis because, with a shortened period of analysis, the BLM is not fulfilling basic National Environmental Policy Act (NEPA) requirements for analyzing the impacts of the projected development in the Planning Area. The DEIS does not satisfy the BLM's obligations under NEPA and the Federal Land Policy and Management Act (FLPMA) to disclose whether the proposed development will cause Clean Air Act (CAA) violations because the analysis does not cover the entirety of the RMPA planning period.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Michael S	Freeman	Earthjustice	0036-27	Climate and Air Quality	Clearly, the DEIS failed to model the near-field impacts of the proposed development to determine compliance with NAAQS and PSD Class II increments as required by NEPA. The BLM must perform a quantitative assessment of near-field impacts as part of this DEIS. This analysis is necessary for the BLM, and the public, to understand the potential human health effects of the activities associated with the proposed additional development in the region and in order for the agency to comply with federal statutes and regulations.	Please see response to comment number 0036-25, sections 3 and 4.
Michael S	Freeman	Earthjustice	0036-28	Climate and Air Quality	In the CARMMS analysis, the BLM has included projected impacts from planned projects in the region that will have cumulative impacts in and near the Planning Area. This is an improvement over the 2006 Roan Plateau FEIS, but the cumulative impacts must be considered for the life of the DEIS. The BLM must ensure that all potential sources of emissions are included in the source inventory, that maximum impacts are modeled and that any control technology assumptions used in the analysis are made enforceable in the final EIS. The BLM has an obligation under NEPA to fully consider the cumulative impacts of the project.	Please see response to comment number 0036-25, sections 1, 2, and 4. There are no planned projects analyzed in the Proposed RMPA/FSEIS, as this information is not foreseeable, but rather the FSEIS analyzes a range of assumptions. The CARMMS is a future year modeling analysis platform intended to be updated as required to adequately account for cumulative emissions inventory changes. The CARRMS high scenario, as presented in the Proposed RMPA/FSEIS only assumed "on the books" emissions controls as of 2012 (see CARMMS Report). As additional modeling results become available (i.e., CARMMS and see response to comment 0036-25, section 3) to inform future development decisions and determine the necessity for mitigation, BLM will apply analyzed control methodologies as Conditions of Approval.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Michael S	Freeman	Earthjustice	0036-29	Climate and Air Quality	The BLM must acknowledge the existing high ozone levels in and near the Planning Area and recognize that high background levels of air pollutants can mean that even if the activities analyzed in the DEIS will result in only minor increases in certain pollutants, the aggregate level of pollution that could result might have significant detrimental effects on human health and the environment (e.g., visibility and ecosystems)	The context for how existing ozone is accounted for in our analysis is described above (please see response to comment number 0036-25, section 5). As shown in the CARMMS Report, most areas of the Rocky Mountain Region (especially populated-urban areas) are expected to see an overall cumulative decrease in ozone for future years including year 2021. This is also the methodology and impact results for other pollutants / AQRVs analyzed in CARMMS. The CARMMS cumulative and RPPA source apportionment specific results disclosed in Chapter 4 (Section 4.2.5.5, see also referenced CARMMS Report) show that impact (ozone, visibility, etc.) contributions for hypothetical future oil and gas development within the Planning Area would be minor compared to applicable analysis thresholds and NAAQS standards. This hypothetical development would be made up of multiple oil and gas "projects," and while project-level impact contribution thresholds are not applicable to the projected cumulative development, they are nonetheless instructive. Currently, such project-level impact contribution thresholds exist for several AQRVs, but there is not a significant impact contribution threshold for ozone that would allow the BLM to assess whether future oil and gas development for a specific oil and gas project (or, by analogy, oil and gas at the planning level like in this SEIS) would significantly contribute to any projected ozone concentrations within the region. Where these thresholds do exist, the comparisons to project-level impacts are disclosed in the SEIS.
Kathleen	Sgamma	Western Energy Alliance	0039-3	Climate and Air Quality	By adding the Comprehensive Air Resources Protection Protocol (CARPP) BLM will create unnecessary confusion and even contradictory requirements for air quality compliance. The State of Colorado, through delegation from the Environmental Protection Agency (EPA) to the Colorado Department of Public Health and Environment (CDPHE), has jurisdiction for air quality, not BLM. BLM lacks authority to impose controls and limitations beyond those adopted by the state and EPA.	BLM manages public lands in accordance with FLPMA. Section 102(8) of FLPMA requires that "the public lands be managed in a manner that will protect...air and atmospheric [values]." Under NEPA, BLM is required "to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" and to "use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment" (40 CFR 1500.2). NEPA also requires BLM to include a discussion of measures that may mitigate adverse environmental impacts (40 CFR 1502.14(f), 40 CFR 1502.16(h)). Thus, BLM must manage the public lands in a manner that appropriately protects air quality and related values. For this SEIS, BLM conducted air quality analyses to determine impacts from specific anticipated Federal actions. During subsequent authorization analysis conducted for NEPA, BLM can utilize emission control strategies and mitigation measures from the CARPP and the CARMMS (medium scenario) to address any significant impacts to achieve desired outcomes for air quality.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kathleen	Sgamma	Western Energy Alliance	0039-4	Climate and Air Quality	BLM's one-year pre-development baseline monitoring requirement is onerous and goes beyond BLM's jurisdiction. BLM has not adequately justified why such extremely expensive and time-consuming monitoring is necessary given that the area in question is currently in attainment for all criteria pollutants. BLM also exceeds its regulatory purview by requiring specific projects to track emissions of criteria pollutants, Volatile Organic Compounds, Hazardous Air Pollutants and greenhouse gas emissions for use in potential enforcement activity. The CARPP and the monitoring requirements exceed BLM jurisdiction and should be removed from the final document.	The possible baseline monitoring described in the CARPP is not expected to be necessary for all or even most future proposed oil and gas projects. The CARPP informs operators and other members of the public that baseline monitoring may be required to support BLM's NEPA analysis for large and unique projects located in sensitive (populated, etc.) areas where baseline air quality monitoring data are not available. Baseline air quality monitoring data can be an important part of an accurate cumulative impacts analysis for a proposed project in terms of quantifying impacts above baseline conditions. This information is useful to the decision maker. The CARPP does not indicate that project emissions will be tracked for enforcement purposes, but rather that when required, the purpose of "life of project" air monitoring "is to measure impacts potentially attributable to the project over time and to determine the effectiveness of emissions control measures." BLM Colorado requests emissions information from oil and gas operators for proposed projects when BLM conducts project-specific NEPA analyses. This information helps BLM to develop accurate emissions inventories for use in the air quality impacts analyses for the proposed projects. NEPA analysis of most oil and gas development projects will include air quality impacts analysis. Thus it is a benefit to operators to provide this information, especially when they implement sound environmental practices, as we can build that into our analysis design features.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-8	Climate and Air Quality	We recommend including a section in the Final EIS that discusses the strengths and weaknesses of the modeling platform based on the results of the CARMMS MPE. This section should also explain how these uncertainties found in the MPE should be used to interpret the model results.	The Proposed RMPA/FSEIS references the CARMMS report, which contains detailed information and an appendix dedicated to describing the Model Performance Evaluation (MPE) for the 4-km modeling domain (covering all of Colorado and portions of nearby states). An MPE is developed to determine how well the model predicts base year conditions (i.e., actual measured values) and therefore, assists in determining the accuracy of analysis. When and where monitoring data are available (including many locations for the modeled base year), the model results for the MPE have been used in a relative sense through the use of USEPA's Modeled Attainment Test Software (MATS) which mitigates potential model biases. Using EPA performance metrics, the MPE shows that the model performed acceptably for predicting ozone and other impacts. Results of the MPE, including both strengths and weaknesses, can be found in the CARMMS report available at http://www.blm.gov/co/st/en/BLM_Information/nepa/air_quality.html. Although the MPE shows that the model performed acceptably, the reliability and usefulness of the CARMMS future year 2021 modeling analysis should not be determined based solely on the MPE. The modeling analysis features multiple simulations accounting for a range of future oil and gas emissions scenarios all of which are relative to each other in terms of performance metrics. These data are useful for estimating a range of expected air quality impacts for each source apportionment area and for describing the atmospheric response from emissions loading from specific groupings of oil and gas sources, as well as the residual impacts from the analyzed mitigation methodologies.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-9	Climate and Air Quality	In October 2015, the EPA strengthened the National Ambient Air Quality Standards (NAAQS) for ground-level ozone from 75 ppb to 70 ppb, based on extensive scientific evidence about ozone's effects on public health and welfare. We recognize that this change occurred just prior to the publication of the Draft SEIS and recommend, to the extent possible, that the ozone analysis results in the Final EIS be presented relative to this revised ozone standard of 70 ppb.	Chapter 3, Section 3.2.5, Table 3.2.14 - Ambient Air Quality Standards, and Chapter 4, Section 4.2.5 were updated throughout to reflect the new standard.

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Philip	Strobel	Environmental Protection Agency - Region 8	0054-10	Climate and Air Quality	To more comprehensively understand the modeled impacts to ozone in the planning area, we recommend that the ozone analysis includes the total or cumulative modeled concentration associated with the maximum contributions of the planning area contained in Table 4.2.17, and the location (s) of the maximum contributions predicted in the model domain.	The cumulative modeled ozone concentrations were added to Table 4.2.17 in the Proposed RMPA/FSEIS and the locations are shown in the associated figures.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-11	Climate and Air Quality	In addition, we recommend a discussion, with appropriate references to figures, explaining that the ozone analysis includes an ambient concentration analysis using absolute modeling results and relative modeling results. This information will assist in understanding the relevance of the planning area contributions to the total ozone impacts.	Additional information has been added to the Proposed RMPA/FSEIS in Section 4.2.5.3 to describe the relationship between relative modeling approach and the absolute ozone analysis. Figures 4.2-14 through 4.2-16 in Section 4.2.5.5 show the predicted Planning Area contribution to ambient ozone for the fourth highest 8-hour average daily maximum period for the high, medium, and low development scenarios.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-12	Climate and Air Quality	The 2011 to 2014 ambient air quality monitoring ozone data presented in the DSEIS (page 3-45, Table 3 .2.16) shows an average design value for monitors with three years of data of approximately 67 ppb and the predicted impact of an additional 1.7 to 3.8 ppb ozone increase (page 4-66, Table 4.2.17). In light of this we recommend that mitigation be considered, even for the low scenario that BLM believes is closest to the Preferred Alternative, since the modeled impact may be underestimated and the average design value is 95.7% of the revised ozone standard of 70 ppb in and around the planning area. It may be beneficial to consider mitigation measures front Table VI-I Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development in the BLM's current Comprehensive Air Resources Protection Protocol.	Mitigation is required on a case-by-case basis for specific projects or when CARMMS modeling suggests the need for emissions controls on planning areas or specific source groups. For this SEIS, the CARMMS source apportionment impacts do not suggest the need for additional emissions control requirements to be applied plan wide.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-13	Climate and Air Quality	Therefore, we recommend either including a discussion of procedures used to generate the results for the cumulative visibility analysis in the Final EIS, or sharing this information with us through a future technical workgroup meeting. we recommend reassessing whether there is value in presenting the quasi-cumulative analysis that compares all Colorado oil and gas emission impacts to the FLAG2010 visibility thresholds. If relevance cannot be assigned to the quasi-cumulative impacts that are above these thresholds, we recommend removing these results and discussion from this section.	Visibility impacts are included in Section 4.2.5.5 of the Proposed RMPA/FSEIS. BLM uses the FLAG2010 baseline concentrations as a basis for projecting visibility contribution impacts. For making adequate decisions, it is understood that BLM should not only make its decisions using source area specific (source apportionment) concentrations but also cumulative concentrations, and in addition, cumulative Colorado Federal contributions since this is BLM's decision space. The difference between Source Groups R and S sheds light on the non-Federal contribution and the analysis clearly explains that for some geographic regions / Class I areas that the Colorado Federal contributions are less and sometimes more than Colorado non-Federal contributions. This information is relevant for the decision maker.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-14	Climate and Air Quality	The EPA has consistently made recommendations on the methodology for presenting the visibility analysis. Specifically, we continue to recommend comparing the visibility results among the development scenarios, in addition to comparing or disclosing the differences between the future year (2021) and base year (2008) modeled visibility results. A comparison or difference among the future proposed development and the base year would be expected to show an overall net improvement (or reduction in impacts) as a result of state and federal control measures (including Regional Haze Regulations). Therefore, presenting the results in a manner that shows the difference among the development scenarios assists in evaluating the range of effects attributable to each alternative. Note that this approach should also be used for NAAQS pollutant analyses (i.e. pages 4-90 to 4-96).	As stated in the CARMMS Report, the cumulative visibility impacts were developed following the recommended procedure provided by the FWS and NPS that uses base year monitored and modeled concentration results for determining future year visibility impacts. The Proposed RMPA/FSEIS presents a comparison of base year 2008 and future year 2021 cumulative visibility concentrations and visibility impact contributions from the Roan Plateau Planning Area-specific source group and from Source Groups R and S for each CARMMS scenario, allowing the reader to compare impacts for the various CARMMS scenarios. Furthermore, these CARMMS scenarios form bookends for the development scenarios, such that all of the alternatives fall between the low and high CARMMS scenarios. The low CARMMS scenario is lower than Alternative I, and the high is equivalent to Alternative II. The medium CARMMS scenarios are roughly equivalent to Alternatives III and IV. Details and more information for the visibility analysis and results are presented in Section 5.3 of the CARMMS Report.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Philip	Strobel	Environmental Protection Agency - Region 8	0054-15	Climate and Air Quality	Finally, the CARMMS results indicate that the planning area's contribution to nitrogen deposition is above the DAT at many of the locations analyzed. However, the magnitude of the cumulative (or total) nitrogen load was not presented to assess whether the area is projected to experience nitrogen deposition exceeding the critical load. We recommend that the analysis connects the planning area impacts with the cumulative impacts to better gauge the significance of the planning area's activities within the cumulative context.	The Proposed RMPA/FSEIS provides planning area specific contribution to nitrogen deposition for all CARMMS scenarios. As described in the SEIS, the DAT is not an appropriate metric to use for the planning area specific impacts because the projected level of oil and gas development for the alternatives would be made up of multiple "projects," and the DAT is used for comparing single project deposition impacts. Full cumulative nitrogen deposition predicted improvement from year 2008 through year 2021 is currently presented in the Proposed RMPA/FSEIS; quasi-cumulative deposition for Source Groups R and S contribution is also presented. Cumulative deposition was added to Tables 4.2.20a, 4.2.20b, and 4.2.20c.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-16	Climate and Air Quality	Certain analyses that are typically included in NEPA air quality assessments are missing from the Draft SEIS. Specifically, assessments of the following impacts are missing: NAAQS for 1-hour S02, 1-hour and 8-hour CO, and 24-hour PM10 for planning area contributions and cumulative impacts; and a comparison of planning area impacts to Prevention of Significant Deterioration (PSD) increments. For consistency with other NEPA air quality assessments and to ensure full disclosure, we recommend that these missing analyses be included in the Final EIS. Such information will further support any decisions related to project development.	The Proposed RMPA/FSEIS currently provides information for relevant pollutants for oil and gas assessments. SO2 and CO results for air quality analyses are seldom an issue for oil and gas projects. NO2 is by far the major combustion-related pollutant for oil and gas emissions sources and therefore impacts for NO2 are used as surrogate for other combustion-related pollutants (i.e., CO and SO2). Likewise, PM2.5 impacts are used as surrogate for PM10 impacts. Consideration of PSD increments is available in the CARMMS report, available at http://www.blm.gov/co/st/en/BLM_Information/nepa/air_quality/carmms.html.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-17	Climate and Air Quality	We recommend that this important commitment to conduct near-field modeling at the project level included in the Final EIS and Record of Decision (ROD), along with a commitment to mitigate adverse air quality impacts identified through the future project-level near-field analyses.	The CARPP describes BLM's framework for the use of near-field impacts analysis as part of its NEPA analysis of future project proposals. Mitigation will be required if determined necessary by the project-specific near-field impacts analysis.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-18	Climate and Air Quality	The Draft SEIS compares total expected Roan Plateau planning area GHG emissions with projected Colorado, U.S. and global GHG emissions. We strongly recommend this be deleted from the Final EIS because these comparisons obscure rather than explain how to consider GHG emissions under NEPA. Similarly, it is not meaningful to compare either the GHG emissions or impacts from planning level oil and gas activities to a USEPA modeled source referenced in a 2008 memo on Endangered Species Act and GHG Emitting Activities to determine that the projected annual planning area federal oil and gas related emissions would have no measurable impact on the climate. We also note that, given the substantial advancements in climate science and associated models since 2008, we do not recommend referencing the 2008 memo in general.	The comparison of GHG emissions to the state and the U.S. by relevant sectors is meaningful in that it provides a context of the magnitude of the analysis area emissions. Climate change is a global problem, and it is the cumulative aggregation of sources that should be considered. Given that there is no substantial advancement in the use of models to provide specific impacts due to the emissions on the analysis area of this Proposed RMPA/FSEIS, the only possible proxy is the disclosure of the GHG emissions. The 2008 USEPA modeled source that is being referred to is the single source that EPA modeled to estimate climate change impact contribution and we compare new oil and gas emissions to the single source emissions rates modeled by USEPA to determine how the new oil and gas would contribute to climate change. BLM's methodology of quantifying the estimated GHG emissions from a proposed action, placing them in a regional or global context, and providing qualitative analysis of climate change impacts is consistent with the approach that has been approved by the Interior Board of Land Appeals in Powder River Basin Resource Council, 180 IBLA 119, 134-35 (2010), and Bristlecone Alliance, 179 IBLA 51, 57 (2010), and the U.S. Court of Appeals for the D.C. Circuit in WildEarth Guardians v. Jewell, 738 F.3d 298, 309-310 (D.C. Cir. 2013).
Philip	Strobel	Environmental Protection Agency - Region 8	0054-19	Climate and Air Quality	Lastly, the Draft SEIS considers potential changes to the affected environment that may occur due to climate change (Section 4.2.4). We recommend considering climate change adaptation measures where appropriate.	The BLM Colorado Air Resource adaptive management strategy also applies to GHG emissions and climate change. Following this approach, GHG emissions and climate change will be addressed over the life of the plan as future guidance and analysis suggest the need to, meaning that BLM Colorado analyses will adapt to changing times of the science for future oil and gas authorizations. Adaptive management practices that will be considered include analyzing impact trends, management actions effectiveness and following new guidance requirements.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Cindy	Copeland		0059-1	Climate and Air Quality	The climate and air quality analyses for the DEIS do not adequately analyze the air quality impacts that could occur as a result of the actions authorized under the Roan Plateau DEIS, therefore, failing to comply with the National Environmental Policy Act (NEPA) and the Federal Land Policy Management Act (FLPMA). Specifically; 1) the modeling analysis used in the DEIS does not project emissions for most of the 20-year life of the DEIS, rather, the modeling analysis only extends to 2021, 2) the modeling analysis grossly underrepresents the number of new wells in the Planning Area and therefore air pollution emissions are underrepresented, 3) the DEIS does not include a near-field analysis, 4) the cumulative impacts analysis inadequately demonstrates future impacts from planned projects, and 5) the DEIS does not take into account the already elevated ozone levels near the Roan Plateau. In the Conservation Colorado Education Fund, et al. v. Jewell, et al. settlement agreement (the 2014 Settlement), the Court remanded the SEIS to the BLM to more fully address three items, two of which were air quality issues. The first being that the cumulative air quality impacts needed to be addressed and the second was that an ozone analysis needed to be included as part of the SEIS. Because of the reasons listed above, the BLM has not fulfilled these requirements.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Cindy	Copeland		0059-2	Climate and Air Quality	In addition, the DEIS does not satisfy the BLM's obligations under NEPA and FLPMA to disclose whether the proposed development will cause CAA violations.	The Proposed RMPA/FSEIS air quality analysis utilized the CARMMS Planning Area-specific and cumulative impacts analysis to disclose air quality concentration impact contributions (and relative magnitude) for the projected oil and gas development within the Planning Area. Throughout the Proposed RMPA/FSEIS air quality section, Planning Area-specific impact contributions are presented for air pollutants and related values. As shown in the Proposed RMPA/FSEIS, in Section 4.2.5.5, Planning Area-specific contributions would be minimal with respect to overall cumulative impacts.
Cindy	Copeland		0059-3	Climate and Air Quality	Unfortunately, the air quality modeling analysis (CARMMS) is inherently flawed with respect to the Roan Plateau DEIS in that it only extends to year 2021, using a ten-year time period for projections. Given that it's now 2016, the time period for any "projections" is much shorter. The DEIS states that the RMPA would have an anticipated 20-year life, therefore, the modeling analysis will only cover the first few years of the RMPA being in place. In other words, by the time this DEIS is finalized there will not be many future years left in the modeling analysis. This is a major problem for the air quality analysis because, with a shortened period of analysis, the BLM is not fulfilling basic National Environmental Policy Act (NEPA) requirements for analyzing the impacts of the projected development in the Planning Area. The DEIS does not satisfy the BLM's obligations under NEPA and the Federal Land Policy and Management Act (FLPMA) to disclose whether the proposed development will cause Clean Air Act (CAA) violations because the analysis does not cover the entirety of the RMPA planning period.	Please see response to comment number 0036-25, sections 1, 2, and 4.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Cindy	Copeland		0059-4	Climate and Air Quality	Another significant problem in the DEIS is that although the CARMMS high, medium and low development scenarios are supposed to approximate Alternatives I-IV, the well counts used are much lower in the modeling analysis than in any of the DEIS alternatives. This is significant because well counts were used to determine production rates, and therefore projected emissions from the planned development. Actual emissions will of course be positively impacted by the state of Colorados increased requirements for oil and gas development, finalized in 2014 and by EPA's anticipated final methane rule. But, under NEPA requirements, the full projections in the DEIS must be accounted for in the air quality modeling analysis in order to determine whether the planned project will adversely impact air quality in the Planning Area and surrounding areas.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Cindy	Copeland		0059-5	Climate and Air Quality	The DEIS presents impacts for all the criteria pollutants, greenhouse gases and hazardous air pollutants (HAPs), but the potential impacts are misrepresented because the modeling analysis does not reflect the actual plans in the DEIS. It can be assumed that future levels of all these pollutants would be higher in the Planning Area due to the planned oil and gas development than the CARMMS modeled impacts show. The results of that modeling analysis are not analyzed or critiqued in these comments because model inputs are so far off the planned alternatives in the DEIS that it's assumed the results are highly inaccurate.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Cindy	Copeland		0059-6	Climate and Air Quality	Without a near-field dispersion modeling analysis the BLM cannot know if the proposed development in the Planning Area will cause NAAQS exceedances or consume more than the PSD increments allow. Putting off any rigorous analysis until source-specific permits are issued or project-specific EISs are proposed means that the BLM is not fulfilling its obligations under NEPA and FLPMA to consider means to mitigate significant impacts to human health or the environment via this EIS process. Furthermore, many of the sources associated with the proposed development (e.g., area sources and smaller point sources) may not trigger the need for the operator(s) to obtain a permit from the state that would include a near-field modeling analysis and therefore, the referenced state analysis will not occur for these sources. It is only fair to the public and those with an interest in developing these resources that the BLM establish, up front, what levels of control may be required in order to accommodate the level of increased development in the region being proposed under the DEIS. And, in fact, other Resource Management Plan updates in Colorado have included a much more comprehensive modeling assessment of impacts, including near-field modeling analyses. For example, the final Little Snake RMP included near-field, far-field and cumulative modeling.	Please see response to comment number 0036-25, section 3. BLM conducts project-specific near-field air quality impact analyses when reviewing specific oil and gas development proposals which provide the detailed information on timing, location, and emissions source equipment and operations needed to conduct a complete analysis. The BLM Colorado Air Resources Program has already developed an Instruction Memorandum (IM) addressing the adequacy, consistency, and efficiency of project-level emissions inventories and procedures for conducting near-field analyses as a result of proposed future project-specific development. The BLM has provided this IM to air quality stakeholder work groups to ensure the approach aligns with accepted methodologies (near-field air quality modeling guidelines, etc.) and approaches for analyzing potential impacts for oil and gas development. Near-field modeling analyses were conducted for previous BLM Colorado RMP EISs when location and project-level information was not known in order to attempt to develop a “one size fits all”- type analysis that could be used or leveraged for subsequent project-level analyses over the life of the plan. BLM Colorado has decided not to follow this approach in this SEIS because the previous analyses have not proven as useful as anticipated, requiring extensive updating once actual oil and gas development information (location, timing, equipment parameter values, etc.) is known. Appendix A of the CARPP describes the oil and gas NEPA analysis process and methodology. This appendix describes the approach for conducting project-specific near-field analyses.

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Cindy	Copeland		0059-7	Climate and Air Quality	In order to comply with 40 CFR 1502.24 (to ensure the professional and scientific integrity of the air quality analysis), the air quality analysis should include a near-field analysis to assess localized air quality impacts. Such an analysis should be performed to assess whether the activities allowed under the DEIS scenarios would comply with the NAAQS and the PSD Class II increments. The inputs for this analysis should include all of the air pollution source categories allowed under the development scenarios of the DEIS. The maximum emission rates from sources over the averaging times of the standard for which compliance is being assessed should be modeled. The modeling analysis should use an EPA approved model and should be based on at least one year of quality-assured, on-site, representative meteorological data or, if no on-site data is available, five years of meteorological data from the closest meteorological station representative of the area. See, e.g., Sections 9.3.a, 9.3.1.2 and 9.3.3.2 of EPA's Guidelines on Air Quality Models at 40 CFR Part 51, Appendix W. For the NAAQS analysis, appropriate background concentrations reflective of current air quality in the area should be added to the modeling results.	Please see response to comment numbers 0036-25, section 3, and 0059-6.
Cindy	Copeland		0059-8	Climate and Air Quality	Clearly, the DEIS failed to model the near-field impacts of the proposed development to determine compliance with NAAQS and PSD Class II increments as required by NEPA. The BLM must perform a quantitative assessment of near-field impacts as part of this DEIS. This analysis is necessary for the BLM, and the public, to understand the potential human health effects of the activities associated with the proposed additional development in the region and in order for the agency to comply with federal statutes and regulations. The EPA has addressed the need for quantitative impact assessments prior to any further [project-specific] planning decisions under NEPA. Specifically, EPA stated that the BLM "has an obligation under NEPA to fully consider the reasonably foreseeable developments including proposed tar sands and oil shale activities that are likely in the next several decades, as well as the expansion of existing oil and gas operations regardless of whether or not an application for drilling has been submitted to your office." (Emphasis added). This would indicate that the EPA does not support waiting until there are project-specific requests before fully assessing air quality impacts, including those to ambient ozone concentrations. The EPA also explicitly recommended, for the proposed West Tavaputs Natural Gas Full Field Development Plan DEIS, that the BLM "prepare a Supplemental Draft EIS that includes modeled demonstrations of both this project and cumulative pollutant emissions sources from other activities in the Uinta Basin demonstrating whether the proposed action will contribute to violations of the ozone NAAQS."	Please see responses to comment numbers 0036-25, section 3, and 0059-6. The West Tavaputs Natural Gas Full Field Development Plan DEIS analyzed impacts for an actual natural gas development project, and therefore, evaluated much more detailed information for development than is being analyzed for this planning-level analysis. For actual submitted plans similar to the West Tavaputs Natural Gas Full Field Development Plan, BLM Colorado would conduct project level impacts analysis and near-field impacts analysis following the methodology described in the CARPP Appendix (IM).
Cindy	Copeland		0059-9	Climate and Air Quality	This is not an accurate representation of the ongoing air emissions from oil and gas operations. The amount of emissions, including volatile organic compounds (VOC) and methane are significant even after the construction phase has ended. And while it's true that existing pollution control regulations should result in reduced emissions from these sources, the potential emissions still need to be analyzed and accounted for in the DEIS.	VOC, HAPs, and GHGs (methane) emissions were calculated and disclosed for the CARMMS scenarios for construction and production phases of projected new oil and gas within the Planning Area. In addition, down-stream / end-use combustion CO2 emissions were estimated for projected Planning Area oil and gas production. The total GHG (including methane) emissions for the Planning Area were included in the GHG emissions and Climate Change impacts analysis, and projected Planning Area VOC emissions were included in CARMMS future year modeling for ozone impacts and other analyses. VOC and methane estimates for the Planning Area are included in Tables 4.2.9 through 4.2.14.

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Cindy	Copeland		0059-10	Climate and Air Quality	For the cumulative impacts analysis, the DEIS again relies on CARMMS, which uses 2008 as the base-year and projects emissions from 2012 through 2021. Unfortunately, ending at year 2021 for future year projections, does not cover much of the 20-year life of the DEIS, which is expected to be finalized during 2016. This failure to consider the full cumulative impacts of the planned development violates NEPA requirements.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Cindy	Copeland		0059-11	Climate and Air Quality	The BLM must ensure that all potential sources of emissions are included in the source inventory, that maximum impacts are modeled and that any control technology assumptions used in the analysis are made enforceable in the final EIS. The BLM has an obligation under NEPA to fully consider the cumulative impacts of the project.	Please see responses to comment numbers 0036-25, sections 1, 2, and 4, and 0054-17.
Cindy	Copeland		0059-12	Climate and Air Quality	The BLM must acknowledge the existing high ozone levels in and near the Planning Area and recognize that high background levels of air pollutants can mean that even if the activities analyzed in the DEIS will result in only minor increases in certain pollutants, the aggregate level of pollution that could result might have significant detrimental effects on human health and the environment (e.g., visibility and ecosystems).	Please see response to comment number 0036-25, section 5.
Cindy	Copeland		0059-13	Climate and Air Quality	Results from the modeling in CARMMS predict that emissions from development in the Planning Area would have a minimal effect on the 4th highest daily 8-hour modeled ozone exceedances. But, for the reasons explained above, the modeling analysis does not calculate the full amount of potential emissions and therefore, under predicts the impacts. And because the ozone NAAQS were just lowered in December 2015, the DEIS uses 75 ppb as the standard.	Chapter 3, Section 3.2.5, Table 3.2.14 - Ambient Air Quality Standards, and Chapter 4, Section 4.2.5 were updated throughout the Proposed RMPA/FSEIS to reflect the new standard.

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Cindy	Copeland		0059-14	Climate and Air Quality	As Table 1 shows, there are already ozone monitors recording values at or near the new ozone standard of 70 ppb, so any increase in emissions could increase the number of ozone exceedances and possibly lead to NAAQS violations. Additionally, none of the "current year" ozone design values used in CARMMS are from counties in or nearby the Planning Area. Instead, most of the 8-hour design values used for the 2021 cumulative scenario are from the Front Range. Although these values are generally higher than ozone values near the Planning Area, there are closer ozone monitors (Table 1 above) and the data collected from those monitors should be used in order to be representative of air quality in the actual Planning Area.	All current monitoring data for the Region (see Chapter 3) as well as photo-chemical grid modeling (CARMMS) results that describe the sensitivity of the atmosphere with respect to emissions loading from future oil and gas development are being used to inform the decisions being made for the Proposed RMPA/FSEIS as well as future oil and gas projects. The CARMMS future year 2021 cumulative ozone analysis used in the Proposed RMPA/FSEIS (also see CARMMS Report) provides detailed information for changes in ozone concentrations from base year to future year for all Regional monitors that were in operation for the base year. Some existing western Colorado monitors were not in operation for CARMMS base year modeling, but the SEIS analysis (and CARMMS Report) also provides results for an Unmonitored Area Analysis (UAA) for remote locations or where monitors did not exist for the base year analysis. The UAA tool provides spatial interpolation for concentrations between the existing monitors in the base year to fill in the gaps that inherently exist in any monitoring network. Despite the lack of nearby monitoring, the monitors used by the UAA tool for more recent base year studies (2011) have similar if not equivalent design values compared to the 2008 base year used by CARMMS. Given these similarities (as well as emissions similarities) we would not expect large variances in our model results had this data been available. This is evidenced by the fact that CARMMS picked up on the elevated ozone levels in the Roan Plateau Planning Area (see SEIS figure 4.2-17). We should note that more recent IMWD models with CAMx have shown elevated or biased (i.e. over predicted) ozone in the exact same area; however more investigation is needed to figure out exactly why this is occurring in the model. (http://vibe.cira.colostate.edu/wiki/Attachments/Modeling/WAQS_Base11b_MPE_Draft_21Jan2016.doc) BLM is aware of the fact that nearby monitor values are elevated in relation to the newly lowered ozone NAAQS. However, as shown in the CARMMS Report, most areas of the Rocky Mountain Region are expected to see an overall cumulative decrease in ozone for future years. BLM will utilize the adaptive management strategies identified in the CARPP to manage development as appropriate.
Cindy	Copeland		0059-15	Climate and Air Quality	And as explained above, the modeling analysis (CARMMS) severely underrepresents the expected impacts from this development because it; 1) only covers a fraction of the 20-year planning period for the DEIS and, 2) the number of projected wells, and thus the expected emissions used in the modeling are grossly underrepresented. The BLM must rectify these issues with the modeling analysis in order to meet all of its NEPA and FLPMA requirements.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-1	Climate and Air Quality	The NPS questions whether the emissions scenarios modeled represent the full range of potential activity that could occur under the various alternatives. We are concerned that the "high scenario" may underestimate the full development potential considered elsewhere in the SDEIS. The NPS agrees that evaluating a high, medium and low development/emissions scenario, which is not precisely tied to the alternatives, is an appropriate way to consider the range of air quality impacts that may occur under the alternatives considered. We also recognize that neither the reasonably foreseeable development (RFD) nor the emissions scenarios provide an accurate prediction of the numbers and locations of wells that could occur should the RMPA and subsequent leasing decisions be approved, and that considering a range of development is an adequate way to address this uncertainty. However, at the very least, we believe the maximum development assumed in the air analysis, i.e., the high scenario should encompass the maximum level of activity assumed within the range of alternatives (i.e., the "scaled" RFD).	Please see response to comment number 0036-25, sections 1, 2, and 4.

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Susan	Johnson	Policy, Planning & Permit Review Branch	0079-2	Climate and Air Quality	Recognizing the different time frames (planning year 10 vs. 20), it appears that the high emissions scenario assumed either lower or slower rates of development than the development estimates for each Alternative in the SDEIS. The air analysis section does not clarify how the emissions assumptions account for or capture the highest potential levels of development assumed under each of the Alternatives, or why the year 2021 represents the maximum emissions year. Further, page 4-56 states: "For projected Colorado oil and gas development, the high-development scenario for oil and gas is based on the RFD." This section does not explain why the high development scenario estimate, even at year 10, is significantly lower than the unconstrained RFD (3,520 new federal wells) and/or alternative II (3,511 new federal wells).	Please see response to comment number 0036-25, sections 1, 2, and 4.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-3	Climate and Air Quality	Please note that the total estimated number of potential new federal wells does not differ significantly between Alternatives III and IV (2,231 and 2,475 new wells, respectively), and that the low emissions scenario assumed a significantly lower level of activity than either of these alternatives (464 new wells in year 10 of the planning period or roughly 19% of the projected maximum number of wells over the life of the plan). Again, the BLM should clarify how the high emissions scenario adequately represents the maximum emissions year based on the maximum potential development under each of the alternatives (technically, this should be 3,511 new wells under Alternative II). In addition, if the "low" emissions scenario is not actually reflective of the maximum development potential for Alternative IV, this text should be revised in the SDEIS.	Please see response to comment number 0036-25, sections 1, 2, and 4.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-4	Climate and Air Quality	In March of 2015, we requested that the SDEIS should present results for each Class I / sensitive Class II area within the vicinity of the Roan Plateau (i.e., within 200 km). We note that SDEIS did not report results for Colorado National Monument (NM), which is within the vicinity of the planning area and is included in the CARMMS modeling assessment outputs. Please include results for this sensitive Class II park in the SEIS analysis. Based on the results presented in the SDEIS, impacts to AQRVs do not exceed FLM concern thresholds for deposition or visibility in Black Canyon of the Gunnison National Park or Dinosaur National Monument. However, as stated previously, the analysis did not report results for Colorado NM. Based on the CARMMS information, it appears that nitrogen deposition in Colorado NM due to emissions from potential oil and gas sources in the Roan Plateau planning area (source group D) may exceed the NPS Deposition analysis threshold (DAT) for nitrogen. In addition, we recommend that the analysis clarify whether the high emission scenario represents the maximum emissions year for the levels of development projected for each Alternative elsewhere in the SDEIS prior to drawing final conclusions regarding the severity of AQRV impacts.	Modeled nitrogen deposition impacts for Colorado National Monument were not specifically reported in the SEIS because there were higher predicted impacts at other locations according to the CARMMS model. The CARMMS-predicted impacts for Colorado NM can be found in the CARMMS Report and associated impacts reporting tools (http://www.blm.gov/co/st/en/BLM_Information/nepa/air_quality.html). For the SEIS, the maximum nitrogen deposition impacts for each CARMMS scenario were reported for Class I and sensitive Class II areas where highest impact contributions for future RPPA Federal oil and gas are predicted to occur according to CARMMS. There are several other Class I and sensitive Class II areas in the immediate area that are as close or closer to the Roan Plateau Planning Area where impacts are predicted to be higher than those that would occur at Colorado National Monument and these predicted impacts could be used as a surrogate for Colorado National Monument. Even though nitrogen deposition impacts are disclosed in the SEIS and CARMMS Report for future oil and gas development in the Roan Plateau Planning Area, the DAT is not an appropriate metric to use for the planning area specific impacts because the projected level of oil and gas development for the Alternatives would be made up of multiple “projects” and is based on a hypothetical oil and gas growth trajectory for a planning-level assessment/decision, and the DAT is used for comparing single-project deposition impacts. Full cumulative nitrogen deposition predicted improvement from year 2008 through year 2021 is also currently presented in the Proposed RMPA/FSEIS.

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Susan	Johnson	Policy, Planning & Permit Review Branch	0079-5	Climate and Air Quality	Page 4-66 states: "The maximum modeled annual nitrogen deposition contributions for each scenario is minimal with respect to the cumulative critical nitrogen deposition load of 2.3 kg/ha-yr value." Please note, a critical load is a cumulative assessment tool, it is not appropriate to compare the deposition results from a single planning area to the nitrogen critical load for a specific Class I area(s). By definition, a critical load of nitrogen is the amount of nitrogen deposition below which no harmful effects to an ecosystem are expected. It is a cumulative number based on ecosystem response, and should only be compared to cumulative modeling results (e.g., source group W in the CARMMS assessment). The NPS DAT of 0.005 kgN/ha/yr would be an appropriate threshold to compare planning area impacts to. Please revise this in the SDEIS.	The projected oil and gas development for the Planning Area for CARMMS and the SEIS would be made up of many "projects" and these projections are current hypothetical oil and gas development values not based on actual operator proposed oil and gas development plans. BLM agrees that the critical load value is a cumulative assessment tool intended for evaluating impacts at a larger cumulative scale than the Planning Area. However, it provides a point of reference for projected oil and gas development at the sub-cumulative scale. Because the DAT is a project-level assessment tool, it is not appropriate for evaluating impacts for projected oil and gas development expected to include multiple projects across a Planning Area. The BLM has requested that the Technical Workgroup develop quasi-cumulative thresholds that would be more appropriate in evaluating impact significance for projected oil and gas development across Planning Areas.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-6	Climate and Air Quality	We recommend that the GHG and climate change section should focus on the potential differences in emissions between alternatives, as well as the effect mitigation implemented through the planning decision may have on reducing GHG emissions. Further, the analysis should discuss the cumulative contribution of the oil and gas industry to GHG emissions nationally and globally, as the industry as a whole is a significant source of these pollutants.	This Proposed RMPA/FSEIS is a planning-level document; for oil and gas development, the specific locations, drilling technology, equipment to be used, and duration of development stages is not known at this time. Project-level GHG emissions and potential mitigation will be evaluated during site-specific NEPA analysis. Currently, the Proposed RMPA/FSEIS discloses GHG emissions (including downstream) for the projected new oil and gas activity associated with the CARMMS high and low production scenarios that represent the anticipated limits on new development for the alternatives.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-7	Climate and Air Quality	Appendix C, Stipulations, does not contain any constraints for protection of air resources. Again, while we agree with the CARMMS and CARPP concepts in theory, we continue to have concerns about how and when air resource mitigation will be implemented. The CARPP proposal is not prescriptive in terms of how and when mitigation will be applied - there is high degree of subjectivity in the plan's language regarding mitigation. This concerning considering that the magnitude of potential impacts from the Roan Plateau Planning area analysis may underestimate the potential maximum level of activity, as described above. Further, these documents tie subsequent mitigation decisions to an adverse effect. However, many individual projects may not rise to the level of adverse, but when considered cumulatively, can have a significant impact on air quality and AQRVs. We believe the RMP is the most effective and appropriate place to incorporate air mitigation (as stipulations) to ensure adequate cumulative air resource protection into the future.	Because the Proposed RMPA/FSEIS is a planning analysis without site-specific information about most of the oil and gas development that could occur in the Planning Area such as facilities equipment and drilling technology, it is premature to identify the appropriate mitigation measures that would apply to individual projects. Emissions control requirements for projects would depend on existing air quality, updated air quality analyses and the applicable regulations at the time when actual oil and gas development is proposed. As stated in the Proposed RMPA/FSEIS and in CARPP, additional mitigation measures may be required on a case-by-case basis. Please see response to Comment 0036-25 sections 1, 2, and 4.
Susan	Johnson	Policy, Planning & Permit Review Branch	0079-8	Climate and Air Quality	Page 4-51 states: "Under the Federal Land Policy and Management Act (FLPMA), the BLM provides for compliance with all applicable Federal, tribal, State, and local air quality laws, statutes, regulations, standards, and implementation plans." We believe that FLPMA not only provides for compliance with existing regulations, but also provides broad discretionary authority to manage public lands "in a manner that will protect the quality of . . . air and atmospheric . . . values." (43 U.S.C 1701). It is appropriate to reflect this authority within the text of the SDEIS.	BLM fully explains FLPMA regulations pertaining the land use planning in Chapter 2.

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Jeff	Thompson		0097-4	Climate and Air Quality	4) It is my understanding that as a result of the "COP 21" international summit on climate change in Paris in November and December, 2015, it is officially the policy of the United States Government that it will implement measures which, together with the measures implemented by other governments, will ensure that global temperatures do not rise more than 1.5 C. I believe it is the consensus of credible scientists that, in order for this goal to be met, something like 80% of the earth's fossil fuel reserves must be left in the ground. Accordingly, if any of the alternatives considered in the Draft Supplement would allow more than 20% of the fossil fuels underneath the BLM land in question to be recovered, that alternative would not be in accordance with the policies of the United States Government. Further, the cumulative impact on the human environment of such alternative must be described as "catastrophic." I request that another Draft Supplement be circulated which recognizes and evaluates this significant new information.	The BLM Colorado Air Resource adaptive management strategy also applies to GHG emissions and climate change. Following this approach, GHG emissions and climate change will be addressed over the life of the plan as future guidance and analysis suggest the need to, meaning that BLM Colorado analyses will adapt to changing times of the science for future oil and gas authorizations. Adaptive management practices that will be considered include analyzing impact trends, management actions effectiveness, and following new guidance requirements. The consensus of credible scientists does suggest the need to consider mitigation, but there is currently no formal guidance that requires such measures for future oil and gas development. Multiple factors need to be considered when determining whether oil and gas development would contribute to climate change impacts. For instance if the BLM denies future Federal oil and gas development in the Federal leases, the development could still occur on nearby private surface at a potentially increased rate or with different oil and gas practices which would not result in a net zero contribution to GHG. Denying Federal oil and gas development in the Planning Area could potentially displace the oil and gas development closer to populated areas or other areas. Denying oil and gas development does not immediately imply that the overall global levels of GHG emissions would be reduced and remain unchanged. The demand for this resource exists, and it is likely to be developed somewhere else (if not authorized in the Planning Area) until other incentives drive the desire for alternative sources of energy.
Kent	Rider	WPX Energy	0103-9	Climate and Air Quality	The need to conduct extensive monitoring, modeling and other emission forecasting and reporting as allowed under the CARPP for proposed future oil and gas development given these drastic changes in industry activity and regulation is questionable. The results of Garfield County's air quality monitoring program demonstrate that air quality has improved in recent years as potential emissions are captured or controlled, and/or decline along with production from existing wells.	Because the Proposed RMPA/FSEIS is a planning analysis without site-specific knowledge or information about most of the oil and gas development that could occur in the planning area such as facilities or the specific types of equipment and drilling technology to be used for each lease, it is premature to identify the appropriate to provide certainty on the necessary mitigation measures or site-specific regulatory requirements that would be applied to individual projects. The reference to the CARPP and the lease notice, however, discloses the types of air quality analysis and mitigation measures that may be required at the APD stage of actual proposed oil and gas development. Emissions control requirements for projects would depend on existing air quality, updated air analyses, and the applicable regulations at the time when actual oil and gas development is proposed. Monitoring data showing either improvements or decline in air quality would be used in project-level analysis to inform the decision maker.
Kent	Rider	WPX Energy	0103-10	Climate and Air Quality	Overall, the BLM must carefully reconsider its entire management approach as outlined in the CARPP, Appendix J. BLM states that air quality would be managed within the scope of BLM's authority, and would ensure that air quality and air quality-related values are adequately protected by analyzing the effects of activities or resource uses authorized by the BLM and cumulative actions. Yet, even a cursory review of Appendix J suggests that the BLM intends to exercise plenary authority over air quality management.	Please see response to comment number 0039-3.
Kent	Rider	WPX Energy	0103-11	Climate and Air Quality	Section III of Appendix J proposes that operators submit an annual report of actual emissions for all criteria pollutants, VOCs, and GHGs for any oil and gas authorization. This requirement is redundant with existing State inventory programs (CDPHE Stationary Source criteria pollutant emissions database) and Federal programs (Greenhouse Gas Mandatory Reporting Rule. 40 C.F.R. 98). This redundant requirement imposes not only an unnecessary burden on operators, but also raises many concerns such as ensuring consistency of emission calculation methodologies, standards, and emission source types, between the BLM developed inventories and the existing State and Federal inventories.	Section III of Appendix J is being misinterpreted as BLM Colorado is not requesting an annual “report” but information from oil and gas operators for proposed projects when BLM is conducting project-specific NEPA analyses; this information is needed to aid BLM in developing adequate and accurate emissions inventories for the proposed development to assist in the NEPA analysis for authorization of the proposed oil and gas development. Without adequate emissions inventories, BLM is forced to make assumptions for the proposed project which would lead to erroneous air quality impacts analysis, etc.

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Kent	Rider	WPX Energy	0103-12	Climate and Air Quality	The BLM indicates that modeling may be required to analyze the potential impacts of air quality on a periodic rolling basis. The BLM should explain how it intends to conduct this modeling and who will perform said modeling. The BLM should also recognize the cost of such modeling, which can total to millions of dollars over time.	For cumulative and planning area-wide modeling analyses, the BLM is heavily involved in the Inter-Mountain Data Warehouse (IWDW) for which modeling products are developed using various sources of funds (Government funding, oil and gas operator support, etc.). BLM Colorado has and will continue to leverage these IWDW products for CARMMS which saves everyone much time and money for CARMMS modeling. The unique CARMMS modeling specific to BLM Colorado (i.e., CARMMS products not part of IWDW) has been supported by Government funding up to this point, and CARMMS is continuously used for all BLM Colorado oil and gas related NEPA assessments (RMPs, EISs, EAs). For project specific near-field analyses, the CARPP Appendix (IM) describes the methodology that BLM Colorado will follow for conducting oil and gas near-field impact assessment for actual submitted oil and gas proposals. BLM Colorado currently has several near-field modeling screening tools that are used to screen potential air quality impacts for proposed projects and in-house modeling capabilities for proposed projects (several AERMOD / CALPUFF analyses were recently conducted in-house for proposed oil and gas development project EAs). In unique circumstances, BLM Colorado may request an oil and gas operator to submit an AERMOD or CALPUFF near-field analysis for a proposed oil and gas project EA if screening tools suggest the need to conduct such an analysis and there are not previously completed near-field analyses that could be used to describe potential air quality impacts for the proposed project. Additional modeling tools (not described here) may also be used in future. Further details regarding methodologies for conducting implementation-level decisions is not required at the planning stage.
Kent	Rider	WPX Energy	0103-13	Climate and Air Quality	In Section III.A.2 of Appendix J, the BLM indicates that it may require project proponents to conduct pre-construction air monitoring within or adjacent to proposed development areas. The BLM indicates this is necessary to demonstrate baseline air quality conditions prior to development. The BLM does not explain how long monitoring will be required or indicate why such monitoring is necessary.	Please see response to comment number 0039-4.
Kent	Rider	WPX Energy	0103-14	Climate and Air Quality	In addition, the potential requirement that the operator fund one or more air monitoring stations for the life of the project, which could exceed 20 years, is an unrealistic and overly burdensome requirement. WPX believes this condition is wholly unacceptable and requests that it be eliminated.	Post-development monitoring, although not likely, could be required to validate the air quality analysis (modeling) that was performed for a proposed action because air quality models are not always perfectly accurate to assess potential air quality changes.
Kent	Rider	WPX Energy	0103-15	Climate and Air Quality	The BLM's language in Sections IV, V and VI of Appendix J must be revised significantly in the Final SEIS. The BLM suggests that it will utilize modeling to implement control requirements or other mitigation measures on future oil and gas development. Such measures are wholly inappropriate and beyond the expertise or authority of the BLM. The EPA and CDPHE have exclusive authority over air quality measures within the State of Colorado.	Please see response to comment 0039-3.
Kent	Rider	WPX Energy	0103-16	Climate and Air Quality	WPX is concerned that the basis for when any of the mitigation options will be selected is subjective and uncertain. There is no clarity or certainty for an operator for when these mitigation options may be imposed. This presents a challenge when planning for future projects and capital outlays.	Mitigation measures are included in the Proposed RMPA/FSEIS as information. BMPs are determined during the Master Development Plan or Application for Permit to Drill process.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kent	Rider	WPX Energy	0103-17	Climate and Air Quality	Overall, WPX questions the need for and value of the comprehensive monitoring, permitting, mitigation and reporting requirements being considered by BLM in its CARPP, when existing federal and state regulatory programs already address most of these requirements. Furthermore, the recently established federal and state emission controls on oil and gas operations do not appear to have been incorporated into the air quality modeling analysis used to support the Roan SEIS, which is based on an oil and gas development forecast that appears to significantly overestimate likely future rates of development.	BLM Colorado will continue to evaluate the relevance of CARMMS for use in analyses and making decisions, and will conduct more modeling as RFDs and emissions inventories are updated, for new applicable rules and regulations and as new monitoring air quality and air quality related values suggest the need for more modeling. Chapter 3, Section 3.2.5, of the Proposed RMPA/FSEIS was updated to include recent regulations.
Doug	Dennison	Bill Barrett Corporation	0035-13	Executive Summary	Footnote 4 is missing from Table ES-2. The assumptions used to develop the anticipated ground disturbance associated with Alternative IV, as presented in Tables ES-2 and Section 4.1.2, are seemingly inconsistent with the terms of the Settlement Agreement. It appears that the methodology used to calculate the temporary disturbance for the 7 pads allowed by the Settlement Agreement is accurate (10 acres/pad for a total of 70 acres), however, the Settlement Agreement specifies that each well pad shall be limited to approximately 3 acres of un-reclaimed ground disturbance during production. Therefore, the long-term disturbance for pads should reflect 21 acres of disturbance instead of the 17.5 acres currently calculated.	This section was revised for clarity in the Proposed RMPA/FSEIS. Footnote 4 was added to the table.
Jeff	Thompson		0097-1	Executive Summary	1) The Executive Summary fails to adequately describe and summarize the impacts of oil and gas operations on the human environment. Section 1500.4(h) of the CEQ Regulations implementing NEPA require agencies to summarize environmental impact statements and circulate the summary instead of the entire environmental impact statement if the latter is unusually long. Section 1502.7 of the CEQ Regulations imposes a 300 page limit for environmental impact statements of unusual scope or complexity. The text of the subject Draft Supplement is much longer than the 300 page limit. In this case, good decisions cannot be made by the BLM and other agencies, and members of the public cannot reasonably be expected to comment, without a good summarization. Section 1502.12 of the CEQ Regulations requires that each environmental impact statement contain a summary which adequately and accurately summarizes the statement and stresses the major conclusions, the areas of controversy (including issues raised by agencies and the public), and the issues to be resolved including the choice among alternatives. I request that the BLM circulate a draft summary for comment that meets the requirements of the regulations stated above.	The Proposed RMPA/FSEIS Executive Summary, is found in Section ES, pages ES1 through ES10. This Executive Summary summarizes impacts for all resources, not just oil and gas. 40 CFR 1502.10 specifies that the "standard format for environmental impact statements should be followed unless the agency determines that there is a compelling reason to do otherwise." BLM determined that the information and analyses in the Proposed RMPA/FSEIS were necessary to understanding the decisions that would be made in the ROD. 40 CFR 1502.19 states that "Agencies shall circulate the entire draft and final environmental impact statements except for certain appendices..." and that "the agency may circulate the summary instead". As stated above, BLM determined that the information and analyses in the Proposed RMPA/FSEIS were necessary to understanding the decisions that would be made in the ROD and therefore circulated the entire RMPA/SEIS. Major issues and areas of controversy (raised by the agencies and public) are described on page ES-1, in paragraph 1. Alternatives are described on pages ES-3 to ES-6. Because the Proposed RMPA/FSEIS is a planning document, decisions that will be made include how BLM will manage all resources in the planning area, as described in the section on Purpose and Need (pages ES-2 and ES-3).
Jeff	Thompson		0097-2	Executive Summary	2) Section 1508.8(b) defines "impacts" or "effects" to include cumulative direct and indirect impacts. Accordingly, the summary section should describe the cumulative direct and indirect impacts of oil and gas operations as cumulative impacts are defined in Section 1508.7 of the CEQ Regulations.	Impacts from oil and gas operations and cumulative impacts as defined in 40 CFR 1508.7 are too lengthy to include in a summary (15 pages as specified in 40 CFR 1502.12). Oil and gas impacts are included in each appropriate resource section (for instance, impacts to wildlife are in Section 4.3.2 and 4.3.4). Impacts to oil and gas are included in Section 4.5.5.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-4	Hazardous Materials	In the Settlement Agreement (Exhibit 2, Part F.), disclosure of drilling and production chemicals are required for activities within the retained leases. In addition we recommend considering the required disclosure of all chemicals introduced to the well bore (including maintenance chemicals) for leases above the rim at a minimum. Knowledge of the chemicals present is necessary to evaluate the potential for impacts related to unintended releases of flowback, produced water, drilling fluids, etc., as well as evaluation of appropriate remediation actions should a release to the environment occur.	Alternative IV, the Proposed Plan, includes specific stipulations consistent with the Settlement Agreement. However, BLM has the authority to determine if additional disclosures, or application of potential BMPs, are warranted at site-specific project implementation. In addition, development activity must adhere to state and Federal law, including applicable disclosure requirements in effect at the time that development occurs.

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Form Letter 1			0015-2	Lands with Wilderness Characteristics	Please select the Settlement Alternative (Alternative 4) in your new RMP for the Roan as well as adopting a final management plan that protectively manages all of the lands with wilderness characteristics on the Roan Plateau, which the agency considers elsewhere in the draft plan.	Alternative IV, the Preferred Alternative in the Draft RMPA/SEIS, presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations and public comment. This alternative is carried-forward as the Proposed Plan analyzed in the FSEIS. Management and protection of Lands with Wilderness Characteristics were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions in the Proposed Plan and analyzed in the FSEIS provide indirect protections for these resources. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise portions of Lands with Wilderness Characteristics.
Janice	Shepherd		0022-1	Lands with Wilderness Characteristics	I believe that the analysis presented in Chapter 4 did not take into account the complete set management practices presented in Appendix F when evaluating the environmental impacts differences between Alternative III that contains the three LWC units and Alternative II and IV that do not. Consider the analysis on pages 4-139 and 4-140 where the impact of Transportation and Travel Management and Recreation Management are described for Alternative III as the same as for Alternative II. There is no mention of how the three LWC units in Alternative III would result in much less stress on wildlife in the winter. Appendix F indicates that the management rules for the LWC units in Alternative III would include the rule All lands are closed to over-snow travel. (page F-3). Thus the analysis on pages 4-139 and 4-140 should have mentioned the great benefit to wildlife in the winter of closing the three LWC units to at the very least snowmobiles.	Chapter 2 of the Proposed RMPA/FSEIS includes "Management Action: Restrictions on Use: Protect wilderness characteristics and associated supplemental values per the Management and Setting Prescriptions for BLM Lands Outside WSAs Being Managed to Protect Wilderness Characteristics (Appendix F). Map 36 in the Proposed RMPA/FSEIS was clarified to better illustrate the areas closed to over-snow travel. The Proposed RMPA/FSEIS includes an analysis of over-snow travel in Alternative III in Section 4.2.4.4 for water resources, Section 4.3.2.4 for wildlife, Section 4.3.3.4 for special status plant species, Section 4.3.4.4 for special status wildlife, and Section 4.3.1.4 for vegetation. Alternative III also evaluated oil and gas development from private property. The document was clarified to show the difference as the comment response references. This was a change between the draft and final SEIS.
Janice	Shepherd		0022-3	Lands with Wilderness Characteristics	Yet there is no analysis of the benefit of reducing snowmobile use by the presence of East Fork Unit LWC in Alternative III in the sections 4.2.4 Water Resources and 4.2.5. Climate and Air Quality, let alone in the more obvious sections involving flora and fauna, rare and common.	Chapter 2 of the Proposed RMPA/FSEIS includes "Management Action: Restrictions on Use: Protect wilderness characteristics and associated supplemental values per the Management and Setting Prescriptions for BLM Lands Outside WSAs Being Managed to Protect Wilderness Characteristics (Appendix F). Map 36 in the Proposed RMPA/FSEIS was clarified to better illustrate the areas closed to over-snow travel. The Proposed RMPA/FSEIS includes an analysis of over-snow travel in Alternative III in Section 4.2.4.4 for water resources, Section 4.3.2.4 for wildlife, Section 4.3.3.4 for special status plant species; Section 4.3.4.4 for special status wildlife, and Section 4.3.1.4 for vegetation. Alternative III also evaluated oil and gas development from private property.
Janice	Shepherd		0022-7	Lands with Wilderness Characteristics	Circled in red is the road amongst ones that would need to be closed if LWCs from Alternative III is included in the final plan. The benefit of this extra road closure was not included in the analysis in Chapter 4.	Management of lands specifically for lands with wilderness characteristics under Alternative III (Section 4.5.8 in the Proposed RMPA/FSEIS) did not analyze closure of existing roads. Rather, areas with existing roads were removed from the total existing roadless areas, per BLM guidance. The route that was circled is labeled as EF-1A (or 8000I) in the East Fork Unit Inventory Update Report. According to the report posted at http://www.blm.gov/co/st/en/fo/crvfo/Lands_Managed_for_Wilderness_Characteristics.html, that route is not a wilderness inventory road. Because the unit was found to contain wilderness characteristics with the route inside the unit boundary, the route may remain open to use by the general public as a designated route.

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Janice	Shepherd		0022-8	Lands with Wilderness Characteristics	Map 18 shows at least 7 springs in that same area around the circled road. Those springs would receive better protection by being included in an LWC given that they are outside the protection of one of the ACECs proposed in Alt IV.	Seeps and springs in the Planning Area would receive a number of protections from surface disturbing activities under the Proposed Plan as described in Chapter 2, Table 2.1 in the form of NGDs/NSOs and SSRs/CSUs. The effect of these protections are described in Chapter 4, Sections 4.2.4 and 4.31. The stipulations for water resources have direct benefits. Water resources are not included in the criteria to determine if wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, water resources would indirectly benefit from the management of the area, but there are no specific direct protections for these resources under wilderness characteristics management.
Janice	Shepherd		0022-9	Lands with Wilderness Characteristics	In general the sections in Chapter 4 on important impacts to the individual physical and biological environments make insufficient analysis of the benefit of the LWCs in Alternative III. In contrast consider the Grand Junction BLM Field Office recent PRMP which states under Chapter 4 on Water Resources 4.3.3 page "Under Alternative B, the BLM would manage 44,100 acres for wilderness characteristics. Management prescriptions would provide protection of the relevant and important values found in these areas and would include actions such as ROW exclusion and avoidance areas, travel restrictions (e.g., closed to motorized travel, limiting mechanized travel to designated routes), and closure to mineral development (subject to valid existing rights). These restrictions on surface-disturbing activities would provide protection for water resources in and adjacent to these areas." There is no similar analysis in section 4.2.4. in this draft RMPA/SEIS.	Water resources in the Planning Area would receive a number of protections from surface disturbing activities under the Proposed Plan as described in Chapter 2, Table 2.1 in the form of NGDs/NSOs and SSRs/CSUs. The effects of these protections are described in Chapter 4, Sections 4.2.4 and 4.31. The stipulations for water resources have direct benefits. Water resources are not included in the criteria to determine if wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, water resources would indirectly benefit from the management of the area (see Section 4.2.4.4), but there are no specific direct protections for these resources under wilderness characteristics management.
Janice	Shepherd		0022-10	Lands with Wilderness Characteristics	From Map 23 it can be seen that at least one occurrence of the Debeque milkvetch is covered by Southeast Cliff Unit LWC that is not covered by the Anvil Points ACEC. The LWC management would help protect that plant or plant community. With the newly discovered instances of the Parachute penstemon there has not been sufficient time to survey more for that rare plant. Incorporating the Alternative III LWCs in the final plan may protect more instances of that and other rare and special species not otherwise covered by an Alt IV ACEC. Therefore Alternative III LWCs should be included in the final plan.	Special status plant species receive a number of protections under BLM's stated objective to manage BLM sensitive and significant plant communities consistent with the Colorado Standards for Public Land Health and with BLM policy on Special Status Species Management (BLM Manual 6840). Additionally, there are a number of NGDs/NSOs and SSRs/CSUs to provide protection to special status species. The impacts to special status plant species are described in Chapter 4, Section 4.3.3.4. The stipulations for special status plant species have direct benefits. Special status plant species are not included in the criteria to determine if wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, special status plant species would indirectly benefit from the management of the area (Section 4.3.3.5), but there are no specific direct protections for these resources under wilderness characteristics management.
Janice	Shepherd		0022-11	Lands with Wilderness Characteristics	Map 23 A red circle shows at least one special status plant/community that would be protected by the LWCs from Alt III that would not be protected by just the Alt IV ACECs. It appears that insufficient analysis has been done to compare special status plants/communities protected by Alt III LWCs that are outside the bounds of Alt IV ACECs as there is no mention of them in Chapter 4. Protecting these special status plants and communities is a crucial step to keeping them of the Federal Endangered list and therefore Alternative III LWCs should be included in the final plan.	Special status plant species receive a number of protections under BLM's stated objective to manage BLM sensitive and significant plant communities consistent with the Colorado Standards for Public Land Health and with BLM policy on Special Status Species Management (BLM Manual 6840). Additionally, there are a number of NGDs/NSOs and SSRs/CSUs to provide protection to special status species. The impacts to special status plant species are described in Chapter 4, Section 4.3.3. The stipulations for special status plant species have direct benefits. Special status plant species are not included in the criteria to determine if wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, special status plant species would indirectly benefit from the management of the area (Section 4.3.3.5), but there are no specific direct protections for these resources under wilderness characteristics management.

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Janice	Shepherd		0022-12	Lands with Wilderness Characteristics	Map 20 shows a single migration corridor for mule deer. It is missing a second migration corridor to the east. The game trails on the slope to the east are even visible on Google Earth. The aerial view in the area of N 39 34 01.05 W 107 53 46.73 clearly shows a switchback of game trails. As stated on page 3-73 migration corridors are crucial for the survival of mule deer and elk. "Migration corridors may include a variety of shapes and types, but within the Planning Area consist of the few points where deer and elk (and other large mammals) are able to find access routes through the otherwise impassable Roan Cliffs. These points are critical for allowing animals to move between summer and winter ranges, as well as to/from security areas." The missing corridor should be added to Map 20. Map 21 should also have migration corridors shown as they are equally important to elk. Given the importance of migration corridors to wildlife and since the Southeast Cliff Unit LWC would cover this important not previously document migration corridor, that LWC along with the other LWCs from Alternative III should be included in the final plan.	BLM used data provided by the Colorado Division of Parks and Wildlife (CPW) to analyze migration corridors for mule deer and other big game. CPW manages these species populations and is a cooperating agency for preparation of the RMPA/SEIS. The information on wildlife migration corridors in the Planning Area is described in Chapter 3, Section 3.3.2. The impacts of protections (SSR/CSU) for migration corridors are described in Chapter 4, Section 4.3.2. The use of aerial imagery to map an additional potential corridor is inappropriate, particularly at the programmatic level where it cannot be field-verified and corroborated by CPW with tracking-collar or other observations. The presence of wildlife is not a criteria to determine if wilderness characteristics exist. Wilderness characteristics include size, naturalness as observed by the casual observer, and outstanding opportunities for solitude and/or primitive/unconfined recreation. If these units were managed to protect for wilderness characteristics, wildlife would indirectly benefit from the management of the area, but there are no specific direct protections for wildlife resources under wilderness characteristics management.
Michael S	Freeman	Earthjustice	0036-4	Lands with Wilderness Characteristics	BLM should better balance the multiple uses of public lands on the Roan Plateau by managing lands for protection of wilderness characteristics in the final RMP amendment. The East Fork LWC unit in particular, which is the only LWC unit on the top of the Plateau, should be managed for protection of its wilderness characteristics.	Alternative IV, the Preferred Alternative in the Draft RMPA/SEIS, presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. This alternative is carried forward as the Proposed Plan analyzed in the FSEIS. Management and protection of Lands with Wilderness Characteristics were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise portions of Lands with Wilderness Characteristics.
Michael S	Freeman	Earthjustice	0036-5	Lands with Wilderness Characteristics	To better fulfill its multiple-use mission, BLM must adopt meaningful protections for wilderness resources.	Alternative IV, the Preferred Alternative in the Draft RMPA/SEIS, presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. This alternative is carried forward as the Proposed Plan analyzed in the FSEIS. Management and protection of Lands with Wilderness Characteristics were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise portions of Lands with Wilderness Characteristics.
Michael S	Freeman	Earthjustice	0036-6	Lands with Wilderness Characteristics	The management prescriptions outlined in Appendix F of the DEIS are appropriate to protect wilderness characteristics, and we encourage BLM to carry those through to the final RMP amendment.4 It is particularly important that LWC are closed to new leasing. DEIS at F-4. For the East Fork LWC unit, BLM should state that the area is closed to new leasing outside of the retained BBC leases to provide clarity and consistency with the 2014 Settlement.	Management prescriptions in Appendix F of the Proposed RMPA/FSEIS were evaluated in Alternative III, in Section 4.5.8.3. Appendix F is consistent with BLM Manual 6320, Considering Lands With Wilderness Characteristics in the BLM Land Use Planning Process. Impacts to lands with wilderness characteristics from application of Alternative IV were considered in Section 4.5.8.4, including beneficial impacts to the East Fork Parachute Creek unit from the oil and gas management decisions. As stated in Chapter 2, Table 2.1, line 4, the BLM surface area closed to leasing is listed for each alternative.

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Form Letter 3			0107-2	Lands with Wilderness Characteristics	However, the BLM's preferred alternative would not go far enough to protect the exceptional wilderness-quality lands that make the Roan Plateau one of our state's most treasured landscapes. The BLM should adopt a plan for the area that would protectively manage all of the lands with wilderness characteristics on the Roan Plateau.	Management and protection of Lands with Wilderness Characteristics are fully considered within the range of alternatives in the Proposed RMPA/FSEIS in Chapter 4, Section 4.5.8. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations (Appendix C) and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACECs) that comprise portions of lands with wilderness characteristics.
Doug	Dennison	Bill Barrett Corporation	0035-4	Oil and Gas Leasing and Development	Any action to retroactively amend and modify lease terms to impose newly created NSO restrictions post-lease issuance would unilaterally rewrite the leases and impose an unreasonable restraint on the lessees' development rights, in breach of the lease and in violation of the lessee's valid existing lease rights. The Draft RMPA/SEIS must be revised to clarify the scope of the Judicial Order and Settlement Agreement, and recognize the legal limits that BLM must respect with regard to valid existing lease rights.	The Proposed RMPA/FSEIS includes this information in Chapter 1, Sections 1.2 and 1.6. As part of the Settlement Agreement, BLM cancelled 17 leases held by BBC. In the Proposed RMPA/FSEIS, lands covered by certain other leases would be subject to specific stipulations described in the Settlement Agreement.
Doug	Dennison	Bill Barrett Corporation	0035-5	Oil and Gas Leasing and Development	Draft RMPA/SEIS 2015, Section 4.1.2 at 4-4. This narrative needs to be revised to reflect that BLM cannot lawfully impose conditions upon privately owned surface that is not agreed to by the private surface owner. BLM must recognize and respect the private property rights of the surface owner. In the event the private surface owner does not agree to limitations or restrictions that BLM may seek to impose upon the surface, then neither BLM, nor the lessee, may implement those measures upon that private surface. The lessee may seek to codify prescriptions for surface use with the landowner via a surface use agreement, but the private surface owner has the legal authority to reject or revise those proposed conditions in the valid exercise of his private property rights.	An RMP does not apply to non-Federal lands, including non-Federal surface estates over Federal minerals ('split-estate' lands). The RMP does apply to the Federal mineral estate. As owner of the dominant mineral estate, the United States has both the right to authorize its lessees and their operators to use the non-Federal surface to access the Federal minerals, and the obligation to prevent unreasonable damage to the surface estate. Accordingly, BLM's oil and gas operating regulations apply to facilities and activities on split-estate lands. BLM's Onshore Oil and Gas Order No. 1 requires operators to make good-faith efforts to reach a surface use agreement with the surface owner. BLM tries to accommodate the needs of the surface owner, but does not impose permit conditions on split-estates that exceed those applicable on wholly Federal lands. (See The Gold Book, p. 12.) The lease stipulations required by the RMP for particular Federal lands within its scope apply on both wholly Federal lands and split-estate lands, unless the RMP otherwise specifies.
Doug	Dennison	Bill Barrett Corporation	0035-6	Oil and Gas Leasing and Development	Because Alternative III is not a technically or economically feasible alternative and does not meet the purpose and need of the EIS (based on the Transfer Act), BLM must simply explain and document why development of the resources underlying the top of the Roan Plateau is infeasible from the base. A separate analysis of a base directional drilling alternative through Alternative III is not required under NEPA.	Alternative III was analyzed in response to public comment and the Judicial Order which said it was not adequately addressed in the EIS. BLM determined it was necessary to analyze the impacts of the proposal and considered feasibility of the alternative throughout the analysis.
Doug	Dennison	Bill Barrett Corporation	0035-7	Oil and Gas Leasing and Development	Thus, an alternative that would not allow development on the top of the plateau "Alternative III" would breach and violate the terms of BBC's leases and be unlawful.	As discussed in Section 1.3.7.2, as a result of the Judicial Order, specific management actions that have been implemented are now subject to reconsideration in the RMPA/SEIS. If BLM's decisions following the RMPA/SEIS process are different from those in the 2007 and 2008 RODs, BLM may need to undertake additional measures to "bring into conformance" its previous implementation actions so as to conform with the new planning decisions. Alternative III responds to portions of the Judicial Order. Alternative III does not address the 2008 leases on the Roan Plateau because the Proposed RMPA/FSEIS is a supplement to the analysis in the 2006 FEIS. Alternative III considers development of all potential Federal minerals. Alternative III is fully discussed in Chapter 2, Section 2.3.3 and Table 2.1.
Doug	Dennison	Bill Barrett Corporation	0035-8	Oil and Gas Leasing and Development	The Draft RMPA/SEIS must be revised to recognize that where leases have already been issued, BLM cannot add new stipulations to existing leases for the benefit of the GrSG and its habitat. Pursuant to FLPMA, any stipulations set in place for GrSG through the RMP amendment process must recognize valid existing lease rights. See 43 U.S.C. 1701 note (h). Thus, proposed lease restrictions can only apply to newly-issued leases, and protective stipulations cannot be imposed as conditions of approval.	As stated in Chapter 2, Section 2.2, existing stipulations for existing oil and gas leases would apply to those leases. New stipulations would apply only to lands leased pursuant to the Record of Decision (ROD) that results from this NEPA process. This may, however, require modification of leases issued in 2008 to achieve conformity with the planning decision (see Section 1.3.7.3). COAs equivalent to stipulations developed through this RMPA could be applied to development on pre-2008 leases, to the extent that they do not conflict with existing lease terms.

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Doug	Dennison	Bill Barrett Corporation	0035-9	Oil and Gas Leasing and Development	As noted in the Draft RMPA/SEIS, the Planning Area was recently mapped as general habitat for the GrSG, though previous mapping indicated the Planning Area as non-habitat. Draft RMPA/SEIS 2015, Section 3.3.4.2 at 3-108. BLM should not impose protective measures on lessees for a species that is non-existent within the Planning Area.	The Planning Area above the rim has been mapped as a General Habitat Management Area for the GRSG, with the exception of a 30-acre Priority Habitat Management Area in the northwest corner of the Planning Area. The Proposed RMPA/FSEIS includes management actions for GRSG, priority habitat, and leks to ensure consistency with the Northwest Colorado Greater Sage Grouse RMPA/FEIS. It is understood that, at the implementation level, areas that are not considered suitable habitat for GRSG will not be treated as such. However, these management actions would allow for the management of priority habitat, or occupied habitat, should the GRSG become established in the future.
Doug	Dennison	Bill Barrett Corporation	0035-10	Oil and Gas Leasing and Development	The Draft RMPA/SEIS must be revised to include an explanation that the Reasonable Foreseeable Development (RFD) Scenario is not a cap or limitation on the number of wells that can be developed within a planning area.	Reasonable Foreseeable Development (RFD) is a technical estimate produced in support of the planning process. BLM developed the RFD with the expertise of geologists, market considerations, and input from industry and believes these estimates to be reasonable for analysis. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the Roan Plateau Planning Area over the next 20 years. As such, it is neither a cap, nor a limitation to the number of wells, that can be developed within the Planning Area. As described in the RFD Appendix G to the Proposed RMPA/FSEIS, “A RFD is a long-term scenario used as a baseline for adjusting the projected amount of oil and gas activity for each alternative in the Draft Resource Management Plan. It is not a decision and does not authorize or approve any development.” The following is from Section 4.1.1.1 in the Proposed RMPA/FSEIS: "The RFD is intended as a technical and scientific approximation of anticipated levels of oil and gas development during the planning timeframe. As such, the RFD and the planning process, of which it is a part, are not intended to define the specific numbers and locations of wells and pads needed to develop the oil and gas resource. Instead, they are intended to allow flexibility during resource development while providing sufficient specificity to support the impact analysis and alternative selection processes."
Doug	Dennison	Bill Barrett Corporation	0035-11	Oil and Gas Leasing and Development	While BBC recognizes that the RFD is a planning tool and not a regulatory limit on development, BBC is concerned that the RFD understates the number of wells projected for on top of the plateau under Alternative IV and the rate at which those wells could be developed. Tables ES-2 and 4.1.2 indicate that a total of 149 wells are projected to be drilled from 7 pads on top of the plateau. BBC has analyzed how many down-hole locations could conceivably be reached from the 7 pad locations specified in the Settlement Agreement and with the typical horizontal displacement being achieved with directional drilling in the Piceance Basin. We estimate that approximately 450 wells could be drilled from these pads. Because of the remoteness of the plateau and infrastructure requirements, an operator of leases on the top of the plateau will be incentivized to maintain continuous operations. BBC estimates that each drilling rig working on top of the plateau will drill approximately 40 wells per year. The Settlement Agreement stipulates that up to two drilling rigs can operate on top of the plateau at any given time, so it is probable that in an economic environment that allows development, approximately 80 wells would be drilled on top of the plateau each year. BBC recommends that BLM consider this information as it finalizes this Draft RMPA/SEIS.	The Reasonable Foreseeable Development (RFD) is a technical estimate produced in support of the planning process. BLM developed the RFD with the expertise of geologists, market considerations, and input from industry and believes these estimates to be reasonable for analysis. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the Roan Plateau Planning Area over the next 20 years. As such, it is neither a cap, nor a limitation to the number of wells, that can be developed within the Planning Area. As described in the RFD Appendix G to the Proposed RMPA/FSEIS, “A RFD is a long-term scenario used as a baseline for adjusting the projected amount of oil and gas activity for each alternative in the Draft Resource Management Plan. It is not a decision and does not authorize or approve any development.” The following is from Section 4.1.1.1 in the Proposed RMPA/FSEIS: "The RFD is intended as a technical and scientific approximation of anticipated levels of oil and gas development during the planning timeframe. As such, the RFD and the planning process, of which it is a part, are not intended to define the specific numbers and locations of wells and pads needed to develop the oil and gas resource. Instead, they are intended to allow flexibility during resource development while providing sufficient specificity to support the impact analysis and alternative selection processes."

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Doug	Dennison	Bill Barrett Corporation	0035-12	Oil and Gas Leasing and Development	Throughout the document, the presentation of areas available for leasing and surface development is inconsistent and confusing. For example, for Alternative IV, Table ES-2 states that 13,000 acres is available for pads, other surface facilities and roads (1,830 acres atop the plateau and 11,170 acres below the cliffs). As noted on that table, this acreage was calculated by subtracting the areas with NSO stipulations from the total leased area. In addition, the Executive Summary page ES-4 states that under Alternative IV there would be 1,990 acres available for lease above the plateau rim, which appears to conflict with the number provided in Table ES-2 (the acreages shown for below the rim are also inconsistent). In contrast, Section 2.3.4 states that there are 1,830 acres above the rim available for leasing and development which, on its face, seems to contradict the acreages presented in Table ES-2. Nowhere is it clearly stated that the total area covered by the two leases to be retained under the Settlement Agreement is approximately 4,650 acres. It is recommended that BLM carefully review all of the acreages indicated for each alternative to ensure the accuracy of the acreages, to revise the text of all applicable sections, and to ensure that how these acreages are described is consistent throughout.	This section was revised for clarity in the Proposed RMPA/FSEIS.
Doug	Dennison	Bill Barrett Corporation	0035-14	Oil and Gas Leasing and Development	It is recommended that the reference to well numbers be removed in Table 4.1.2 because this table only addresses the surface impacts from oil and gas development. It is likely, particularly in the case of the pads on top of the plateau where the size of pads is limited by the Settlement Agreement, and considering the incentive for continuous operations described earlier, that changes in the number of wells/pad will not significantly affect the pad size. In addition, the formula contained in footnote 5 should be corrected to reflect ".40" miles of new roads instead of "40".	Well numbers are used throughout the impact analysis in Chapter 4 of the Proposed RMPA/FSEIS as the basis for estimating potential short-and long-term surface disturbance by alternative oil and gas leasing and development scenarios. This section was revised for clarity in the Proposed RMPA/FSEIS.
Doug	Dennison	Bill Barrett Corporation	0035-16	Oil and Gas Leasing and Development	On page 4-123 under the bullet titled "Exploration and Construction", the text of this bullet should specify that the disturbance figures provided are per well pad not per well.	This section was revised for clarity in the Proposed RMPA/FSEIS.
Michael S	Freeman	Earthjustice	0036-2	Oil and Gas Leasing and Development	The DEIS's discussion of no surface occupancy (NSO) stipulations does raise serious concerns because it appears to limit their applicability in a manner inconsistent with the 2014 Settlement Agreement. We urge BLM to correct this error so that its final environmental impact statement and RMP conform to the Settlement Alternative as defined in the Settlement Agreement.	Alternative IV, the Settlement Alternative, incorporates all oil and gas management requirements and conditions described in the Settlement Agreement. The stipulations carried forward in the Proposed RMPA/FSEIS are directly from the 2007 ROD and the leases as issued. The language noted in this comment has been revised in the FSEIS to more clearly reflect BLM's typical description of NSO stipulations and how they are applied. For specific standards, waivers, exceptions, and modification criteria that apply to each stipulation, please see Appendix C.
Michael S	Freeman	Earthjustice	0036-3	Oil and Gas Leasing and Development	The clear intent of an NSO stipulation is to ensure that all activities are conducted from outside the area - not to arbitrarily assign temporal frameworks during which surface-disturbing activities can occur. BLM must update the definition and explanation of NSO stipulations in the final EIS to clearly state that the stipulation applies to all activities associated with oil and gas development.	Alternative IV, the Settlement Alternative, incorporates all oil and gas management requirements and conditions described in the Settlement Agreement. The stipulations carried forward in the Proposed RMPA/FSEIS are directly from the 2007 ROD and the leases as issued. The language noted in this comment has been revised in the FSEIS to more clearly reflect BLM's typical description of NSO stipulations and how they are applied. For specific standards, waivers, exceptions, and modification criteria that apply to each stipulation, please see Appendix C.

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Michael S	Freeman	Earthjustice	0036-16	Oil and Gas Leasing and Development	The DEIS greatly exaggerates the limit on oil and gas development represented by Alternative 3. It is not realistic to assume that imposing NSO stipulations on the top of the Plateau will preclude any development of those leases. As discussed in the Conservation Groups' March 2013 scoping comments, directional and horizontal drilling technologies currently being used in the Piceance Basin (and likely to be further developed over the 20-year life of the RMP) would allow much of the minerals to be recovered from private lands at the west, southwest, and northern boundaries. See March 29, 2013 Conservation Group Scoping Comments at 5-8 and attached maps and appendix. The DEIS's prediction of virtually no federal development under Alternative 3 appears to ignore this technology.	Section 4.5.5.4 clearly states BLM's assumptions for this analysis based on the Reasonable Foreseeable Development (RFD) Roan Plateau Planning Area, in Appendix G. As the RFD states, lateral reaches in the northern Parachute field area can approach 4,877 feet. However, lateral reach is dependent on geology and reservoir characteristics, and most of the directional drilling within the CRVFO and Roan Plateau area has a lateral reach around 2,500 feet. The lateral reach constrains the amount of oil and gas that can be recovered.
Michael S	Freeman	Earthjustice	0036-17	Oil and Gas Leasing and Development	Instead of assuming that Alternative 3 precludes development of federal minerals atop the Plateau, the EIS should analyze the oil and gas recoverable from surface locations on private lands above the rim at the perimeter of the federal NSO leases, using directional or horizontal wellbores extending at least two miles across the NSO leases. That analysis also should consider which lands at the base are close enough to allow similar development of federal leases above the rim.	Alternative III does not preclude development of Federal minerals atop the plateau; rather it anticipates, based on the RFD in Appendix G, that Federal minerals can be developed from the private surface at the edges of NOSRs. As the RFD states, lateral reaches in the northern Parachute field area, can approach 4,877 feet. However, lateral reach is dependent on geology and reservoir characteristics, and most of the directional drilling within the CRVFO and Roan Plateau area has a lateral reach around 2,500 feet. The lateral reach constrains the amount of oil and gas that can be recovered.
Michael S	Freeman	Earthjustice	0036-18	Oil and Gas Leasing and Development	Moreover, the DEIS discussion of the extent to which private surface would be used under Alternative 3 to develop federal minerals above the rim is inadequate for a meaningful comparison between the environmental impacts of that approach and the impacts from Alternative 2.	The availability of private lands for oil and gas development above the rim under Alternative III would be subject to negotiation between Federal minerals leaseholders and private surface owners. The impacts analysis presented in Section 4.5.5.4 assumes successful completion of negotiations for development of two well pads and 40 wells above the rim on private surface at the perimeter of BLM land under NOSRs. Potential locations for these hypothetical well pads under Alternative III were estimated using a GIS analysis with an assumed lateral directional drilling reach of 2,500 feet in areas with slopes of less than 20 percent (this has been noted in Sections 2.3.3 and 4.5.5.4, as it already was in Section 4.5.5.3). Impacts to resources on private surface as discussed throughout Chapter 4, both in terms of potential indirect impacts to resources on Federal surface within the Planning Area, as well as in *Offsite and Cumulative Impacts* sections are included in the discussion of impacts to each resource. The potential for adverse offsite impacts to various resources is discussed, as applicable, in these sections.
Michael S	Freeman	Earthjustice	0036-20	Oil and Gas Leasing and Development	Moreover, these estimates substantially understate the reasonably foreseeable level of drilling that would occur under Alternative 2. The RFD, and the DEIS, only consider the first twenty years of development. DEIS Appx G at 31 (RFD covers wells spud from 2016-2035); DEIS at ES-8 (DEIS Alternative 2). Drilling authorized by the leases, however, is very unlikely to end after only twenty years.	Reasonable Foreseeable Development (RFD) is produced as a planning document. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the Roan Plateau Planning Area over the next 20 years. Per BLM guidance, 20 years is a standard and accepted horizon over which to develop an RFD for the life of a plan in order to avoid speculation beyond that foreseeable period. As such, it is neither a cap, nor limitation to the number of wells that can be developed within the Planning Area. The RFD follows BLM guidance found in Handbook-1624-1 – PLANNING FOR FLUID MINERAL RESOURCES. The following is from Section 4.1.1.1 in the Draft RMPA/SEIS and Proposed Plan/Final SEIS: "The RFD is intended as a technical and scientific approximation of anticipated levels of oil and gas development during the planning timeframe. As such, the RFD and the planning process, of which it is a part, are not intended to define the specific numbers and locations of wells and pads needed to develop the oil and gas resource. Instead, they are intended to allow flexibility during resource development while providing sufficient specificity to support the impact analysis and alternative selection processes."

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Ursa	Piceance	Ursa Piceance, LLC	0038-1	Oil and Gas Leasing and Development	Although the foregoing statements indicate that BLM will recognize Ursa's valid existing rights except as modified by the Settlement Agreement, the Draft RMPA/SEIS also suggests BLM may seek modification. Appendix C states that 'leases issued prior to 2007 will remain subject to their existing terms, suggesting that leases issued in 2008 will not. .....Those stipulations for Alternative IV indicated that they apply to new leases, but BLM should expressly confirm that they do not apply to existing leases beyond the additional stipulation Ursa agreed to in the Settlement Agreement....	Under all alternatives considered in the Proposed RMPA/Final SEIS, leases issued under the 1999 FEIS are considered valid existing leases and would be unaffected by the decision that results from this Proposed RMPA/Final SEIS. As discussed in Section 1.3.7.3, ”specific management actions that have been implemented are now subject to reconsideration in the RMPA/SEIS. If BLM’s decisions following the RMPA/SEIS process are different from those in the 2007 and 2008 RODs, BLM may need to undertake additional measures to ‘bring into conformance’ its previous implementation actions so as to conform with the new planning decisions.” This includes the 2008 sale of oil and gas leases. As discussed in Section 2.3.4, under the Proposed Plan all ”base” and “retained” lease areas would be subject to the same stipulations as those prescribed by the 2007 ROD, as summarized in Appendix C, except as modified by the terms and conditions detailed under Exhibits 2 and 3 of the Settlement Agreement (Appendix K). As stated in the Settlement Agreement, Section D, 14, the Parties acknowledged that nothing in Settlement Agreement affects BLM’s discretion to adopt the plan of its choice among the alternatives (or a combination of the alternatives) analyzed in the Proposed RMPA/Final SEIS.
Ursa	Piceance	Ursa Piceance, LLC	0038-2	Oil and Gas Leasing and Development	Imposing certain BMPs/COAs in Appendix H may impermissibly modify Ursa's lease rights. Any BMPs or COAs which modify Ursa's lease rights and are not permitted under the Settlement Agreement are not valid.	As stated in Appendix H of the Proposed RMPA/FSEIS (and in the 2006 FEIS appendix of BMPs), “The BMPs identified in this Appendix represent the kinds of activities which may be required; actual BMPs required during the permitting process to mitigate impacts may vary. BMPs and specific methodologies associated with them are expected to change over time to reflect the results of monitoring and ongoing adaptive management efforts. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments, but would likely be analyzed as part of the NEPA analysis associated with the permitting process.” See also Yates Petroleum Corporation, 176 IBLA 144 (September 30, 2008): “When making a decision regarding discrete surface-disturbing oil and gas development activities following site-specific environmental review, BLM has the authority to impose reasonable measures to minimize adverse impacts on other resource values, including restricting the siting or timing of lease activities.”
Ursa	Piceance	Ursa Piceance, LLC	0038-3	Oil and Gas Leasing and Development	BLM must reject the Community Alternative because (i) it would impermissibly infringe on the lease rights of lessees located below the rim and (ii) the directional drilling proposed is not feasible.	As discussed in Section 1.3.7.2, as a result of the Judicial Order, specific management actions that have been implemented are now subject to reconsideration in the RMPA/SEIS. If BLM’s decisions following the RMPA/SEIS process are different from those in the 2007 and 2008 RODs, BLM may need to undertake additional measures to “bring into conformance” its previous implementation actions so as to conform with the new planning decisions. Under all alternatives considered in the Proposed RMPA/FSEIS, leases issued under the 1999 FEIS are considered valid existing leases and would be unaffected by the decision that results from this PRMPA/FEIS. No analyzed alternative would change the lease rights of leases issued under the 1999 FEIS.
Ursa	Piceance	Ursa Piceance, LLC	0038-4	Oil and Gas Leasing and Development	The Community Alternative fails in at least the following respects. First, in issuing Ursa's leases, BLM used the agency's standard lease form which grants Ursa the exclusive right to mill for, mine, extract, remove and dispose of all the oil and gas ... in the lands described. Granting a third party the right to develop oil and gas resources on Ursa's leases would impermissibly interfere with Ursa's valid existing property and contractual rights. Any effort to require Ursa to accommodate well pads, pipelines, or other development infrastructure without its consent would amount to a breach of the lease agreement, and would effectively constitute a government taking of private property. Accordingly, even if it was feasible to develop the Plateau leases through directional drilling from locations at the base of the Plateau, any such directional drilling must be undertaken from development sites other than those located on Ursa's leases.	As analyzed in Section 4.5.5 of the Proposed RMPA/FSEIS, implementation of Alternative III, the Community Alternative, would not include BLM granting access, or directing that any agreement be reached. Development from private land or adjacent leases under Alternative III would be the subject to formal ROW requests and site-specific analyses, and/or negotiation between parties. That this would be possible was an assumption for the impact analysis. The Proposed RMPA/FSEIS includes information on development from private land or adjacent leases. BLM addresses the limit of directional drilling in the RFD and in Chapter 4, Section 4.4.5.1, with the assumption that directional drilling would extend approximately 2,500 feet.

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Ursa	Piceance	Ursa Piceance, LLC	0038-5	Oil and Gas Leasing and Development	Second, development of the leases above the rim from pad locations at the base of the Plateau is operationally infeasible due to, among other factors, the geologic nature of the reservoir and physical limitations in horizontal drilling technology. Those and other problems with the Community Alternative are discussed in greater detail in the scoping comments Ursa previously submitted jointly with WPX Energy Rocky Mountain, LLC and Oxy USA Inc. and which are incorporated herein by reference.	The RFD assumed that directional drilling would be feasible to an extension of approximately 2,500 feet and this assumption is carried forward to the Proposed RMPA/FSEIS (Section 4.5.5.2). As analyzed in Section 4.5.5 of the Proposed RMPA/FSEIS, implementation of Alternative III, the Community Alternative, would not include BLM granting access, or directing that any agreement be reached. Development from private land or adjacent leases under Alternative III would be the subject to formal ROW requests and site-specific analyses, and/or negotiation between parties. That this would be possible was an assumption for the impact analysis. The Proposed RMPA/FSEIS includes information on development from private land or adjacent leases. BLM addresses the limit of directional drilling in the RFD and in Chapter 4, Section 4.4.5.1, with the assumption that directional drilling would extend approximately 2,500 feet.
Ursa	Piceance	Ursa Piceance, LLC	0038-6	Oil and Gas Leasing and Development	The Draft RMPA/SEIS contains some minor typographical errors. The third full paragraph at ES-2 repeats the second full paragraph on that page. The second full paragraph in the Biological Environment discussion at 2-24 incorrectly states that A commensurate SSR restriction would apply to all special status plants and significant plant communities above below the rim.	This section was clarified in the Proposed RMPA/FSEIS.
Kathleen	Sgamma	Western Energy Alliance	0039-1	Oil and Gas Leasing and Development	The Associations adamantly oppose Alternative I, which would close the 24,980 acres of the Roan Plateau Planning Area (RPPA) to further oil and gas leasing and development during the anticipated 20-year life of this Draft RMPA. Under Alternative I, BLM likely would cancel oil and gas leases issued in 2008 for lands within the Planning Area to return to previous conditions. This would be a violation of valid existing rights as well as the National Defense Authorization Act of 1997 that transferred management of the Naval Oil Shale Reserves 1 and 3 to the Department of the Interior specifically for the purpose of developing natural gas resources.	Alternative I is the No Action Alternative, which is a required element of this EIS under NEPA regulations. As stated in Section 2.3.1, because this document supplements the Roan FEIS, the No Action Alternative presented here represents management of the Planning Area prior to the ROD for the Roan Plateau RMPA/FEIS. Therefore, this is essentially the same No Action Alternative that was analyzed in the Roan FEIS. Pre-2008 leases are considered valid existing leases; 2008 leases are subject to review and decision. As discussed in Section 1.1 of the Proposed RMPA/FSEIS, the original RMPA/FEIS (2006) was remanded and because the court set aside the RMPA, no land use plan exists for the Planning Area. In view of the Court's ruling, the BLM determined that a supplemental analysis under NEPA and a new proposed RMPA were warranted. This required evaluating the No Action Alternative from the RMPA/FEIS as well as a full range of alternatives even if they conflicted with the terms of the 2008 leases. As stated in the Settlement Agreement, Section D, 14, the Parties acknowledged that nothing in Settlement Agreement affects BLM's discretion to adopt the plan of its choice among the alternatives (or a combination of the alternatives) analyzed in the SEIS.
Kathleen	Sgamma	Western Energy Alliance	0039-2	Oil and Gas Leasing and Development	Alternatives II and III also do not honor the terms of the settlement agreement, and as such should not be selected. The Preferred Alternative, Alternative IV, follows the terms of the settlement most closely, and as such should be the basis for the final RMPA. However, there are certain provisions of the Preferred Alternative that are not related to the settlement agreement and should be removed prior to finalization, as discussed below.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kathleen	Sgamma	Western Energy Alliance	0039-5	Oil and Gas Leasing and Development	The RMPA should clarify the conditions that determine whether a Waiver, Exception, or Modification (WEM) of an NSO stipulation may be granted. Specifically, the use of generalized maps referenced in the Draft RMPA may not accurately depict topography and other actual conditions on the ground encountered at a specific location proposed for oil and natural gas development.	The Proposed RMPA/FSEIS is a programmatic document that guides BLM management of the Roan Plateau Planning Area. The Proposed RMPA/FSEIS does not evaluate each potential well location in detail because exact locations are not known. Site-specific evaluation will be conducted during the Master Development Plan or Application for Permit to Drill process. Modifications and/or waivers to stipulations are described in Appendix C, Tables C-1 through C-4.
Kathleen	Sgamma	Western Energy Alliance	0039-6	Oil and Gas Leasing and Development	For example, broad areas may be designated as subject to an NSO stipulation due to steep slopes. Yet there may be locations within these broad areas where the slopes do not exceed the steepness criteria. Rather than simply designating areas through the use of inaccurate maps at too broad of a scale, BLM should only apply NSO where actual conditions warrant. When an oil and natural gas project can be situated to avoid any actual steep slopes even though the corresponding BLM map may show the broader area as being comprised of steep slopes, then it should not be considered to need an exception, modification or waiver.	The Proposed RMPA/FSEIS is a programmatic document that guides BLM management of the Roan Plateau Planning Area. The Proposed RMPA/FSEIS does not evaluate each potential well location in detail because exact locations are not known. Site-specific evaluation will be conducted during the Master Development Plan or Application for Permit to Drill process. Lease stipulations under the Proposed RMPA/FSEIS reflect the terms of the Settlement Agreement. Modifications and/or waivers to stipulations are described in Appendix C, Tables C-1 through C-4.

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Kathleen	Sgamma	Western Energy Alliance	0039-7	Oil and Gas Leasing and Development	Further, while the acreage numbers provided for each stipulation in Tables C-1 through C-4 presumably reflect the polygons shown in the maps, the actual application of restrictions for resource protection should be based on the extent of the sensitive resource that's being protected. When more accurate information about the presence or absence of the resource can be collected from ground surveys, improved data collection technology, or other methods, then the project proponent should not have to seek a WEM. Once the absence of a sensitive resource is demonstrated, the restriction should be deemed inapplicable and excluded from the requirement to obtain a WEM.	The Proposed RMPA/FSEIS is a programmatic document that describes and evaluates BLM management actions. Site specific analyses will be conducted during the Master Development Plan or Application for Permit to Drill process.
Kathleen	Sgamma	Western Energy Alliance	0039-8	Oil and Gas Leasing and Development	We strongly urge BLM to explicitly recognize valid existing rights as it moves forward with the RMPA. The Mineral Leasing Act, the Federal Land Policy and Management Act, and BLM's own Planning Handbook all expressly limit the agency's authority to impose mitigation measures that would exceed the terms and conditions of previously issued leases. Operators retain the right to develop their leases in accordance with the terms under which they were issued, and BLM must ensure that any proposed management would not infringe on those rights. BLM cannot burden existing leases with new stipulations or select an alternative that results in the cancellation of leases beyond those that were voluntarily relinquished as part of the settlement agreement. Unambiguous language asserting valid existing rights should be included in the final document.	BLM states in Section 1.2 of the Proposed RMPA/Final SEIS that BLM will recognize valid existing rights. Under all alternatives considered in the Proposed RMPA/FSEIS, leases issued under the 1999 FEIS are considered valid existing leases and would be unaffected by the decision that results from this Proposed RMPA/FSEIS. As discussed in Section 1.3.7.3, ”specific management actions that have been implemented are now subject to reconsideration in the RMPA/SEIS. If BLM’s decisions following the RMPA/SEIS process are different from those in the 2007 and 2008 RODs, BLM may need to undertake additional measures to ‘bring into conformance’ its previous implementation actions so as to conform with the new planning decisions.” This includes the 2008 sale of oil and gas leases. As discussed in Section 2.3.4, lands covered by leases issued in 2008, including those located below the rim, are subject to review and decision as to whether they will be open to oil and gas leasing and development. Under the Proposed Plan, they would be subject to the same stipulations as those prescribed by the 2007 ROD, as summarized in Appendix C, except as modified by the terms and conditions detailed under Exhibits 2 and 3 of the Settlement Agreement (Appendix K). As stated in the Settlement Agreement, Section D, 14, the Parties acknowledged that nothing in Settlement Agreement affects BLM’s discretion to adopt the plan of its choice among the alternatives (or a combination of the alternatives) analyzed in the Proposed RMPA/FSEIS.
Kathleen	Sgamma	Western Energy Alliance	0039-9	Oil and Gas Leasing and Development	The final RMPA should clearly state, however, that the RFD is merely an estimate, and cannot be used to place a cap or limitation on development in the planning area.	Reasonable Foreseeable Development (RFD) is a technical estimate produced in support of the planning process. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the Roan Plateau Planning Area over the next 20 years. As such, it is neither a cap, nor limitation to the number of wells that can be developed within the Planning Area. The following is from Section 4.1.1.1 in the Draft RMPA/SEIS and Proposed Plan/FSEIS: "The RFD is intended as a technical and scientific approximation of anticipated levels of oil and gas development during the planning timeframe. As such, the RFD and the planning process, of which it is a part, are not intended to define the specific numbers and locations of wells and pads needed to develop the oil and gas resource. Instead, they are intended to allow flexibility during resource development while providing sufficient specificity to support the impact analysis and alternative selection processes."
Kathleen	Sgamma	Western Energy Alliance	0039-11	Oil and Gas Leasing and Development	However, where leases have already been issued, BLM must acknowledge it cannot add new stipulations for the benefit of GrSG mitigation without violating FLPMA. BLM should acknowledge this limitation in the final RMPA.	As stated in Chapter 2, Section 2.2, existing stipulations for existing oil and gas leases would apply to those leases. New stipulations would apply only to lands leased pursuant to the Record of Decision (ROD) that results from this NEPA process. This may, however, require modification of leases issued in 2008 to achieve conformity with the planning decision (see Section 1.3.7.3). COAs equivalent to stipulations developed through this RMPA could be applied to development on pre-2008 leases, to the extent that they do not conflict with existing lease terms.

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Kathleen	Sgamma	Western Energy Alliance	0039-12	Oil and Gas Leasing and Development	The Associations support the adoption of the Preferred Alternative in the final RMPA where it accords with the settlement agreement. However, as outlined above there are several provisions where the draft RMPA exceeds the scope of the settlement agreement and BLM's authority to act. There are also instances where some clarification is needed so that future management actions do not violate federal laws and regulations.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Leslie	Robinson	Grand Valley Citizens Alliance	0040-2	Oil and Gas Leasing and Development	It is possible that directional drilling from the private property sites could reach much of the energy resources under proposed drilling locations in Alt. IV. Drilling and fracking methodology and technology improves all the time, therefore, it would make sense to delay the drilling applications that could cause the most negative impacts on wildlife and natural habitat, such as below the rim.	The Proposed RMPA/FSEIS is a programmatic document. Additional analysis will be conducted during the Master Development Plan or Application for Permit to Drill processes. Drilling from private property to access minerals underneath lands atop the plateau is considered as part of Alternative III.
Kent	Rider	WPX Energy	0103-1	Oil and Gas Leasing and Development	WPX is concerned whether this additional planning and analysis fully honors WPX' s valid existing lease right for the Roan Plateau base lease it legally acquired in 2008.	Under all alternatives considered in the Proposed RMPA/FSEIS, leases issued under the 1999 FEIS are considered valid existing leases and would be unaffected by the decision that results from this Proposed RMPA/FSEIS. As discussed in Section 1.3.7.3, "specific management actions that have been implemented are now subject to reconsideration in the RMPA/SEIS. If BLM's decisions following the RMPA/SEIS process are different from those in the 2007 and 2008 RODs, BLM may need to undertake additional measures to 'bring into conformance' its previous implementation actions so as to conform with the new planning decisions." This includes the 2008 sale of oil and gas leases. As discussed in Section 2.3.4, under the Proposed Plan all "base" and "retained" lease areas would be subject to the same stipulations as those prescribed by the 2007 ROD, as summarized in Appendix C, except as modified by the terms and conditions detailed under Exhibit 3 of the Settlement Agreement (Appendix K). As stated in the Settlement Agreement, Section D, 14, the Parties acknowledged that nothing in Settlement Agreement affects BLM's discretion to adopt the plan of its choice among the alternatives (or a combination of the alternatives) analyzed in the Proposed RMPA/FSEIS.
Kent	Rider	WPX Energy	0103-7	Oil and Gas Leasing and Development	Alternative IV serves as both the Settlement Alternative as well as BLM's Preferred Alternative. As stated previously, WPX generally supports Alternative IV and those conditions and restrictions that conform to the terms of the Settlement Agreement. However, WPX expects BLM to honor the valid existing rights for the lease it acquired during the 2008 Roan Plateau lease sale, along with previous adjacent leases acquired from BLM that are also located in the RPPA.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kent	Rider	WPX Energy	0103-8	Oil and Gas Leasing and Development	Appendix H to the Draft SEIS includes 40 pages of proposed best management practices (BMPs), and some of these appear to exceed those BMPs and conditions of approval (COAs) that are currently applicable to WPX's leases. Any new BMP or COA that was not included or attached to WPX's original lease cannot be imposed upon WPX's leases without the operator's consent.	As stated in Appendix H (and in the 2006 FEIS appendix of BMPs), "The BMPs identified in this Appendix represent the kinds of activities which may be required; actual BMPs required during the permitting process to mitigate impacts may vary. BMPs and specific methodologies associated with them are expected to change over time to reflect the results of monitoring and ongoing adaptive management efforts. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments, but would likely be analyzed as part of the NEPA analysis associated with the permitting process." See also Yates Petroleum Corporation, 176 IBLA 144 (September 30, 2008): "When making a decision regarding discrete surface-disturbing oil and gas development activities following site-specific environmental review, BLM has the authority to impose reasonable measures to minimize adverse impacts on other resource values, including restricting the siting or timing of lease activities."

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Kent	Rider	WPX Energy	0103-20	Oil and Gas Leasing and Development	WPX requests that the SEIS recognize under the Settlement Agreement that the parties retain the right to challenge BLM's approval of surface disturbing activities at a location identified in a Base Lease as being subject to an NSO stipulation and the grant of any exceptions, modifications or waivers of lease stipulations. However, the conditions that determine whether an exception, modification of waivers is truly necessary should be clarified. Specifically, the use of generalized maps referenced in the SEIS may not accurately depict actual field conditions encountered at a specific location proposed for oil and gas development. For example, broad areas of a map may designate an area subject to an NSO stipulation due to steep slopes.	Modifications and/or waivers to stipulations for Alternative IV (Proposed Plan) are described in Appendix C, Table C-4, in the column entitled "Standards" of the Proposed RMPA/FSEIS. Alternatives I through III exception/modification/waiver criteria are included in Appendix C, Tables C-1 through C-3 respectively. As stated in Chapter 2, Section 2.2 of the Proposed RMPA/FSEIS, the original 2008 lease terms apply in accordance with the Settlement Agreement. Known current conditions of soil resources are found in Chapter 3, Section 3.2.3.
Kent	Rider	WPX Energy	0103-21	Oil and Gas Leasing and Development	WPX also requests that BLM acknowledge and allow that new oil and gas locations that minimally encroach on a designated NSO area also not be deemed an exception, modification or waiver of lease stipulations especially if site-specific analysis shows that potential harm can be avoided or minimized through sound management practices. According to Section 4.2.3: Soil Resources, all alternatives including the preferred alternative appear to provide a net benefit to soil resources when all land uses are considered. Unless soil resources are currently impaired, BLM should more fully accommodate uses of public lands instead of restricting other uses by means of NSO, CSU, and travel and grazing restrictions to protect soils to the degree all four alternatives do. If soil resources are currently impaired, BLM should identify them as such in the Draft SEIS, and provide sufficient justification for this conclusion.	Modifications and/or waivers to stipulations for Alternative IV (Proposed Plan) are described in Appendix C, Table C-4, in the column entitled "Standards" of the Proposed RMPA/FSEIS. Alternatives I through III exception/modification/waiver criteria are included in Appendix C, Tables C-1 through C-3 respectively. As stated in Chapter 2, Section 2.2 of the Proposed RMPA/FSEIS, the original 2008 lease terms apply in accordance with the Settlement Agreement. Known current conditions of soil resources are found in Chapter 3, Section 3.2.3.
Kent	Rider	WPX Energy	0103-22	Oil and Gas Leasing and Development	Appendix C provides tables that describe NSO/CSU stipulations applicable to river valley, riparian and wetland areas. While the acreage numbers provided for each stipulation in Tables C-1 through C-4 presumably reflect the polygons shown in the maps, the actual application of restrictions for resource protection should be based on the extent of the sensitive resource that's being protected when more accurate information about presence of the resource can be collected by way of on the ground surveys, improved data collection technology, etc. As stated above, generalized map depictions of resource conditions may not accurately represent site-specific conditions, which should be verified by field surveys, prior to review and decision-making of proposed oil and gas development. Once the absence of a sensitive resource is demonstrated, the restriction should be deemed inapplicable and categorically waived from the requirement for without requiring the formally granting of an exception, modification or waiver.	The Proposed RMPA/FSEIS is an availability decision and the specific applicability of a given stipulation is determined at the time of the lease sale (and per BLM NEPA Handbook 1790-1 and LUP Handbook H 1601-1). Exceptions, modifications, and/or waivers to stipulations for Alternatives are described in Appendix C, Tables C-1 through C-4 respectively. As stated throughout the Proposed RMPA/FSEIS, oil and gas lease stipulations under the Proposed Plan reflect the terms of the Settlement Agreement.
Kent	Rider	WPX Energy	0103-30	Oil and Gas Leasing and Development	The terms control and eradicate are both used in the discussion of reclamation and noxious weeds. Will the project proponent be required to eradicate list A species and control list B and C species as outlined in the Colorado Noxious Weed Act or will eradication be required for all A, B, and C list species? WPX requests that BLM clarify this requirement and establish objectives that are consistent with State programs.	Control or eradication are species-specific management goals integrated into the definition of A-, B-, and C-listed noxious weed species, according to the Colorado Noxious Weed Act, and incorporated into Appendix I of the Proposed RMPA/FSEIS by reference.
Leslie	Scopes		0005-1	Opinion	Please preserve this pristine area to inspire future generations! Once it's violated, it is gone! Let it be!! Don't sell out our scenic wonders to Big Oil! Stand up for our rights to beauty and tranquility!	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kary	Pierce		0006-1	Opinion	I don't think the report accurately depicts the impacts, they're projections that suit a particular interest - the gas and oil industry. The government benefits charging for the water and land use and therein lies the problem of bias.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Jim	Drevescraft		0007-1	Opinion	It is my opinion that any proposed oil and gas leasing on the Roan Plateau not go forward, and that the area be set aside from any development.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
J.W.	Pavlic		0008-1	Opinion	Hon'ble Consulate, wouldn't it be nice to move into the next century with no worries towards the thousands of water producing filtration plants that could be found dotting the rising shoreline or the creatively productive monorails that transport commodities and materials to different ports run by safe and efficient electricity. . The productivity of safe transport and water filtration systems of the future could be used with a variety of tidal wave or wind power generators (and parabolic solar disk) that combined would raise the standard of our creative living environment. . . P.S. As it's concerning about today's learning or the impersonal attitudes taken sometimes in creating a better tomorrow. The possibilities of creating a better world or the attitudes of an infinite learning should be aligned with the knowledge of a self instilled reasoning and motivation of creativeness. The impersonal understanding of todays world's sometimes found to be unsure of its creativeness or that it's a creature of creative thought and reasonable understanding. The behavior of a materialist society or its impersonalist understanding's not based upon an infinite learning or a part of the human stature. The impersonal knowledge of todays' materialist world's based upon the dualism of a symbiotic reasoning that's particled by a dependent degree of learning or its materialist understanding. The edifice of human understanding in today's materialist world is found in the reasoning of "what enters the conscious enters the mind" as the consciousness is the consciousness of truth, and forgiveness. Thus realizing the human constitution's based upon honesty, and is not above nature's law. The infinite realization of trust and human understanding in the world today's part of the Universal cosmos and destined perhaps by a higher degree of reasoning.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Lynne	Johnson		0012-1	Opinion	Are you planning on killing more horses or other wildlife. I find your activities despicable.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Jean	Public		0014-1	Opinion	public comment on above Colorado river valley and roan plateau sites which are national lands not state lands and nor private lands, which means they should be managed for the benefit of 325 million people and not just for local pal stakeholder are bribes being taken here by blm, they have a history of taking bribes in this levil govt algency that is after killing all wild horsese in every place they try tio lkive. the evil doings of this agency are enough to make most americans vomit.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Jean	Public		0014-2	Opinion	deny all christmas tree taking from national lands. grow them on private land ifyou want to make money on christmas trees, sto pstealing from the nations citizxens/workers/taxpaeyrs. deny all grazing allotments by robber baron cxattelr ranchers. all american are sick of the clive bundy types who make money on our public lands and destroy them with their cattle, and drive off and kill all wildlife so it cant stay alive oin these national lands. jthose lands belong to 325 million pepple and letting clive lbundy types use them does not help us. these dlivel bundy types pay low low low or zero rates to use our land and destroy them., we want nature on our lands, not clive bundy robber baron cattle ranchers. deny suti ranch land exahcnage. its certainly not to help national taxpayers that this land exchange has been proposed. deny all applications to drill. this commetn is for the public record.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Donald and Nancy		Citizens	0016-1	Opinion	Good luck with the election.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Teagen	Andrews	Citizen	0017-1	Opinion	I fully support the conservation and protection of natural wildlife along the Roan Plateau. It is dangerous and costly to open up more mining when there are alternative energy sources that do not include massive devastation to this planet.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Leslie	Robinson	Grand Valley Citizens Alliance	0040-4	Opinion	The development of more drilling on the Roan Plateau in Alt. IV feeds into the boom/bust economic cycles in the Rifle/Western Garfield County area, whereas, tourism is much more stable. With all the federal land already open for O&G development in the valley, and the private land available on the Roan for O&G development, it just makes more sense to set aside the Roan Plateau BLM land for natural habitat. Much like has been decided by the BLM for Thompson Divide in nearby Carbondale.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Nicholas	Payne	Theodore Roosevelt Conservation Partnership	0041-2	Opinion	The Settlement Alternative achieves this balance in the form of the Watershed Management Area of Parachute Creek, No Ground Disturbance/No Surface Occupancy (NGD/NSO) in high-value Colorado River Cutthroat Trout (CRCT) habitat, and water quality standards, as well as approximately 28,660 acres above the rim and 6,310 acres below the rim closed to oil and gas leasing and development. These conservation measures for the populations of Colorado River Cutthroat Trout found on the Roan are invaluable, and we ask to see them implemented in the Final EIS.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Joyce D	Olson	Great Old Broads for Wilderness	0053-1	Opinion	The Roan Plateau is a very special place and it needs to be protected for future generations. I'm a Great Old Broad for wilderness and I am old (pushing 84). Much of my adult life I have been hiking and backpacking. I can't do that anymore. Future generations need to enjoy that privilege. The Roan Plateau has wonderful flowers, some rare penstemons and lovely columbine, primroses and many more. The major waterfall is unique in Colorado. It is truly a special place. We don't need to drill baby drill on the Roan. What disruption is there now is more than we need. Save the Roan, save the environment, save our pristine areas for our future generations. Please	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Lou	Illes	Linn & Associates	0071-1	Opinion	Yours is the first response I have ever received from the BLM on any issue I have had with them which are many. NO private businesses should ever be allowed to use or drill or mine or pasture animals on any public lands whether is it a park, reserve, monument, or any land the BLM is supposed to keep for the people of America. The BLM should be dismantled as a US government agency and all its land put under the National Park Service.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Eric	Page		0083-1	Opinion	The tide is turning in the fight for humanity to be actual stewards of the earth rather than exploit it and degrade it. Play a role in this cause, a cause every human has an interest in, or become obsolete.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Mary	Seeber		0086-1	Opinion	HANDS OFF ALL PUBLIC LANDS!	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Vencill	Matthew		0098-1	Opinion	What is just is just. What must be done must be done. What is just must be done. What is just and undone shall take its toll from those responsible, through action, or through inaction. So it is. So it was. So it always will be. May it be that you are wise enough to do what is just.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Dave	Way		0100-1	Opinion	This area needs to be protected, in my eyes and mind it is very sacred to me. Not only the streams but the landscape and wildlife that abounds on the Roan, it is still very wild.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Kent	Rider	WPX Energy	0103-19	Opinion	WPX also supports Alternative IV in that it recognizes the recent RMPA for the Greater Sage Grouse, which clearly indicates that no known leks or priority or general habitat (see Figure 1 -4 in Appendix A of the Greater Sage Grouse RMPA) are known to occur in the RPPA at locations below the rim, including the parcel that comprises WPX's 2008 lease. As such, it is WPX's understanding that BLM will impose no additional conditions or restrictions related to protection of Greater Sage Grouse populations or habitat on or in the immediate vicinity of WPX's 2008 Roan Plateau lease, unless site-specific conditions are observed that warrant otherwise.	The RMPA/SEIS includes management actions for GRSG even though they are not currently present in the Planning Area because BLM is striving for consistency with the Northwest Colorado Greater Sage Grouse RMPA/EIS and priority habitat or a lek could be established in the future.
Andy	Singer		0108-2	Opinion	Please do everything you can to protect the Roan and its wildlife from fracking and other fossil fuel development. Thank you.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Form Letter 1			0015-1	Opinion - Alternatives	I urge you to adopt the Settlement Alternative (Alternative 4 in the draft supplemental environmental impact statement) in your final RMP decision	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Randy	Winkler	City of Rifle	0028-3	Opinion - Alternatives	It is in good faith that the City is recommending Alternative 4 in the Roan Plateau RMP NSEIS. We understand how complicated and bureaucratic this process is. It is the City's hope that the BLM will honor and reward the City's good faith by revisiting the Hubbard Mesa condition in a timely and responsive manner.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Ron	Velarde	Colorado Parks and Wildlife	0029-1	Opinion - Alternatives	CPW concurs with the BLM's selection of the settlement Alternative, the Preferred Alternative, in the Draft Environmental Impact Statement (EIS). The Settlement Alternative contains the underpinnings of the FEIS and addresses CPWs wildlife concerns. CPW offers the following comments for this Draft Supplemental Environmental Impact Statement (DSEIS).	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
John	Martin	Garfield County	0030-1	Opinion - Alternatives	Garfield County supports BLM's Preferred Alternative, Alternative IV, and asks BLM to expediently bring forward Alternative IV, without substantive amendments, into the Final EIS. Under Alternative IV, 17 oil and gas leases are canceled and closed to new leasing per the Roan Plateau settlement for the approximately 20-year duration of this 2016 RMPA/SEIS. Garfield County supports Alternative IV in part because it does not preclude future management decisions that may reopen areas closed to new oil and gas leasing.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Rose	Pugliese	Mesa County	0033-1	Opinion - Alternatives	Consistent with our position and comments our Board supports Alternative 4 of the DSEIS, the Settlement alternative.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Michael S	Freeman	Earthjustice	0036-1	Opinion - Alternatives	Please select the Settlement Alternative in the final Resource Management Plan Amendment (RMP or Plan) for the Roan.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Michael S	Freeman	Earthjustice	0036-24	Opinion - Alternatives	We also suggest incorporating some elements of Alternative 3, such as management for LWCs, into the final RMP for the Planning Area. These elements can be included in a manner consistent with the Settlement Alternative, and will provide important additional resource protections.	Alternative IV presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. Lands with Wilderness Characteristics were fully considered in the Proposed RMPA/FSEIS.
Mike	Pritchard	RFMBA - IMBA	0037-1	Opinion - Alternatives	In general, we support the BLM's creation of Alternative IV - Settlement Alternative (Preferred Alternative) for its proposed management of oil and gas leasing and development.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Mike	Pritchard	RFMBA - IMBA	0037-2	Opinion - Alternatives	RFMBA recommends that the final plan address the intentions of the proposed recreational target shooting prohibitions in order to create a safe environment for all recreational users on Hubbard Mesa.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Shooting Sports were fully considered in the Proposed RMPA/FSEIS.
Ursa	Piceance	Ursa Piceance, LLC	0038-7	Opinion - Alternatives	In the Final RMPA/SEIS and Record of Decision, BLM should (i) provide certainty that existing leases will not be modified other than as to those terms agreed to by the lessees in the Settlement Agreement and (ii) reject the Community Alternative.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Leslie	Robinson	Grand Valley Citizens Alliance	0040-5	Opinion - Alternatives	GVCA members are aware that the chances of Alt. I being accepted as the Roan Plateau management plan are slim. We understand the importance of compromise, but can only half-heartedly support the Alt. IV, because of the proposed areas of O&G development could suffer from impacts that may never be rectified, such as abandoned wells, careless re-vegetation, accidental spills, and water contamination.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Nicholas	Payne	Theodore Roosevelt Conservation Partnership	0041-1	Opinion - Alternatives	We're writing to ask you to take actions finalizing a balanced management plan for the Roan Plateau. We strongly support the BLM's preferred alternative, Alternative 4 (Settlement Alternative) of the Draft Supplemental Environmental Impact Statement, which will ensure the conservation of some of the most significant and delicate fish and wildlife habitat on the Roan Plateau while also allowing for responsible energy development.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Nicholas	Payne	Theodore Roosevelt Conservation Partnership	0041-3	Opinion - Alternatives	We ask BLM to ensure that the conservation measures under the Settlement Alternative are fully and finally incorporated into BLM's revised plan for the Roan Plateau by adopting Alternative 4.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kathleen C	Zimmerman	National Wildlife Federation	0042-1	Opinion - Alternatives	While NWF supports the DSEIS Preferred Alternative, NWF offers comments below on specific issues regarding the conservation of big game habitats in the Planning Area. These issues were addressed in the 2014 Settlement and should be clarified in the Preferred Alternative.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Bill	Hamann	Citizen	0043-1	Opinion - Alternatives	I urge BLM to adopt Alternative 3, which would allow no surface disturbance above the rim. Although Alternative 4 is similar in that it allows only two lease areas on the top of the Plateau, the oil and gas industry would never miss those leases. There is presently a huge glut in natural gas and 500 permits are going undrilled in Colorado.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Jan	Burch		0046-1	Opinion - Alternatives	But if you are educated to the value of biodiversity and watershed protection alone it would seem clear to me that you must decide that your Alternative 1 and Alternative 2 should not even be considered. The top should be totally closed to leasing. Alternative 3 should also be closed for any future leasing, watershed protection and maintaining values of wilderness characteristics would be most important there	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Jan	Burch		0046-2	Opinion - Alternatives	In the Alternative 4 there should be additional protection from Alternative 3 for eligible stream reaches under the Wild and Scenic River Act, and to maintain wilderness characteristics within the three wilderness inventory units.	BLM presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment in preparing the Proposed RMPA/FSEIS. Wild and Scenic Rivers and Lands with Wilderness Characteristics were fully considered in the Proposed RMPA/FSEIS.
Charles	Hensel	Citizen	0048-1	Opinion - Alternatives	I support Alternative IV with inclusion of aspects of Alternative related to suitability designation for Wild & Scenic Rivers.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Ken	Klassen	Grand Valley Anglers	0049-1	Opinion - Alternatives	I support Alternative 4 ADDING Wild & Scenic River designation.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Harriet	Matthews	Grand Valley Anglers	0050-1	Opinion - Alternatives	I support Alternative 4 with a Wild & Scenic River designation for the 8 rivers deemed to be suitable.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Kevin M	Matthews	Grand Valley Anglers	0051-1	Opinion - Alternatives	I would like to support Alternative #4 along with consideration of identified wild/scenic river suitability [...]. I feel that this proposal is both in the best interest as well benefit of the people of Colorado.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Darlyne	Merkel	Citizen	0052-1	Opinion - Alternatives	I support Alternative 4 with inclusion of aspects of alternative related to suitability designation for Wild & Scenic Rivers.	BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the Final SEIS. Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Jim	Steitz		0055-1	Opinion - Alternatives	I urge you to enact a management plan for the Roan Plateau Planning Area that forbids any oil or gas exploitation, and thereby to uphold BLM's sacred responsibility to the public interest, as well as the spirit of the 2013 settlement of Conservation Colorado Education Fund, et al. v. Jewell, et al. The Settlement Alternative IV in the DEIS best approaches this plain imperative, by cancelling 16 of the 18 existing leases and enacting more stringent conditions for the retaining leases.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Jim	Steitz		0055-2	Opinion - Alternatives	Again, I urge to select the Settlement Alternative (Alternative IV) in the new Resource Management Plan for the Roan Plateau Planning Area, and to take all legally available measures to ensure that the remaining two leases are not developed and exploited either. Thank you for your attention to this urgent issue.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Michael Leonard	Creditor		0061-1	Opinion - Alternatives	I urge you to adopt the Settlement Alternative (Alternative IV in the Draft Supplemental Environmental Impact Statement) in your final management plan (RMP) for the Roan Plateau Planning Area. This alternative reflects the need to keep fossil fuels in the ground to protect public health, the climate, and public lands for present and future generations. Please select the Settlement Alternative (Alternative IV) in the new RMP for the Roan Plateau Planning Area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Jennifer & Bryan	Dorr	Citizen / HC4W	0063-1	Opinion - Alternatives	Thank you for the opportunity to comment on the proposed EIS plans. Our family would like to show our support for the Alternative IV plan and to strongly oppose the Alternative III plan.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Grand Valley Audubon Society			0067-1	Opinion - Alternatives	This letter represents the nearly 500 members of Grand Valley Audubon Society in Grand Junction, Colorado. With reference to the Draft Supplemental EIS to amend the Resource Management Plan for the Roan Plateau, we wish to express our support for Alternative IV. Thus, the previous compromises that were to protect the Roan have not been that successful. By choosing Alternative IV, the BLM can do much to preserve what remains of this unique area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Rick	Hasbrouck		0068-1	Opinion - Alternatives	1. Of the Alternatives presented I urge you to adopt the Settlement Alternative (Alternative 4), but I'd like to see the following additions: 2. I support BLM canceling the leases as agreed in the 2014 settlement, but I also support closing the entire top of the plateau to drilling, and strong stipulations for drilling at the base to minimize negative impacts on fish and wildlife. 3. All lands with wilderness characteristics should be protected under the new plan, including Anvil Points and the Southeast Cliffs. 4. The final plan should stipulate that all streams eligible for Wild and Scenic River designation are suitable for such designation. My rationale for the above additions is that the Roan is one of the crown jewels of Colorado public lands: it is home to dozens of threatened fish and wildlife species, some of the rarest plants in North America, key winter range for elk and deer, is a popular spot for outdoor recreation, and contains thousands of acres of lands with wilderness character. The BLM and Colorado Natural Heritage Program have described the top of the Plateau as one of the most biologically rich areas in the state, and comparable in importance to several of our national parks and monuments.	Alternative IV presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. Lands with Wilderness Characteristics, Wild and Scenic Rivers, and ecological resources were fully considered in the Proposed RMPA/FSEIS.
Renee	Valenzuela	High County Four Weelers	0069-1	Opinion - Alternatives	I am in favor of EIS Alternative IV, no change to the current usage area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Jennifer	Isenhart	Citizen / HC4W / WRTR	0072-1	Opinion - Alternatives	I appreciate how special the Hubbard Mesa area is. There are not many truly "open" use areas anymore. Therefore I am writing to say I do not support Alternative III with the closure of the 610 acres area to target shooting. I find fault in the closures as it would create dangerous conflicts by pushing target shooters out to unsafe areas.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Dylan	Johns	Zone 4 Enterprises	0073-1	Opinion - Alternatives	This letter addresses the proposed closure of recreational target shooting in a 610-acre area of the Hubbard Mesa OHV area as an alternative in its Roan Plateau Supplemental EIS. I strongly urge that additional restrictions are not put into place. This action will not likely reduce the numbers of people who are taking part in recreational shooting, but it will move these activities to other areas which may not be as suitable for this type of activity.	In response to public concerns regarding shooting sports at Hubbard Mesa, BLM has added Alternative IIIB for analysis in the FSEIS to consider the potential impacts of prohibiting recreational target shooting in the Hubbard Mesa Open OHV Riding Area. Including Alternative IIIB allows BLM to consider a range of management options for recreation in the Hubbard Mesa Open OHV Riding Area. Please see Chapters 2 and 4 for analysis and impact conclusions related to Alternative IIIB. The issues raised in your comment have been addressed as part of the analysis of Alternative IIIB in Chapter 4.
Dave	Kirk		0074-1	Opinion - Alternatives	Please select the Settlement Alternative (Alternative IV) in the new RMP for the Roan Plateau Planning Area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Mary	McCutchan	Citizen	0076-1	Opinion - Alternatives	In general, it seemed to be blessed with a more pristine appearance than similar land forms, perhaps because of its geologic isolation. More specific comments follow, but in general I support your preferred alternative IV, with a few additions. In order to preserve the trout population, containing five conservation populations of Colorado River cutthroat trout (90% genetically pure) with two of these as core conservation populations (99% pure), the most appropriate wild and scenic stream segments need to be declared and managed for the trout. Giving either ACEC status or wild and scenic stream reaches status would help accomplish the objectives for the fish and plants. For the plants: Eight globally or State-ranked rare plant communities are found in the Planning Area as well as seven special status plant species. This is what I was seeing that looked so different to me. Two of the plant species are listed as Federally threatened, and two (of five known) populations of Parachute penstemon, one of the rarest plant species in North America. This penstemon has been ignored in some locations by another field office and it would help if it is preserved on the Roan. Again, the Roan has the advantage of being a relatively isolated land mass. In addition, road building could be minimized by following the recommendations in Alternative IV to limit drilling. Again, finding wild and scenic status for those eight stream reaches mentioned in Alt III would offer a stronger level of protection. Water is our most precious resource globally. We need to preserve its quality whenever there's an opportunity to do so. I can live without oil if I have to. I will die without water, and so would you.	Alternative IV presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations and public comment. ACECs and Wild and Scenic Rivers were fully considered in the Proposed RMPA/FSEIS.
Margaret			0077-1	Opinion - Alternatives	After perusing the contents of the various proposals regarding the Roan Plateau areas of interest I wish to advocate Alternative IV as the best step. It contains something for everyone. and should provide for adequate fish habitat for the Roan Plateau, adequate access for mineral development, and flexibility for the Bureau of Land Management going forward.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Susan	Nichols-Alvis	Garfield Area Gun Enthusiasts	0081-1	Opinion - Alternatives	I support the BLM's Alternative 4 reflecting no changes to the Hubbard Mesa area, and allow leasing below the rim.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Tris	Ozark		0082-1	Opinion - Alternatives	I am writing to urge you to adopt Alternative IV to protect the Roan Plateau in Colorado from drilling and other energy extraction and development.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Elaine	Pilz		0084-1	Opinion - Alternatives	Dear Bureau of Land Managment - Roan Plateau In your new RMP for the Roan Plateau, please select the Settlement Alternative 4 and add the following two management provisions from Alternative 3 of the Draft Supplemental Environmental Impact Statement. The Alternative 3 additions would be - to manage the 3 wilderness inventory units to protect the wilderness characteristics - to protect all eligible river reaches suitable for designation as Wild and Scenic Rivers I'm a member of the Great Old Broads for Wilderness group in Grand Junction, Colorado. I have not yet seen the unusual hanging gardens and water falls there on the Road Plateau, nor had the opportunity to catch and release a rare cutthroat trout in the region's streams. Please select the above management recommendation so that these and other unique features will remain for future enjoyment and study.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Betty	Sabo		0085-1	Opinion - Alternatives	I urge you to adopt the Settlement Alternative (Alternative IV in the Draft Supplemental Environmental Impact Statement) in your final RMP decision.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kathy	Slaughter		0090-1	Opinion - Alternatives	I support the proposal to include the terms of the settlement agreement into the new management plan, including closing most of the top of the Plateau to oil and gas leasing and putting strong stipulations in place for drilling that occurs at the base of the Plateau to minimize impacts on fish and wildlife. The Roan Plateau is one of the last homes of native cutthroat trout.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kathy	Slaughter		0090-2	Opinion - Alternatives	However, the BLM's preferred alternative would not go far enough to protect the exceptional wilderness-quality lands that make the Roan Plateau one of our state's most treasured landscapes. The BLM should adopt a plan for the area that would protectively manage all of the lands with wilderness characteristics on the Roan Plateau. The final plan should document that all of the streams which are eligible for designation as Wild and Scenic Rivers are also suitable for that designation. That action is critical to protecting the valuable water resources on the Roan. This includes Parachute Creek and Trapper Creek, which provide important habitat for the Colorado River cutthroat trout.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Tristan	Sophia		0091-1	Opinion - Alternatives	Please select the Settlement Alternative (Alternative IV) in the new RMP for the Roan Plateau Planning Area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Richard	Villastrigo		0099-1	Opinion - Alternatives	I urge you to adopt Alternative IV in the Draft Supplemental Environmental Impact Statement in your final RMP decision so that the Roan Plateau remains the rich ecosystem that it is today.. The 2014 settlement will protect the Roan Plateau especially from environmentally destructive oil and gas development. I urge the Bureau of Land Management to continue to look for ways to eliminate, rather than increase, fossil fuel production on public lands.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Susan	Nichols-Alvis		0101-1	Opinion - Alternatives	Regarding the Roan Plateau SEIS, the White River Trail Runners ATV/UTV Club supports BLM's preferred alternative 4 reflecting no changes to Hubbard Mesa, and no changes to the lease settlement.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kent	Rider	WPX Energy	0103-2	Opinion - Alternatives	The Roan Draft SEIS is the product of a Settlement Agreement reached between BLM and the plaintiffs (conservation groups) and interveners (operators) in a Federal lawsuit over the original Roan Plateau FEIS. As a party to this settlement, WPX generally supports the adoption of Alternative IV, the Settlement Alternative (Preferred Alternative) subject to specific comments addressed below and subject to an assurance that BLM will implement this alternative in a way that honors WPX's valid existing lease rights.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kent	Rider	WPX Energy	0103-3	Opinion - Alternatives	WPX adamantly opposes Alternative I as the Selected Alternative which would allow the 24,980 acres comprising the Planning Area to remain unavailable (closed) for further oil and gas leasing and development during the anticipated 20-year life of this RMP A. Under Alternative I, BLM would likely cancel oil and gas leases issued in 2008 for lands within the Planning Area to return to previous conditions. WPX believes this action would violate its valid existing lease rights. Furthermore, this alternative does not honor the Settlement Agreement for which BLM and WPX are signatories.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.

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Kent	Rider	WPX Energy	0103-4	Opinion - Alternatives	Alternative II was selected by BLM as the original Roan FEIS Proposed Plan Alternative. However, given the marked change in the proposed development of the Roan Plateau leases Pursuant to the Settlement Agreement, WPX does not believe many of the provisions in Alternative 2, which contemplate full development of these leases, are appropriate. For example, unitization and/or phased leasing and limits on un-reclaimed surface disturbance are not necessary for the limited oil and gas development allowed under the Settlement Agreement and under the 20-year duration of the Roan RMPA.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kent	Rider	WPX Energy	0103-5	Opinion - Alternatives	Alternative III represents the Community Alternative, which BLM developed from public comments it received on the Draft RMP AIEIS in 2005, as well as public scoping comments for the RMPA/SEIS in 2013. Under the Community Alternative, no BLM surface in the Planning Area would be closed to oil and gas leasing, but surface disturbance on BLM lands above the rim would be limited. WPX strongly opposes this alternative since it does not honor the terms and conditions of the Settlement Agreement to which BLM and WPX are signatories, and would violate the lease rights of WPX and the other Valley Lessees.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Kent	Rider	WPX Energy	0103-6	Opinion - Alternatives	WPX agrees with BLM that the Community Alternative is limited by technical and economic feasibility of directional drilling.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Kent	Rider	WPX Energy	0103-18	Opinion - Alternatives	As stated throughout this letter, WPX supports the adoption of Alternative IV as the Final Alternative. As shown on Table 4.3.10, Alternative IV would have a moderate beneficial effect on Terrestrial and Aquatic Wildlife. While the Draft SEIS is intended to balance oil and gas development with other resources, including wildlife, WPX feels it is important that additional restrictions that are outside the scope of the Settlement Agreement only be applied as necessary to continue to strike that balance.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Form Letter 4			0106-1	Opinion - Alternatives	For those reasons, the only reasonable management alternative for the Roan Plateau is one that protects our climate, public health, and preserves our public lands for present and future generations. Please select the Settlement Alternative (Alternative IV) in the new RMP for the Roan Plateau Planning Area.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Form Letter 3			0107-1	Opinion - Alternatives	I support the proposal to include the terms of the settlement agreement into the new management plan, including closing most of the top of the Plateau to oil and gas leasing and putting strong stipulations in place for drilling that occurs at the base of the Plateau to minimize impacts on fish and wildlife.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS.
Terry	Lianzi		0003-1	Opinion - Oil and Gas	Please do not allow any more drilling for oil or gas on the Roan Plateau. Please retire any unused oil and gas leases. If we are to slow the effects of Global Warming, we need to keep most of our reserves of fossil fuels in the ground.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Marcia	Sage		0004-1	Opinion - Oil and Gas	Please, protect to the utmost, the Roan Plateau for future generations. Do not let unwise decisions and the greedy interests of some persons rob our kids and grand kids of what should be passed to them in pristine condition.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Lindy	Marrington		0009-1	Opinion - Oil and Gas	For the record, I am adamantly opposed to any leases being given for the extraction of natural gas in the Roan Plateau. The whole world is attempting to get off the addiction to fossil fuels. It is time now for governments to release squelched and/or shelved patents that provide clean energy of which there have been many! We do not need more natural gas, we need to keep fossil fuels in the ground from now on. We have entered a new age and the planet must be given the utmost care and protection.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.

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Nancy	Chismar		0011-1	Opinion - Oil and Gas	Further development and drilling on the Roan Plateau will have long term devastating results for the immediate and surrounding regions. Air and water quality will be compromised as will habitats of flora, fauna and the nearby human dwellings and soil. Do not sell out to greed. Save our earth...	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Frederic	Griffin		0013-1	Opinion - Oil and Gas	Certain powers in CO have plans to increase fracking and oil drilling by ten times their existing infrastructure.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Doug	Dennison	Bill Barrett Corporation	0035-2	Opinion - Oil and Gas	The Draft RMPA/SEIS also needs to be revised to acknowledge that voluntary relinquishment, cancellation, and reimbursement for certain leases on the top of the plateau has already occurred. Under Alternative IV, the settlement/preferred alternative, under the terms of the Settlement Agreement, lease cancellation for certain specific leases on the top of the plateau has already occurred. BBC voluntarily relinquished those leases under the terms of the Settlement Agreement, and the DOI, Office of Natural Resource Revenue, reimbursed BBC for the money paid for those leases.	The Proposed RMPA/FSEIS includes this information in Chapter 1, Section 1.6. As part of the Settlement Agreement, BLM cancelled 17 leases held by Bill Barrett Corporation (BBC). BLM prepared an environmental assessment for the proposed cancellation (BLM 2015a), and after the leases were cancelled, the lessees were reimbursed rent and bonus bids paid for the leases.
Doug	Dennison	Bill Barrett Corporation	0035-3	Opinion - Oil and Gas	Accordingly, the NEPA analysis and Record of Decision for the revised RMP cannot seek to cancel leases as part of the federal land use plan amendment process.	The Proposed RMPA/FSEIS does not seek to cancel leases as any part of any alternative, nor is this included as an assumption in the impact analyses. Instead, the planning analysis focuses on the combination of lands that would be open or closed to leasing under each of the alternatives, and the impacts of those decisions.
Judy	DiMario		0062-1	Opinion - Oil and Gas	We are losing so much of our wild habitats, forested areas, etc. over the years, that PROTECTION is the most important thing we need. Land management doesn't mean development, drilling, loss of our remaining valuable lands. Please protect!	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Daniel	Laemmerhirt		0075-1	Opinion - Oil and Gas	I will keep this very brief. If we want to simply survive the next one hundred years, we need to keep ALL fossil fuels in the ground. Even those that desperately want to extract the fuels to get easy money are in grave danger. Many different renewable fuels have become cheaper and cheaper as the intelligent people of the world realize this. Basically, there is absolutely NO LONG TERM MONEY in fossil fuels. It is simply no longer a viable option in any way. Please keep the Roan Plateau free of these greedy businessmen and protect our gravely injured planet!	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Form Letter 2			0105-1	Opinion - Oil and Gas	I urge you to take the necessary steps to protect Colorado's Roan Plateau from dangerous oil and gas drilling. The Roan is one of America's most biologically-rich wildlands, home to many imperiled fish and wildlife species, some of the rarest plants in North America and critical habitat for elk and deer. Drilling in these untouched areas would destroy the Roan's irreplaceable landscape and the wildlife that make their homes there while threatening our air, water, climate and health. Please do everything you can to protect the Roan and its wildlife from fracking and other fossil fuel development. Thank you.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS. The Proposed Plan incorporates stipulations and other measures to conserve and/or protect special and unique natural resources and water and air quality. Please refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Andy	Singer		0108-1	Opinion - Oil and Gas	The US Government and the BLM can't demonstrate that allowing fracking on public land is in the national interest, economically or environmentally.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Bryan	Wyberg		0109-1	Opinion - Oil and Gas	I urge you to take the necessary steps to protect Colorado's Roan Plateau from dangerous oil and gas drilling. The lease cancellations in Spring last year were a huge step in the right direction, but it was done in the expectation that the resulting resource management plan would provide the management protections to make the conservation of the Roan Plateau complete.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Bryan	Wyberg		0109-2	Opinion - Oil and Gas	I expect that the BLM will conclude its duty under the legal settlement agreement to provide the protections necessary to keep the Roan Plateau wild and free of any new energy development.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Bryan	Wyberg		0109-4	Opinion - Oil and Gas	Please do everything you can to protect the Roan and its wildlife from fracking and other fossil fuel development.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Katherine	Fredericks		0110-1	Opinion - Oil and Gas	I urge you to take the necessary steps to protect Colorado's Roan Plateau from dangerous oil and gas drilling.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Katherine	Fredericks		0110-2	Opinion - Oil and Gas	Because the cement casings on fracking wells are never perfect, poisonous chemicals chronically escape frack wells, poisoning the surrounding watershed, and all the human and animal life drinking that water.	Thank you for your interest in and comment on the Draft RMPA/SEIS. The potential for release of chemical pollutants from oil and gas development activities into nearby water resources is addressed in Section 4.2.4 of the Proposed RMPA/FSEIS impact analysis.
Katherine	Fredericks		0110-3	Opinion - Oil and Gas	Please do everything you can to protect the Roan and its wildlife from fracking and other fossil fuel development. Thank you.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Mark	Gerhardt		0111-1	Opinion - Oil and Gas	I am in favor of expanding the oil and gas production in Colorado. Reckless is a lie. There are numerous safe guards in place to protect the environment. it is important the the USA becomes energy independent from foreign nations. Thank you.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Trucia	Quistarc		0112-1	Opinion - Oil and Gas	Please consider that (1) here in Kansas and Oklahoma there has been a huge increase in earthquakes since the rise in fracking during the past several years, as well as elsewhere that fracking has become prevalent, and (2) that currently, with oil quantity immensely available and prices continuing to remain low and with investor expectations that this will not be changing anytime soon, and (3) that it is time to leave the enslavement to money mentality and genuinely care about the consequences that fossil fuels (and mining) developments have upon the ecological integrity of Earth's natural environments composed with Life-consciousness species great in variety and untold current and future values, and (4) that as public servants you are responsible for wise stewardship of public lands for long into the eras of future generations.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Trucia	Quistarc		0112-2	Opinion - Oil and Gas	I urge you to take the necessary steps to protect Colorado's Roan Plateau from dangerous oil and gas drilling.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Trucia	Quistarc		0112-3	Opinion - Oil and Gas	Please do everything you can to protect the Roan and its wildlife from fracking and other fossil fuel development. Thank you.	Measures to conserve and/or protect special and unique natural and scenic resources have been incorporated into the Proposed Plan and analyzed in the FSEIS. Refer to Section 2.3 and Chapter 4 of the Proposed RMPA/FSEIS for details.
Steven	Fuller		0001-1	Opinion - Shooting Sports	I have an interest in the BLM addressing its own rules (laws?) that are already in place regarding shooting. This includes but is not limited to location/orientation to trails, litter, and other common sense safety practices. If these regulations were followed by users, I believe that Hubbard Mesa would be a much safer environment.	The analysis of all alternatives has been revised in the Proposed RMPA/FSEIS to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Starr	Matthews	Rifle Sportsmen's Club	0026-8	Opinion - Shooting Sports	While hunting and firearms for self-protection would still be allowed in the Hubbard Mesa OHV under the proposed closure, it would set a dangerous precedent for the future of all firearms usage on public lands in the area.	Thank you for your interest in and comment on the Roan Plateau Planning Area Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Jake	Mall	Citizen	0032-2	Opinion - Shooting Sports	We totally agree with a NO SHOOTING ZONE area that was suggested at the Rifle Library meeting around the restroom and loading area. It is sad this would need to be posted as it is a common sense issue.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The Proposed Plan (Alternative IV) has been revised to note the prohibition on recreational target shooting in developed recreation sites (existing and future) per Federal regulation (43 CFR 8365.0-2). Please see Table 2.1, line 173 of the Proposed RMPA/Final SEIS. The analysis of Alternative IV also has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/Final SEIS.
Jake	Mall	Citizen	0032-3	Opinion - Shooting Sports	We would like to see the BLM take the Preferred Alternative (no changes in recreational shooting areas) and the BLM manage the area as they always have. We are happy and excited that the BLM has taken a no change plan for the traffic management of the area for all users, we hope you take the same action for recreational target shooters.	The analysis of the Proposed Plan (Alternative IV) has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/Final SEIS.
John	Bernard	Citizen	0044-2	Opinion - Shooting Sports	Be closed to all activity except target shooting	Thank you for your interest in and comments on the Draft RMPA/SEIS. As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. Therefore, this comment has not been carried forward for analysis in the Proposed RMPA/FSEIS. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title.
Dan	Alvis		0057-1	Opinion - Shooting Sports	I am this letter in opposition to proposed shooting restrictions at Hubbard Mesa.	Thank you for your interest in and comment on the Roan Plateau Planning Area Draft RMPA/SEIS.
Alison	Birkenfeld	RAMBO	0058-1	Opinion - Shooting Sports	Using 18 Road in Fruita as a successful model of how we can designate areas for certain user groups is ultimately what I would like to see happen. I support a shooting free zone in the 1/4 mile area discussed at the meeting back in January 2016.	Alternative IIIA would prohibit recreational target shooting within 1/4 mile of developed recreation sites (present and future) and, within the Hubbard Mesa Open OHV Area, within 1/4 mile of the centerline of Fravert Access Road located in Township 6 South, Range 93 West to the Hubbard Mesa Trailhead. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed Plan/FSEIS for discussion related to Alternative IIIA. The analysis of Alternatives I, II, and IV has been revised to note the prohibition on discharge of firearms in present and future developed recreation sites, in accordance with Federal regulation (43 CFR 8365.2-5). See Table 2.1, line 173. As noted in Section 4.5.3.2, 4.5.3.3, and 4.5.3.5 of the Proposed Plan/FSEIS, under Alternatives I, II, and IV, BLM would continue to address concerns surrounding recreational target shooting in the Hubbard Mesa OHV Area through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations.
Dylan	Johns	Zone 4 Enterprises	0073-3	Opinion - Shooting Sports	2. Recreational shooting has been recognized as a traditional, legitimate activity on Hubbard Mesa for decades. Generations of people have enjoyed shooting on Hubbard Mesa without serious incident.	Thank you for your interest in and comment on the Roan Plateau Planning Area Draft RMPA/SEIS.
Janice	Shepherd		0022-19	Opinion - Wild and Scenic Rivers	The final plan should include the designation of "suitable" for the 8 eligible streams under the assessment of Wild & Scenic Rivers. While I understand that congress must approve the actual designation to the list of Wild & Scenic Rivers the designation of "suitable" would prioritize the health of the streams and their streambanks in the interim.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS. Alternative IV provides protection of stream segments that were determined to be eligible under the Wild and Scenic Rivers Act through designation of Areas of Critical Environmental Concern, through surface use restrictions, and through multiple stipulations on oil and gas operations that will prevent impacts to eligible stream corridors.

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Janice	Shepherd		0022-20	Opinion - Wild and Scenic Rivers	Livestock grazing can have significant impact on the health of streams which in turn impacts the efforts to establish a viable population of Colorado River cutthroat trout in the planning area. Page 4-163 states "Overall, livestock grazing is one of the more impactful activities to the existing populations of CRCT and their habitats of all the programs BLM manages in the Planning Area". A designation of "suitable" would better prioritize the health of these important streams and therefore should be included in the final plan.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS. Alternative IV provides protection of stream segments that were determined to be eligible under the Wild and Scenic Rivers Act through designation of Areas of Critical Environmental Concern, through surface use restrictions, and through multiple stipulations on oil and gas operations that will prevent impacts to eligible stream corridors.
Janice	Shepherd		0022-21	Opinion - Wild and Scenic Rivers	Further from page 3-219 we see for the CRCT "Because of its genetic purity, it is still an irreplaceable Conservation Population of CRCT, which is rare within and outside the range of the Blue Lineage fish. In addition, the occupied streams require special management attention to protect the fish and their habitats in the face of potential threats. These facts support the Importance criterion." Designating the streams as suitable under WSRA would provide the management attention to protect this irreplaceable resource. Once it is gone it is gone forever. We should do the right thing now and designate the 8 streams as "suitable".	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. BLM has chosen Alternative IV from the Draft RMPA/SEIS as the Proposed Plan analyzed in the FSEIS. Alternative IV provides protection of stream segments that were determined to be eligible under the Wild and Scenic Rivers Act through designation of Areas of Critical Environmental Concern, through surface use restrictions, and through multiple stipulations on oil and gas operations that will prevent impacts to eligible stream corridors.
Randy	Winkler	City of Rifle	0028-1	Recreation	Since the original RMP/EIS was prepared, and the alternatives crafted, conflicts amongst user groups have emerged within the Hubbard Mesa Recreation Area. Alternative 4 within the RMP/SEIS proposes no change with regard to management of Hubbard Mesa. The City understands why this is the recommendation, and grasps that this planning process was meant to deal with a separate matter. However, the City cannot support the idea that nothing needs to occur with regard to the method of managing the Hubbard Mesa Recreation Area. There are growing safety issues emerging as a result of the areas popularity and the absence of enforcement. The lack of a more formal management plan and evaluation of the overlap of recreational use activities has the appearance of negligence. Currently, this area allows for but does not manage mountain biking, target shooting, off-road vehicle use, trail running, hiking, and seasonal hunting. The ample area and diverse geography provide the opportunity to accommodate each of the use types occurring currently, but oversite by the BLM with input and participation from the user groups is absolutely necessary.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Two sub-alternatives were added to Alternative III to allow consideration of different areas of shooting closures. The on-going management process related to recreational use of the Hubbard Mesa Open OHV Area could include a collaborative process as suggested. The Roan Plateau Planning Area is "undesignated" under all alternatives to be consistent with updated planning guidance (IM No. 2008-90). "Undesignated" lands are public lands not designated as Recreation Management Areas. "Undesignated" areas are managed to meet basic recreation and visitor services and resource stewardship needs including visitor health and safety, use and user conflicts and resource protection. This does not preclude different types of recreation from occurring within the Planning Area. However, the Planning Area is not managed to emphasize recreation. All public lands are required to have OHV area designations (43 CFR Section 8342.1). Areas must be designated as open, limited, or closed to motorized travel activities as defined in 43 CFR Section 8340.0-5, (f), (g), and (h) respectively. Hubbard Mesa is designated as Open to OHV travel under Alternatives II, III, and IV.
Sean	Strode	RAMBO	0093-3	Recreation	Management practices that once worked for the Hubbard Mesa OHV area, are not effective anymore. The area has evolved, accessibility has improved, and it is being used by more people. BLM's management of the area must evolve too, in order to accommodate the new and different users.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/Final SEIS. The Roan Plateau Planning Area is not managed to emphasize recreation, but is managed under all alternatives to meet basic recreation and visitor services and resource stewardship needs including visitor health and safety, use and user conflicts and resource protection.

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Sean	Strode	RAMBO	0093-4	Recreation	Enforcement. There is no way to enforce the rules, that BLM has already established, in the Hubbard Mesa OHV area. Many people don't know where trails, double track, and even roads run in the OHV area. With extremely limited signage, how can they know? For example, I was riding with a friend and on a hill descending towards the main road. In a moment of having fun, my friend yelled out, "Woohoo" as we descended a steep hill. Then we come around a brushy corner and there's the road. Except this time, there was a man and his son there pointing guns at us. Not trying to threaten us, but the father had been teaching his son to shoot in this small gully. He had no idea there was a trail there and he was doing nothing wrong. But if my friend hadn't yelled out because he was having fun, we would have most likely been shot that day. No one is at fault and there is no real way to enforce any rules here. Or for another example, there is a spot where some people commonly shoot, and an established dirtbike trail crosses the shooting path three times. How is a shooter supposed to know that they are shooting across a trail three times? It is an open designation shooting area and they are not at fault. Yet the trail has been there so long, and used by so many people, that it shows up on BLM maps now.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process. BLM does not designate trails or areas for particular uses in open OHV areas. Section 3.5.3.3 of the Proposed RMPA/FSEIS has been revised to note that many mapped and unsigned cross-country trails exist in the Hubbard Mesa area. All public lands are required to have OHV area designations (43 CFR Section 8342.1). Areas must be designated as open, limited, or closed to motorized travel activities as defined in 43 CFR Section 8340.0-5, (f), (g), and (h) respectively. Hubbard Mesa is designated as Open to OHV travel in Alternatives II, III, and IV. The Open designation means an area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards. the delineation of Travel Management Areas (TMAs) addresses other modes of travel not covered by OHV area designations (43 CFR Section 8432.1). The Hubbard Mesa TMA delineation allows muscle-powered travel and mechanized (wheel conveyance) travel cross-country year-round consistent with the Open OHV designation for motorized travel.
Becky	Tedrow		0095-2	Recreation	Another observation and comment. Dust suppression by graveling roads with the 1 1/2 to 2 in. crushed rock I have seen up there is awful. You can't ride a bike or a horse on it and it is uncomfortable to run on. The four wheelers and dirt bikes just throw the rocks. So do not think this reverses the damage of large road building by gas and oil companies. It doesn't. The roads are only good for cars and trucks , not recreation. Think of something else.	The impacts of oil and gas development, and associated road widening and maintenance, are discussed in Section 4.5.3.1. The section analyzes impacts to recreation from direct management actions and management actions directed at other resources, such as oil and gas development, that impact recreation. As noted in that section, BMPs would be implemented for all surface-disturbing activities under the Action Alternatives, as appropriate to individual projects. A list of selected BMPs that may be implemented is provided in Appendix H and includes use of horizontal drilling to limit surface disturbance and road construction or widening in the Planning Area and enforcing reduced speed limits for construction and operations-related traffic.
Jake	Mall	Citizen	0018-1	Shooting Sports	Leave all areas below narrow road open for shooting. No shooting 1/4 mile arc around loading area.	Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components. The suggestion provided falls within the range of alternatives considered in the FSEIS and therefore has not been analyzed specifically.
Aaron	Mattix	RAMBO	0019-1	Shooting Sports	The southern triangles are actually some of the safest places for shooting. Swap that area to extend no shooting zone further east from the parking lot.	Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components. The suggestion provided falls within the range of alternatives considered in the FSEIS and therefore has not been analyzed specifically.
Anonymous			0020-1	Shooting Sports	In review of Alternatives, I would strongly oppose any recreational shooting closures. It has long been a failed belief of all federal government bodies to implement restriction; create policy etc in order to make up for lack of enforcement. The first and most important issue would be hiring more law enforcement officers to handle already existing rules etc. Garbage trash etc. all could be mitigated with additional enforcement.	Alternatives I through IV in the Proposed RMPA/FSEIS have been revised to consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OVH Area. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process.

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Daniel	LeMoine	Citizen	0021-1	Shooting Sports	My comment specifically addresses recreational target shooting within the Hubbard Mesa OHV Area north of Rifle, Colorado (Hubbard Mesa). The purpose of this correspondence is to ask you to consider: (1) Eliminating target shooting in Hubbard Mesa except in a designated area safely away from roads and trails; or (2) Eliminating target shooting in Hubbard Mesa. I also ask that you include this solution in whichever overall alternative (I, II, III or IV) is ultimately chosen. I am a native of Rifle, Colorado and regularly spend time on Hubbard Mesa. I have recreated in the area for over thirty years. Over the last several years, I have spent most of my time in Hubbard Mesa trail running. I also enjoy the area for hiking with family and mountain biking on occasion. When conditions allow, I run the trails of Hubbard Mesa 3-4 days per week, and I am usually running 1-4 hours each session. I have explored every inch of trail within Hubbard Mesa and know the area intimately. I am also an outdoorsman, a hunter and enjoy shotgun sports. I believe it is time to rethink the policy of open and unrestricted shooting in Hubbard Mesa. Recreational target shooting is one of the many historic public uses of the Hubbard Mesa area. However, recent improvements have brought more and different users to the area. Mountain bikers, hikers, runners, dirt bikers and other off-road enthusiasts of all ages are enjoying the resource in greater numbers than ever before. As uses of Hubbard Mesa have evolved, more and more users have been exposed to the impacts and potential hazards that can accompany unrestricted shooting. The Draft Supplemental Environmental Impact Statement recognizes this when it states, recreation users are more frequently asking BLM to address shooting conflicts and reduce the potential of an accidental shooting. Draft Supplemental Environmental Impact Statement for the Roan Plateau Resource Management Plan Amendment, at 3-192. Based on my personal observations, unrestricted shooting in the area now poses a	Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OVH Area. Two sub-alternatives have been included under Alternative III to allow consideration of closure of different parts of the Hubbard Mesa area to recreational target shooting. Under Alternative IIIB, the entire Hubbard Mesa area would be closed. Please see Table 2.1, line 173, for a description of the management components related to recreational target shooting under each alternative and Section 4.5 for a discussion of potential impacts to all resources. These management components have been taken into consideration in the selection of the Proposed Plan.

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					significant public hazard and a direct threat to the safety of other users. It has also resulted in an accumulation of shooting related-litter and damage to natural features, native plants, as well as government and private property, all of which are routinely used as targets, backstops and target holders. I sincerely believe most recreational target shooters are conscientious and would not knowingly shoot in an unsafe direction. However, evidence in the area provides conclusive proof that at least some Hubbard Mesa target shooters are shooting from, across, or toward roads, trails and parking areas and are shooting in an unsafe manner and in unsafe directions. Signs along existing roads and trails and in parking areas are routinely shot. Private property signs and gates bordering the OHV have also been targeted. In addition to the overwhelming physical evidence of unsafe shooting in the area, I have personally observed target shooters shooting in the direction of designated trails from close and dangerous range on numerous occasions. As you know, many of the trails on Hubbard Mesa are narrow, elevated and extremely hard to see from road level. These shooters may not even know they are shooting at or across a trail or that a biker, hiker or trail runner might emerge from the trees. While shooters can hold their fire if they hear a motorcycle or ATV approaching, the same cannot be said for the quiet approach of a mountain biker, runner or a family of hikers. Hubbard Mesa attracts many users who concentrate in specific areas along the established OHV trail system. The users of the trails should not be in the line of fire. Nor should those using the roads, parking lot or restroom. Eliminating target shooting in Hubbard Mesa except in an area safely away from roads and trails would greatly reduce the risk to users of the trails and make enforcement much easier. I doubt I need to mention that unrestricted target shooting in the area has also resulted in a tremendous volume of shooting-related litter, refuse and abandoned	

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					Glass bottles, containers, and other materials that break into small pieces are regularly used for target practice. Spent shells, ammunition boxes, targets, household items used as targets, and other shooting related-litter is widespread and constitutes the majority of litter in the area. One does not have to walk far to find a shell casing or other shooting related debris in the middle of any road, trail or parking lot in the area. I do not believe it is an exaggeration to say that more than 90% of the litter within the Hubbard Mesa OHV Area is shooting related. The amount of shooting-related litter in the area is almost beyond belief and continues to grow. Pictured below are 9 bags full of shooting-related garbage a friend and I picked up on November 2, 2015 in one small location on BLM land in Hubbard Mesa. 100% of the trash we collected was shooting related: shell casings, ammunition boxes, live rounds, paper targets, and an almost unimaginable array of household items used as targets. Unfortunately, we couldn't safely pick up much of the shot-up glass, which still litters the area. Eliminating target shooting in Hubbard Mesa except in an area safely away from roads and trails would reduce unsightly litter and debris in other parts of the OHV Area. All of the shooting-related garbage we collected was less than 20 yards from a very popular hiking/running/biking trail. In fact, the BLM .. Trigger Trash .. sign/target you see in the pictures had been set up as a target directly behind -- (within 2 feet of) --the trail. It is also worth noting that we pulled numerous targets out of trees. One particularly large old tree, has been blown nearly to pieces from being shot so many times. Yet somehow, it still lives. Sadly, after a 1/2 day's work, we barely made a dent cleaning up the trigger trash in one small area. And, our efforts were undone in less than 24 hours. The pictures below show some of the new shooting garbage I found less than 24 hours after picking up 9 bags of shooting-related garbage at this very spot.	
					(That's a yellow plastic cat litter box shot to pieces in the picture on the right.) At least one of the Hubbard Mesa recreational shooters couldn't even let the area be clean for a single day. Lawful hunting and recreational target shooting are legitimate uses of the public lands. However, shooting at and across designated roads and trails, defacing federal property, using trees as backstops, and leaving shooting-related litter are all violations of existing BLM regulations. The activities evidenced by these pictures are in violation of existing BLM regulations, including but not limited to: a. Causing a public disturbance or creating risk to other persons on public lands. (see 43 C.F.R. Sec 8365.1-4(a)); b. Defacing, removing or destroying natural features, native plants, cultural resources, historic structures or government and/or private property. (see 43 C.F.R. Sec 8365.1-5(a)(1)); c. facilitating and creating a condition of littering, refuse accumulation and abandoned personal property. (see 43 C.F.R. Sec. 8365.1-1). I am concerned that shooting activities in the Hubbard Mesa Area are not being adequately monitored to ensure public safety or to curtail littering or refuse accumulation. The current plan of addressing safe shooting and trigger trash through education signage is not working, as these signs often become nothing more than targets for recreational shooters. Current enforcement paradigms are also not working. The Draft Supplemental Environmental Impact Statement states: the BLM generally relies on the public to find safe locations to shoot, and clean up their targets and other debris. Draft Supplemental Environmental Impact Statement for the Roan Plateau Resource Management Plan Amendment, at 3-192 (emphasis supplied).	

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Daniel	LeMoine	Citizen	0021-2	Shooting Sports	It is imperative that the BLM make an effort in the interest of public safety to direct shooting away from established roads and trails within the Hubbard Mesa OHV Area. Reduction of shooting-related litter is also an important objective. Both can be best achieved by eliminating target shooting in Hubbard Mesa except in an area safely away from roads and trails; or by simply eliminating target shooting in the Hubbard Mesa OHV Area. I also urge you to have the flexibility to include a solution addressing target shooting in Hubbard Mesa in whichever overall alternative is ultimately chosen.	Alternative III has been revised to include two sub-alternatives, IIIA and IIIB, addressing potential shooting closures in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these sub-alternatives and Section 4.5.3.4 for a discussion of the potential impacts on recreation management. Under the Proposed Plan, Alternative IV, BLM would prohibit recreational target shooting in developed recreation sites (existing and future). In addition, the analysis under all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process.
Starr	Matthews	Rifle Sportsmen's Club	0026-1	Shooting Sports	RSC believes that public lands are held in trust for the public, and that BLM should manage its lands under its multiple-use mandate while not bowing to radical environmental pressure.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Federal regulation directs BLM to manage public lands, including recreation areas, so they "can be used by the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" (43 CFR 8365.0-2). Alternatives I through IV in the Proposed Plan/FSEIS present and consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.
Starr	Matthews	Rifle Sportsmen's Club	0026-2	Shooting Sports	Recreational shooting has been recognized as a traditional, legitimate activity on Hubbard Mesa for decades. Generations of people have enjoyed shooting on Hubbard Mesa without serious incident.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS.
Starr	Matthews	Rifle Sportsmen's Club	0026-3	Shooting Sports	The proposed closure area would force shooters from a safe location with many backstops to a less safe area with fewer safe backstops and more roads and trails.	In response to public concerns regarding shooting sports at Hubbard Mesa, Alternative III in the Proposed Plan/FSEIS has been revised to include two sub-alternatives, IIIA and IIIB, that propose different areas of shooting closures in the vicinity of developed recreation sites and in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed RMPA/FSEIS for a description of these sub-alternatives and potential impacts on recreation management. The issues raised in your comment have been noted in the Proposed RMPA/FSEIS analysis in Section 4.5.3.4.
Starr	Matthews	Rifle Sportsmen's Club	0026-4	Shooting Sports	Closure would push shooters from safe public land onto private property on Hubbard Mesa and to the south of Fravert Reservoir Road.	The issues raised in your comment have been noted in the Proposed Plan/FSEIS analysis in Section 4.5.3.4.
Starr	Matthews	Rifle Sportsmen's Club	0026-5	Shooting Sports	Federal regulations already prohibit shooting across roads, trails, bodies of water, and toward areas where people are camped, picnicking, or otherwise gathered. Any violations can be easily self-policed by the public and reported to local law enforcement under existing laws.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/Final SEIS.
Starr	Matthews	Rifle Sportsmen's Club	0026-6	Shooting Sports	BLM has not met its own Federal Land Policy and Management Act which requires the agency to perform the required balancing of multiple uses to show, specifically in this case, that the benefit of prohibiting target shooting in the Hubbard Mesa OHV area outweighs the substantial benefits of target shooting to the American people.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. The on-going management process would be undertaken with the goal of allowing use of the Hubbard Mesa Open OHV Area by "the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" in accordance with Federal law (43 CFR 8365.0-2).

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Starr	Matthews	Rifle Sportsmen's Club	0026-7	Shooting Sports	In many cases the BLM is justifying its decision to close recreational shooters out of public land because it claims that shooting is a "resource-harming" activity. At the same time, the agency will allow other activities to continue, like camping, mountain biking, off road vehicle use, and grazing that clearly have more impact on the area as a whole.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Management actions related to shooting sports have been included under each alternative in the Proposed RMPA/FSEIS to protect visitor safety by minimizing the potential for accidental shootings, in accordance with Federal regulations (43 CFR 8364.1). Table 2.1, line 173 summarizes these management actions. The impact analysis in Section 4.5 discusses potential indirect impacts to all resources as a result of these management actions.
Starr	Matthews	Rifle Sportsmen's Club	0026-9	Shooting Sports	BLM does not have the staff to enforce any recreational shooting closures, and enforcement responsibilities will be placed on local law enforcement. Our local law enforcement is already stretched thin covering the 2,947 square miles in Garfield County.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Starr	Matthews	Rifle Sportsmen's Club	0026-10	Shooting Sports	Public land should be kept open to all recreational activities. Note the BLM motto: Public Lands USA: Use, Share, Appreciate.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Federal regulation directs BLM to manage public lands, including recreation areas, so they "can be used by the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" (43 CFR 8365.0-2). Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.
Stacy	Hardee	RAMBO	0027-1	Shooting Sports	I support restrictions for recreational target shooting in the Hubbard Mesa OHV Open Area. The possible 610 acres of closure to target shooting 1/4 mile off the southern entrance to the area is a great start to increased safety. I have one recommendation on the proposed area of closure. The two southern most areas of triangle shape are actually a reasonably safe area to shoot with a sufficient backdrop. Please see attached .pdf file for visual. I feel these acres at the beginning of the road would be better if they were added to the most northeastern portion. Extending the area of closure further northeast will likely be more beneficial as there are less ideal shooting conditions compared to the most southern area.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Potential recreation management impacts as a result of closing areas with natural backstops to recreational target shooting under Alternatives IIIA and IIIB have been addressed in Section 4.5.3.4 of the Proposed RMPA/Final SEIS.
Stacy	Hardee	RAMBO	0027-2	Shooting Sports	With that being said, there needs to be sufficient signage notifying the areas of closure, adequate public notification of the changes, and an increased presence of law enforcement. I believe that increased law enforcement visibility and presence will encourage safe conditions.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/Final SEIS.
Randy	Winkler	City of Rifle	0028-2	Shooting Sports	The City of Rifle is requesting the Bureau of Land Management commit to more enforcement and education on how to properly and safely use this unique recreational area. Additionally, the City strongly recommends the BLM take on a more specific planning study for the Hubbard Mesa Recreation Area. We believe the user groups are at a place where they can come together and offer BLM constructive ideas on how to better manage this incredible resource.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. A planning study such as the one suggested could be considered as part of this on-going management process.
Ron	Velarde	Colorado Parks and Wildlife	0029-2	Shooting Sports	CPW believes that the Hubbard Mesa shooting closure as proposed in Alternative 3 at page 2- 60 is not appropriate; CPW does not support this closure.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The Proposed Plan (Alternative IV) has been revised to note the prohibition on recreational target shooting in developed recreation sites (existing and future) per Federal regulation (43 CFR 8365.0-2). Please see Table 2.1, line 173 of the Proposed RMPA/FSEIS. The analysis of Alternative IV also has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/FSEIS.

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Ron	Velarde	Colorado Parks and Wildlife	0029-3	Shooting Sports	By BLM's own documentation the proposed area identified for a shooting closure contains the following characteristics that lead to its overall undesirable appearance and condition: poor soils and soil potential, high erosion potential, soils not meeting upland standards, lack of enforcement of illegal dumping, livestock grazing, drainage from roads, trails and constructed facilities and OHV use (at DEIS V1. Page 3-10). Additionally, shooters erroneously get blamed for household dumping because home appliances discarded on Federal lands are used a targets and left in place (at DEIS V1.page 3-192).	Thank you for your interest in and comments on the Draft RMPA/SEIS. The Proposed Plan (Alternative IV) has been revised to note the prohibition on recreational target shooting in developed recreation sites (existing and future) per Federal regulation (43 CFR 8365.0-2). Please see Table 2.1, line 173 of the Proposed RMPA/Final SEIS. The analysis of Alternative IV also has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/FSEIS.
Ron	Velarde	Colorado Parks and Wildlife	0029-4	Shooting Sports	Closing recreational target shooting on 1/4 mile of developed recreation sites and the centerline of Fravert Access Road, Township 6 South, Range 93 West to the Hubbard Mesa Trailhead in the Hubbard Mesa OHV Area (640 acres total) would create confusion for hunters, target shooters, and the public. It would also prove problematic for law enforcement for the part of the year when small game seasons are open. The following ideas provide a better solution than closing target shooting in the area.	The Proposed Plan (Alternative IV) has been revised to note the prohibition on recreational target shooting in developed recreation sites (existing and future) per Federal regulation (43 CFR 8365.0-2). Please see Table 2.1, line 173 of the Proposed RMPA/FSEIS. The analysis of Alternative IV also has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/FSEIS.
Ron	Velarde	Colorado Parks and Wildlife	0029-5	Shooting Sports	This area receives substantial use from a broad range of user groups, its popularity should reflect in its continuation as a multiple use area. Rather than imposing a shooting closure the area on Hubbard Mesa, the area would benefit from emphasized user-group self policing (from all individuals and user groups), community clean ups, improved/increased signage, and some additional law enforcement/patrolling.	The Roan Plateau Planning Area is "undesignated" under all alternatives to be consistent with updated planning guidance (IM No. 2008-90). "Undesignated" areas are managed to meet basic recreation and visitor services and resource stewardship needs including visitor health and safety, use and user conflicts and resource protection. This does not preclude different types of recreation from occurring within the Planning Area. However, the Planning Area is not managed to emphasize recreation. The Proposed RMPA/FSEIS has been revised to include a greater range of alternatives for addressing shooting sports within the Hubbard Mesa Open OHV Area. Two sub-alternatives have been added to Alternative III to allow consideration of different areas of shooting closures. Alternatives I, II, and IV have been revised to note the prohibition on discharge of firearms in present and future developed recreation sites, in accordance with Federal regulation (43 CFR 8365.2-5). In addition, the analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. Please see Table 2-1, line 173, and Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS for discussion and analysis related to recreation management.
Ron	Velarde	Colorado Parks and Wildlife	0029-6	Shooting Sports	The shooting safety concern can be addressed by creating a focused shooting area where shooting can continue in an area that is suitable and compatible with other uses in the area. CPW provides grant opportunities for development of shooting ranges. Specific criteria can be found at CPW's web page. http:cpw .state. co. us/thingstodo/ Pages/ShootingRangeGrants.aspx	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title.
Ron	Velarde	Colorado Parks and Wildlife	0029-7	Shooting Sports	CPW encourages BLM in partnership with user groups to find a non regulatory solution to the multiple use management on Hubbard Mesa. A more focused management approach would result in community support and continued multiple uses.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations to allow the Hubbard Mesa Open OHV Area to continue to be open to the maximum number of users. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
John	Martin	Garfield County	0030-2	Shooting Sports	While Garfield County believes target shooting safety concerns arising from conflicting recreational uses are a serious matter deserving BLM's attention, we believe the issues should not be addressed within the SEIS.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.

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John	Martin	Garfield County	0030-3	Shooting Sports	Garfield County recommends BLM address Hubbard Mesa recreational user conflict issues through a separate and collaborative process among BLM, Garfield County, City of Rifle, private landowners and recreational users.	The analysis of all alternatives has been revised in the Proposed RMPA/FSEIS to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Jake	Mall	Citizen	0032-1	Shooting Sports	We have hunted and used this area continually for target shooting. We also ride our ATV's in the area. Our main concern at this time is the possibility of closing some of the main areas we use for target shooting. By closing areas within 1/4 mile of the road you would be eliminating the safest areas for target shooting. These areas have excellent dirt backstops and good places to set up our benches. If you close these areas we would have to move out to the upper areas that are more used by other users and do not have the safe backstops that the other areas provide.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Alternative III has been revised in the Proposed RMPA/Final SEIS to consider two sub-alternatives, Alternatives IIIA and IIIB (see Table 2.1, line 173). The impacts analysis for Alternative III has been revised to include the issues raised in your comment. Please see Section 4.5.3.4 of the Proposed RMPA/Final SEIS.
Michael S	Freeman	Earthjustice	0036-21	Shooting Sports	Target shooting should be subject to the same standards and restrictions as those applied to recreational travel, hunting, camping, etc. when weighing its impact on cultural and biological resources, as well as to other public lands uses and visitor safety. BLM should conduct a public safety analysis to determine the appropriate restrictions for target shooting. For example, in developing the Prehistoric Trackways National Monument RMP, BLM conducted a GIS-based analysis of safety zones for recreational target shooting, mathematically determining Surface Danger Zones. That analysis was used to determine areas that should be closed to target shooting to protect public safety and paleontological resources. Prehistoric Trackways National Monument Final EIS at 2-4 and Appendix G.12	The analysis of all alternatives has been revised in the Proposed RMPA/FSEIS to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. The on-going management process could include a public safety analysis similar to the one suggested.
Michael S	Freeman	Earthjustice	0036-22	Shooting Sports	BLM should also consider whether seasonal restrictions, such as during times of high recreation use, would achieve public safety objectives. Regardless of how BLM ultimately decides to manage target shooting in the Hubbard Mesa area, the RMP amendment should describe how any restrictions will be implemented and commit to dedicating necessary resources such as enforcement.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process. BLM does not designate trails or areas for particular uses in open OHV areas. The Hubbard Mesa TMA delineation (same boundary as the Hubbard Mesa OHV Riding Area) allows muscle-powered travel and mechanized (wheeled conveyance) travel cross-country year-round consistent with the "open" OHV designation for motorized travel. All TMA delineations are subject to additional restrictions (i.e., seasonal, area, type, and number) set forth in the ROD or in subsequent travel planning.

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Mike	Pritchard	RFMBA - IMBA	0037-3	Shooting Sports	The specific restrictions on recreational target shooting should be revised from those currently proposed. Restrictions should require that target shooting take place at locations within Hubbard Mesa that provide sufficient natural (cliff or steep slope) backstop. Additionally, line of fire target shooting should not be allowed to cross over the area's roads and trails. As an open travel designated area, the trails in questions may be open to OHV, mechanized, or foot and horse travel, and are not necessarily mapped by the BLM. Self regulation by recreational target shooters will be key to any management decision successes. However, minimal signage (yes/no recreation target shooting) may be appropriate in certain high use shooting and/or trail areas. In general, the higher elevation areas of Hubbard Mesa provide fewer adequate natural backstops; target shooting should be encouraged at lower elevation locations where cliff walls and steep slopes provide opportunity for effective backstops. While safety is our primary concern, effective enforcement regarding littering and abandonment of trash (often used for target shooting) remains an issue in need of a long term solution.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process. BLM does not designate trails or areas for particular uses in open OHV areas.
John	Bernard	Citizen	0044-1	Shooting Sports	Instead of closing the area to shooting, close the area highlighted on attached map to all uses except target shooting.	Thank you for your interest in and comments on the Draft RMPA/SEIS. As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. Therefore, this comment has not been carried forward for analysis in the Proposed RMPA/FSEIS. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title.
John	Bernard	Citizen	0045-1	Shooting Sports	I am writing this comment to express my concerns about closing the 610 acres of the Hubbard Mesa OHV Area to recreational target shooting. - The area of proposed closure is the safest area for target shooting. There is a backstop. Closure of this area will result in target shooting where there is not a backstop and there are more trails. - Recreational target shooting has been going on in this area for many decades and predates the mountain bike. OHV use is a recent development. - Recreational target shooting is a safe and family friendly activity. Generations of shooters utilize Hubbard Mesa OHV Area. - Public lands are for multiple use. - The BLM does not have staff or funds to enforce such a closure.	The analysis of Alternative IV has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Section 4.5.3.5 of the Proposed RMPA/FSEIS. The concerns raised regarding backstops have been included in the impacts analysis of Alternative III; see Section 4.5.3.4.
Adam	Cornely	RFMBA Newcastle Trails	0060-1	Shooting Sports	That said I believe your proposal to limit open shooting to certain areas is a wise idea. We need to figure out a way to satisfy the needs of all user groups. while keeping safety priority number one. I can't comment specifically on where to locate the open shooting areas, but I would focus on the following: -avoid areas where currently in place mountain biking and hiking trails exist. Folks are used to riding these trails and in my opinion they will continue to use them despite the changes that this study may result it. -avoid areas where the local biking community has indicated the possibility of future trail expansion. -avoid parking area where families may be parking to load kids on their bikes, have post ride picnics, etc. Families like mine are not gun owning families, and for better or for worse do not feel comfortable being that close to open shooting when we are recreating outside.	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title. Alternative III in the Proposed Plan/FSEIS has been revised to include two sub-alternatives, IIIA and IIIB, that proposed different areas of shooting closures in the vicinity of developed recreation sites and in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed Plan/FSEIS for a description of these sub-alternatives and potential impacts on recreation management.

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Jennifer & Bryan	Dorr	Citizen / HC4W	0063-2	Shooting Sports	We are very concerned that if Alternative III is chosen, it will actually create more safety concerns than it will address the ones outlined in the proposal. Banning shooting from these known, established shooting areas will push shooting to areas that may not have safe backdrops. These areas have been chosen by folks for years because of safety in mind, the area provides hillsides that protect bullets from traveling to unintended targets. Most other areas, especially outside of the 610 acre prohibited do not have the same land features. Also, most people expect to watch more diligently around these known areas as the shooting seems to, for the most part, stay in the general area. Once it is spread out, it becomes a dispersed area that really leaves people having to question where the next new shooting areas will form. Another issue that concerns us is that one user group seems to be pushing for regulations that will affect all other user groups in an area that is designated as open use. No single user group should have that much influence, and no single user group should be banned in an area that is designated as open use. Instead of banning an interest/use, let's facilitate a meeting between the user groups and hash out the differences and issues and come up with a plan or some understanding of the issues. There has to be a solution that does not cut off any group but is able to allow everyone a way to recreate safely and respectfully.	In response to public concerns regarding shooting sports at Hubbard Mesa, BLM has added Alternative IIIB for analysis in the FSEIS to consider the potential impacts of prohibiting recreational target shooting in the Hubbard Mesa Open OHV Riding Area. Including Alternative IIIB allows BLM to consider a range of management options for recreation in the Hubbard Mesa Open OHV Riding Area. Please see Chapters 2 and 4 for analysis and impact conclusions related to Alternative IIIB. Alongside the RMPA effort, BLM will remain engaged in adaptive management and stakeholder engagement to find and use the most effective methods to manage recreation at Hubbard Mesa.
Jennifer & Bryan	Dorr	Citizen / HC4W	0063-3	Shooting Sports	Safety education may be the best way to work with the conversation that has begun regarding this proposal. Education for shooters to shoot in safe places and hikers and riders to keep their eyes and ears open.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Wayne	Edgeton	Citizen	0064-1	Shooting Sports	Concerns with no shooting area. Shooter will be pushed farther off road and in some case encroach on trails that currently are not impacted, more opportunity for shooter to shoot across existing trails, that they may not even know are there. Currently users know where shooting areas are and work with according to use. Force shooter to make worse decisions when they don't have available backstops that are appropriate for citizen protection, more firearms discharged in general direction of Hwy 13 and Rifle if they go beyond lift station and past no shooting zone. Where do you expect these shooter to find new location at, is that West side of road next to open area, Hwy 13 side, private property on way in, Dry Rifle Creek?	In response to public concerns regarding shooting sports at Hubbard Mesa, Alternative III in the Proposed Plan/FSEIS has been revised to include two sub-alternatives, IIIA and IIIB, that propose different areas of shooting closures in the vicinity of developed recreation sites and in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed RMPA/FSEIS for a description of these sub-alternatives and potential impacts on recreation management. The issues raised in your comment have been noted in the Proposed Plan/FSEIS analysis in Section 4.5.3.4.
Bruce	Gallagher		0066-1	Shooting Sports	Since I will not be able to attend, here's some input. BLM's proposal of the 1/4 mile rule is downright scary to me as a recreational Mtn. Bike rider in the Hubbard Mesa area. In my opinion it only adds to the existing danger in that area! Pushing target shooting inward 1/4 mi. from the road only puts the flying lead even closer to our existing trail system! How does this proposal, in their eyes, create a safer environment for all recreational users in that area? I am definitely an advocate of shared use in that area, but use that is shared safely!	Thank you for your interest in and comments on the Draft RMPA/SEIS. Section 4.5.3.4 of the Proposed RMPA/FSEIS has been revised to address potential safety considerations associated with the proposed recreational shooting closures under Alternative III (see Table 2.1, line 173). In addition, the analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.

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Aaron	Humphrey	Alpenglow Lighting Design, Inc.	0070-1	Shooting Sports	As user groups expand into areas, it is important for each to respect other users and spaces. I think a gun range or zone makes perfect sense; I promise not to ride there if they promise not to shoot at or near trails. It seems to work quite well at 18 Road in Fruita, where I also ride regularly. At that location, user groups are able to recreate, spend money in local businesses, and get along without conflict. Please work with all the users to encourage outdoor recreation, but also please educate the groups so that there can be no tragic shooting accidents of trail users. I am sure even the most ardent supporter of guns does not want to accidentally kill a hiker or cyclist.	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Dylan	Johns	Zone 4 Enterprises	0073-2	Shooting Sports	1. This proposed closure of recreational target shooting is a direct result of the 2011 Obama administration directive to the BLM that enables these types of closures. The section of the announcement that concerns millions of shooters across the country reads: ?When the authorized officer determines that a site or area on BLM-managed lands used on a regular basis for recreational shooting is creating public disturbance, or is creating risk to other persons on public lands; is contributing to the defacement, removal or destruction of natural features, native plants, cultural resources, historic structures or government and/or private property; is facilitating or creating a condition of littering, refuse accumulation and abandoned personal property is violating existing use restrictions, closure and restriction orders, or supplementary rules notices, and reasonable attempts to reduce or eliminate the violations by the BLM have been unsuccessful, the authorized officer will close the affected area to recreational shooting. At the time the directive was issued a spokesman for the BLM told U.S. News and World Report that the proposed ban was being enacted in response to urbanites who freak out when they hear shooting on public lands. The spokesman also acknowledged that the impetus for this restriction was not rooted in safety, rather it was introduced to reduce social conflict. Please reference the attached U.S. News and World Report article by Paul Bedard on November 16, 2011. RSC believes that public lands are held in trust for the public, and that BLM should manage its lands under its multiple use mandate while not bowing to radical environmental pressure.	Thank you for your interest in and comments on the Draft RMPA/SEIS. BLM policy is to manage public lands, including recreation areas, so they "can be used by the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" (43 CFR 8365.0-2). The Proposed RMPA/FSEIS has been revised to include a greater range of alternatives for addressing shooting sports at the Hubbard Mesa Open OHV Area. Two sub-alternatives have been added to Alternative III to allow consideration of different areas of shooting closures. The analysis of Alternatives I, II, and IV has been revised to note the prohibition on discharge of firearms in present and future developed recreation sites, in accordance with Federal regulation (43 CFR 8365.2-5). Please see Table 2-1, line 173, and Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS for discussion and analysis related to recreation management.
Dylan	Johns	Zone 4 Enterprises	0073-4	Shooting Sports	3. The proposed closure area would force shooters from a safe location with many backstops to a less safe area with fewer safe backstops and more roads and trails.	In response to public concerns regarding shooting sports at Hubbard Mesa, Alternative III in the Proposed RMPA/FSEIS has been revised to include two sub-alternatives, IIIA and IIIB, that propose different areas of shooting closures in the vicinity of developed recreation sites and in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed RMPA/FSEIS for a description of these sub-alternatives and potential impacts on recreation management. The issues raised in your comment have been noted in the Proposed RMPA/FSEIS analysis in Section 4.5.3.4.
Dylan	Johns	Zone 4 Enterprises	0073-5	Shooting Sports	4. Closure would push shooters from safe public land onto private property on Hubbard Mesa and to the southeast of Fravert Reservoir Road.	The issues raised in your comment have been noted in the Proposed RMPA/FSEIS analysis in Section 4.5.3.4.
Dylan	Johns	Zone 4 Enterprises	0073-6	Shooting Sports	5. Federal regulations already prohibit shooting across roads, trails, bodies of water, and toward areas where people are camped, picnicking, or otherwise gathered. Any violations can be easily self-policed by the public and reported to local law enforcement under existing laws.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.

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Dylan	Johns	Zone 4 Enterprises	0073-7	Shooting Sports	6. BLM has not met its own Federal Land Policy and Management Act which requires the agency to perform the required balancing of multiple uses to show, specifically in this case, that the benefit of prohibiting target shooting in the Hubbard Mesa OHV area outweighs the substantial benefits of target shooting to the American people.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. The on-going management process would be undertaken with the goal of allowing use of the Hubbard Mesa Open OHV Area by "the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" in accordance with Federal law (43 CFR 8365.0-2).
Dylan	Johns	Zone 4 Enterprises	0073-8	Shooting Sports	7. In many cases the BLM is justifying its decision to close recreational shooters out of public land because it claims that shooting is a "resource-harming" activity. At the same time, the agency will allow other activities to continue, like camping, mountain biking, off road vehicle use, and grazing that clearly have more impact on the area as a whole.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Management actions related to shooting sports have been included under each alternative in the Proposed RMPA/FSEIS to protect visitor safety by minimizing the potential for accidental shootings, in accordance with Federal regulations (43 CFR 8364.1). Table 2.1, line 173 summarizes these management actions. The impact analysis in Section 4.5 discusses potential indirect impacts to all resources as a result of these management actions.
Dylan	Johns	Zone 4 Enterprises	0073-9	Shooting Sports	8. BLM does not have the staff to enforce any recreational shooting closures, and all enforcement will be placed on local law enforcement. Our local law enforcement is already stretched thin covering the 2,947 square miles in Garfield County. 9. While hunting and firearms for self-protection would still be allowed in the Hubbard Mesa OHV under the this proposed closure, it would set a dangerous precedent for the future of all firearms usage on public lands in the area.	Thank you for your interest in and comments on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.
Dylan	Johns	Zone 4 Enterprises	0073-10	Shooting Sports	10. Public land should be kept open to all recreational activities. Note the BLM motto: Public Lands USA: Use, Share, Appreciate.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Federal regulation directs BLM to manage public lands, including recreation areas, so they "can be used by the maximum number of people with minimum conflict among users and minimum damage to public lands and resources" (43 CFR 8365.0-2). Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.
Aaron	Mattix		0078-1	Shooting Sports	The safest location for shooting is stretch is the north side of the Fravert Res. Rd, from approximately the rc airplane field to the gas handling facility at the Y in the road. The steep cliff band provides a natural backstop, and trail traffic is limited. Ideally, shooting should be limited to this area, as combining open cross-country travel, and open shooting areas can only be an inevitable recipe for disaster.	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title. Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.
Aaron	Mattix		0078-2	Shooting Sports	The North Fruita Desert Special Recreation Management Area provides an excellent example to consider in managing similar challenges.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. The on-going management process could include additional studies and consideration of management models provided by other public recreation areas.
Aaron	Mattix		0078-3	Shooting Sports	Contining to allow unregulated shooting in the area effectively inhibits the freedom of all other users; impinging on its status as an Open OHV area.	Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Susan	Nichols-Alvis	Garfield Area Gun Enthusiasts	0081-2	Shooting Sports	Because they are so quiet, perhaps hikers, joggers and mountain bikers should be required to wear orange reflective gear while enjoying the area. (This is something I do while ATVing during hunting season.) Mountain bikes could be required to have a flag, just as we do while riding sand dunes.	Thank you for your interest in and comments on the Draft RMPA/SEIS. BLM has considered your suggestion for requiring certain recreational users to wear reflective gear while in the Hubbard Mesa Open OHV Riding Area. However, BLM's preference is to recognize that all users of this multiple use area are responsible for their own safety, as well as the safety of others who may be affected by their activities. Target shooters are responsible for ensuring that they shoot safely in the open area, just as they must on all other BLM lands open to shooting, where other users are always a consideration. Therefore, this alternative mitigation measure is not considered in the Proposed RMPA/FSEIS.
Steven	Spevere		0092-1	Shooting Sports	I would like to see BLM enforcing current regulations for firearm safety. I don't feel that closing off any area to shooting is necessary in Hubbard Mesa. I do think that there needs to be signage, stating that the area is multiuse and firearms need to be discharged in a manner which does not impact other recreational users.	Thank you for your interest in and comment on the Draft RMPA/SEIS. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. The on-going management process could include consideration of additional signage and other methods to educate users of the Hubbard Mesa Open OHV Area.
Sean	Strode	RAMBO	0093-1	Shooting Sports	This letter is in reference to the open comment period for the draft SEIS in regards to the Hubbard Mesa OHV recreation area. I am suggesting that BLM close the entire OHV area to shooting. With the topics of conflict, outreach, and education, I hope you will see my side of the perspective.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Alternative III has been revised in the Proposed RMPA/FSEIS to consider two sub-alternatives, Alternatives IIIA and IIIB. Alternative IIIB includes closure of the entire Hubbard Mesa Open OHV Area to recreational target shooting. Please see Table 2-1, line 173, for a description of this alternative and Section 4.5.3.4 for analysis of the potential impacts of this alternative.
Sean	Strode	RAMBO	0093-2	Shooting Sports	The only conflict that exists is with negligent shooters (which is a small, but impactful group), and people who litter. Closing the area to all shooters will negate negligent shooters.	Thank you for your interest in and comments on the Draft RMPA/SEIS. Alternative III has been revised in the Proposed RMPA/FSEIS to consider two sub-alternatives, Alternatives IIIA and IIIB. Alternative IIIB includes closure of the entire Hubbard Mesa Open OHV Area to recreational target shooting. Please see Table 2-1, line 173, for a description of this alternative and Section 4.5.3.4 for analysis of the potential impacts of this alternative.
Sean	Strode	RAMBO	0093-5	Shooting Sports	I feel that shooters have rights, and those rights should be respected. The first two miles, on the north side of the JQS road, should be a recommended shooting area due to the safe backdrop.	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title.
Becky	Tedrow		0095-1	Shooting Sports	Who ever thought this would be better? We are already used to the target shooting along the bottom of the main road. The shooters are easy to see and hear. By leaving these already popular areas available to shooting it is actually safer. It also concentrates the trash. Think of the remote pockets of trash that would be created if target shooting is restricted to areas away from the main road. If target shooting is encouraged on the rest of the largely open areas up there it puts motorcycle riders, bicycle riders, and hikers, to name a few, at risk. There are many trails out there. We don't need shooters to be shooting over single track trails or small road trails and run the risk of the surprise jogger or bike rider. No. Leave the target shooting to the main areas already established along the main road.	Thank you for your interest in and comments on the Draft RMPA/SEIS. In response to public concerns regarding shooting sports at Hubbard Mesa, Alternative III in the Proposed RMPA/FSEIS has been revised to include two sub-alternatives, IIIA and IIIB, that propose different areas of shooting closures in the vicinity of developed recreation sites and in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, and Section 4.5.3.4 in the Proposed RMPA/FSEIS for a description of these sub-alternatives and potential impacts on recreation management. The issues raised in your comment have been noted in the Proposed RMPA/FSEIS analysis in Section 4.5.3.4. The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kathy	Exline		0096-1	Shooting Sports	I do feel there is an error in your analysis. The idea that by restricting the outdoor activities of some will help us all get along better is wrong. We as a people do not enjoy (or are more compatable with) each other if some are restricted and some are not.	Thank you for your interest in and comment on the Roan Plateau Draft RMPA/SEIS. The analysis of all alternatives has been revised in the Proposed RMPA/FSEIS to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components.
Kathy	Exline		0096-2	Shooting Sports	I would like to clarify: the land used most often for target shooting has the best backstops and this is the land where most people target shoot. Why restrict the best location for this particular recreation?	Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components to minimize user conflicts in the Hubbard Mesa Open OHV Area. Please see Table 2.1, line 173, for a description of these management components and Section 4.5 for discussions of potential impacts to all resources under each alternative as a result of these management components. The issues raised in your comment have been noted in the Proposed RMPA/FSEIS analysis in Section 4.5.3.4.
Kathy	Exline		0096-3	Shooting Sports	An effective consideration, would minimized risk to all, could be to start bicycle trailheads just past the OHV parking. There is a place for all on Public Lands.	The analysis of all alternatives has been revised to note that BLM would continue to address concerns surrounding recreational target shooting through existing partnerships with the Town of Rifle, Garfield County, and users of public lands; visitor information and education; and enforcement of existing regulations. See Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, and 4.5.3.5 of the Proposed RMPA/FSEIS. Additional measures to minimize user conflicts could be considered as part of this on-going management process. BLM does not designate trails or areas for particular uses in open OHV areas. Section 3.5.3.3 of the Proposed RMPA/FSEIS has been revised to note that many mapped and unsigned cross-country trails exist in the Hubbard Mesa area. All public lands are required to have OHV area designations (43 CFR Section 8342.1). Areas must be designated as open, limited, or closed to motorized travel activities as defined in 43 CFR Section 8340.0-5, (f), (g), and (h) respectively. Hubbard Mesa is designated as Open to OHV travel in Alternatives II, III, and IV. The Open designation means an area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards. the delineation of Travel Management Areas (TMAs) addresses other modes of travel not covered by OHV area designations (43 CFR Section 8432.1). The Hubbard Mesa TMA delineation allows muscle-powered travel and mechanized (wheel conveyance) travel cross-country year-round consistent with the Open OHV designation for motorized travel.
Amy	Wittenberg		0102-1	Shooting Sports	It would be so much safer if there was designated shooting areas. I don't bring my kids with me mtn biking there anymore for their safety!	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. Alternatives I through IV in the Proposed RMPA/FSEIS present and consider a range of management components related to shooting sports in order to minimize user conflicts in recreation areas, specifically the Hubbard Mesa Open OVH Area. Please see Table 2-1, line 173, for a description of these management components and Section 4.5 for a discussion of potential impacts on recreation management.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Amy	Shipley		0104-1	Shooting Sports	Please make the areas designated in the attached map open shooting areas. Please designate the rest of the OHV as off limits to shooting. In addition, please enforce laws related to shooting on public lands by ticketing offenders and holding them accountable for their actions. Does someone need to die or be injured before this issue will be taken seriously?	As noted in Section 3.5.3.6 of the Proposed RMPA/FSEIS, BLM policy does not allow for designation of shooting areas on public lands, due to concerns about lead contamination. BLM Instruction Memorandum No. 2008-074 explains BLM's policy for allocating designated target shooting areas through direct sale under Section 203 of the Federal Land Policy and Management Act or through Recreation and Public Purposes Act Patents, which transfer responsibility for remediation to the holder of the property title. Alternatives I through IV in the Proposed Plan/FSEIS present and consider a range of management components for shooting sports, particularly in the Hubbard Mesa Open OHV Area. Please see Table 2-1, line 173, for descriptions of these management components and Section 4.5 for a discussion of potential impacts under each alternative.
Rose	Pugliese	Mesa County	0033-2	Socioeconomics	However, the DSEIS consistently understates the socio-economic differences between the No Action and Proposed Action alternatives. The DSEIS socio-economic impact analysis regards revenue from local sales and use tax as insignificant by attributing it only to workers' spending on taxable goods. Mesa County is home to most of the oil and gas service companies and associated businesses in the region. Such businesses pay significant sales and use taxes for equipment purchases, operations, maintenance, and other purchases from Mesa County vendors. The Final SEIS should include a rigorous analysis of revenue from sales and use taxes paid by oil and gas industry.	The impact to Mesa County fiscal conditions because of use taxes under any alternative is small and was therefore omitted from economic analysis in the FSEIS. An estimate of those amounts is as follows: Total oil and gas industry sales and use tax revenue to Mesa County government in 2012 was estimated to have been about $2 million, or about 2 percent of total general fund revenue in Table 6 (Wobbekind et al. 2014)*. This source is the most readily accessed estimate of that revenue, as it is an industry-commissioned study. Total oil and gas industry employment was about 4,000 in 2012, as shown in Table 3.4.16 of the Proposed RMPA/FSEIS. This equates to about $500 in use tax revenue per job, with jobs acting as a proxy or index for level and change in economic and fiscal activity from the alternatives. Using total oil and gas employment impact predictions for Mesa County, by alternative, from Table 4.4.17 of the Proposed RMPA/FSEIS, the predicted incremental use tax to Mesa County would be approximately $120,000 per year under Alternative I; $266,000 per year under Alternative II; $158,000 per year under Alternative III; and $176,000 per year under Alternative IV. Given the similarity in the order of magnitude among these figures, it was concluded that a more rigorous analysis is not required in order to compare socioeconomic impacts among alternatives. [*Wobbekind, R., B. Lewandoski, and E. Chung. 2014. Oil and Gas Industry Economic and Fiscal Contributions in Colorado by County, 2008–2012. Prepared for The American Petroleum Institute. Prepared by Business Research Division, Leeds School of Business, University of Colorado Boulder. May. Available: <http://www.api.org/~/media/files/news/2014/14-october/colorado-api-economic-impact-study.pdf.]
Rose	Pugliese	Mesa County	0033-3	Socioeconomics	Specifically we recommend that the Public Revenues sections of the Final SEIS reflect the following comments/concerns: 1. The $26.9M in sales tax for Mesa County should be bumped up to include use tax as well, since use tax is also driven by new jobs. The total should be $29.8M. (Table 4.4.31) 2. The analysis defines sales tax effects as only indirect effects. Since oil and gas bring in direct sales tax ($780K for Mesa County in 2015), the analysis should also include direct sales tax effects. 3. The DSEIS does not estimate the increase in Mesa County property taxes that would come from employees living in Mesa County.	Local revenue based on sales for Mesa County is shown in Table 4.4.31 in the Draft RMPA/SEIS. Mesa County data in Table 4.4.31 is from the Mesa County 2013 Comprehensive Annual Financial Report.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Doug	Dennison	Bill Barrett Corporation	0035-21	Socioeconomics	The socio-economics analysis may have underestimated the potential employment, wages, taxes, etc. under Alternative IV since the number of wells that could be drilled is underestimated.	The number of wells is an estimate based on the BLM Reasonable Foreseeable Development (RFD). The BLM developed the RFD with the expertise of geologists, market considerations, and input from industry and believes these estimates to be reasonable for analysis. It provides the interdisciplinary planning team with an estimate of the oil and gas development activities that are reasonably likely to occur on BLM-administered lands within the Roan Plateau Planning Area over the next 20 years. As such, it is neither a cap, nor a limitation to the number of wells, that can be developed within the Planning Area. As described in the RFD Appendix G to the Proposed RMPA/FSEIS, "A RFD is a long-term scenario used as a baseline for adjusting the projected amount of oil and gas activity for each alternative in the Draft Resource Management Plan. It is not a decision and does not authorize or approve any development." The following is from Section 4.1.1.1 in the Proposed RMPA/FSEIS: "The RFD is intended as a technical and scientific approximation of anticipated levels of oil and gas development during the planning timeframe. As such, the RFD and the planning process, of which it is a part, are not intended to define the specific numbers and locations of wells and pads needed to develop the oil and gas resource. Instead, they are intended to allow flexibility during resource development while providing sufficient specificity to support the impact analysis and alternative selection processes."
Michael S	Freeman	Earthjustice	0036-23	Special Status Species	BLM should not only reference the data and management from the final documents, but ensure that the decisions in the Roan EIS are consistent with those provisions across all activities managed by this plan amendment, including incorporating mitigation and adaptive management processes set out in the ROD and Approved LUPA.	The Proposed RMPA/FSEIS is consistent with the greater sage-grouse Record of Decision and Approved LUPA.
Kathleen	Sgamma	Western Energy Alliance	0039-10	Special Status Species	The settlement agreement provided that the RMPA would address efforts to mitigate impacts to the Greater Sage-Grouse (GrSG) under the associated Northwest Colorado Land Use Plan Amendment (LUPA). Although the Preferred Alternative adopts planning tools and restrictions according to the finalized LUPA, it should also clarify that these restrictions cannot be applied retroactively to valid existing leases.	As stated in Chapter 2, Section 2.2, existing stipulations for existing oil and gas leases would apply to those leases. New stipulations would apply only to lands leased pursuant to the Record of Decision (ROD) that results from this NEPA process. This may, however, require modification of leases issued in 2008 to achieve conformity with the planning decision (see Section 1.3.7.3). COAs equivalent to stipulations developed through this RMPA could be applied to development on pre-2008 leases, to the extent that they do not conflict with existing lease terms.
Leslie	Robinson	Grand Valley Citizens Alliance	0040-1	Special Status Species	The development of O&G on private property situated on the Roan Plateau and below the rim are placed in areas sensitive to wildlife habitat for the Mexican Spotted owl and the native Brown trout, as examples. More O&G production on BLM land adjacent to those areas could have a negative cumulative effect on wildlife, especially in the winter. We recommend more wildlife study is needed before O&G drilling occurs on BLM land on the Roan Plateau.	The Proposed RMPA/FSEIS took into account development on private lands in the sections in Chapter 4 on cumulative impacts.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kent	Rider	WPX Energy	0103-27	Special Status Species	To the extent that it would not conflict with the requirements of the Settlement Agreement, WPX is opposed to the addition of restrictions for special status plants protection as proposed in Alternative IV. Rather, WPX supports the habitat for special status plant species populations and significant plant communities identified in Alternative II as referenced in the map in Appendix C (C2-38). WPX believes this is an example of where the SEIS process has gone beyond what is required by the Judicial Order remand and the Settlement Agreement. WPX requests that the BLM provide evidence that this greater restriction is the result of new information or changed circumstances that may result in significantly different environmental effects, as stated in the Settlement Agreement. BLM should acknowledge that advancements in directional drilling and use of multi-well pads have resulted in a significantly reduced surface disturbance. These arguments should be recognized given WPX's ability to utilize and directionally drill from existing well pads located on adjacent leases to access most of its 2008 base lease.	In accordance with BLM's NEPA Handbook H 1790-1 (BLM 2008c), BLM must address significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its effects (40 CFR 1502.9(c)(1)(ii)). New circumstances and information integrated into the Proposed RMPA/FSEIS include changes in special status plant designations that have occurred since the completion of the FEIS. Two species, DeBeque phacelia (*Phacelia submutica*) and Parachute penstemon (*Penstemon debilis*), were candidate species for Federal listing under the Endangered Species Act (ESA) during the original analysis. Both of these species were listed as threatened by the U.S. Fish and Wildlife Service (USFWS) in 2011 (USFWS 2011), and Critical Habitat for both species was designated by the USFWS in 2012 (USFWS 2012). Critical habitat for Parachute penstemon was designated within the Planning Area, and includes a 1-kilometer buffer around known populations of this species. • Under Alternative IV, the Proposed Plan, GS-CSU-Roan-12: Habitat for special status plant species populations and significant plant communities (Appendix C, page C4-41) is reflective of 2007 ROD/lease mapping, per the terms of Settlement Agreement. • Under Alternative II, CRVFO-CSU-Roan-12: Habitat for special status plant species populations and significant plant communities (Appendix C, page C2-38) is reflective of this new information and shows a reduced area of special status plant habitat relative to the Proposed Plan/FEIS, because of the shift of classification from "special status species habitat" to "designated Critical Habitat for a T&E species". • Per Alternative IV, the Proposed Plan (Settlement Alternative), leases would be managed with stipulations reflective of what was attached to leases in 2008, even if there is new information. • The Proposed RMPA/FSEIS has been revised to clarify that GS-NSO-Roan 24: Threatened, Endangered, or Candidate Species Habitat would not apply to designated Critical Habitat under Alternative IV, the Proposed Plan (Settlement Alternative), except where it applied under the 2007 ROD. However, the ESA still applies and BLM will fulfill its Section 7 consultation obligations. • Finally, a note has been added to Appendix C in the Proposed RMPA/FSEIS to explain the apparent contradiction between the wording of GS-NSO-Roan 24 and the illustrative map on page C4-34.
Janice	Shepherd		0022-4	T&E Species	On page 3-93 there is a description of the distressing reduction in the population of Parachute penstemon on the upper slopes near the Anvil Points Road. The analysis does not consider the possibility of acidic run-off from snowmobile pollutants left in the snowpack above the plants. Yet studies have shown that soil acidity can have a large impact on plants Foy CD. 1992. "Soil chemical factors limiting plant root growth. In: Hatfield JL, Stewart BA, eds. Limitations to plant root growth. New York: Springer-Verlag, 97-149."	The declining status of the referenced Parachute penstemon population has been known and followed for numerous years by BLM. Several factors for this decline have been hypothesized and studied by specialists. These are incorporated by reference in the Proposed RMPA/FSEIS, Section 3.3.3.2. Potential negative impacts from acidic run-off from snowmobile use in the area have not been suggested by these specialists as a potential factor in this population decline. Therefore, while the analysis of potential impacts to Parachute penstemon from alternative management actions in the Proposed RMPA/FSEIS considers a large number of potential factors, this specific analysis was not included. BLM does not have the means to quantify potential deposition of polycyclic aromatic hydrocarbon (PAH) and/or snowmelt acidification from snowmobile use or apply potential exposure of Parachute penstemon plants to these constituents.
Michael S	Freeman	Earthjustice	0036-9	T&E Species	Motorized travel and recreation on the Plateau will have adverse impacts on these special status plants and significant plant communities. To help minimize those impacts, we recommend providing an additional layer of protection for these plants by managing some of their locations for preservation of wilderness character. Doing so should help minimize or avoid dust and disturbance from roads and off-road motorized traffic.	Threatened, Endangered, and Candidate species, as well as BLM special status species, are protected by an NGD/NSO for occupied and Critical Habitat, and an SSR/CSU for sensitive plant species populations and significant plant communities. Impacts are described in Chapter 4, Section 4.3.3. Management of LWCs is analyzed in Chapter 4, Section 4.5.8.

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Doug	Dennison	Bill Barrett Corporation	0035-22	Transportation	Section 4.5.2.5 should reiterate that oil and gas traffic will not generally use Cow Creek or Rim Road for access and that the area to be developed is largely not currently accessible to the public via roads from the east, due to intervening private inholdings.	Although the referenced section (Section 4.5.2.5) specifically addresses Travel Management impacts, the reader is correct in pointing out that oil and gas development traffic under Settlement Alternative would use existing private development roads to access the proposed "settlement leases" from the west. As stated in Section 4.4.4.5 of the Proposed RMPA/FSEIS under Transportation impact section: "Under the terms of the Settlement Agreement, primary access above the rim would be limited to designated roads, subject to BLM's onsite inspection and approval. Operators would not use Cow Creek Road or Rim Road east of the retained leases for access, except in emergencies. This restriction would require contractual access across private land/roads from the south or west."
Mike	Pritchard	RFMBA - IMBA	0037-6	Transportation	Appendix F, Lands with Wilderness Characteristics. Recreation and Visitor Services Management, Comprehensive Trails and Travel Management. Mechanized use is an appropriate, quiet, human powered form of recreation when planned sensitively and managed to limit impacts during critical wildlife seasons. Language that conflates Motorized use with Mechanized use should be revised to maintain a clear distinction between these use types given the greatly differing impacts of each use type. While mechanized use may not be emphasized on these lands, a de facto prohibition on mechanized use should not be pursued; mountain bikers desire to experience the very same public land wilderness characteristics that are sought by those who choose to hike historic trails, camp in a beautiful setting, rock climb a natural cliff face, explore a cave, fish for trout in a wild stream, hunt big game, trap small animals or collect minerals as a hobby.	It is within BLM's allowable discretion to determine type of motorized and mechanized travel that would be authorized within lands managed for wilderness characteristics, at the implementation level. At that time, a number of best management practices to enhance and protect wilderness characteristics would be applied, as stated in Appendix F of the Proposed RMPA/FSEIS. These could include making a distinction between types of allowable mechanized and/or motorized vehicles, as well as allowable routes and off-route authorizations/restrictions. This is analyzed for Alternative III of the Proposed RMPA/FSEIS in Chapter 4, Section 4.5.8.
Janice	Shepherd		0022-2	Travel Management	Map 36, by the way, needs correcting to show that the area of Cross Country Snow Machine travel would be smaller under Alternative III because of the presence of the LWCs. Other text in chapter 2 should also be corrected to show to mention over-snow travel is prohibited within the proposed LWCs.	Map 36 in the Proposed RMPA/FSEIS was clarified to better illustrate the areas closed to over-snow travel. The Proposed RMPA/FSEIS includes an analysis of over-snow travel in Chapter 4, Section 4.5.8, Alternative III.
Mike	Pritchard	RFMBA - IMBA	0037-4	Travel Management	Travel Management Areas / Routes. Map 30 (All Action Alternative Transportation and Travel Management) does not indicate for routes open to Mechanized use. While mountain bikers expect to have access to "Full Sized Vehicle" routes, the recreational experience most riders desire is provided via singletrack trails. Simply put, there may be a number of routes labeled as "Foot and Horse Trail" that should be open to mechanized use. We request that the BLM be open and willing to work with RFMBA, IMBA, and/or RAMBO on revising travel management designations if such routes are identified as high value for mechanized use in the future.	The Roan Plateau across all alternatives is managed as undesignated for recreation management. The area is not managed to emphasize mountain biking and the Roan Plateau Planning Area TMA is limited to designated routes year round, except in the Hubbard Mesa Open OHV Area. However, new routes may be considered during implementation of an approved management plan. Any decision on a proposed new route would be based on management actions and allowable uses in the approved land use plan.
Mike	Pritchard	RFMBA - IMBA	0037-5	Travel Management	Areas of Critical Environmental Concern should not prohibit mechanized use on specified routes, nor limit the ability for BLM to plan, study, approve, and manage for future mechanized use within these designated areas. Mechanized use can be an appropriate, quiet, human powered form of recreation when planned sensitively and managed to limit impacts during critical wildlife seasons.	Management prescriptions for ACECs under the Proposed RMPA/FSEIS do not prohibit mechanized use on specified routes. However, new routes and allowable uses may be considered during implementation of the approved plan. Any decision on a proposed new route would be based on management actions and allowable uses for the ACECs identified in the approved land use plan.
Mike	Pritchard	RFMBA - IMBA	0037-7	Travel Management	Routes / Areas open to Cross Country Snow Travel. Where snowmobiles are allowed, it is appropriate to also allow for Mechanized use by Fat Bikes, which are mountain bikes specifically designed for over-the-snow travel.	As noted in Chapter 2, "Outside Hubbard Mesa, motorized travel within the Planning Area would be limited to designated routes, except for over-snow travel by snowmobiles when the depth of snow cover is at least 12 inches." BLM's intent in limiting over-snow travel to snowmobiles is to ensure that properly tracked vehicles with the ability to float are used. Other vehicles, such as bicycles, are free to use designated routes during times when snow is on the ground.

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Doug	Dennison	Bill Barrett Corporation	0035-20	Visual Resources	Table 4.4.3 - the number of pads visible in the close range from I-70 for Alternative IV does not appear to be consistent with the analysis documented in Section 4.4.1.5, Tables 4.4.1 and 4.4.2, or Maps 26 and 27. These latter portions of the document correctly indicate that little or no oil and gas development would be visible in the close range or near foreground.	Table 4.4.3 was revised for clarity in the Proposed RMPA/FSEIS.
Kent	Rider	WPX Energy	0103-31	Visual Resources	Appendix D: Visual Resource Management Classes and Objectives states that the visual contrast rating system described in BLM Manual 8400 will be used, where appropriate, in assessing proposals for projects on public lands or private lands with federal subsurface mineral rights. BLM Manual 8400 does not prescribe the use of BLM VRM methodology for private land; in fact, it consistently states that VRM objectives, responsibilities, and policy apply specifically to public land. Any visual resource or aesthetics management on private land falls under the sole jurisdiction of private landowners and the county.	BLM will follow BLM Manual 8400, Visual Resource Management, in assessing impacts to visual resources both on public and private lands where there is Federal nexus. BLM must fulfill its obligation to analyze the impacts. An RMP does not apply to non-Federal lands, including non-Federal surface estates over Federal minerals ('split-estate' lands). The RMP does apply to the Federal mineral estate. As owner of the dominant mineral estate, the United States has both the right to authorize its lessees and their operators to use the non-Federal surface to access the Federal minerals, and the obligation to prevent unreasonable damage to the surface estate. Accordingly, BLM's oil and gas operating regulations apply to facilities and activities on split-estate lands. The BLM's Onshore Oil and Gas Order No. 1 requires operators to make good-faith efforts to reach a surface use agreement with the surface owner. The BLM tries to accommodate the needs of the surface owner, but does not impose permit conditions on split-estates that exceed those applicable on wholly Federal lands. (See The Gold Book, p. 12.) The lease stipulations required by the RMP for particular Federal lands within its scope apply on both wholly Federal lands and split-estate lands, unless the RMP otherwise specifies.
Janice	Shepherd		0022-16	Water Resources	There is no map in the document of the proposed "Parachute Creek Watershed Management Area". How can analysis of the environmental impacts be undertaken without a map of this important proposed WMA? The public comment on the plan will also be compromised without a map of the WMA. The description of the area is given on page 2-14 "The entire area atop the plateau, excluding a minor portion draining northward into the Piceance Creek basin, would be designated as the Parachute Creek WMA, with a total area of 33,010 acres." It might be argued that the description given on page 2-14 is sufficient to guess what parts of the Planning area are included in the WMA, except that the description has a vague reference to an area being excluded. Everyone's analysis of the benefit of the WMA and of the possible need to protect that excluded area will be compromised without access to a map that shows the WMA.	The Parachute Creek Watershed Management Area (WMA) is included in Alternatives II and IV in the Proposed RMPA/FSEIS. Specific management goals, objectives, and management actions for the WMA are detailed in Table 2.3. The area of the WMA under Alternative II would be 33,010 acres. This area is protected by CRVFO-CSU-Roan 13, shown integrated into the stipulations illustrated on Map 5, as well as the parallel surface use restriction, illustrated in Map 4. Specific management restrictions entailed in this stipulation are detailed on page C2-17. The specific area covered by this CSU under Alternative II is shown on page C2-43. This area, and the specific management under this stipulation are included throughout the impact analysis for Alternative II. The area of the WMA under Alternative IV would be 4,450 acres. This reduction in size under Alternative IV is due to the fact that most of the WMA would be closed to leasing under this alternative. This area is protected by CRVFO-CSU-Roan 13, shown integrated into the stipulations illustrated on Map 11. Specific management restrictions entailed in this stipulation are detailed on page C4-18. The specific area covered by this CSU under Alternative IV is shown on page C4-46. This area, and the specific management under this stipulation are included throughout the impact analysis for Alternative IV.
Janice	Shepherd		0022-17	Water Resources	Further, misleading information in Chapter 2 may have impacted the analysis in Chapter 4. Specifically on page 2-45 the text under Alternative II states "Within the WMA, prevent disruption, alteration, or interruption of surface and subsurface water flows that support rare and/or significant natural plant communities. Implement WMA management prescriptions, as detailed in Table 2.3. " Under Alternative III and IV the text is "Same as Alternative II". Thus someone reading that section might have believed that the WMA management would be the same in Alternatives II, III and IV when Alternative III does not include the WMA.	Table 2.1 in the Proposed RMPA/FSEIS has been updated to clarify this point. It is important to note that a WMA is not a component of Alternative III.
Janice	Shepherd		0022-18	Water Resources	This implication that Alternative III contains the WMA is repeated in several places in Chapter 2 and is thus confusing to the reader, especially when a map is not provided that clearly shows the WMA is in Alternatives II and IV but not in Alternative III.	Table 2.1 in the Proposed RMPA/FSEIS has been updated. It is important to note that a WMA is not a component of Alternative III.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Philip	Strobel	Environmental Protection Agency - Region 8	0054-1	Water Resources	The FEIS states that the chemistry of many groundwater sources both atop and below the rim are not of drinking water quality, and/or are not known to contain significant useable water-bearing zones (pgs. 3-34 to 3-37 and 4-39 to 4-40). This is confusing because most of the groundwater resources identified in the Proposed RMPA/FSEIS do meet the BLM definition of usable water under Onshore Order No.2, which are those waters containing up to 10,000 ppm of total dissolved solids which must be reported, protected and/or isolated under Onshore Order 2. Under the Safe Drinking Water Act (SDWA), these aquifers are also considered Underground Sources of Drinking Water (USDW) if their total dissolved solids (TDS) concentrations are less than or equal to 10,000 mg/L. As such, these USDWs are subject to protection during injection activity under the SDWA unless an aquifer exemption has been granted. Therefore, we recommend identifying all groundwater sources that qualify as usable water as defined by Onshore Order No. 2 and USDW as defined by SDWA.	The text has been revised based on this comment in Chapter 3, Section 3.2.4.2 and in Chapter 4, Section 4.2.4.1 of the Proposed RMPA/FSEIS. Four water-bearing zones are identified. The water quality of samples collected from the zones is discussed, including meeting drinking water standards with a few exceptions. However, it is noted that, "Waters with dissolved solids concentrations in excess of 1,000 mg/L are not freshwater; more than 500 mg/L of dissolved solids is undesirable for drinking purposes." Appendix B of the Proposed RMPA/FSEIS (Information Related to Oil and Gas Leasing, Permitting, and Development: Typical Oil and Gas Operations) addresses properly setting and cementing surface casing to protect aquifers from contamination by drilling and production operations, stating that minimum standards and enforcement provisions are part of Onshore Order No. 2. Best management practices for preventing the degradation of groundwater are also noted in Appendix H of the Proposed RMPA/FSEIS. During site-specific permitting and in accordance with the Safe Drinking Water Act, an assessment of usable water(s) is completed and practices are applied to protect the identified usable water(s).
Philip	Strobel	Environmental Protection Agency - Region 8	0054-2	Water Resources	Because of these findings, we recommend inclusion of a comprehensive geologic map, demonstrating the orientation, distribution, and density of faults and fractures in the study area. These maps can help guide well placement or identify where additional measures may be necessary to protect groundwater resources (i.e., in areas of high fracture density, zones containing conjugate or bimodal fracture sets, or faults). Protection of seeps, springs, wetlands and other surface waters is dependent not only on protection from surface-disturbances, but also on protection against groundwater contamination. We recommend including in the Final EIS a discussion on the protective measures for groundwater that will be required for this project. These measures are particularly important where geologic structures or deep aquifers under artesian pressure (i.e., Williams Fork) are likely to increase communication with deeper fluids that may become contaminated by drilling and completion activities, and in areas where groundwater supports seeps or springs which contribute to perennial springs containing CRCT habitat. We also recommend including well bore diagrams depicting cement and casing requirements that will be implemented to protect groundwater sources in the project area.	BLM has determined that the inclusion of a comprehensive geologic map would not provide useful information or insight into the analysis of potential impacts in this programmatic document. Instead, such information may appropriately guide well placement or necessary measures for protecting groundwater resources when site-specific projects are analyzed for a Master Development Plan or Application for Permit to Drill. At the site-specific stage of permitting, appropriate mitigation measures are required during well development to minimize potential adverse impacts. Appendix B of the Proposed RMPA/FSEIS (Information Related to Oil and Gas Leasing, Permitting, and Development: Typical Oil and Gas Operations) discusses properly setting and cementing surface casing to protect aquifers from contamination by drilling and production operations, stating that minimum standards and enforcement provisions are part of Onshore Order No. 2. The water resources analysis (Section 4.2.4) assumes that oil and gas operators will comply with all local, state, and Federal laws and regulations, especially as they relate to state and Federal groundwater protection, storm water, and 404 permitting. The analysis also assumes that appropriate best management practices listed in Appendix H would be implemented for all ground-disturbing activities under the Action Alternatives, as appropriate to individual projects. These would include casing, cementing, and well-monitoring requirements under COGCC rules, BLM regulations including the Onshore Orders, Standard Operating Procedures, best management practices, and conditions of approval issued by the BLM. The inclusion of a well bore diagram would not provide useful information or insight into the analysis of potential impacts in this programmatic document, but would apply to a site-specific analysis.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-3	Water Resources	We recommend that the Final EIS identify where existing groundwater monitoring wells are located and consider inclusion of new dedicated groundwater monitoring wells where appropriate to detect spill events in remote or sensitive areas which otherwise may go undetected until significant impacts have already occurred. Groundwater monitoring wells should be located both up and down- gradient of production or injection wells to identify contamination before impacts to USDW or groundwater supported springs, seeps or CRCT habitat become significant. This is particularly important for retained leases under the Settlement Agreement, in those portions of the leases that overlap with the natural recharge area of the Piceance Basin as displayed in Maps 11 and 18. Please clarify whether or not any groundwater-specific monitoring programs will be required.	All known wells and their classification, according to the Colorado State Engineers Office, are described in Chapter 3, Section 3.2.4.2 and maps are included in Appendix A. As noted in Section 2, under Alternatives II and IV, baseline water quality data and a monitoring program would be established for drainages prior to allowing surface-disturbing activities, disturbance-related water quality changes would be assessed, and mitigation measures would be identified and implemented to meet water-quality standards as needed. In addition, as the approved RMPA is being implemented, BLM would monitor and evaluate how well the plan is guiding the Planning Area toward desired or acceptable resource conditions. If management issues are not being resolved or suitable conditions are not being met, the RMPA may be further amended or revised within the constraints of valid existing rights (Section 1.6).

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Philip	Strobel	Environmental Protection Agency - Region 8	0054-5	Water Resources	The EPA recommends identifying how much (if any) of this freshwater use is expected to come from groundwater. Consider discussing the maximum groundwater drawdown that seeps and springs can tolerate before negative impacts develop. Please also consider timing limitations for groundwater use to minimize impacts to wetlands, seeps, and springs, particularly those that support perennial streams with populations of CRCT.	Because the Proposed RMPA/FSEIS is a planning-level document, the BLM cannot determine what portion of estimated water depletions under Alternative IV, the Preferred Alternative, would be derived from specific groundwater sources. Project specific, on-site evaluations of existing seeps and springs would be conducted during the Master Development Plan or Application for Permit to Drill process. Streams, riparian areas, and wetlands are protected under Alternative IV by NGD/NSO and SSR/CSU protections.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-6	Water Resources	Page 4-107 of the Draft SEIS states that a large number of riparian/wetland areas would be expected to return to PFC over time, resulting in tolerate beneficial impacts within the Planning Area. Please clarify whether return to PFC means there is an anticipated recovery from current status as a result of development under Alternative 4, or that impacts as a result of development will eventually be returned to PFC.	This excerpt is under the “Upland Vegetation and Riparian/Wetland Areas Management” subsection (4.3.1). As such, this statement refers to management actions for riparian/wetland areas that, when implemented, would result in returning areas to PFC. The following subsections specifically address oil and gas leasing and development, grazing and rangeland management, etc.
Philip	Strobel	Environmental Protection Agency - Region 8	0054-7	Water Resources	A number of streams in the planning area fall into Colorado's Integrated Report Categories 2 and 3 (insufficient data to determine if designated uses are being met). We recommend attempting to fill in these water quality data gaps. For example, operators could work with the United States Geological Survey to reopen some existing monitoring stations that had provided data through the 1980s (assuming the stations are still there but have been shut down). More recent monitoring data would help CDPHE determine water quality status for some of these streams. Given the sensitivity and high-quality of these resources, we recommend a specific commitment to monitor water quality on a regular basis, perhaps quarterly (pre-construction for baseline conditions, as well as during operations).	As noted in Section 2, under Alternatives II and IV, baseline water quality data and a monitoring program would be established for drainages prior to allowing surface-disturbing activities, disturbance-related water quality changes would be assessed, and mitigation measures would be identified and implemented to meet water-quality standards as needed. In addition, as the approved RMPA is being implemented, BLM would monitor and evaluate how well the plan is guiding the Planning Area toward desired or acceptable resource conditions. If management issues are not being resolved or suitable conditions are not being met, the RMPA may be further amended or revised within the constraints of valid existing rights (Section 1.6). Specific requirements for surface water monitoring would be determined during the Master Development Plan or Application for Permit to Drill process, based on the specific proposal.
Jeff	Thompson		0097-3	Water Resources	3) With respect to impacts to water resources, I request the summary section include cumulative impacts on the Colorado River and Colorado River Basin, which would include impacts to water quality and impacts to water quantity. I believe oil and gas operations would permanently remove a large quantity of water from the basin, and remove that quantity of water from the earth's hydrologic cycle.	The Proposed RMPA/FSEIS Executive Summary summarizes impacts for all resources, including oil and gas. Additional site and project-specific analysis will be conducted during the Master Development Plan or Application for Permit to Drill process. Cumulative impacts to the Colorado River and Colorado River Basin from oil and gas development are discussed in Section 4.2.4 - Water Resources under Offsite and Cumulative Impacts for each alternative. Irreversible and irretrievable commitments of resources are evaluated in Section 4.6.
Kent	Rider	WPX Energy	0103-23	Water Resources	Up to 100 cubic yards of cuttings (for an 8,000-foot-deep well and a 7.875-inch gauge bore) may be left in mud pits at each drill pad per well drilled. In our experience, the actual volume of cuttings generated per well of these dimensions is closer to 600 cubic yards. Also, it is now not accurate to consider the pits 'mud pits' as most operators are using closed-loop drilling systems to recycle mud before it goes to the pit.	Alternative IV, the Settlement Alternative, is the only alternative that specifies that closed loop drilling be used. As stated in the Executive Summary, “much of this Proposed RMPA/FSEIS integrates the language and analyses of the original RMPA/EIS process. This Proposed RMPA/FSEIS is updated to reflect supplemental analyses required by the Judicial Order, any new significant resource information, and revised maps and tables.” As such, the paragraph from which the text is quoted has been revised to, “Drill cuttings, including rock fragments and unsalvaged mud, typically are not removed from the site. This analysis has assumed that up to 100 cubic yards of cuttings (for an 8,000-foot-deep well and a 7.875-inch gauge bore) may be left in pits at each drill pad per well drilled; however, operator experiences may vary, and the volume of cuttings generated may be closer to 600 cubic yards. The pits have typically been unlined, 8 to 10 feet deep, and backfilled with the excavated soil and subsoil material after drilling is completed. The COGCC has developed a Notice to Operators that includes new design requirements for pits, including liners and base compaction and conductivity, which would reduce impacts to the surrounding environment.”
Kent	Rider	WPX Energy	0103-24	Water Resources	While disposal of produced water by underground injection is common in some regions, it is not common in the Roan Plateau area, and the BLM has not approved any injection wells in the Planning Area. Current practice does not support this statement as WPX operates multiple produced water injection wells, including several within the RPPA, some of which are approved by BLM.	As stated in the Executive Summary, “much of this Proposed RMPA/FSEIS integrates the language and analyses of the original RMPA/EIS process. This Proposed RMPA/FSEIS is updated to reflect supplemental analyses required by the Judicial Order, any new significant resource information, and revised maps and tables.” As such, the quoted text has been revised to, "In the State of Colorado, produced water may be treated, disposed, reused and recycled, or used for mitigation purposes."

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Kent	Rider	WPX Energy	0103-25	Water Resources	Use of pits or ponds to dispose of produced water by evaporation (and, to a lesser extent, infiltration into the soil) is also common in some areas but less so in the Planning Area. Infiltration into soil is not, to any extent, a practice that is used for disposal of produced water in the Planning Area. COGCC requires that all produced water storage pits be constructed with an impervious liner system.	As stated in the Executive Summary, “much of this Proposed RMPA/FSEIS integrates the language and analyses of the original RMPA/EIS process. This Proposed RMPA/FSEIS is updated to reflect supplemental analyses required by the Judicial Order, any new significant resource information, and revised maps and tables.” As such, the quoted text has been revised to, "In the region, produced water is typically reused and recycled (after treatment, if necessary) and/or disposed either via underground injection or evaporation in a lined pit or pond."
Janice	Shepherd		0022-22	Wild and Scenic Rivers	The document does not analyze the economic benefit of listing the eight streams as suitable for Wild & Scenic River designation. Yet other BLM documents such as: http://www.blm.gov/style/medialib/blm/co/field_offices/uncompahgre_field/rmp/wsr_docs.Par.98 454.File.dat/Wild%20and%20Scenic%20River%20Designation%20Impacts%20and%20Benefits.pdf extoll the increased tourism that can result from such a designation. In these times of problematic employment in the oil & gas industry improving the local economy from increased tourism should be highly valued. Therefore the eight streams should be listed as suitable in the final plan.	Table 4.4.13 in the Proposed RMPA/FSEIS estimated employment effects to Garfield County, including the arts, entertainment, recreation, lodging, and food services industries, of all BLM programs by alternative. Table 4.4.14 summarizes earning effects to Garfield County by industry, including lodging and food services. Text in Section 4.5.9.3 of the FSEIS further clarifies: Designated Wild and Scenic Rivers may not necessarily be marketed or advertised. Increased tourism may occur, but these details would be determined through the River Management Plan that is required once a river is designated.
Janice	Shepherd		0022-23	Wild and Scenic Rivers	The analysis on page 4-330 seems to be conflicting for in one sentence it is stated "Alternative III focuses on moving grazing away from riparian habitat, a **definite** benefit for WSR ORVs" and yet the conclusion is of only a "minor" beneficial impact. This is especially surprising given the earlier assessment that livestock grazing is one of the more impactful activities to CRCT (page 4-163). The assessment of "minor" benefit underestimates the benefit of the suitable WSR listing where grazing management would result in better outcomes for the ORVs of the streams with only minor inconveniences to the grazing permittees	The statement quoted in this comment regarding a minor beneficial impact did conflict with the conclusions on the next page, which show a negligible to moderate adverse impact. As such, the statement is not included in the FSEIS. BLM's conclusion that grazing and rangeland management would have up to a negligible to moderate adverse effect on fisheries ORVs is consistent with the analysis of the effects of grazing and rangeland management on special status fish species, as per sections 4.3.4.3 and 4.3.4.4.
Bill	Fenstermaker	Grand Valley Anglers chapters of Colorado Trout Unlimited and the International Federation of Fly Fishers	0025-1	Wild and Scenic Rivers	Grand Valley Anglers supports Alternative IV, the Preferred Alternative, but recommends adding additional protection by including provisions of Alternative III for eligible stream reaches under the Wild and Scenic River Act, and for management that would maintain wilderness characteristics within the East Fork Parachute Creek Inventory Unit.	Alternative IV, the Preferred Alternative in the Proposed RMPA/FSEIS, presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations and public comment. This alternative is carried-forward as the Proposed Plan analyzed in the FSEIS. Management and protections of stream reaches eligible for listing under the Wild and Scenic Rivers Act and Lands with Wilderness Characteristics were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS in Chapter 4, Section 4.5.9. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise the eligible stream reaches and units that contain wilderness characteristics.
Michael S	Freeman	Earthjustice	0036-10	Wild and Scenic Rivers	Through BLM's eligibility findings, the agency has formally acknowledged that those segments possess outstandingly remarkable values. In the RMP amendment, BLM must ensure protection of those ORVs, either through suitability determinations (and attendant BLM management) or other means such as alternative conservation designations with appropriate management prescriptions.	Alternative IV, the Preferred Alternative in the Draft RMPA/SEIS, presents a balanced management approach that allows multiple use of the Roan Plateau Planning Area and takes into account the Settlement Agreement, Cooperating Agency considerations, and public comment. This alternative is carried-forward as the Proposed Plan analyzed in the FSEIS. Management and protection of stream reaches eligible for designation under the Wild and Scenic Rivers Act were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise the eligible stream reaches.

First Name	Last Name	Organization	Comment Number	Issue	Comment	Response
Michael S	Freeman	Earthjustice	0036-11	Wild and Scenic Rivers	For many of the segments BLM determines are eligible for inclusion in the National Wild and Scenic Rivers System, appropriate protection should be provided under a formal finding of suitability for designation under the 1968 Act. In others, clear, reliable and enduring management prescriptions may be more appropriate. This could be accomplished through other designations and/or allocations in the RMP amendment that are within the range of alternatives, such as Areas of Critical Environmental Concern and Lands with Wilderness Characteristics, or management prescriptions specific to river and stream corridors such as closures to energy development and rights-of-way.	Management and protection of stream reaches eligible for designation under the Wild and Scenic Rivers Act were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise the eligible stream reaches.
Michael S	Freeman	Earthjustice	0036-12	Wild and Scenic Rivers	We can support BLM utilizing other mechanisms to protect identified values where appropriate, provided that such mechanisms specifically conserve ORVs.	Management and protection of stream reaches eligible for designation under the Wild and Scenic Rivers Act were fully considered within in the range of alternatives in the Proposed RMPA/FSEIS. Several management actions provide indirect protections for these resources in the Proposed Plan and analyzed in the FSEIS. These include numerous stipulations and parallel surface use restrictions for many resources, as well as special management prescriptions for Areas of Critical Environmental Concern (ACEC) that comprise the eligible stream reaches.
Michael S	Freeman	Earthjustice	0036-13	Wild and Scenic Rivers	Protective management for the eligible stream segments included in the East Middle Fork Parachute Creek Complex warrant specific, extensive, and reliable stipulations to protect the present populations of native Colorado River cutthroat trout and associated habitat by prohibiting all surface-disturbing activities, all siltation and unnatural run-off, and all stream impoundments and diversions, and by maintaining existing healthy populations and communities of native riparian vegetation (restricting presence or spread of non-native invasive plants).	The Proposed Plan includes direct protections to Parachute Creek and the Colorado Cutthroat Trout from an NGD/NSO for fish habitat and an SSR/CSU for the Parachute Creek Watershed Management Area (Chapter 2, Table 2.1). Indirect protections are also provided by management prescriptions for botanical/ecological resources in the Areas of Critical Environmental Concern (ACEC) and through overlapping surface-use restrictions including plant habitat and the sensitive plants and significant plant communities' stipulations.
Form Letter 3			0107-3	Wild and Scenic Rivers	The final plan should document that all of the streams which are eligible for designation as Wild and Scenic Rivers are also suitable for that designation. That action is critical to protecting the valuable water resources on the Roan. This includes Parachute Creek and Trapper Creek, which provide important habitat for Colorado River cutthroat trout.	While BLM's Proposed Plan (Alternative IV from the Draft RMPA/SEIS) assumes a determination that all eligible stream segments in the Planning Area are unsuitable for designation as Wild and Scenic Rivers and releases them from interim management protections, the Proposed Plan would protect many of the outstanding resource values of these stream segments through other means. Various stipulations, designations, and mitigation measures would protect these stream segments and their corridors from direct impacts and indirect effects of surface disturbing activities. Impacts from suitability determinations on all eligible stream segments were analyzed under Alternative III. Please see Section 4.5.9 of the Proposed RMPA/FSEIS for details.

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Appendix M

Biological Assessment and U.S. Fish and Wildlife Service Consultation Documents

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO: BLM/CRVFO
TAILS: 06E24100-2016-I-0259

May 19, 2016

Memorandum

To: Field Manager, Colorado River Valley Field Office, Bureau of Land Management, Silt, Colorado

From: Western Colorado Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado

Subject: Section 7 Consultation on Roan Planning Area Resource Management Plan Amendment

On May 16, 2016, we received your letter, dated May 2, 2016, and associated biological assessment (BA) (received 11 April, 2016) regarding the amendment of the Roan Planning Area resource management plan (RMPA). You have requested initiation of section 7 consultation under the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C 1531 et. seq.) on this plan amendment.

You have requested our concurrence with your determined that implementation of your plan amendment may affect, but is not likely to adversely affect the following species:

Colorado hookless cactus	*Sclerocactus glaucus*
DeBeque phacelia	*Phacelia submutica*
Ute ladies'-tresses orchid	*Spiranthes diluvialis*
Parachute penstemon, and its critical habitat	*Penstemon debilis*
Mexican spotted owl	*Strix occidentalis lucida*
Western yellow-billed cuckoo	*Coccyzus americanus*
Green-lineage cutthroat trout^	*Oncorhynchus clarkii*
Colorado pikeminnow, and its critical habitat*	*Ptychocheilus lucius*
Razorback sucker, and its critical habitat *	*Xyrauchen texanus*
Humpback chub, and its critical habitat*	*Gila cypha*
Bonytail, and its critical habitat *	*Gila elegans*

^Due to unsettled taxonomy, the Service has advised Federal agencies to conduct section 7 consultations for actions that may affect the greenback cutthroat trout as well as the green lineage cutthroat trout (=Lineage GB) (Service 2012).
*The four endangered fish and their critical habitats are not likely to be adversely affected except through water depletions; discussed below.

Planning Area and Proposed Action

The Proposed RMPA would provide direction for managing 73,800 acres of BLM lands within the Roan Planning Area, under the jurisdiction of the Colorado River Valley Field Office (CRVFO). The Roan Planning Area contains Federal land mostly in Garfield County, Colorado, and is generally bounded on the east by State Highway (SH) 13, on the south by the Colorado River, on the west by Parachute Creek, and on the north by the line between Township 4 South and Township 5 South of the Sixth Principal Meridian. A small area in the northeastern portion of the Planning Area extends into Rio Blanco County. The 73,800 acres of public land within the Roan Planning Area is within the 116,350 acres managed by the CRVFO. This total includes 66,780 acres with BLM surface and minerals and an additional 7,020 acres with private surface but Federal minerals. An additional 4,730 acres of BLM surface and mineral estate is managed by the White River Field Office (WRFO).

Under the proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Approximately 1,830 acres above the rim (in two leases) and 11,170 acres below the rim would be open to oil and gas leasing and development. Approximately 28,660 acres above the rim and 6,310 acres below the rim would be closed to oil and gas leasing and development. Above and below the rim, lands available to oil and gas leasing and development would be subject to the same stipulations as those prescribed by the 2007 Record Of Decision for the Roan Planning Area (and contained in leases issued for those lands in 2008), except as modified by the terms and conditions detailed in a legal Settlement Agreement. These include specific limits as to the number of well pads to be allowed, maximum surface disturbance per well pad, timing/phasing of well pad construction, allowable access roads, collocation of associated infrastructure, and development of a Master Development Plan (MDP) (formerly Geographical Area Plan). Where the Settlement Agreement is silent on the management of specific resources and resource uses, actions from the 2006 Roan Final Environmental Impact Statement are brought forward into the Proposed RMPA. Additional details and maps of the proposed RMPA can be found in the BA for the project.

Colorado hookless cactus, DeBeque phacelia, Ute ladies'-tresses orchid

No known occurrences of Colorado hookless cactus, DeBeque phacelia, or Ute ladies'-tresses exist within the Roan Planning Area. All known occurrences are at least 5 miles from the Roan Planning Area or further. However, the possibility exists for these plant species to be found within the Roan Planning Area in the future as habitats potentially suitable for all three species occur there. Critical habitat has not been designated for the Colorado hookless cactus or the Ute ladies'-tresses orchid. Critical habitat has been designated for the DeBeque phacelia, but none is found within the Roan Planning Area. You have not requested consultation on DeBeque phacelia critical habitat.

BLM would conduct or require surveys for threatened and endangered (listed) plant species in all identified potential habitats prior to approving any new surface-disturbing activities. Should any of these listed plant species be found within the Roan Planning Area, all such proposed activities would be subject to a No Ground Disturbance (NGD) restriction and a No Surface Occupancy (NSO) stipulation for listed species habitat through application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat, as well as the application of protective Conditions of Approval (COAs). Therefore, direct and indirect effects to these species from oil and gas development and all other surface-disturbing activities would likely be avoided. In the event that complete avoidance of impacts to listed plant species habitats is not possible, impacts would be minimized.

Additional protections for potentially suitable habitats for these species would come through application of GS-NSO-23: Riparian and Wetland Habitat, GS-NSO-Roan-29: Colorado River Corridor, the CRVFO Integrated Weed Management Plan (BLM 2009, Service 2009), and other protective measures as outlined in the BA.

For these reasons and further measures outlined in the BA, we concur with your determination that the RMPA is not likely to adversely affect the Colorado hookless cactus, DeBeque phacelia, and Ute ladies'-tresses orchid.

Parachute penstemon

Parachute penstemon is the only listed plant species known to occur in the Roan Planning Area. There are two documented occurrences of Parachute penstemon within the Roan Planning Area occupying small areas within very specific habitat comprising sparsely vegetated, steep, talus slopes. Both documented populations are within the area closed to leasing for oil and gas (No Lease Area). Both populations are also within the Anvil Points Area of Critical Environmental Concern (ACEC)—this ACEC specifically provides protection and special management for important botanical resources, including the Parachute penstemon.

Within the Roan Planning Area, areas of potential habitat where Parachute penstemon could be found in the future are also found outside of the No Lease Area and outside of the Anvil Points ACEC. Most of these areas are protected by other protective measures, such as NSO-22: Steep Slopes and NSO-30: I-70 Viewshed. Safeguards during weed treatment within potentially suitable habitat for this species would be provided by the CRVFO Integrated Weed Management Plan (BLM 2009, Service 2009). Additionally, GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat would be applied to any new Parachute penstemon observations, as described for the other listed plant species above.

Occupied habitat for Parachute penstemon is very to extremely steep and poorly vegetated, making access by livestock unlikely, therefore minimizing the possibility of trampling or introduction of weeds. Mitigation measures, such as fencing and restrictions on livestock grazing, and bedding or trailing in the vicinity of the Parachute penstemon population along the Anvil Points Rim Road have been implemented to protect this species from negative impacts from livestock grazing.

Critical habitat has also been designated for the Parachute penstemon within the Roan Planning Area (Anvil Points critical habitat unit). Most Federal land within this critical habitat unit is protected from ground disturbance through its location within the No Lease Area and the Anvil Points ACEC. A small portion of this critical habitat unit is located outside of these protected areas, but would receive incidental protection through application of NSO-22: Steep Slopes and NSO-30: I-70 Viewshed.

For these reasons and further measures outlined in the BA, we concur with your determination that the proposed RMPA is not likely to adversely affect the Parachute penstemon or its critical habitat.

Mexican spotted owl (MSO)

No Mexican spotted owls have ever been reported in or near the Roan Planning Area, nor has any critical habitat for this species been designated in the area. The nearest known MSO territories are in Utah and one or two individuals were heard near the Utah border in Moffat County, Colorado a number of years ago. However, as stated in the BA, potentially suitable habitat exists on Federal land within the first mile extending downstream from the East Fork Parachute Creek waterfall (see Figure 4 in BA).

Several stipulations in the RMPA provide protection for the area of potentially suitable MSO habitat. Nearly all of the potentially suitable Mexican spotted owl habitat in the Planning Area is located within the No Lease Area and/or the East Fork Parachute Creek ACEC. Several stipulations provide protection for this area as well, such as GS-NSO-Roan-28: High-value Special Status Fish Species Habitat, GS-NSO-Roan-31: East Fork Falls Viewshed, and GS-NSO-22: Steep Slopes.

For these reasons, and further measures outlined in the BA, we concur with your determination that the proposed RMPA is not likely to adversely affect the Mexican spotted owl. Because it would not be affected, you have not requested consultation on Mexican spotted owl critical habitat.

Western yellow-billed cuckoo

No western yellow-billed cuckoos (YBC) have ever been reported in or near the Roan Planning Area, nor has any critical habitat for this species been designated in the area. The nearest known recent YBC observation is 15 miles to the south along Plateau Creek. The nearest YBC proposed critical habitat unit, is over 28 miles downstream along the Colorado River near Palisade, CO. However, a small amount of potentially suitable YBC habitat exists within the Roan Planning Area along the Colorado River corridor (BA, Figure 4).

Several stipulations in the RMPA provide protection for the area of potentially suitable YBC habitat, such as GS-NSO-Roan-29: Colorado River Corridor and GS-NSO-Roan-23: Riparian and Wetland Habitat. Additionally, as stated in the BA (p. 5-6), potential habitat for western yellow-billed cuckoo does not overlap with oil and gas lease and development areas on Federal surface lands.

For these reasons, and further measures outlined in the BA, we concur with your determination that the proposed RMPA is not likely to adversely affect the western yellow-billed cuckoo. Because it would not be affected, you have not requested to conference on western yellow-billed cuckoo proposed critical habitat.

Green lineage cutthroat trout

Recent genetic (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) research indicates that two cutthroat trout lineages exist in western Colorado where it was originally thought that only one existed. The two genetically distinct lineages of cutthroat trout are currently called the blue lineage (native to the Green, White, and Yampa river basins) and the green lineage (native to the Colorado, Dolores, and Gunnison river basins).

Initially, the new genetic information led to uncertainty regarding the relationship between greenback and green lineage cutthroat trout, and whether or not these lineages could both be considered the greenback cutthroat trout, which is listed as threatened under the ESA. While the taxonomy of these fish has yet to be fully resolved, the Service is advising Federal agencies to conduct section 7 consultations for actions that may affect the both the greenback and green lineage cutthroat trout until such time as a status assessment and a decision pursuant to the ESA is made (Service 2012).

As stated in the BA, green lineage cutthroat trout were stocked in 2014 and 2015 into the upper portion of the East Fork of Parachute Creek, which is in the Roan Planning Area. Several measures in the RMPA provide protection for the area occupied by the green-lineage cutthroat trout. The stream segment currently occupied by the green Lineage cutthroat trout is within the No Lease Area, as well as within the East Fork Parachute Creek ACEC. Should green-lineage cutthroat trout occupy downstream reaches within the leasing area on the Roan Plateau, they would also be protected by application of GS-NSO-Roan-28: High-value Special Status Fish Species Habitat and NGD-Roan-24 for non-oil and gas activities.

For these reasons, and further measures outlined in the BA, we concur with your determination that the proposed RMPA is not likely to adversely affect the green-lineage cutthroat trout. No critical habitat has been designated for this species.

Colorado River endangered fish

Water depletions associated with projects addressed in the proposed RMPA would adversely affect the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail, and their critical habitats. Water use for these projects would be reported and tracked at the project level. BLM-authorized water depletions have been addressed in the December 19, 2008 "Programmatic Biological Opinion (PBO) for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program within the Upper Colorado River Basin in Colorado" (ES/GJ-6-CO-08-F-0006) ("Fluid Mineral PBO") and the February 25, 2009 "PBO for Water Depletions Associated with Bureau Of Land Management (BLM) Projects (excluding Fluid Mineral Development) Authorized by BLM within the Upper Colorado River Basin in Colorado" (ES/GJ-6-CO-08-F-0010).

Regarding the fluid mineral PBO, as a means of offsetting the impacts associated with water use, the BLM secured a contribution from an industry representative group (Independent Petroleum Association of Mountain States) in the form of a monetary payment to the National Fish and Wildlife Foundation on behalf of the Upper Colorado River Endangered Fish Recovery Program. These funds are used to contribute to the recovery of endangered fish through habitat restoration, fish propagation, genetics management, instream flow protection, nonnative fish management, research and monitoring, public education, and similar recovery actions. Under the PBO these contributions to the Recovery Program are considered a conservation measure that helps to avoid jeopardizing the continued existence of the endangered fish in the upper Colorado River Basin. All water depletions from the upper Colorado River Basin involved with fluid mineral extraction from BLM administered lands are compiled annually and reported to our Ecological Services Office in Grand Junction. Water depletions from non-fluid mineral related BLM-authorized actions are similarly reported on an annual basis.

The Service and the Recovery Program track all water depletions that are covered under the 15 Mile Reach of the Colorado River and Gunnison PBOs on a quarterly basis. A summary of those depletions are available at: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/consultation-list.html . Also, in accordance with the Section 7, Sufficient Progress, and Historic Projects Agreement, the Service reviews cumulative accomplishments and shortcomings of the Recovery Program in the upper Colorado River basin. Per that Agreement, the Service uses the following criteria to evaluate whether the Recovery Program is making "sufficient progress" toward recovery of the four listed fish species:

- actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction;
- status of the fish populations;
- adequacy of flows;
- and magnitude of the impact of projects.

Through these bi-annual Sufficient Progress reviews the Service evaluates the best available and current information to determine if the Recovery Program continues to offset depletion effects identified in existing Section 7 consultations including the depletions covered by these PBOs. In the most recent assessment (dated October 7, 2015), the Service determined that sufficient progress has been made towards recovery. Sufficient Progress reports can be found at: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/sufficient-progress-letters.html .

According to the BA and correspondence via electronic mail on 5/16/16 (BLM 2016), water depletions associated with Federal gas wells that could be drilled within the Roan Planning Area under the RMPA would amount to roughly 95 acre-feet/year. This estimate is within the amount addressed in the Fluid Mineral PBO (4,046 acre-feet/year) and would fall under the umbrella of that PBO. As stated above, the actual amount of water used will be tracked and reported at the project stage for both fluid mineral and non-fluid mineral projects. (Based on past quantities, water depletions for non-fluid mineral projects are expected to be very minor.)

The Roan Planning Area contains only a very small amount of Federal land and Federal minerals that lie within the Colorado River corridor and contain endangered fish critical habitat (Colorado pikeminnow and razorback sucker). For these small areas, critical habitat would be protected by GS-NSO-Roan-29: Colorado River Corridor, which prohibits surface disturbance within 0.5 mile of the Colorado River. Endangered fish critical habitat would also be protected by GS-NSO-Roan-23: Riparian and Wetland Habitat. We concur with your determination that, other than through future water depletions discussed above, the proposed RMPA is not likely to adversely affect any of the Colorado River endangered fish or their critical habitats.

If new information becomes available, new species listed, or should there be any changes to the project which alter the operation of the project, or the extent of the anticipated impact, from that which is described in this memo or which may affect any endangered or threatened species in a manner or to an extent not considered in the proposed action, section 7 consultation should be reinitiated. If the Service can be of further assistance, please contact Creed Clayton at (970) 628-7187.

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United States Department of the Interior

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Colorado River Valley Field Office
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05/02/2016

Mr. Creed Clayton
U.S. Fish and Wildlife Service, Ecological Services
Grand Junction Field Office
764 Horizon Drive South, Building B
Grand Junction, CO 81506-3946

Dear Mr. Clayton,

I am writing to request initiation of informal Section 7 consultation under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.). Mr. Greg Larson transmitted a Biological Assessment (BA), prepared by the Bureau of Land Management (BLM) Colorado River Valley Field Office (CRVFO) for the Roan Plateau Planning Area Proposed Resource Management Plan Amendment (RMPA) and Supplemental Environmental Impact Statement (SEIS), to you via email on April 11, 2016. The CRVFO is requesting concurrence with the effects determinations in that BA through informal consultation.

The Proposed RMPA/SEIS provides a framework for management direction and appropriate use on BLM-administered lands and Federal mineral estate located in the Roan Plateau Planning Area, consisting of 73,800 acres in western Garfield County, Colorado, and a small portion of southern Rio Blanco County, Colorado. The Planning Area includes 56,540 acres of the former Naval Oil Shale Reserves (NOSRs) Numbers 1 and 3.

The CRVFO prepared the Proposed RMPA/SEIS after considering public comments on the Draft RMPA/SEIS. The development of the Proposed RMPA/SEIS also included consultation with the BLM Northwest Resource Advisory Council, tribes, and cooperating agencies which included the U.S. Fish and Wildlife Service.

The BA provided also reflects recent informal discussions we have had with you and specific comments you supplied on the draft BA that CRVFO received during a March 8 call and in writing on March 31.

In summary, this BA has made a determination of "May Affect, but is Not Likely to Adversely Affect" for:

Parachute Penstemon
DeBeque Phacelia
Colorado Hookless Cactus

Ute Ladies'-Tresses
Bonytail Chub*
Colorado Pikeminnow*
Humpback Chub*
Razorback Sucker*
Colorado River Cutthroat Trout (Green Lineage)
Mexican Spotted Owl
Western Yellow-billed Cuckoo

**Potential adverse effects to Colorado River fishes from water depletions are addressed through the 2008 programmatic consultation.*

In order not to compromise our RMPA/SEIS schedule and BLM Washington Office deadlines, I respectfully request your concurrence by no later than May 26, 2016. If you cannot meet the requested date please contact me at (970) 876-9002.

We appreciate your assistance in the development of this BA and your cooperation regarding this request. We look forward to continuing to work with you and your office. If you have any questions regarding this consultation, please contact Mr. Larson in our office at (970) 876- 9048 or via email at glarson@blm.gov.

Sincerely,

Karl Mendonca
Field Office Manager
Colorado River Valley Field Office

United States Department of the Interior
Bureau of Land Management

BIOLOGICAL ASSESSMENT

Roan Plateau Planning Area
Resource Management Plan Amendment

Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

April 2016

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LIST OF ABBREVIATIONS AND ACRONYMS

ACEC	Area of Critical Environmental Concern
AMP	Allotment Management Plan
APD	Application for Permit to Drill
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
COA	condition of approval
CPW	Colorado Parks and Wildlife
CRCT	Colorado River cutthroat trout
CRVFO	Colorado River Valley Field Office
CSU	controlled surface use
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
EA	Environnemental Assessment
ECR	Ecological Condition Rating
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FR	Federal Register
GSFO	Glenwood Springs Field Office
GSRA	Glenwood Springs Resource Area
I	Interstate
IWMP	Integrated Weed Management Plan
LHA	Land Health Assessment
LN	lease notice
MDP	Master Development Plan (formerly Geographic Area Plan)
NEPA	National Environmental Policy Act

NGD	No Ground Disturbance
NMFS	National Marine Fisheries Service
NOSR	Naval Oil Shale Reserve
NPS	National Park Service
NSO	no surface occupancy
OHV	off-highway vehicle
PBA	Programmatic Biological Assessment
PBO	Programmatic Biological Opinion
PCE	primary constituent elements
PFC	Proper Functioning Condition
Planning Area	Roan Plateau Planning Area
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
ROW	right-of-way
SEIS	Supplemental Environmental Impact Statement
SH	State Highway
SOP	Standard Operating Procedure
SSR	Site-Specific Restoration
T&E	threatened and endangered
TL	timing limitation
U.S.C.	United States Code
USDI	U.S. Department of the Interior
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
WMA	Watershed Management Area
WRFO	White River Field Office
WRRA	White River Resource Area
WSR	Wild and Scenic River

1 INTRODUCTION

Eleven species listed as threatened or endangered (T&E) under the Endangered Species Act (ESA) are addressed in this Biological Assessment (BA) for the Roan Plateau Planning Area (Planning Area) Resource Management Plan Amendment (RMPA). This serves to satisfy Bureau of Land Management's (BLM) requirements under the ESA.

1.1 BACKGROUND

The United States Department of the Interior (USDI), BLM has prepared a Proposed RMPA/Final Supplemental Environmental Impact Statement (FSEIS) to provide direction for managing public lands administered in the Roan Plateau Planning Area by the Colorado River Valley Field Office (CRVFO) (formerly the Glenwood Springs Field Office [GSFO]) and analyze the environmental effects that could result from implementing the alternatives addressed in the RMPA. The Proposed RMPA is a refinement of the Preferred Alternative (Alternative IV) from the Draft RMPA/SEIS (BLM 2016), hereafter referred to as the Proposed RMPA.

The purpose of this BA is to review the Proposed RMPA to determine the extent that implementation of the RMPA may affect T&E species within the Planning Area. Because the Proposed RMPA is a planning document, this BA focuses on the effect of management actions to be implemented as a part of this planning effort.

The adoption, revision, or amendment of a BLM land use plan is a Federal agency action subject to Section 7(a)(2) of the ESA (BLM 2008a). A Federal action is defined as any decision/action authorized, funded, or carried out by a Federal agency. This BA provides an analysis of potential impacts of implementation of the Proposed RMPA. There are three types of effects that are considered under Section 7(a)(2) of the ESA: direct effects, indirect effects, and cumulative effects. In addition, when considering the effects of a proposed action under Section 7(a)(2), BLM is required to consider the effects of interrelated or interdependent actions.

Under provisions of the ESA of 1973, as amended (16 United States Code [U.S.C.] Section 1531, et seq.), Federal agencies are directed to conserve T&E species and the habitats in which these species are found. Section 7(a)(1) states that all Federal agencies shall "utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species…." Thus, the conservation and recovery of T&E species is not simply the responsibility of the U.S. Fish and Wildlife Service (USFWS), but of all Federal agencies. In order to meet this requirement, the CRVFO would implement protective stipulations (Appendix B), best management practices (BMPs) (Appendix C), conservation measures (Appendix D), and apply conditions of approval (COA) and survey requirements for T&E species on implementation of management actions that comprise the Proposed RMPA.

Section 7(c) of the ESA requires BLM to complete a BA to determine the effects of implementing the Proposed RMPA on listed species, based on compliance with Section 102 of National Environmental Policy Act (NEPA). Federal agencies are required to consider, avoid, or prevent adverse impacts to fish and wildlife species. Federal agencies are also required to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of T&E species or their Critical Habitat. The ESA requires action agencies, such as BLM, to not only consult or confer with the USFWS when there is discretionary Federal involvement or control over the action, but also to ensure that resources are afforded

adequate consideration and protection. Formal consultation becomes necessary when the action agency requests consultation after determining that the proposed action is likely to adversely affect listed species or Critical Habitat, or the aforementioned Federal agencies do not concur with the action agency's finding (USFWS 1998a).

This BA provides documentation and analysis for the Proposed RMPA to meet the Federal requirements and agreements set forth among the Federal agencies. Site-specific evaluations would be conducted for activities authorized under the Proposed RMPA, and consultation or conference would occur with the USFWS for those activities that may affect T&E species. In addition, BLM would evaluate site-specific activities that may affect candidate and BLM Colorado sensitive species, in compliance with BLM Manual 6840 (BLM 2008a). In conjunction with this BA, BLM requests informal consultation for the effects of the Proposed RMPA on all of the T&E species listed in Table 1, below.

1.2 SPECIES ADDRESSED

This BA serves to address potential effects of the Proposed RMPA, on protected resources, pursuant to Section 7 of the ESA. Specifically, this BA addresses four plant species and seven wildlife species that are listed as threatened or endangered under the ESA and that may occur within the Planning Area (Table 1). No proposed or candidate species are known to occur within the Planning Area; nor is potential habitat for proposed or candidate species known within the Planning Area.

Table 1. List of Threatened and Endangered Species Addressed in the Roan Plateau RMPA Biological Assessment

Common Name	*Scientific Name*	*Federal Status*
Plants		
Parachute penstemon	*Penstemon debilis*	Threatened, CH
DeBeque phacelia	*Phacelia submutica*	Threatened
Colorado hookless cactus	*Sclerocactus glaucus*	Threatened
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened
Fish		
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered, CH*
Bonytail	*Gila elegans*	Endangered, CH*
Humpback chub	*Gila cypha*	Endangered, CH*
Razorback sucker	*Xyrauchen texanus*	Endangered, CH*
Colorado River cutthroat trout	*Oncorhynchus clarki* spp. – *Green Lineage*	Threatened
Birds		
Mexican spotted owl	*Strix occidentalis lucida*	Threatened
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Threatened

Key:
CH = Critical Habitat designated.
*Water depletions anywhere in the Upper Colorado River basin adversely affect these species and/or their Critical Habitats.

1.3 CONSULTATION HISTORY

The Roan Plateau Proposed RMPA will amend the existing RMP for the CRVFO and White River Field Office (WRFO) as they pertain to the Roan Plateau Planning Area. Several programmatic and project-specific consultations have been completed for activities occurring in the Planning Area since the completion of these previous resource area plans. The Roan Plateau Planning Area was excluded from consideration in the earlier CRVFO RMP/Environmental Impact Statement (EIS) and associated BA (BLM 2006, 2013a). The BA for the original Roan Plateau Planning Area RMPA (BLM 2007a), and concurrence letter (USFWS 2007) were integrated into the current process. The USFWS has been a Cooperating Agency on the Roan Plateau RMPA/SEIS since it began in 2000.

The following sections summarize this consultation history by species considered in this BA.

1.3.1 Listed Plant Species

In 2012 the BLM prepared a Programmatic BA (PBA) (BLM 2012a), as well as an amendment containing revised conservation measures (BLM 2012b), assessing the effects of the BLM's livestock grazing program on Federally listed plants in the CRVFO, Grand Junction, and Uncompahgre Field Offices of Colorado. This consultation addressed Colorado hookless cactus (*Sclerocactus glaucus*) and DeBeque phacelia (*Phacelia submutica*), both of which have the potential to occur in habitat within the Planning Area. This BA determined that livestock grazing permitted by BLM may affect, and is likely to adversely affect, these two species. The USFWS issued a Programmatic Biological Opinion (PBO) for this consultation on November 15, 2012 (USFWS 2012a).

In 2014, BLM prepared a BA for the Parachute penstemon, and other species, for livestock grazing on the JQS Allotment (BLM 2014a) in the Planning Area. With the implementation of the conservation measures specified in the BA, it was determined that the action may affect, but is not likely to adversely affect, Parachute penstemon.

1.3.2 Colorado River Endangered Fishes

To date, four big river fishes have undergone consultations regarding activities, in areas that comprise the Planning Area, with the potential to cause water depletions to the Colorado River. Prior to 1994, BLM completed several individual consultations on projects with the potential to deplete small amounts of water. This resulted in the preparation and completion of a PBA in May 1994 that addressed water-depleting activities in the Colorado River Basin. In response to the PBA, USFWS issued a PBO on June 13, 1994 (USFWS 1994a), which determined that water depletions from the Colorado River Basin would jeopardize the continued existence of the Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) and result in the destruction or adverse modification of their Critical Habitat. The PBO included reasonable and prudent alternatives developed by USFWS to allow BLM to authorize projects with resultant water depletions of less than 125 acre-feet. Projects or actions resulting in depletions of greater than 125 acre-feet per year fall outside the PBA and require individual consultation with USFWS. The PBA and PBO were written to remain in effect until a total depletion threshold of 1,417 acre-feet is reached. As of January 2008, BLM had depleted or authorized the depletion of approximately 1,354 acre-feet of new depletions.

In January 2007, the GSFO prepared a BA for the Proposed RMPA for the Planning Area (BLM 2007a) that, among other things, addressed water-depleting activities within the Planning Area, including those associated with fluid mineral development. The USFWS issued a memo dated February 7, 2007, that concurred with BLM's determination that water depletions from the Colorado River Basin would adversely affect the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker and their Critical Habitat (USFWS 2007). Because the average annual depletion was less than a total of 125 acre-

feet (83.6 acre-feet/year), these depletions were addressed by the PBO issued to BLM on June 13, 1994 (amended March 2, 2000, and September 27, 2005) for small water depletions authorized by BLM in Colorado (BO number ES/GJ-6-CO-94-F017).

In October 2008, BLM completed a PBA for water depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado (BLM 2008b). In response to BLM's PBA, the USFWS issued a PBO (USFWS 2009), which concurred with BLM's determination that water depletions are likely to adversely affect the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker and their Critical Habitat. However, the USFWS determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, or razorback sucker, or destroy or adversely modify designated Critical Habitat. The PBA and PBO were written to remain in effect for up to 15 years, or as long as the average annual depletion amount of 4,046 acre-feet per year is not exceeded.

BLM also completed a PBA for small water depleting activities other than fluid mineral development in the Colorado River Basin in Colorado (BLM 2008c). In 2009, the USFWS issued a PBO (USFWS 2009) in response to BLM's PBA, which concurred with BLM's determination that water depletions are likely to adversely affect the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker, and designated Critical Habitats for these endangered fish. However, the USFWS also determined that BLM water depletions from within the Upper Colorado River Basin are not likely to jeopardize the continued existence of these four species, or destroy or adversely modify designated Critical Habitat. The PBA and PBO were written to remain in effect for up to 15 years, or as long as the average annual depletion amount of 1,785 acre-feet per year is not exceeded.

In the event these aforementioned thresholds are exceeded, BLM would reinitiate consultation on a new depletion amount. Water use associated with BLM programs is tracked and reported annually.

1.3.3 Colorado River Cutthroat Trout (Green Lineage)

The USFWS provided a position paper (USFWS 2012f) outlining the recommendation to Federal action agencies to consider this lineage as Federally threatened and consult on any actions that may affect any of these populations in Colorado until such time as a status assessment is completed on this lineages.

1.3.4 Fire Management Plan

The GSFO submitted a BA on March 20, 2002 (BLM 2002) that analyzed the effects of implementing the GFSO Fire Management Plan (FMP) on 14 threatened, endangered, and candidate species, and two species trending toward listing. A concurrence letter was obtained from the USFWS on May 6, 2002.

1.3.5 Integrated Weed Management Plan

On May 20, 2009, CRVFO completed a BA for the Programmatic Integrated Weed Management Plan (IWMP) for the GSFO and submitted it to USFWS. On June 19, 2009, USFWS concurred with BLM's determination that the IWMP would not likely adversely affect listed fish species (Colorado River cutthroat trout [*Oncorhynchus clarki* spp.] Green Lineage, Colorado pikeminnow, bonytail, humpback chub, or razorback sucker), Ute ladies'-tresses (*Spiranthes diluvialis*), and Colorado hookless cactus.

In response to concerns regarding the effects of treating vegetation on public lands, the BLM prepared a PBA for vegetation treatments using herbicides on BLM lands in 17 western states (BLM 2007d). The PBA assessed effects of herbicide treatments on listed species, species proposed for listing, and/or their Critical Habitat to ensure that the BLM recovers or maintains populations of listed species or species

proposed for listing that occur on public lands by outlining conservation and standard operating procedures.

1.4 PURPOSE OF AND NEED FOR THE RESOURCE MANAGEMENT PLAN AMENDMENT

The Proposed RMPA would amend the existing RMP for the Glenwood Springs Resource Area (GSRA) and White River Resource Area (WRRA) as they pertain to the Planning Area. The FSEIS presents an evaluation of environmental consequences that supplements the original Final Environmental Impact Statement (FEIS) (BLM 2007b).

BLM is amending the existing RMPA for the Planning Area in accordance with the Federal Land Policy and Management Act (FLPMA), which specifies periodic updates to guide management of public lands within BLM's jurisdiction. In this case, an amendment is needed to incorporate lands for which management was transferred to BLM from the U.S. Department of Energy (DOE). BLM-administered surface lands within the Planning Area include 66,780 acres with a Federal surface.

The Planning Area boundary is shown on Figures 1 and 2. Figure 1 illustrates the Planning Area location. Figure 2 shows surface land ownership status within the Planning Area. The Planning Area encompasses a total of 126,890 acres, with 73,800 acres as Federal surface. This total includes 66,780 acres with Federal surface and minerals, multiple parcels totaling 7,020 acres with private surface and Federal minerals, and a total of 53,090 acres of lands with both private surface and private minerals. Since lands with both private surface and private minerals are not subject to BLM planning or management, approximately 42 percent of the total Planning Area shown on the figures and maps is not subject to BLM planning or management decisions. However, these lands were included in the total Planning Area boundary because of the close spatial relationship with Federal lands and the many ways in which uses and conditions in either private or Federal lands affect, both directly and indirectly, uses and conditions in the other.

The 73,800 acres of Federal lands in the Planning Area include 56,540 acres in Naval Oil Shale Reserves (NOSRs) Numbers 1 and 3 (Figure 2). Management responsibility for the NOSRs was formally transferred to BLM from DOE in 1997. The NOSRs have not previously been the subject of a coordinated planning process and are currently managed under the guidance of the above-mentioned plans.

A lawsuit was filed in July 2008 that challenged the BLM's oil and gas leasing and management decisions for the Roan Plateau. On June 22, 2012, the U.S. District Court issued a decision (Colorado Environmental Coalition v. Salazar, 875 F. Supp. 2d 1233; D. Colo. 2012), hereinafter called the Judicial Order, that upheld BLM's interpretation of the National Defense Authorization Act for Fiscal Year 1998, Pub. L. No. 105-85, 111 Stat. 1629 (1997) (Transfer Act) and its consideration of a No Leasing Alternative. However, the Judicial Order set aside the RMPA, including provisions for issuing leases for oil and gas fluid minerals, and remanded the matter to the BLM for further action to address noted deficiencies. Because the court set aside the RMPA, no land use plan exists for the Planning Area. The Proposed RMPA, analyzed in the FSEIS, would become the land use plan for the Planning Area upon issuance of a ROD.

1.5 DESCRIPTION OF THE PLANNING AREA

The Planning Area contains 73,800 acres of Federal land mostly in Garfield County, Colorado, and is generally bounded on the east by State Highway (SH) 13, on the south by the Colorado River, on the west by Parachute Creek, and on the north by the line between Township 4 South and Township 5 South of the Sixth Principal Meridian. A small area in the northeastern portion of the Planning Area extends into Rio Blanco County (Figure 2). The 73,800 acres of public land within the Planning Area is within the 116,350 acres managed by the CRVFO. This total includes 66,780 acres with BLM surface and minerals and an additional 7,020 acres with private surface but Federal minerals. An additional 4,730 acres of BLM surface and mineral estate is managed by the WRFO.

The Planning Area includes both public and private lands, although the Proposed RMPA would guide only BLM efforts on the public lands that it administers. "Public lands" in this context include lands with a split estate (i.e., private surface but Federal minerals), although BLM management authority on these lands is limited to activities (both surface and subsurface) related to exploration and development of the minerals. About 58 percent of the Planning Area (73,800 acres) is public land in the sense of either Federal surface, Federal minerals, or both. The proportion of public land is higher on top of the plateau (65 percent) than below the rim. The total area managed by the CRVFO includes approximately 116,350 acres. The WRFO manages approximately 4,730 acres in the Planning Area.

Figure 2 shows the location of the line used to differentiate areas referred to throughout the Proposed RMPA/FSEIS as lying "above the rim" or "atop the plateau" versus "below the rim" or "below the cliffs." This distinction is important for the Planning Area because of the very different resources and existing land uses associated with these two topographically and ecologically disparate areas. Note from Figure 2 that this line ("the rim boundary") is not present along the northern edge of the Planning Area, which is separated from adjacent lands to the north by a gradual slope rather than a sheer escarpment. Table 2 shows the vegetation communities in the BLM lands in the Planning Area.

Table 2. Vegetation Communities in BLM Lands in the Planning Area

Vegetation Community	*Acres*	*Percentage of Planning Area*
Agricultural land	1,400	1.1
Aspen woodland	11,390	9.0
Coniferous forest	6,760	5.3
Mountain grassland	4,960	3.9
Mixed mountain shrubland	31,770	25.0
Pinyon/juniper woodland	23,590	18.6
Riparian/wetland	1,430	1.1
Sagebrush shrubland	27,400	21.6
Semi-desert shrubland	5,330	4.2
Shale barrens	1,600	1.3
Unvegetated*	10,880	8.6
Total	73,800	100.0

* Includes rock, exposed soil, talus slopes, rock outcrops, and surface water.

2 PROPOSED ACTION

The Proposed RMPA would provide direction for managing 73,800 acres of BLM lands within the Planning Area, under the jurisdiction of the CRVFO. This chapter summarizes all management actions in the Proposed RMPA. Table 3 describes the goals, objectives, management and implementation actions, and allowable uses in the Proposed RMPA. The contents of this table, in conjunction with Appendix B (Stipulations Applicable to New Oil and Gas Leases Under the Proposed RMPA), Appendix C (Best Management Practices), Appendix D (Conservation Measures for Federally Listed Species), and Appendix K (The Settlement Agreement) comprise the Proposed RMPA.

The Proposed RMPA incorporates the terms of the Settlement Agreement (BLM 2014b) for the Roan Plateau Planning Area. Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. There would be two leases above the rim. Approximately 1,830 acres above the rim and 11,170 acres below the rim would be open to oil and gas leasing and development (Figure 2). Approximately 28,660 acres above the rim and 6,310 acres below the rim would be closed to oil and gas leasing and development. Above and below the rim, lands available to oil and gas leasing and development would be subject to the same stipulations as those prescribed by the 2007 ROD (and contained in leases issued for those lands in 2008), except as modified by the terms and conditions detailed in the Settlement Agreement. These include specific limits as to the number of well pads to be allowed, maximum surface disturbance per well pad, timing/phasing of well pad construction, allowable access roads, collocation of associated infrastructure, and development of a Master Development Plan (MDP) (formerly Geographical Area Plan). This specifies that a proposed MDP be submitted prior to exploration and/or lease development so that it includes consultation with Colorado Parks and Wildlife (CPW). Therefore, where the Settlement Agreement is silent on the management of specific resources and resource uses, actions from the 2006 Roan FEIS Proposed RMPA are brought forward into the Proposed RMPA.

The Proposed RMPA would be implemented within the framework of the following land availability and restrictions on development or use (percentage of BLM lands shown in parentheses):

Closed to Oil and Gas Leasing: 34,780 acres (47.7 percent);

No Ground Disturbance/No Surface Occupancy (NGD/NSO): 21,720 acres (29.4 percent);

Site-Specific Relocation/Controlled Surface Use (SSR/CSU): 36,990 acres (50.1 percent);

Timing Limitations (TLs): 32,150 acres (43.6 percent), includes five-month restriction on big game winter range; and

Standard Restrictions and Limitations: 3,050 acres (4.1 percent).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
General Management Goals, Objectives, and Techniques
Based on the Settlement Agreement (Conservation Colorado Education Fund et al. v. Sally Jewell, Bill Barrett Corporation, and Oxy USA Inc. et al. 2014). All other management actions from the FEIS Proposed Plan (BLM 2007a). Emphasize landscape management, visual aesthetics, natural values, geological features, ecological richness, and unique ecosystem values for rare and sensitive species. Encourage non-consumptive resource uses, while allowing for limited consumptive resource uses, including oil and gas development, on top of the plateau.
BLM surface open to oil and gas leasing = 32,000 acres. [Fee surface/Fed sub = 5,480 acres]
BLM surface closed to oil and gas leasing = 34,780 acres. [Fee surface/ Fed sub = 1,540 acres] Note: areas closed to oil and gas leasing would remain subject to non-oil and gas surface use restrictions.
Emphasize natural resource values through application of protective surface use restrictions and stipulations, directed management actions, and administrative designations. • NGD/NSO – 21,720 acres • SSR/CSU – 36,990 acres • TL – 32,150 acres • Standard Stipulations – 3,050 acres TLs include limitations on permitted activities, and road construction for five months (December – April) of every year in order to protect big game winter range. TL acres shown above include overlaps with other stipulations. Designate four ACECs (East Fork Parachute Creek, Trapper/Northwater Creek, Magpie Gulch, and Anvil Points) to highlight important resources. Key fisheries, botanical, and visual resources that lie within the ACECs would be protected with specific NGD/NSO designations independent of ACEC designations. Protect important ecological values outside ACECs through a variety of NGD/NSO, SSR/CSU, COAs, BMPs, and other site-specific mitigation. Protect water quality, ecosystem integrity, and hydrologic functions that support the CRCT and its habitat through an array of graduated mitigations, and designate the Parachute Creek WMA. Determine all eligible rivers in the Planning Area as not suitable for designation and release them from interim management protections afforded eligible segments. This would conclude the suitability study phase for these rivers.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Colorado Public Land Health Standards
Implement appropriate management actions on a landscape basis that would result in meeting Colorado Public Land Health Standards and associated guidelines, with emphasis on outcome-based adaptive management.
Geological Resources
Goal: Protect and preserve Geological Heritage Resources. **Objective**: Protect and preserve the existing scientific and historic geological values associated with the Anvil Points Claystone Cave and karst system.
Restrict activities that could cause direct or indirect impacts, such as structural collapse or dewatering, through the application of a NGD/NSO stipulation. Consider public education opportunities to help achieve goals.
Manage significant caves in accordance with the Federal Cave Resources Protection Act.
Manage Anvil Points Claystone Cave in accordance with the Federal Cave Resources Protection Act.
Manage caves to retain their current physical, social, and operational settings, per setting prescriptions described in Appendix H - CRVFO Management and Setting Prescriptions for Caves (BLM 2015c).
Manage the Anvil Points Claystone Cave to maintain remoteness and natural appearance by not allowing new facilities, roads, or trails to access the Cave.
Manage the Anvil Points Claystone Cave for scientific purposes and to allow safe use.
Limit Anvil Points Claystone Cave use and monitor use.
Initiate the nomination, evaluation, and designation of other potentially significant caves.
Apply: • NGD/NSO for Anvil Points Claystone Cave.
Paleontological Resources
Goal: Protect and preserve paleontological resources. **Objective:** Protect Sharrard Park's scientifically significant Eocene fossil mammal localities from surface-disturbing activities, and recover such resources and associated data through an authorization process.
Management Actions: Apply a SSR/CSU stipulation to protect the paleontological resources in Sharrard Park. **Standards:** Require survey and mitigation prior to any surface-disturbing activities in PFYC 4 and 5 areas and some PFYC 3 areas.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Apply: • SSR/CSU for Sharrard Park paleontological resources.
Soil Resources
Goal: Maintain watershed soil stability and productivity. **Objective:** Manage to meet Land Health Standards for soils on a watershed scale, and support other resource needs.
Management Actions: Maintain site stability and site productivity on steep slopes and erosive soils throughout the Planning Area by applying NGD/NSO and SSR/CSU stipulations, COAs, BMPs, and other site-specific mitigation. **Standards:** Apply NGD/NSO on slopes greater than 50% to maintain site stability. Apply COAs, BMPs, and other site-specific mitigation to minimize erosion, encourage rapid reclamation, retain soils using stormwater mitigation structures, maintain soil stability, and support other resources (including fisheries habitat).
Apply: • NGD/NSO for steep slopes (>50%). • SSR/CSU for erosive soils and slopes (>30%).
Water Resources
Goal: Meet all State and Federal water quality standards, and support water quantity and quality needs of other resources. **Objective:** Ensure authorized activities comply with all applicable water quality standards.
Management Actions: Establish baseline water quality data and a monitoring program for drainages prior to allowing surface-disturbing activities. Assess disturbance-related water quality changes. Identify and implement mitigation measures, as needed, to meet water quality standards. **Standards:** Implement those actions associated with the Parachute Creek Watershed Area (see Table 2.3, Proposed RMPA/FSEIS [BLM 2016]).
Apply: • NGD/NSO on designated municipal watersheds. • NGD/NSO for the Colorado River corridor.
Climate and Air Quality
Goal: Within the scope of BLM's authority, ensure that air quality and air quality-related values are adequately protected by analyzing the effects of activities or resource uses authorized by the BLM and cumulative actions. Protect air resources in accordance with the methodology and provisions outlined in the Comprehensive Air Resource Protection Protocol (CARPP).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Objective: If warranted by the results of analyses conducted following the CARPP, control or reduce air pollutants associated with construction and industrial activities to help protect human health and ecosystems (meeting State and Federal standards), and conform with the Colorado Regional Haze State Implementation Plan to improve visibility, reduce atmospheric deposition, and reduce greenhouse gas emissions.
Management Actions: Based on project-level analyses, as described in the CARPP (Appendix J), during the construction phase, reduce emissions of fugitive dust by requiring operators to implement watering (a minimum of twice daily during dry conditions) or application of other dust-suppressant agents at construction areas, including access roads used during construction. The Authorized Officer may direct the operator to change the level and type of dust abatement if the measures being used are insufficient to prevent visible plumes of fugitive dust or deposition of excessive dust on nearby surfaces in conjunction with vehicular traffic, equipment operations, or wind events. Require fugitive dust control plans in conjunction with oil and gas MDPs. As described in the CARPP, air quality monitoring may be required for large proposed oil and gas development projects in locations where no representative air quality monitoring data exists, or over the life of large projects to be used as a validation tool in conjunction with projected air quality modeling. Based on project-level analyses, as described in the CARPP, require that industrial operators use gravel (in combination with watering or other dust suppressant), chip-seal, asphalt, or other road-surfacing material to minimize fugitive dust emissions from BLM-authorized access roads (“local” and “resource” roads) during long-term production and maintenance operations. Based on annual review required by the CARPP and on the rate of actual oil and gas development, require phased-in use of improved drilling and completion engines that meet or exceed Tier 4 non-road diesel emission standards (40 CFR 1039). Based on annual review required by the CARPP and on the rate of actual oil and gas development, require “no-bleed” pneumatic devices at well pads and production facilities. Require that oil and gas operators use reduced-emission completion technologies (i.e., “green” completions), as defined in COGCC Rule 805 and the New Source Performance Standards for Crude Oil and Natural Gas Production at 40 CFR Part 60 subpart OOOO, for all wells on BLM lands and wells that access Federal minerals. An exemption may be granted on a case-by-case basis if the installation of necessary infrastructure is impracticable. Require flaring of natural gas during well completions that are exempted from green completion technology. Prohibit venting of natural gas except during emergency situations. Require that natural-gas-fired reciprocating internal combustion engines at BLM-authorized field compression facilities comply with Colorado Department of Public Health and Environment Air Quality Control Commission Regulation No. 7, 5 CCR 1001-9, Section XVII.E.2 (Emission Standards for New and Relocated Engines) and Section XVII.E.3 (for existing engines). Require compliance with applicable New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants for all internal combustion engines. Powering centralized compression facilities with electricity may be required in the future based on: implementation of the CARPP (Appendix J), future availability of

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
adequate electricity, and advances in compression technology.
Ecological Values
Goal: Protect key ecological values and natural processes. **Objective:** Provide protection for candidate and sensitive species in addition to supporting important ecological processes throughout the Planning Area.
Management Actions: Apply NGD/NSO, SSR/CSU, COAs, and BMPs to provide protections to minimize impacts to an acceptable level and support sustainable ecosystem processes. Design and implement COAs, BMPs, other mitigation, and monitoring on a site-specific basis to mitigate the effects of surface disturbance. Designate four ACECs. Specific stipulations and mitigation measures are identified independently of ACEC designation for protection of various resources (see Table 2.2, Proposed RMPA/FSEIS [BLM 2016]). Table 2.3 (Proposed RMPA/FSEIS [BLM 2016]) provides more information on the management of resources within the Parachute Creek WMA.
Vegetation Resources
Goal: Manage vegetation resources in a long-term, sustainable manner, protecting the soil, hydrologic, and watershed conditions that support them. **Objectives:** • Enhance the health, productivity, and ecological condition of native and other desirable plant communities, including the integrity of native stands of aspen, mountain shrubs, grasslands, and conifers. • Optimize forage production, given other uses and objectives. **GRSG Objective:** (1) Use habitat restoration as a tool to create and/or maintain landscapes that benefit GRSG; (2) Use Integrated Vegetation Management to control, suppress, and eradicate, where possible, noxious and invasive species per BLM Handbook H-1740-2; and (3) In all Sagebrush Focal Areas and Priority Habitat Management Areas, the desired condition is to maintain a minimum of 70% of lands capable of producing sagebrush with 10 to 30% sagebrush canopy cover. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).
Management Actions: In ADH, when planning restoration treatments in GRSG habitat, identify seasonal habitat availability, and prioritize treatments in areas that are thought to be limiting GRSG distribution and/or abundance, in accordance with the Prioritization section of the narrative for Alternative D (NWCOGSG FEIS; BLM 2015d). The habitat objectives for GRSG (see Table 2-5, NWCOGSG FEIS [BLM 2015d]) are a list of indicators and values that describe GRSG seasonal habitat conditions. The values for the indicators were derived using a synthesis of current local and regional GRSG habitat research and data and reflect variability of ecological sites. The habitat cover indicators are consistent with existing indicators used by the BLM.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
When determining if a site is meeting habitat objectives, the measurements from that particular site would be assessed based on the range of values for the indicators in Table 2-5. Table 2-5 is one component of GRSG multi-scale habitat assessment (see Appendix F, Greater Sage-Grouse Monitoring Framework) (NWCOGSG FEIS; BLM 2015d). The results of the habitat assessment would be used during the land health evaluation to ascertain if the land health standard applicable to GRSG habitat (e.g., special status species habitat standard) is being met. When authorizing activities in GRSG habitat, the BLM would consider if habitat objectives are being achieved. If the habitat objectives are not being achieved and the site has the potential for achieving these objectives, the BLM would determine the causal factor(s) and make the necessary management adjustments to address the causal factor(s), following current BLM regulations and policy. Treat areas that contain *Bromus tectorum* and other invasive or noxious species to minimize competition and favor establishment of desired species. Remove conifers encroaching into sagebrush habitats. Prioritize treatments closest to occupied GRSG habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. Use of site-specific analysis and principles like those included in the Fire and Invasives Assessment Team report (Chambers et. al. 2014) and other ongoing modeling efforts to address conifer encroachment will help refine the location for specific priority areas to be treated. See Appendix H, Guidelines for Implementation (NWCOGSG FEIS; BLM 2015d).
In GRSG GHMA, when planning restoration treatments in GRSG habitat, identify seasonal habitat availability and prioritize treatments in areas that are thought to be limiting GRSG distribution and/or abundance, in accordance with the Prioritization section of the narrative for Alternative D, NWCOGSG FEIS.
In GRSG PHMA, include GRSG habitat parameters or if available, State GRSG Conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within GRSG PHMA areas a high restoration priority.
In GRSG GHMA require use of native plant seeds that are beneficial for GRSG, for vegetation treatments based on availability, adaptation (site potential), probability for success, and the vegetation management objectives for the area covered by the treatment. Where probability of success or native seed availability is low, use species that meet soil stability and hydrologic function objectives as well as vegetation and GRSG habitat objectives.
In GRSG PHMA, design post-restoration management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain the desired condition of ESR projects to benefit GRSG.
In GRSG GHMA, manage for a habitat objective that is primarily sagebrush with a mosaic of seral stages and sagebrush in all age classes. On a site-by-site basis, do not allow treatments that would adversely affect GRSG populations. Remove conifers encroaching into sagebrush habitats. Prioritize treatments closest to occupied sage-grouse habitats and near occupied leks, and where juniper encroachment is phase 1 or phase 2. Use of site-specific analysis and principles like those included in the FIAT report and other ongoing modeling efforts to address conifer encroachment will help refine the location for specific priority areas to be treated.
In GRSG GHMA, make reestablishment of sagebrush and desirable understory plant cover (relative to ecological site potential) the highest priority for restoration efforts. Consider GRSG habitat requirements in conjunction with all resource values managed by the BLM, and give preference to GRSG habitat unless site-specific circumstances warrant an exemption.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Riparian/Wetland Resources
Goal: Ensure healthy and vigorous riparian plant communities. **Objective**: Achieve a minimum condition rating of PFC (proper functioning condition) and late-seral stage plant community development, and provide high-quality fisheries habitat atop the plateau.
Management Actions: Establish condition ratings based on Ecological Site Indices (or equivalent assessments of potential natural vegetation based on site and soil characteristics and conditions). Manage to improve riparian-related fisheries habitat atop the plateau based on site potential findings. Apply NGD/NSO protections to riparian vegetation to avoid direct impacts. Apply SSR/CSU stipulations to riparian/wetland areas to avoid indirect impacts. Avoid or mitigate activities that could cause a downward trend in the condition of riparian resources or functioning condition. Initiate activity plans that identify habitat improvement projects to achieve desired conditions. Close, reclaim, or relocate routes that are negatively impacting the stream and/or riparian zones. Locate new routes outside riparian zones to reduce or eliminate negative impacts. Initiate riparian restoration projects within those systems that have been identified as not functioning, or functioning at risk with a downward or static trend, and in those reaches of streams where fisheries habitat can be enhanced. Implement grazing management on riparian/wetland areas that would result in achieving PFC and late-seral stage plant community development and improve fisheries habitat. **Standards:** Mitigate or relocate activities that would fall within 500 feet of the outer edge of the riparian vegetation. Avoid surface-disturbing activities within a 0.5-mile buffer on either side of the Colorado River. Management actions in and near riparian areas atop the plateau should not only result in a PFC rating surpassing the minimum standards, but also provide for high-quality fisheries habitat for the CRCT.
Apply: • NGD/NSO for riparian and wetland habitat. • SSR/CSU for riparian and wetland habitat.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Noxious Weeds
Goal: Maintain healthy native vegetation free of noxious weeds and exotic (introduced) species on Federal lands within the Planning Area. **Objective**: Promote natural processes and healthy native plant communities to deter noxious weeds while minimizing and, to the extent practicable, eradicating noxious weed and undesirable exotic species on Federal lands within the Planning Area.
Management Actions: Implement an integrated weed management program (which includes a weed management plan; pre-disturbance weed mapping; and mechanical, biological, and chemical control techniques). For activities creating a surface disturbance larger than 1.0 acre, require a weed management plan that emphasizes and details prevention, inventory, detection, eradication, monitoring efforts, corrective measures, and other weed control actions. Require weed-free seed for reclamation activities. Require the use of weed-free hay and feed for livestock. Require weed control actions for all disturbances, including those less than 1.0 acre in size. Require prompt reclamation of all disturbed areas with native species. **Standards:** To the extent practicable, eradicate all noxious weeds and minimize the occurrence of exotic species within the Planning Area.
Terrestrial Wildlife (including Big Game)
Goal: Protect important wildlife habitats atop the plateau and below the rim. **Objective**: Protect wildlife security areas, habitat connectivity, habitat carrying capacity, and winter range.
Management Actions: Within the constraints of other resource management objectives and activities, maintain or enhance habitats capable of sustaining existing or increasing populations of wildlife. Minimize loss of habitat connectivity and displacement of wildlife through design and siting of allowed activities. Maintain or enhance big game habitat through vegetation management to improve habitat quantity and quality. Apply travel restrictions on new and existing routes atop the plateau and within or near wildlife security areas. Cluster disturbances to limit fragmentation, or loss of roadless wildlife habitat, below the rim.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Atop the plateau, require clustered and sequenced development of oil and gas resources; location of drilling pads not closer than 2,640 feet, and on slopes of 20% or less along ridgetops; limit direct surface disturbance not yet meeting reclamation standards to less than 1% of the land area (350 acres); require successful reclamation (five-year standard) prior to development of other ridgetop areas. (See Tables 2.3 and C-1). Encourage offsite mitigation across the landscape, in consultation with CPW, to offset impacts to wildlife habitat.
Apply: • NGD/NSO for wildlife seclusion areas below rim. • SSR/CSU for wildlife security areas above the rim. • SSR/CSU for big game migration corridor. • SSR/CSU for sensitive bat species habitat. • TL for big game winter range. • TL for elk production areas.
Avian Wildlife
Goal: Protect raptor nests and nesting raptors from human disturbances. Avoid the construction of facilities hazardous to raptors. **Objective:** Comply with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Avoid destruction or abandonment of the nest or reduction in nesting productivity.
Management Actions: Apply NSO and TL stipulations to nest sites. The cliff nesting complex for peregrine falcon on the cliffs and wildlife seclusion areas above the rim would be protected with SSR/CSU, rather than NGD/NSO restrictions, because the peregrine falcon is now a sensitive species, rather than threatened or endangered. **Standards**: No surface disturbances would be allowed within a 0.125-mile radius of a nest site for owls, ospreys, golden eagles, buteos, accipiters, and falcons (except kestrels). The buffer for the peregrine falcon cliff nesting complex and bald eagle roost or nest sites would be a 0.25-mile radius. TL stipulations would apply during the roosting and nesting season of each species.
Apply: • NGD/NSO for raptor nest sites (below the rim). • NGD/NSO for raptors (non-special status raptor species) (above the rim). • NGD/NSO for bald eagle nest or winter roost sites. • SSR/CSU for peregrine falcon cliff nesting complex. • TL for active raptor nest sites (below the rim).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• TL for non-special status raptor species (above the rim). • TL for bald eagle nest or winter roost sites. • TL for peregrine falcon cliff nesting complex. • TL for waterfowl and shorebird nesting areas. • TL for migratory bird nesting season.
Aquatic Wildlife
Goal: Maintain and enhance habitats important to CRCT and other native fish. **Objective:** Maintain or improve water quality, natural stream flow, and stream ecological function by preventing or minimizing direct, indirect, or cumulative adverse impacts to CRCT or their habitat.
Management Actions: Prior to conducting surface disturbance in the WMA, collect baseline data to assess current local hydrological and ecological conditions. Continue water quality monitoring throughout development of surface-disturbing activities until reclamation is complete. Require project-specific design and mitigation such that proposed actions and site locations would prevent or minimize reductions in natural stream flow, additional sedimentation or other degradation of water quality, or adverse impacts to stream ecological function for reaches containing cutthroat trout habitat, and reaches upstream from occupied habitat. **Standards:** Required design components may include construction design, implementation of BMPs, mitigation, reclamation, revegetation, monitoring (to guide adaptive management), and erosion control. Project design would incorporate baseline studies, other results as available, and require monitoring of mitigation components sufficient to demonstrate effectiveness. Relocate activities, as necessary, to minimize negative impacts to water quality and stream ecological function. Recognize valid existing water rights. Design culvert and bridge installations such that erosion and sedimentation would be minimized, structures would function properly with anticipated water flows, and fish passage would be facilitated. Consider activities designed to provide long-term habitat improvement or protection, such as culvert or bridge installation or bank stabilization actions. Assess terms of indicator values for Public Land Health Standard #2 – Riparian Systems, #3 – Plant and Animal Communities, #4 – Special Status Species, and #5 – Water Quality. Implement WMA management prescriptions as detailed in Table 2.3, Proposed RMPA/FSEIS (BLM 2016).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Apply: • NGD/NSO for high-value special status fish species habitat.
Special Status Plants and Significant Plant Communities
Goal: Prevent the need for listing of proposed, candidate, and sensitive species under the ESA and improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted. Promote recovery of special status plant species that may become listed. **Objective:** Manage listed, proposed, or candidate threatened or endangered species to comply with the provisions of the ESA and promote their recovery. Manage BLM sensitive and significant plant communities consistent with the Colorado Standards for Public Land Health and with BLM policy on Special Status Species Management (BLM Manual 6840).
Management Actions: Any species that is listed in the future or moved to candidate status would be protected through application of a NGD/NSO. Sensitive species and significant plant communities would be protected through the application of a SSR/CSU. Designate four ACECs. ACECs serve to highlight the importance of natural values. Specific stipulations and mitigation measures are identified independently of ACEC designation for protection of various resources, and are synopsized in Table 2.2, Proposed RMPA/FSEIS (BLM 2016). . Within the WMA, prevent disruption, alteration, or interruption of surface and subsurface water flows that support rare and/or significant natural plant communities. Implement WMA management prescriptions, as detailed in Table 2.3, Proposed RMPA/FSEIS (BLM 2016). Take action to protect against invasion and establishment of noxious weeds or other aggressive exotic plants, including nonnative species used for reclamation or vegetation treatments. Close selected routes to protect special status species and significant plant communities. Prohibit collection of rare plants or plant parts, except for scientific research as approved by USFWS in the case of TE plants, and with a valid collection permit.
Apply: NGD/NSO for Threatened, Endangered, or Candidate species habitat. SSR/CSU for habitat for special status plant species populations and significant plant communities.
Special Status Fish and Wildlife Species
Manage the Colorado River Endangered Fishes (Colorado pikeminnow, razorback sucker, bonytail, and humpback chub) in accordance with existing recovery plans and consultations completed with the USFWS. Manage special status fish and wildlife consistent with the Colorado Standards for Public Land Health and BLM direction for the management of special status species in BLM Manual 6840 (BLM 2001b).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Implement the strategies outlined in the Conservation Agreement and Strategy for CRCT *(Oncorhynchus clarkii pleuriticus*) in the States of Colorado, Utah, and Wyoming (CRCT Conservation Team 2006). Implement the strategies outlined in the Range-Wide Conservation Agreement and Strategy for Roundtail Chub (*Gila robusta*), Bluehead Sucker (*Catostomus discobolus*), and Flannelmouth Sucker (*Catostomus latipinnis*) (UT DNR 2006).
Goals: • Protect, preserve, restore, recover, and enhance special status fish and wildlife species and their habitats. • Implement actions originating from laws, regulations, and policies and conform to day-to-day management, monitoring, and administrative functions not specifically addressed in the Regional Mitigation Strategy, Monitoring Framework, and Adaptive Management (NWCOGSG FEIS; BLM 2015d). **Objectives:** • Protect supporting habitat and ecosystem integrity and function; maintain or improve water quality and stream flow; and manage, in accordance with recovery plans and Conservation Agreement and Strategies for the CRCT, the three species (bluehead sucker, flannelmouth sucker, and roundtail chub, and Colorado River endangered fishes (Colorado pike minnow, razorback sucker, bonytail chub, and humpback chub). • Protect habitat for the Townsend's big-eared bat that inhabits the Anvil Points Claystone Cave. This includes preventing or minimizing direct, indirect, or cumulative adverse impacts to this species' habitats. • Promote maintenance and recovery of greater sage-grouse by protecting occupied and adjacent habitat consistent with the NCGSG RMP/EIS. • Maintain and enhance populations and distribution of GRSG by protecting and improving sagebrush habitats and ecosystems that sustain GRSG populations.
Greater Sage-Grouse Goals: • Conserve, enhance, and restore the sagebrush ecosystem upon which GRSG populations depend in an effort to maintain or increase their abundance and distribution, in cooperation with other conservation partners. • Comply with State and Federal laws, regulations, policies, and standards, including FLPMA multiple-use mandates. • Implement actions originating from laws, regulations, and policies and conform to day-to-day management, monitoring, and administrative functions not specifically addressed (see Appendix G, Mitigation Strategy; Appendix F, Monitoring Framework (NWCOGSG FEIS). • Preserve valid existing rights, which include any leases, claims, or other use authorizations established before a new or modified authorization, change in land designation, or new or modified regulation is approved. Existing fluid mineral leases are managed through COAs. • Collaborate with adjacent landowners, Federal and State agencies, local governments, tribes, communities, other agencies, and other individuals and organizations, as needed, to monitor and implement decisions to achieve desired resource conditions.
Apply: • NGD/NSO for Threatened, Endangered, or Candidate species habitat. • CSU/SSR for sensitive bat species habitat. • NSO within 2 miles of active GRSG leks in GRSG GHMA.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• NSO without waiver or modification in PHMA. See Appendix D (Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations) for exceptions. NWCOGSG FEIS. • TL on activities associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1-July 15). • TL on GRSG PHMA ROWs to prohibit surface occupancy and surface-disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1-July 15). • LN for any lands leased in GRSG PHMA are subject to the restrictions of one disturbance per 640 acres calculated by CO management zone to allow clustered development. • LN within GRSG PHMA, operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single-well Applications for Permit to Drill for all but exploratory wells. • Temporary closures will be considered in accordance with 43 CFR 8364 (Closures and Restrictions); 43 CFR 8351 (Designated National Area); 43 CFR 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); 43 CFR 8341 (Conditions of Use). • Temporary closure or restriction orders under these authorities are enacted at the discretion of the authorized officer to resolve management conflicts and protect persons, property, and public lands and resources. Where an authorized officer determines that OHVs are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence (43 CFR 8341.2). A closure or restriction order should be considered only after other management strategies and alternatives have been explored. The duration of temporary closure or restriction orders should be limited to 24 months or less; however, certain situations may require longer closures and/or iterative temporary closures. This may include closure of routes or areas. • In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer distances identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review (Open File Report 2014-1239) in accordance with Appendix B. In all sage-grouse habitat, in undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.
Visual Resources
Goal: Protect and maintain visual and aesthetic qualities in sensitive areas, while allowing for changes to visual quality in less sensitive areas. **Objectives:** Manage changes in the landscape to maintain and protect visual qualities, as identified by VRM Class designations throughout the Planning Area.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Management Actions: Apply: • NGD/NSO for East Fork Falls viewshed (VRM Class I). To preserve the landscape character within the East Fork Falls viewshed and to maintain VRM Class I. • NGD/NSO for I-70 viewshed (VRM Class II). On slopes steeper than 30%, visible from and within 5 miles of I-70 to retain the existing character of the landscape and to maintain VRM Class II. • SSR/CSU for VRM Class II areas below the rim. • SSR/CSU for VRM Class III areas above the rim. Manage lands below the rim adjacent to Highway 13 and urban areas as VRM Class IV, which allow for major modifications to the existing landscape character. Restrictions based on VRM would not apply to the existing utility corridor (Map 25). VRM Classes (acres): • Class I: 1,620 • Class II:30,400 • Class III:33,510 • Class IV: 8,280
Transportation and Travel Management
Travel Management Areas (TMAs)
Goal: Travel Management Area (TMA) delineation addresses other modes of travel not covered by OHV area designations (43 CFR 8342.1). **Objective:** Identify appropriate TMA conveyances to supplement and complement goals and objectives for other resources atop the plateau, and to accommodate recreational demand in Hubbard Mesa. **GRSG Objectives:** Manage travel and transportation to: (1) reduce mortality from vehicle collisions; (2) limit change in GRSG behavior; (3) avoid, minimize, and mitigate habitat fragmentation; (4) limit the spread of noxious weeds; and (5) limit disruptive activity associated with human access.
Management Actions: Within the Roan Plateau Planning Area TMA, allow muscle-powered (e.g., foot, ski, horse, stock) travel cross-country year-round. Mechanized (wheeled conveyance) travel in the Roan Plateau Planning Area TMA is limited to designated routes year-round as signed or identified on maps available onsite or at the CRVFO. Future travel plans will minimize disturbance and redundant routes in order to outline criteria for future route development.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Within the Hubbard Mesa TMA (same boundary as the Hubbard Mesa OHV Riding Area), allow muscle-powered (e.g., foot, ski, horse, stock) travel and mechanized (wheeled conveyance) travel cross-country year-round consistent with the "open" OHV designation for motorized travel. **Standards:** All TMA delineations are subject to additional restrictions (i.e., seasonal, area, type, and number) set forth in the ROD or in subsequent travel planning.
In GRSG PHMA, limit motorized travel to existing roads, primitive roads, and trails, at a minimum.
In GRSG PHMA, evaluate and consider permanent or seasonal road or area closures as needed to address a current threat.
In GRSG PHMA, complete activity-level travel plans as soon as possible, subject to funding. During activity-level planning, where appropriate, designate routes with current administrative/agency purpose or need to administrative access only.
In GRSG PHMA, complete activity-level travel plans as soon as possible, subject to funding. Limit route construction to routes that will not adversely affect GRSG populations due to habitat loss or disruptive activities.
In GRSG PHMA, use existing roads or realignments whenever possible. If it is necessary to build a new road, and the use of existing roads would cause adverse impacts to GRSG, construct new roads to the appropriate minimum Gold Book standard and add the surface disturbance to the total disturbance in the priority habitat management area if it meets the criteria in Appendix E, Methodology for Calculating Disturbance Caps, NWCOGSG FEIS. Construct no new roads if the CO Management Zone is over the 3% disturbance cap, unless there is an immediate health and safety need, or to support valid existing rights that cannot be avoided. Evaluate and implement additional, effective mitigation necessary to offset the resulting loss of GRSG habitat.
In GRSG PHMA, allow upgrades to existing routes after documenting that the upgrade will not adversely affect GRSG populations due to habitat loss or disruptive activities.
In GRSG PHMA, conduct restoration of roads, primitive roads, and trails not designated in travel management plans. This also includes primitive routes/roads that were not designated in WSAs and within lands with wilderness characteristics that have been selected for protection in previous LUPs.
In GRSG PHMA, when reseeding roads, primitive roads, and trails, use appropriate native seed mixes and require the use of transplanted sagebrush.
Designation of Off-Highway Vehicle (OHV) Management Areas
Goal: Motorized recreation opportunities coexist with fragile resources. **Objective:** Provide for motorized recreational opportunities in the Hubbard Mesa Area, while managing for non-motorized and non-mechanized travel based recreation opportunities in other portions of the Planning Area.
Management Actions: Hubbard Mesa is designated as *Open* to OHV travel. Travel on all other public lands is classified as limited to designated routes, except for snowmobiles, which are allowed to travel cross-country on top of the Roan Plateau if there is at least 12 inches of snow (43 CFR 8340-0.5). The designation excludes vehicles in emergency, official, and authorized use (by permit holders, lessee, etc.). OHV travel and access may also be limited at certain times/seasons, in certain areas, and/or to certain vehicular types and numbers of vehicles. Authorization for oil and gas development may modify route designations to reduce conflict and ensure public health and safety.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
New routes associated with oil and gas would be designated administrative access only (BLM use), unless specific objectives for other resources (e.g., recreational travel routes or access to recreational sites) are present that warrant other designations on a case-by-case basis.
Designate 2,330 acres, the Hubbard Mesa (Map 36), as OHV Open Area.
Designate 64,450 acres as OHV Limited Area, where all OHV use is limited to designated routes (Map 36).
Designate 32,680 acres (Map 36) as OHV Limited Area. Within this area, over snow use would be allowable cross-county with a minimum snow depth of 12 inches. Aside from the over-snow exception, all OHV use is restricted to designated routes.
Apply: • SSR/CSU for Hubbard Mesa Open OHV Riding Area.
Transportation Routes
Route discussion applies only to currently existing routes, unless otherwise noted. Additional routes that may be authorized as part of permitted activities would generally be for administrative access only in order to reduce impacts to wildlife and habitat fragmentation, but such routes may be open to limited use by recreationists, or for other resource management purposes. Such future identification would not require an RMP amendment, but would be addressed in site-specific NEPA analyses.
Goals: • Provide a network of roads and trails open to administrative, recreational, and permitted uses that accommodates environmental and resource concerns. • Maintain the present visual quality and character associated with the JQS Road. **Objectives:** • Manage routes as open if they provide recreational opportunities, needed administrative access (including permitted uses), are not redundant with other routes, and do not pose a potential risk to other resources. Restrict use to administrative purposes to avoid or minimize conflicts. Close routes that are redundant, conflict with management objectives, or pose threats to the various resources present, and are not needed for administrative purposes. The primary purpose in implementing closures and administrative use limitations is to minimize impacts to wildlife and to reduce habitat fragmentation. • Maintain the JQS Road in its present condition and allow for present uses. Note: Where OHVs are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness characteristics, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence.
Management Actions: Open to motorized and mechanized use: 191 miles (96 miles atop the plateau, 95 miles below the rim). Open only for administrative motorized use: 54 miles (47 miles atop the plateau, 7 miles below the rim). Administrative roads in the Hubbard Mesa OHV Riding Area would be open to the public. Closed to motorized and mechanized travel use: 24 miles (23 miles atop the plateau, 1 mile below the rim).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Standards: Routes atop the plateau would be managed to not exceed approximately 138 miles of open and administrative routes, although some exceptions may apply (Appendix C). Routes are subject to closure or restrictions for public safety or environmental protection. Closed routes would be rehabilitated and may be designated/managed for foot and horse travel, and/or other non-motorized uses, including mountain bikes. The JQS Road would be managed to allow for only historical and recreational use and would be maintained in approximately its current condition. It is not suitable as a main access route for industrial or other long/heavy equipment due to steep grades and switchbacks. Improvements to accommodate such use would not be permitted.
The JQS Road is not suitable as a main access for oil and gas drilling equipment and other long or heavy equipment due to steep grades and switchbacks. It is assumed that oil and gas lessees would access the top of the plateau across private lands from the west.
Lands and Realty
Goal: Provide for compatible land use authorizations within the framework of laws and regulations. Provide for land tenure adjustments and sales to benefit the public interest and facilitate effective land management. **Objective:** Meet agency and public ROWs, utility, land exchange, land tenure adjustments, and consolidation of ownership needs when in the public interest and within the constraints for other resources. **GRSG Objectives:** • Manage the Lands and Realty program to avoid, minimize, and mitigate the loss of GRSG habitat and habitat connectivity through the authorizations of ROWs, land tenure adjustments, proposed land withdrawals, agreements with partners, and incentive programs. • Effects of infrastructure projects, including siting, will be minimized using the best available science and updated as monitoring information on current infrastructure projects becomes available.
Management Actions: Acquisition of in-holdings and other lands with important resource values would be encouraged or allowed. Allow development in the existing ROWs corridor along SH 13 and I-70. Retain lands atop the plateau and acquire in-holdings atop the plateau. Below the rim, lands would be considered for sale, acquisition, or exchange on a case-by-case basis. No exchanges or disposals would be allowed within ACECs or the WMA. Use authorizations would conform to the various protective measures contained in this alternative. Allow for potential disposal or exchange of approximately 40 acres adjacent to the gun range, along with about 190 acres in other isolated parcels.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Allow utility corridors within 50 feet of BLM-designated and administrative travel routes except where such placement would negatively impact other important resource values (e.g., wildlife seclusion areas, occupied habitat for special status plants or significant plant communities). In such areas (typically with SSR/CSU restrictions), utilities would be placed within the existing roadway or realigned to avoid important resource values. Retain lands atop the plateau. Below the rim, lands would be considered on a case-by-case basis for exchange. Retain significant caves.
Recommend modification of the current oil shale withdrawal affecting the transferred lands to allow for land tenure actions while keeping land closed to mineral location and entry, but retain oil shale withdrawal (without modification) for Anvil Points Facility Repositories 1 and 2 for consistency with perpetual ROW on repositories. Recommend withdrawal of Anvil Points Oil Shale Facility Repository 3. Retain BLM ROW on Anvil Points Facility Repositories 1, 2, and 3.
Apply: • CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories.
For lands in GHMA that are identified for disposal, the BLM would only dispose of such lands consistent with the goals and objectives of this LUPA, including, but not limited to, the LUPA objective to maintain or increase GRSG abundance and distribution.
Manage areas within PHMA as avoidance areas for BLM ROW permits. (See Special Stipulations applicable to GRSG PHMA ROW Avoidance, Proposed LUPA*.) Manage areas within GHMA as avoidance areas for major (transmission lines greater than 100 kilovolts and pipelines greater than 24 inches) and minor BLM ROW permits. (See Special Stipulations applicable to GRSG PHMA ROW Avoidance, Proposed LUPA*.) No new roads or above-ground structures would be authorized within 1 mile of an active lek. Above-ground structures are defined as structures that are located on or above the surface of the ground, including but not limited to: roads, fences, communication towers, and/or any structure that would provide perches. Above ground structures would only be authorized if: It is consistent with the overall objective of the RMP Amendment; • The effect on GRSG populations or habitat is nominal or incidental; • Allowing the exception prevents implementation of an alternative more detrimental to GRSG or similar environmental concern; and • Rigid adherence to the restriction would be the only reason for denying the action. PHMA and GHMA are designated as avoidance areas for high-voltage transmission line ROWs. All authorizations in these areas must comply with the conservation

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
measures outlined here, including the RDFs and avoidance criteria presented in this document. GRSG PHMA ROW Avoidance, Proposed LUPA*. ROWs may be issued after documenting that the ROWs would not adversely affect GRSG populations based on the following criteria: • Location of proposed activities in relation to critical GRSG habitat areas as identified by factors, including, but not limited to, average male lek attendance and/or important seasonal habitat. • An evaluation of the potential threats from proposed activities that may affect the local population as compared to benefits that could be accomplished through compensatory or off-site mitigation (see Section 2.7.3, Regional Mitigation). • An evaluation of the proposed activities in relation to the site-specific terrain and habitat features. For example, within 4 miles from a lek, local terrain features such as ridges and ravines may reduce the habitat importance and shield nearby habitat from disruptive factors. Any new projects within PHMA would be subject to the 3% disturbance cap as described in Appendix H, Guidelines for Implementation of the Proposed Plan (NWCOGSG FEIS; BLM 2015d). If the 3% disturbance cap is exceeded in PHMA in any Colorado MZ, no new ROW would be authorized in PHMA within that biologically significant unit (Colorado populations) and proposed project analysis area (Colorado MZ), unless site-specific analysis documents no impact to GRSG. GRSG PHMA ROW TL, Proposed LUPA*: Prohibit surface occupancy and surface-disturbing activities associated with BLM ROW within 4 miles from active leks during lekking, nesting, and early brood-rearing (March 1 to July 15). (See Special Stipulations applicable to GRSG PHMA ROW TL, Proposed LUPA*). (PHMA) Only issue ROWs after documenting that the ROWs will not adversely affect GRSG populations due to habitat loss or disruptive activities (independent of disturbance cap), except where such limitation would make accessing valid existing rights impracticable. Construct new roads to the appropriate Gold Book standard and add the surface disturbance to the total disturbance in the PHMA. Any new ROW authorizations would be subject to the 3% disturbance cap, and would be evaluated based on an analysis of the following: • Location of proposed activities in relation to critical GRSG habitat areas as identified by factors, including, but not limited to, average male lek attendance and/or important seasonal habitat. • An evaluation of the potential threats from proposed activities that may affect the local population as compared to benefits that could be accomplished through compensatory or off-site mitigation (see Section 2.7.3, Regional Mitigation). • An evaluation of the proposed activities in relation to the site-specific terrain and habitat features. For example, within 4 miles from a lek, local terrain features such as ridges and ravines may reduce the habitat importance and shield nearby habitat from disruptive factors. GRSG PHMA ROW TL, Proposed LUPA*: Prohibit surface occupancy and surface-disturbing activities associated with BLM ROW within 4 miles from active leks during lekking, nesting, and early brood-rearing (March 1 to July 15). * NCGSG Proposed LUPA/FEIS

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GRSG PHMA, new ROWs may be collocated within approved ROW corridors that are encumbered by existing ROW authorizations. Apply special stipulations in Appendix D, Stipulations Applicable to Fluid Mineral Leasing and Land Use (NWCOGSG FEIS).
In GRSG PHMA, issue ROWs only after documenting that the ROWs will not adversely affect GRSG populations due to habitat loss or disruptive activities (independent of disturbance cap) except where such limitation would make accessing valid existing rights impracticable. Construct new roads to the appropriate Gold Book standard and add the surface disturbance to the total disturbance in the priority habitat management area. Any new ROW authorizations would be subject to the 3% disturbance cap, and would be evaluated based on an analysis of the following: • Location of proposed activities in relation to critical GRSG habitat areas as identified by factors including, but not limited to, average male lek attendance and/or important seasonal habitat. • An evaluation of the potential threats from proposed activities that may affect the local population as compared to benefits that could be accomplished through compensatory or offsite mitigation. (See Mitigation Strategy, NGSG RMP/EIS.) • An evaluation of the proposed activities in relation to the site-specific terrain and habitat features. For example, within 4 miles from a lek, local terrain features such as ridges and ravines may reduce the habitat importance and shield nearby habitat from disruptive factors. Apply: • GRSG PHMA ROW TL: Prohibit surface occupancy and surface-disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1-July 15).
In GRSG PHMA, or within 4 miles of an active lek, for ROW renewals, where existing facilities cannot be removed, buried, or modified, require perch deterrents.
In GRSG PHMA, reclaim and restore ROWs per regulatory requirements (43 CFR 2805.12(i)(1); 43 CFR 2885.11(b)(9)(i)). Designate new ROW corridors in GRSG PHMAs only where there is a compelling reason to do so and location of the corridor within PHMAs will not adversely affect GRSG populations due to habitat loss or disruptive activities.
Manage areas within GHMA as avoidance areas for major (transmission lines greater than 100 kilovolts and pipelines greater than 24 inches) and minor BLM ROW permits. (See Special Stipulations applicable to GRSG PHMA ROW Avoidance, Proposed LUPA*.) * NCGSG Proposed LUPA/FEIS
Retain public ownership of GRSG PHMA. Consider exceptions where there is mixed ownership and land exchanges would allow for additional or more contiguous Federal ownership patterns within the GRSG PHMA area.
In GRSG PHMA, in isolated Federal parcels, only allow tract disposals that are beneficial or neutral to long-term management of GRSG populations. For GRSG GHMA: 1. For parcels in GHMA for which land retention was analyzed in one alternative (i.e., not analyzed for disposal in every alternative), the allocation for that piece of GHMA should be "retention" in the Proposed Plan.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
2. For pieces of land in GHMA for which land retention was never analyzed (i.e., analyzed for disposal in every alternative), the lands will remain identified for "disposal" subject to the following drop in: For lands in General Habitat that are identified for disposal, the BLM will only dispose of such lands consistent with the goals and objectives of this plan, including, but not limited to, the land use plan objective to maintain or increase GRSG abundance and distribution.
In GRSG PHMA, consider petitioning for withdrawal on a case-by-case basis from mineral entry based on risk to GRSG and its habitat.
Recreation
Goal: Manage the entire Planning Area as undesignated for recreation management. **Objectives:** Manage to meet basic recreation and visitor services and resource stewardship needs: 1. Visitor Health and Safety – Ensure that participants in dispersed recreational activities have a low potential for serious accidents (< two accidents/year that require hospitalization) due to human-created conditions and no (zero) exposure to hazardous health conditions. 2. Use and User Conflicts – Limit incidents of conflict that impede gas production (as determined by BLM Natural Resource Specialists) to three or less per year by increasing the understanding of participants in traditional dispersed recreational activities about gas production and the phasing of development. 3. Resource Protection – Create an increased awareness, understanding, and sense of stewardship in recreational activity participants so their conduct safeguards natural resource values within ACECs and overall land health (as defined by ACEC objectives or Land Health Standards). **GRSG Objectives:** Manage Recreation to avoid activities that: (1) disrupt GRSG; (2) fragment GRSG habitat; or (3) spread noxious weeds.
Management Actions: Management activities would include custodial recreation management actions only. Marketing/Interpretation: Mitigate conflicts through visitor outreach efforts. Monitoring: BLM staff would monitor conflicts with other uses (i.e., oil and gas production, grazing, ACEC management and land health), and private lands. Administration: Mitigate conflicts directly by way of recreation use restrictions, realignments, signage, and closures. Permitted special events and Special Recreation Permits (SRPs) for commercial use, organized group use, competitive events, and vending use would be allowed consistent with other management objectives for other resources and uses
In GRSG PHMA, do not allow SRPs with the potential to adversely affect GRSG or GRSG habitat.
Grazing and Rangeland Management
Goal: Provide livestock forage while maintaining or enhancing healthy landscapes. **Objective:** Grazing management would conform to BLM grazing regulations (43 CFR 4180) and BLM Colorado's Standards for Public Land Health and Guidelines for Livestock Management.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
GRSG Objectives: GRSG objectives and well-managed livestock operations are compatible because forage availability for livestock and hiding cover for GRSG are both dependent on healthy plant communities. Agreements with partners that promote sustainable GRSG populations concurrent with sustainable ranch operations offer long-term stability. In the context of sustainable range operations, manage the range program to: (1) maintain or enhance vigorous and productive plant communities; (2) maintain residual herbaceous cover to reduce predation during GRSG nesting and early brood rearing; (3) avoid direct adverse impacts to GRSG-associated range project infrastructure; and (4) employ grazing management strategies that avoid concentrating animals on key GRSG habitats during key seasons.
Management Actions: Regularly monitor rangeland health and evaluate existing grazing management practices. Continue to implement the BLM CRVFO Monitoring Plan (Appendix I) and current AMPs in conjunction with Standards for Public Land Health and Guidelines for Livestock Management to assess overall rangeland health. Develop, implement, and review AMPs on a regularly scheduled basis with grazing permittees with priority for allotments determined not to be meeting Land Health Standards. Apply guidelines and BMPs (Roan FEIS Appendix L) to rest, and defer grazing of riparian areas. Ensure that Land Health Standards are being met through Land Health surveys and application of the most current version of the CRVFO Monitoring Plan (Appendix I). Use a combination of administrative solutions (season-of-use revisions, livestock exclusion, and stocking level adjustments) and rangeland projects (fences, ponds, etc.) to direct livestock use to meet resource objectives and Land Health Standards, following the latest version of BLM Technical Reference 1734-6 or equivalent documents. Modify or abandon and rehabilitate rangeland projects that do not function to maintain resource values and meet management objectives. Identify criteria for determining the beginning and end of droughts (or droughty periods whether officially declared or not) on the basis of scientifically credible methods, data, and BLM policy (e.g., Palmer Drought Severity Index, Crop Moisture Index, and soil moisture). The authorized officer has the authority to modify grazing based on resource conditions and objectives and the need to protect resources from imminent likelihood of resource damage (43 CFR 4110.3-3(b)).
In GRSG GHMA, incorporate GRSG habitat objectives and management considerations into all BLM grazing allotments through Allotment Management Plans or permit renewals.
In GRSG GHMA, work cooperatively on integrated ranch planning within GRSG habitat. Develop management strategies that are seamless with respect to actions on public and private lands within BLM grazing allotments.
In GRSG PHMA, the BLM will prioritize: • the review of grazing permits/leases, in particular to determine whether modification is necessary prior to renewal, and • the processing of grazing permits/leases in PHMAs. In setting workload priorities, precedence will be given to existing permits/leases in these areas not meeting Land Health Standards, with focus on those containing riparian areas, including wet meadows. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (e.g., fire) and legal obligations.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GRSG GHMA, conduct land health assessments that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving GRSG habitat objectives. If local/State seasonal habitat objectives are not available, use GRSG habitat recommendations from Connelly et al. 2000 and Hagen et al. 2007.
In GRSG GHMA, develop specific objectives—through NEPA analysis conducted in accordance with the permit/lease renewal process—to conserve, enhance, or restore GRSG habitat. Base benchmarks on Ecological Site/Range Site Descriptions. When existing Ecological Site/Range Site Descriptions have not been developed, or are too general to serve adequately as benchmarks, identify and document local reference sites for areas of similar potential that exemplify achievement of GRSG habitat objectives and use these sites as the benchmark reference. Establish measurable objectives related to GRSG habitat from baseline monitoring data, ecological site descriptions, or land health assessments/evaluations, or other habitat and successional stage objectives.
In GRSG GHMA, manage for vegetation composition and structure consistent with ecological site potential and within the reference state subject to habitat objectives, including successional stages.
In GRSG GHMA, include terms and conditions on grazing permits and leases that address disruptive activities that affect GRSG and that ensure plant growth requirements are met and residual forage remains available for GRSG hiding cover. Specify as necessary: • Season or timing of use; • Numbers of livestock (include temporary non-use or livestock removal); • Distributions of livestock use; • Intensity of use (utilization or stubble height objectives); • Kind of livestock (e.g., cattle, sheep, horse, llama, alpaca, and goat); • Class of livestock (e.g., yearlings versus cow/calf pairs); and • Locations of bed grounds, sheep camps, trail routes, etc.
In GRSG GHMA, develop drought contingency plans at the appropriate landscape unit that provide for a consistent/appropriate BLM response. Plans should establish policy for addressing ongoing drought and post-drought recovery for GRSG habitat objectives.
In GRSG PHMA, the NEPA analysis for renewals and modifications of livestock grazing permits/leases that include lands within PHMAs would include specific management thresholds based on GRSG Habitat Objectives Table and Land Health Standards (43 CFR 4180.2) and defined responses that would allow the authorizing officer to make adjustments to livestock grazing without conducting additional NEPA.
Allotments within PHMAs, focusing on those containing riparian areas, including wet meadows, would be prioritized for field checks to help ensure compliance with the terms and conditions of the grazing permits. Field checks could include monitoring for actual use, utilization, and use supervision.
In GRSG GHMA, manage riparian areas and wet meadows for proper functioning condition.
In GRSG GHMA, manage wet meadows to maintain diverse species richness, including a component of perennial forbs, relative to site potential (i.e., reference state).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GRSG GHMA, establish permit/lease terms and conditions (see above) in conjunction with grazing strategies to ensure that the timing and level of utilization results in wet meadows with diverse species richness, including a component of perennial forbs, relative to site potential (i.e., reference state).
In GRSG GHMA, authorize new water development only after determining that the project will not adversely impact GRSG due to habitat loss. Ensure that adequate long-term grazing management is in effect before authorizing water developments that may increase levels of use or change season of use. Give specific consideration to adjacent or downstream wetland habitat when a project entails a diversion from a spring or seep.
In GRSG GHMA, analyze springs, seeps, and associated pipelines to determine whether modifications are necessary to maintain the continuity of the predevelopment riparian area. If necessary to maintain GRSG populations or reverse a downward population trend caused by habitat loss, modify the project as necessary to restore the applicable wetland habitat.
In GRSG GHMA, manage for a habitat objective that is primarily sagebrush with a mosaic of seral stages and sagebrush in all age classes. On a site-by-site basis, do not allow treatments that would adversely affect GRSG populations.
In GRSG PHMA, evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to GRSG PHMA to determine whether they should be restored to sagebrush or habitat of higher quality for GRSG. If these seedings are part of an Allotment Management Plan or if they provide value in conserving or enhancing the rest of the PHMA, then no restoration would be necessary. Assess the compatibility of these seedings for GRSG habitat or as a component of a grazing system during the land health assessments (or other analyses only). For example, some introduced grass seedings are an integral part of a livestock management plan and reduce grazing pressure in important sagebrush habitats or serve as a strategic fuels management area.
In GRSG GHMA, design new range improvement projects to enhance livestock distribution and control the timing and intensity of utilization. Examples of structural range improvement projects are cattle guards, fences, corrals, pipelines, troughs, storage tanks, windmills, ponds/reservoirs, solar panels, and spring developments. Include a plan to monitor and control invasive plant species following any related ground disturbance. Place mineral or salt supplements away from water sources and leks in locations that enhance livestock distribution.
In GRSG PHMA, where conditions create the potential for impacts from West Nile virus from developments or modification of water developments, use PDFs/RDFs to mitigate the potential impacts. See Appendix I, NWCOGSG FEIS.
(ADH), at the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was authorized should remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments or fire breaks. When a permittee or lessee voluntarily relinquishes grazing preference, consider conversion of the allotment to a reserve common allotment that will remain available for use on a temporary, nonrenewable basis for the benefit of GRSG habitat. Authorize temporary nonrenewal permits in Reserve Common Allotments to meet resource objectives elsewhere such as rest or deferment due to fire or vegetation treatments. Temporary use of reserve common allotments would not be allowed due to drought or overuse of customary allotments.
In GRSG GHMA, mark fences in high-risk areas. In GRSG PHMA, where marking fences does not reduce fence-related GRSG mortality, modify fences. Where modification does not reduce GRSG mortality and the fence-related mortality is sufficient to adversely affect GRSG populations, remove fences.
In GRSG GHMA, monitor for and treat invasive species associated with existing range improvements.
In ADH, at the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
authorized shall remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments or fire breaks. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR 4110.2-3. When a permittee or lessee voluntarily relinquishes grazing preference, consider conversion of the allotment to a reserve common allotment that will remain available for use on a temporary, nonrenewable basis for the benefit of GRSG habitat. Authorize temporary nonrenewal permits in Reserve Common Allotments to meet resource objectives elsewhere. such as rest or deferment due to fire or vegetation treatments. Temporary use of reserve common allotments would not be allowed due to drought or overuse of customary allotments.
Oil and Gas Leasing and Development
Protection of Threatened, Endangered, or Special Status Species
In addition to standard stipulations, all lands made available for lease under any alternative would have the following special stipulation: The lease area may now or subsequently contain threatened, endangered, or other special status species of plants or animals or their habitats. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such species or their habitat under the ESA, as amended (16 U.S.C. 1531 et seq.). BLM will require modifications to, or disapprove, a proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed Critical Habitat. BLM will not approve any ground-disturbing activity that may affect any such species or Critical Habitat until it completes its obligations under applicable requirements of the ESA, including any required procedure for conference or consultation.
Greater Sage-Grouse
Fluid Minerals Management
GRSG Objectives: • Manage fluid minerals to avoid, minimize, and compensate for: 1) direct disturbance, displacement, or mortality of GRSG; 2) direct loss of habitat or loss of effective habitat through fragmentation; and 3) cumulative landscape-level impacts. Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside PHMA and GHMA. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA and GHMA, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG. The implementation of these priorities will be subject to valid existing rights and any applicable law or regulation, including, but not limited to, 30 U.S.C. 226(p) and 43 CFR 3162.3-1(h). • Utilize Federal authority to protect GRSG habitat on split estate lands to the extent provided by law.
Unleased Fluid Minerals
No new leasing 1 mile from active leks in ADH. NSO without waiver or modification in PHMA. See Appendix D (Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations NWCOGSG FEIS) for exceptions.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GHMA, any new leases would include appropriate TL stipulations to protect GRSG and its habitat. In addition, in GHMA, NSO with waivers, exceptions, and modification within 2 miles of active leks (Appendix D, Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations NWCOGSG FEIS). 3% disturbance cap in PHMA (by biologically significant unit) with disturbances limited to one disturbance per 640 acres density calculated by Colorado MZ and proposed project analysis area would apply to new lease activities. No new leasing in PHMA if disturbance cap exceeds 3% calculated by biologically significant unit (Colorado populations) and proposed project analysis area (Colorado MZ) or one disturbance per 640 acres density is exceeded. The following stipulations would apply (Appendix D, Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations NWCOGSG FEIS): GRSG NSO-46e: See Appendix D, Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations (NWCOGSG FEIS), for waiver, modification, and exception criteria. GRSG TL-46e: No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood-rearing (March 1 to July 15). GRSG LN-46e: Any lands leased in PHMA are subject to the restrictions of one disturbance per 640 acres calculated by biologically significant unit (Colorado populations) and proposed project analysis area (Colorado MZ) to allow clustered development.
In GRSG PHMA, allow geophysical exploration within GRSG PHMAs to obtain information for existing Federal fluid mineral leases or areas adjacent to State or fee lands within GRSG PHMAs. Allow geophysical operations only using helicopter-portable drilling, wheeled, or tracked vehicles on existing roads, or other approved methods conducted in accordance with seasonal timing limitations and other restrictions that may apply. Geophysical exploration shall be subject to seasonal restrictions that preclude activities in breeding, nesting, brood-rearing, and winter habitats during their season of use by GRSG.
Leased Fluid Minerals
GRSG Objectives: Where a proposed fluid mineral development project on an existing lease could adversely affect GRSG populations or habitat, the BLM will work with the lessees, operators, or other project proponents to avoid, reduce, and mitigate adverse impacts to the extent compatible with lessees' rights to drill and produce fluid mineral resources. The BLM will work with the lessee, operator, or project proponent in developing an Application for Permit to Drill for the lease to avoid, minimize, and compensate for impacts to GRSG or its habitat and will ensure that the best information about GRSG and its habitat informs and helps guide development of such Federal leases.
Within 1 mile of active leks, disturbance, disruptive activities, and occupancy are precluded. If it is determined that this restriction would render the recovery of fluid minerals infeasible or uneconomic, considering the lease as a whole, or where development of existing leases requires that disturbance density exceeds one disturbance per 640 acres and/or the 3% disturbance cap, use the criteria below to site proposed lease activities to meet GRSG habitat objectives and require mitigation as described in Appendix G (Greater Sage-Grouse Mitigation Strategy; NWCOGSG FEIS). In PHMA and within 4 miles of an active lek, the criteria below would be applied to guide development of the lease or unit that would result in the fewest impacts possible to GRSG.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Based on site-specific conditions, prohibit construction, drilling, and completion within PHMA within 4 miles of a lek during lekking, nesting, and early brood-rearing (March 1 to July 15). In consultation with the State of Colorado, this TL may be adjusted based on application of the criteria below. Criteria: • Location of proposed lease activities in relation to critical GRSG habitat areas as identified by factors, including, but not limited to, average male lek attendance and/or important seasonal habitat. • An evaluation of the potential threats from proposed lease activities that may affect the local population as compared to benefits that could be accomplished through compensatory or off-site mitigation (see Section 2.7.3*, Regional Mitigation). • An evaluation of the proposed lease activities, including design features, in relation to the site-specific terrain and habitat features. For example, within 4 miles from a lek, local terrain features such as ridges and ravines may reduce the habitat importance and shield nearby habitat from disruptive factors. This is particularly likely in Colorado MZ 17, which has an atypical GRSG habitat featuring benches with GRSG habitat interspersed with steep ravines. To authorize an activity based on the criteria above, the environmental record of review must show no significant direct disturbance, displacement, or mortality of GRSG. * NCGSG Proposed LUPA/FEIS
In GRSG PHMA COA, BLM should closely examine the applicability of categorical exclusions in PHMA. If extraordinary circumstances review is applicable, the BLM should determine whether those circumstances exist.
GRSG PHMA Notice to Lessees-54e*: Within PHMA, operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single-well Applications for Permit to Drill for all but exploratory wells. (Refer to Appendix D*, Stipulations Applicable to Fluid Mineral Leasing and Land Use Authorizations.) *NWCOGSG FEIS
In GRSG PHMA, conduct effective mitigation, first within the same Colorado Management Zone where the impact is realized and, if not possible, then conduct mitigation within the same population as the impact, or in other Colorado GRSG populations, in consultation with the State of Colorado.
In GRSG PHMA, when necessary, conduct effective mitigation in (1) GRSG PHMA areas; or, less preferably, (2) GHMA (dependent upon the area-specific ability to increase GRSG populations and in consultation with the State of Colorado).
In GRSG PHMA, allow applicants and partners to offset impacts from development and disruption with conservation easements.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GRSG GHMA, for future actions, require a full reclamation bond specific to the site in accordance with 43 CFR 3104.2, 3104.3, and 3104.5. Ensure bonds are sufficient for costs relative to reclamation that would result in full restoration of the lands to the condition they were found prior to disturbance. Base the reclamation costs on the assumption that contractors for the BLM will perform the work.
The range of alternatives is articulated in the specific Preferred Design Features/Required Design Features (PDFs/RDFs) sections.
In GRSG PHMA, where the Federal government owns the mineral estate in PHMAs and GHMAs, and the surface is in non-Federal ownership, apply the same stipulations, COAs, and/or conservation measures and RDFs applied if the mineral estate is developed on BLM-administered lands in that management area, to the maximum extent permissible under existing authorities, and in coordination with the landowner.
Allow geophysical exploration within GRSG PHMA areas to obtain information for existing Federal fluid mineral leases or areas adjacent to State or fee lands within GRSG PHMA areas. Allow geophysical operations only using helicopter-portable drilling, wheeled, or tracked vehicles on existing roads, or other approved methods conducted in accordance with seasonal timing limitations and other restrictions that may apply. Geophysical exploration shall be subject to seasonal restrictions that preclude activities in breeding, nesting, brood-rearing, and winter habitats during their season of use by GRSG.
In GRSG PHMA and GHMA, where the Federal government owns the surface and the mineral estate is in non-Federal ownership in PHMA and GHMA, apply appropriate surface use COAs, stipulations, and mineral RDFs/PDFs through ROW grants or other surface management instruments, to the maximum extent permissible under existing authorities, in coordination with the mineral estate owner/lessee.
Leasing and Permitting
Goal: Make lands available, as appropriate for oil and gas leasing in an environmentally sound manner, under multiple use mandates. Conduct oil and gas leasing on leasable lands in accordance with the Mineral Leasing Act and the Federal Onshore Oil and Gas Reform Act of 1987 (Reform Act) and applicable regulations under 43 CFR 3100 and in accordance with the decisions made through application of FLPMA and other laws applicable to public lands. Regulations governing onshore oil and gas operations can be found at 43 CFR 3160.
Objective: Limit lands open to oil and gas leasing and development atop the plateau. Open lands below the rim of the plateau to oil and gas leasing and development. All leases would be subject to lease notices, stipulations, and standard lease terms and conditions, except as modified by CRVFO-CSU-Roan-1: Settlement Terms and Conditions (Appendix C). **Management Actions:** Limited areas above the rim would be available for oil and gas leasing and development. Well drilling, well pad construction, and associated actions and facilities, such as upgrading existing roads and constructing well sites, new roads, pipelines, and compressor stations, would be sited and constructed in compliance with CRVFO-CSU-Roan-1: Settlement Terms and Conditions (Appendix C). For leases below the rim, prior to exploration and/or lease development, the operator shall submit a proposed MDP identifying its projected activities. Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's MDP (CRVFO-CSU-Roan-1: Settlement Terms and Conditions [Appendix C). The standard lease form, along with standard terms and conditions, is shown in Appendix B. Lease stipulations are described in Appendix C.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Mineral Split Estate
GRSG Objectives: Utilize Federal authority to protect GRSG habitat on split-estate lands to the extent provided by law.
Where the Federal Government owns the mineral estate in PHMA and GHMA, and the surface is in non-Federal ownership, apply the same stipulations, COAs, and/or conservation measures and RDFs/PDFs applied if the mineral estate is developed on BLM-administered lands in that management area, to the maximum extent permissible under existing authorities, and in coordination with the landowner.
In PHMA/GHMA, where the Federal Government owns the surface and the mineral estate is in non-Federal ownership in PHMA and GHMA, apply appropriate surface use COAs, stipulations, and mineral RDFs/PDFs through ROW grants or other surface management instruments, to the maximum extent permissible under existing authorities, in coordination with the mineral estate owner/lessee.
Stipulations and Restrictions: The following terms and conditions would be applied to oil and gas development in the Planning Area to accommodate needs of other resources and to ensure that development is performed in an environmentally responsible manner.
Closed to Oil and Gas Leasing: 36,320 acres* * Includes 0 acres of GRSG GHMA within 1.0 mile of an active lek.
Well spacing: • Limit to two well sites per section (320-acre spacing) in sensitive wildlife habitat (including severe winter range and winter concentration areas). • Limit to one well per section (640-acre spacing) in greater sage-grouse habitat.
No Surface Occupancy (NSO): 21,720 acres (29%) May overlap with less restrictive stipulations. NSO stipulations for the following resources: • GS-NSO-Roan-22: Steep slopes (> 50%) • GS-NSO-Roan-24: Threatened, endangered, or candidate species habitat • GS-NSO-Roan-25: Raptor nest sites • GS-NSO-Roan-26: Bald eagle nest or winter roost sites • GS-NSO-Roan-27: Wildlife seclusion areas below rim

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• GS-NSO-Roan-28: High value special status fish species habitat • GS-NSO-Roan-23: Riparian and wetland habitat • GS-NSO-Roan-30: I-70 viewshed (VRM Class II) • GS-NSO-Roan-31: East Fork Falls viewshed (VRM Class I) • GS-NSO-Roan-21: Anvil Points Claystone Cave • GS-NSO-Roan-29: Colorado River corridor • CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories • GRSG NSO-46e1/GRSG NSO-46e2: NSO within 2 miles of active GRSG leks; NSO without waiver or modification in PHMA. In GHMA, NSO with waivers, exceptions, and modification within 2 miles of active leks. • CRVFO-NSO-Roan 4: Designated municipal watersheds
Controlled Surface Use (CSU): 36,990 acres (50%) CSU is the most restrictive stipulation, where no NSO stipulations apply. CSU stipulations for the following resources: • GS-CSU-Roan-12: Habitat for BLM sensitive plant species populations and significant plant communities • GS-CSU-Roan-07: Riparian and wetland habitat • GS-CSU-Roan-08: Peregrine falcon cliff nesting complex • GS-CSU-Roan-09: Wildlife security areas above the rim • GS-CSU-Roan-10: Big game migration corridors

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• GS-CSU-Roan-11: Sensitive bat species habitat • GS-CSU-Roan-04: Erosive soils and slopes (>30%) • GS-CSU-Roan-14: VRM Class II areas below the rim • GS-CSU-Roan-15: VRM Class III areas above the rim • GS-CSU-Roan-18: Sharrard Park paleontological resources • GS-CSU-Roan-13: Parachute Creek high value watershed and Watershed Management Area • GS-CSU-Roan-16: Hubbard Mesa open OHV riding area • CRVFO-CSU-Roan-17: Lease area above the rim • CRVFO- CSU-Roan-18: Lease area below the rim
Timing Limitation (TL): 32,150 acres (44%) Lands available for lease with TLs on periods when construction and drilling activities are prohibited to protect important wildlife habitats. These limitations do not apply to the operation and maintenance of producing wells. TL stipulations for the following resources: • GS-TL-Roan-13: Big game winter range • GS-TL-Roan-14: Active raptor nest sites • GS-TL-Roan-15: Bald eagle nest or winter roost sites • GS-TL-Roan-16: Peregrine falcon cliff nesting complex • GS-TL-Roan-17: Waterfowl and shorebird nesting areas

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• GRSG TL-46e: No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1-July 15). • GRSG PHMA ROW TL: Prohibit surface occupancy and surface-disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1-July 15). • CRVFO-TL-Roan 1: Migratory bird nesting season • CRVFO-TL-Roan 3: Elk production areas • CRVFP-TL-1: Salmonid and native non-salmonid fishes
Lease Notices (LN): • GS-LN-Roan-14: Master Development Plan (MDP) • GS-LN-Roan-34: ESA consultation • GRSG PHMA LN-46e: any lands leased in PHMA are subject to the restrictions of one disturbance per 640 acres calculated by CO management zone to allow clustered development • GRSG PHMA LN-54e: Within PHMA, operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single-well Applications for Permit to Drill for all but exploratory wells. • CRVFO-LN-Roan-35: Emergency response plan. The operator is required to prepare and maintain a current emergency communications plan.
Areas with Protective Designations or Management Actions: 0 acres Lands where exploration and development activities are subject to surface use restrictions, BMPs, and mitigation measures. These would be in the form of COAs and would be developed through the permitting process. BMPs and mitigation measures to protect wildlife, greater sage-grouse, vegetation, geological, watershed, fisheries, and visual resources.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Standard Terms and Conditions with or without TLs: 3,050 acres (4.1%) Lands where exploration and development activities are subject to standard lease terms and conditions plus a stipulation for the protection of species under the ESA. Mitigation measures, which may be in the form of COAs, would be developed through the impact analysis process.
Oil Shale Leasing and Development
Goal: Conduct oil shale leasing in conformance with the Approved Resource Management Plan Amendment/Record of Decision for Oil Shale and Tar Sands Resources to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final Programmatic Environmental Impact Statement. **Objective:** Conduct potential oil shale leasing in conformance with surface disturbance stipulations identified in Appendix C. Resource condition objectives identified in this RMPA will guide reclamation activities of areas to be developed before their abandonment. **GRSG Objective**: Utilize Federal authority to protect GRSG habitat on split estate lands to the extent provided by law.
Solid Minerals - Coal Leasing and Development
Goal: Provide opportunities for leasing, exploration, and development of coal to meet local and national energy and mineral needs, consistent with 43 CFR 4320.1-4. **Objective:** Facilitate environmentally sound exploration and development of coal resources using the best available technology.
No lands are currently identified as containing potentially developable coal resources based on geologic and economic constraints and lack of expressions of interest. Only areas of potentially developable coal resources may be identified at the land use planning level as acceptable for further consideration for leasing (43 CFR 3420.1-4). Therefore, no lands are currently identified as acceptable for further consideration for coal leasing.
GRSG Objectives: • Manage solid mineral programs to avoid, minimize, and mitigate adverse impacts to GRSG habitat to the extent practical under the law and BLM jurisdiction. • Utilize Federal authority to protect GRSG habitat on split estate lands to the extent provided by law.
In GRSG GHMA, Existing Coal Leases*:* During the term of the lease, encourage the lessee to voluntarily follow PDFs (Appendix I, Required Design Features, Preferred Design Features, and Suggested Design Features, NWCOGSG FEIS) to reduce and mitigate any adverse impacts to GRSG. At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is "unsuitable" for all or certain coal mining methods pursuant to 43 CFR 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR 3461.5(o)(1). To authorize expansion of existing leases, the environmental record of review must show no significant direct disturbance, displacement, or mortality of GRSG based on the criteria below: • Critical GRSG habitat areas as identified by factors including, but not limited to, average male lek attendance and/or important seasonal habitat. • An evaluation of the threats affecting the local population as compared to benefits that could be accomplished through compensatory or offsite mitigation (See Chapter 2, Mitigation Strategy, NWCOGSG FEIS).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• An evaluation of terrain and habitat features. For example, within 4 miles from a lek, local terrain features such as ridges and ravines may reduce the habitat importance and shield nearby habitat from disruptive factors.
In GRSG PHMA, no new surface coal mine leases would be allowed in PHMA. At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM would determine whether the lease application area is "unsuitable" for all or certain coal mining methods pursuant to 43 CFR 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR 3461.5(o)(1).
New Underground Coal Mine Leases would be subject to special stipulations: • All surface disturbances will be placed more than 2 miles from active leks. • No surface disturbance on remainder of PHMA, subject to the following conditions: If, after consultation with the State of Colorado, and in consideration of the following criteria, there is no significant direct disturbance, displacement, or mortality of GRSG or impact to GRSG habitat; 3% disturbance cap in PHMA with disturbances limited to one per 640-acre density calculated by CO Management Zone would apply to new lease activities. No new leasing in PHMA if disturbance cap exceeds 3% for the CO Management Zone or one disturbance per 640 acres is exceeded.
In GRSG GHMA, underground mining exemption criteria for new leases: 1. Federal lands with coal deposits that would be mined by underground mining methods shall not be assessed as unsuitable where there would be no surface coal mining operations, as defined in 43 CFR 3400.0-5 (mm) of this title, on any lease, if issued. 2. Where underground mining will include surface operations and surface impacts on Federal lands to which a criterion applies, the lands shall be assessed as unsuitable unless the surface management agency find that a relevant exception or exemption applies. See 43 CFR 3461.1(b). Where practicable, limit permitted disturbances as defined in Appendix E, Methodology for Calculating Disturbance Caps, NWCOGSG FEIS, to 3% in any Colorado MZ. Where disturbance exceeds 3% in any Colorado MZ, make additional, effective mitigation necessary to offset the resulting loss of GRSG habitat.
In GRSG PHMA, see 43 CFR 3461.4 (a) and (b) Exploration. Authorized exploration activities may be conducted only if the Authorized Officer reviews any application for an exploration license on such lands to ensure that any exploration does not harm any value for which the area has been assessed as unsuitable and determines that the exploration will not adversely affect GRSG populations due to habitat loss or disruptive activities or that the impact can be fully mitigated. Where practicable, limit permitted disturbances as defined in Appendix E, Methodology for Calculating Disturbance Caps, NWCOGSG FEIS, to 3% in any Colorado MZ. Where disturbance exceeds 3% in any Colorado MZ make additional, effective mitigation necessary to offset the resulting loss of GRSG habitat. Disturbance Cap Exception Criteria: Where data-based documentation is available to warrant a conclusion that GRSG populations in the applicable Colorado GRSG MZ are healthy and stable at objective levels or increasing, and that the development will not adversely affect GRSG populations due to habitat loss or disruptive activities, the Authorized Officer may authorize disturbance in excess of the 3% disturbance cap without requiring additional mitigation. In many cases, this exception will require project proponents to fund studies necessary to secure the "data-based documentation" requirement.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
In GRSG PHMA - Underground Mining – Lease Renewals: • Require that all surface mining appurtenant facilities for underground mining be located outside of PHMA (unless the lessee establishes that that such location is not technically feasible). • If surface mining facilities must be located in PHMA, require the facilities be located in areas of existing disturbance and to have the smallest footprint possible utilizing design strategies to minimize disturbance such as those identified in the PDF section of this table. • Apply as conditions of lease renewal all appropriate conservation measures, PDFs, and mitigation designed to avoid and minimize impacts to GRSG. In GRSG GHMA - Surface Mining – Lease Renewals/ Readjustments: Apply as conditions of lease renewal all appropriate conservation measures, PDFs, and mitigation designed to avoid and minimize impacts to GRSG.
In GRSG GHMA, recommend or require as appropriate during all relevant points of the coal leasing and authorization process, minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on important seasonal GRSG habitats. Apply these measures during activity-level planning (jurisdiction is managed by the State). The Office of Surface Mining or a delegated State regulatory authority under the Surface Mining Control and Reclamation Act of 1977 authorizes surface disturbance activities of active coal mining operations on Federal mineral estate. The BLM coordinates with the Surface Mining Control and Reclamation Act of 1977 regulatory authority in overseeing coal leasing and permitting on Federal lands. The resource recovery and protection plan for which BLM recommends approval to the Secretary integrates the reclamation plan recommended by the Surface Mining Control and Reclamation Act of 1977 regulatory authority for active coal mines on Federal mineral estate. Approval of coal mining plans on lands containing leased Federal coal is reserved to the Secretary of the Interior (30 CFR 740.4). BLM issues coal leases and exploration licenses for right of entry to promote development of minerals on Federal lands. See the following in regards to BLM exploration: 43 CFR 3461.4. Exploration. States with delegated authority on Federal lands from the Office of Surface Mining may have their own GRSG guidance in association with State wildlife agencies, and such guidance may differ from state to state.
In GRSG GHMA: (a) Assessment of any area as unsuitable for all or certain stipulated methods of coal mining operations pursuant to Section 522 of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272) and the regulations of this subpart does not prohibit exploration of such area under 43 CFR 3410 and 43 CFR 3480. 43 CFR 3461.4(a). (b) An application for an exploration license on any lands assessed as unsuitable for all or certain stipulated methods of coal mining shall be reviewed by the BLM to ensure that exploration does not harm any value for which the area has been assessed as unsuitable. 43 CFR 3461.4(b).
Locatable Minerals
Goal: Make lands available for mining claim location. **Objective:** Allow mineral exploration and development activities.
Management Action: The Naval Oil Shale Withdrawal affecting the transferred lands would be proposed for revocation. All lands would be available for mining claim location.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Exploration/development activities would be subject to 43 CFR 3809, but not the NGD/NSO or SSR/CSU stipulations identified in the Proposed Plan. Rights granted under the mining law cannot be modified by NGD/NSO or SSR/CSU stipulations.
GRSG Objective: Manage solid mineral programs to avoid, minimize, and mitigate adverse impacts to GRSG habitat to the extent practical under the law and BLM jurisdiction.
In GRSG PHMA, in plans of operations required prior to any proposed surface-disturbing activities, include, as appropriate, effective mitigation for conservation in accordance with existing policy (BLM Washington Office Instruction Memorandum 2008-204). In GRSG PHMA, apply seasonal restrictions if deemed necessary to prevent unnecessary or undue degradation.
In GRSG GHMA, an application for an exploration license on any lands assessed as unsuitable for all or certain stipulated methods of coal mining shall be reviewed by the BLM to ensure that exploration does not harm any value for which the area has been assessed as unsuitable. 43 CFR 3461.4(b).
The range of alternatives is articulated in Appendix I, Required Design Features, Preferred Design Features, and Suggested Design Features, NWCOGSG FEIS.
Salable Minerals
GRSG Objective: Manage solid mineral programs to avoid, minimize, and mitigate adverse impacts to GRSG habitat to the extent practical under the law and BLM jurisdiction.
(PHMA) Close PHMA to new mineral material sales. However, these areas would remain open to free use permits and the expansion of existing active pits, only if the following criteria are met: • The activity is within the biologically significant unit and the project area disturbance cap • The activity is subject to the provisions set forth in the mitigation strategy (Appendix G *) • All applicable required/preferred design features are applied; and [if applicable] the activity is permissible under the regional screening criteria (Appendix H *, Guidelines for Implementation). * NWCOGSG FEIS.
In GRSG GHMA, restore salable mineral pits no longer in use to meet GRSG habitat conservation objectives. Require reclamation/restoration of GRSG habitat as a viable long-term goal to improve the GRSG habitat.
Areas of Critical Environmental Concern (ACECs)
Goal: Highlight management of relevant and important resource values. **Objective**: Designate four ACECs where special management is applied through special designations, recognize the unique values on BLM lands that require special management in order to protect resource values. Protect important geologic, botanic, historic, cultural, and scenic values, fish and wildlife resources, and other natural systems (rare or exemplary) that are vulnerable to adverse change and protect human life and property from natural hazards.
Management Action: Designate four ACECs in which risk of impacts to significant values would be minimized through management prescriptions on 25,010 acres:

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
• East Fork Parachute Creek: 7,110 acres (visual, fish/wildlife, botanical/ecological). • Trapper/Northwater Creek: 6,290 acres (fish/wildlife, botanical/ecological). • Magpie Gulch: 4,710 acres (visual, wildlife, botanical/ecological). • Anvil Points: 6,900 acres (visual, wildlife, botanical/ecological). Management prescriptions for resources within the ACECs are detailed in Table 2.2, Proposed RMPA/FSEIS (BLM 2016).
Watershed Management Area (WMA)
Goals: The goals of the WMA are threefold: 1. Maintain or improve CRCT habitat. This may be accomplished by habitat improvement and by preventing or minimizing impacts to ecological function throughout the WMA. 2. Maintain or improve special status plant populations, significant plant communities, and their habitat. 3. Maintain the hydrologic regime and ecological integrity/function that provide existing habitat for special status plant populations and significant plant communities in the WMA (defined in Section 3.3.3). **Objectives:** The objectives are also threefold: 1. Maintain or improve water quality, natural stream flow, and stream ecological function throughout the WMA by preventing or minimizing direct, indirect, or cumulative adverse impacts to CRCT or their habitat. 2. Maintain or improve surface and subsurface water flows, and the ecological integrity and function that supports rare and/or significant natural plant communities. 3. Prevent disruption, alteration, or interruption of surface and subsurface water flows that support rare and/or significant natural plant communities, and protect against invasion of noxious weeds or other aggressive exotic plants.
Apply: • SSR/CSU for Parachute Creek high-value watershed and WMA.
Management Actions: Protections would be applied to the watershed in the form of a SSR/CSU. For more information on these management actions, see Table 2.3, Proposed RMPA/FSEIS (BLM 2016).
Lands With Wilderness Characteristics
Goal: Reduce impacts to wilderness characteristics to preserve the social, cultural, economic, scientific, and ecological benefits they provide to current and future generations.
Objective: Achieve indirect protection of some wilderness characteristics through application of protections for other natural resources.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
No areas would be managed specifically to maintain wilderness characteristics. However, protections for various resources may have the effect of maintaining some wilderness characteristics (e.g., roadlessness and naturalness) within NGD/NSO allocations.
Streams Suitable for Management under the Wild and Scenic Rivers Act
Goal: Manage suitable river segments and identify suitable segments for inclusion in the National Wild and Scenic River System, protecting outstandingly remarkable resource values (ORV) in accordance with the Wild and Scenic Rivers Act and BLM guidance. **Objective:** Apply interim protection for all suitable segments to protect the free-flowing nature, ORVs, water quality, and tentative classification, pending congressional action or for the duration of the RMPA in accordance with 43 CFR 1610.4-9.
Determine all eligible rivers in the Planning Area as not suitable for designation and release them from interim management protections afforded eligible segments. This would conclude the suitability study phase for these rivers.
Public Health and Safety/Hazardous Materials
Goal: Protect lives, resources, and property to improve the quality of life in local communities. **Objective:** Ensure that BLM lands provide safe facilities and conditions for visitors, users, and employees, with minimum conflict among users and minimum damage to BLM lands and resources, as defined by the Department of the Interior Performance and Accountability Report measures.
Inspect incidents and injuries as a result of reported events in accordance with Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL-3A) in order to ensure that all contributing factors in which the BLM has jurisdictions are identified and, where appropriate, plans are formulated to take corrective actions.
Apply: Lease Notice, Emergency Response Plan*:* The operator is required to prepare and maintain a current emergency response plan. The plan shall be provided to the BLM, Colorado State Patrol, the affected county and communities, and the general public. The plan shall contain information sufficient to describe the potential for emergency incidents related to fluid minerals development that pose an immediate danger to human health and safety and would normally require immediate actions by the operator to remove the threat, such as for hazardous materials spills, actions to be taken by the operator in the event of such an incident, and a communications plan to inform appropriate authorities and potentially affected citizens.
Forest Products
Goal: Maintain and promote forest health consistent with other resource objectives.
Fire Management
Goals: • Recognizing that management of wildfires is inherently dangerous; give first priority to public and firefighter safety when determining what actions would be necessary to protect property and natural and cultural resources from fire. • Consistent with risk management principles, manage fires to meet natural and cultural resource objectives. • Suppress wildfires at the minimum cost, considering firefighter and public safety and potential resource benefits and values to be protected.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Objectives: • Integrate fire and fuels management across all BLM programs to restore and maintain resilient landscapes. • Pursue opportunities to work with neighbors and partners across jurisdictional boundaries to improve land health and address wildland-urban interface concerns.
Use a full range of wildfire management options, from full suppression to management of unplanned ignitions to meet resource and protection objectives. Allow the use of naturally caused wildfires to be managed for multiple objectives, including protection and resource benefit in specific geographic areas on 53,775 acres. On remaining acreage of BLM lands, fire will be managed to meet the single objective of protection (Map 33).
Use fuels treatments to meet FRCC objectives (see Appendix H for types of treatments and relevant Best Management Practices). In FRCC 2 areas, apply moderate levels of restoration treatments; in FRCC 3 areas, apply higher levels of restoration treatments to restore to the fire regime condition class.
Prioritize vegetation treatments to strategically reduce wildfire threat in areas of high fire risk and low potential for natural recovery.
GRSG Objective: Manage the fuels program to avoid GRSG habitat loss and restore damaged habitat.
In GRSG PHMA, do not reduce sagebrush canopy cover to less than 15% in a project area unless a vegetation management objective requires additional reduction in sagebrush cover to meet strategic protection of GRSG PHMA and conserve habitat quality for the species, in consultation with the State of Colorado.
In GRSG PHMA, apply appropriate seasonal restrictions for implementing vegetation management treatments according to the type of seasonal habitats present in a Colorado MZ. See Table 2.5**,** Existing Habitat Timing Limitations by Field Office, NCGSG RMP/EIS.
In GRSG PHMA, allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality, unless in consultation with the State of Colorado it is deemed necessary to reduce risk to life.
In ADH, do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species) (Connelly et al. 2000; Hagen et al. 2007; Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have been explored, and site-specific variables allow, the use of prescribed fire or natural ignition fire for fuels breaks that would disrupt fuel continuity or enhance land health could be considered where cheatgrass is deemed a minor threat. If prescribed fire is used in GRSG habitat, the NEPA analysis for the burn plan will address: why alternative techniques were not selected as viable options; how GRSG goals and objectives would be met by its use; • how the COT report objectives would be addressed and met; • a risk assessment to address how potential threats to GRSG habitat would be minimized. Prescribed fire as a vegetation or fuels treatment shall only be considered after the NEPA analysis for the burn plan has addressed the four bullets outlined above. Prescribed fire could be used to meet specific fuels objectives that would protect GRSG habitat in PHMA (e.g., creating fuel designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality, breaks that would disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, burning slash piles from conifer-reduction treatments, or being used as a component with other treatment methods to combat annual grasses and restore native plant communities).

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Prescribed fire in known winter range shall only be considered after the NEPA analysis for the burn plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat would need to be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality.
In GRSG GHMA, monitor and control invasive vegetation post-treatment.
In GRSG GHMA, rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise.
In GRSG GHMA, require use of native plant seeds for vegetation treatments based on availability, adaptation (site potential), probability for success, and the vegetation management objectives for the area covered by the treatment. Where probability of success or native seed availability is low, use species that meet soil stability and hydrologic function objectives, as well as vegetation and GRSG habitat objectives.
In GRSG PHMA, design post fuels management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain the desired condition of ESR projects to benefit GRSG.
In GRSG GHMA, design vegetation treatments in GRSG habitats to strategically facilitate firefighter safety and reduce wildfire threats and extreme fire behavior. This may involve spatially arranging new vegetation treatments with past treatments, vegetation with fire-resistant serial stages, natural barriers, and roads in order to constrain fire spread and growth. This may require vegetation treatments to be implemented in a more linear versus block design.
In GRSG GHMA, during fuels management project design, consider the utility of using livestock to strategically reduce fine fuels, and implement grazing management that will accomplish this objective. Consult with ecologists to minimize impacts to native perennial grasses consistent with the objectives and conservation measures of the grazing section.
GRSG Objective: Manage fire to maintain and enhance large blocks of contiguous sagebrush.
In GRSG PHMA, prioritize suppression immediately after firefighter and public safety. Consider GRSG habitat requirements commensurate with all resource values at risk managed by the BLM. See Appendix O GRSG Wildland Fire & Invasive Species Assessment, NWCOGSG FEIS.
In GRSG GHMA: The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be conducted based on the values to be protected, human health and safety, and the costs of protection. Consider GRSG habitat requirements commensurate with all resource values at risk managed by the BLM.
In GRSG GHMA, prioritize suppression immediately after firefighter and public safety. Consider GRSG habitat requirements commensurate with all resource values at risk managed by the BLM. See Appendix O GRSG Wildland Fire & Invasive Species Assessment, NWCOGSG FEIS.
In GRSG PHMAs and GHMAs, temporary closures would be considered in accordance with 43 CFR subpart 8364, 43 CFR subpart 8351, 43 CFR subpart 6302, and 43 CFR subpart 8341.
Objective: In partnership with local, State, and Federal partners, conduct fire mitigation and fire-prevention activities to reduce human-caused wildfire ignition and improve public safety.
Use signage, mass media, personal contacts, assistance with Community Wildfire Protection Plans, and other associated activities to reduce human ignition and other threats from wildfire.
Coordinate fire restrictions closely with State, county, and local partners, while considering economic and social effects on local communities.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA
Objective: For the emergency stabilization program, determine the need to prescribe and implement emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural and cultural resources from the effects of a wildfire.
Design ESR treatment actions based on the severity of the wildfire impacts. ESR priorities include, but are not limited to, areas where: • Life, safety, or property requires protection. • Unique or sensitive cultural resources are at risk. • Soils are highly susceptible to accelerated erosion or water quality protection is required. • Perennial grasses and forbs are not expected to provide soil and watershed protection within two years. • Unacceptable vegetation, such as noxious weeds, may invade and become established. • It is necessary to quickly restore threatened, endangered, or special species habitat populations to prevent adverse impacts. • Stabilization and rehabilitation are necessary to meet RMP resource objectives.
GRSG Objective: Use ESR to address post-wildfire threats to GRSG habitat.
In GRSG GHMA, require use of native plant seeds that are beneficial to GRSG for vegetation treatments based on availability, adaptation (site potential), probability for success, and the vegetation management objectives for the area covered by the treatment. Where attempts to use native seeds have failed, or native seed availability is low, use species that meet soil stability and hydrologic function objectives, as well as vegetation and GRSG objectives.
In GRSG GHMA, design post-fire ESR and Burn Area Emergency Rehabilitation management to ensure long-term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain the desired condition of ESR and Burn Area Emergency Rehabilitation projects to benefit GRSG.
In GRSG GHMA, rest burned areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise.
Objective: The purpose of the Burned Area Rehabilitation (BAR) program is: 1. To evaluate actual and potential long-term, post-fire impacts to critical cultural and natural resources and identify those areas unlikely to recover naturally from severe wildfire damage. 2. To develop and implement cost-effective plans to emulate historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with RMP objectives or, if that is infeasible, then restore or establish a healthy, stable ecosystem in which native species are well represented. 3. To repair or replace minor facilities damaged by wildfire.
Design BAR treatment actions based on the severity of the wildfire impacts. BAR priorities include, but are not limited to, the following: • Repair or improve lands unlikely to recover naturally. • Weed treatment to remove invasive species and planting native or nonnative species to restore or establish healthy ecosystems.

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA						
• Plant trees to reestablish native trees. • Repair or replace minor facilities (e.g., fences, campgrounds, interpretive signs, shelters, wildlife guzzlers, etc.).						
Cultural Resources						
Goal 1. Preservation Management Program						
Most amount of proactive field work.						
Goal: Identify, preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations (FLPMA Sec. 103(c), 201(a), 202(c); NHPA Sec. 110(a); ARPA Sec. 14(a).). **Objectives:** Implement the site use allocations as listed in Appendix C of the Class I Cultural Resource Overview of the Roan Plateau Management Area, Garfield County, Colorado (Hoefer et al. 2002) and apply use allocations for cultural resources identified since 2002 and in the future according to their nature and relative preservation value (BLM Manual Section 8110.42 and Planning Handbook H-1601-1 Appendix C).						
Goal 2. Section 106 of National Historic Preservation Act (NHPA) Compliance						
Goal: Reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration or potential conflict with other resource uses by ensuring that all authorizations for land use and resource use will comply with Section 106 of NHPA. **Objectives:** • Comply with the NHPA, National Programmatic Agreement/2014 State Protocol Agreement, WO-IB-2002-101, and other applicable laws, regulations, and policies. • Use the sensitivity model developed from the Class I Cultural Resource Overview of the Roan Plateau Management Area, Garfield County, Colorado (Hoefer et al. 2002) in the Section 106 compliance process. Fulfill the requirements of “Section 106” of the National Historic Preservation Act (NHPA), now codified at 54 U.S.C. § 306108 (formerly 16 U.S.C. § 470f), for the travel and transportation management decisions, as set forth in Attachment F of the 2014 Colorado State Agreement (Protocol) between the Colorado State Historic Preservation Officer (SHPO) and BLM. For existing routes (for which continued use is proposed under all alternatives), Attachment F establishes a phased process for the identification and evaluation of adverse effects to historic properties eligible for or listed on the National Register of Historic Places, and for resolution of those potential adverse effects in consultation with the SHPO. In accordance with Attachment F, BLM will comply with the steps in the Section 106 regulations for proposed designations of new routes or areas as open to cross country travel prior to issuing a decision designating such new routes or areas, including consultation with the SHPO, Native American tribes, and other consulting parties, completion of a Class III inventory, and as appropriate, resolution of adverse effects prior to designation.						
Cultural Resources Fieldwork Actions by Sensitivity Area and Location						
Sensitivity Zone	*Survey Management*			*Management of Cultural Resource Locations*		
	Project Location	*Areas Not*	*Inventoried Areas*	*Sites Needing Data*	*NRHP Eligible Sites*	*NRHP Not Eligible*

Table 3. Summary of Management Components for the Proposed RMPA

Proposed RMPA						
		Inventoried	*(No Resources)*			*Sites*
High	Atop the plateau	Class III – 100% Inventory	Monitor [1]	Avoid or test [2]	Avoid or implement data recovery plan [3]	Monitor
	Below the rim	Class III – 100% Inventory	Monitor	Avoid or test [2]	Avoid or implement data recovery plan [3]	No further work
Moderate	Atop the plateau	Class III – 100% Inventory	Monitor	Avoid or test [2]	Avoid or implement data recovery plan [3]	Monitor
	Below the rim	Class II – Reconnaissance	No further work	Avoid or test [2]	Avoid or implement data recovery plan [3]	No further work
Low	Atop the plateau	Class I – Records Search	No further work	Avoid or test [2]	Avoid or implement data recovery plan [3]	No further work
	Below the rim	Class I – Records Search	No further work	Avoid or test [2]	Avoid or implement data recovery plan [3]	No further work

[1] *Monitor refers to having a qualified archaeologist onsite during construction/maintenance activities as determined by the Cultural Resource Specialist.*
[2] *Test refers to evaluative testing and excavation of a site to determine NRHP eligibility.*
[3] *Data recovery refers to large-scale excavation of the site for mitigation purposes.*

All authorizations for land and resource use would comply with Section 106 of the NHPA, consistent with and subject to the objectives established in the RMPA for the proactive use of cultural properties in the public interest (NHPA Sec. 106, 101(d)(6), 110(a)(2)(E); BLM-ACHP-NCSHPO Programmatic Agreement of March 1997).
Proposed activities would not be authorized until compliance with Section 106 of NHPA has been completed and documented, including, where applicable, consultation with the State Historic Preservation Officer and Native American tribes.
Native American consultation for identification and protection of culturally sensitive properties and use areas would occur under all alternatives.
Level of proactive work and/or need for National Register District or ACEC based on Class I overview data and potential impacts of a proposed action.

Closed to oil and gas leasing (Fee surface/Federal subsurface)

2.1 OIL AND GAS LEASING AND DEVELOPMENT

Although the Proposed RMPA addresses management of all resources in the Planning Area, oil and gas leasing and development is of particular importance in this BA due to the potential for this activity to impact T&E species. The following discussion outlines the terminology and limitations on fluid minerals activities. The following summary of oil and gas leasing terminology is taken from the Uniform Format for Oil and Gas Lease Stipulations (Rocky Mountain Regional Coordinating Committee 1989):

No Surface Occupancy (NSO) – Prohibits long-term use or occupancy of the land surface for fluid mineral exploration or development to protect identified resource values. This means that an area is protected from permanent structures or long-term, ground-disturbing activities (i.e., with impacts lasting longer than two years). For example, an NSO designation would preclude construction of a well pad (because it would last longer than two years), but not a typical pipeline (because it would be revegetated within two years). Also, an NSO does not preclude the extraction of underlying fluid minerals if they can be accessed from outside the area by directional drilling. Except for specified situations, individual NSOs may include exceptions, modifications, or waivers that would allow a ground-disturbing activity if it meets specific, stated criteria. In situations where a ground-disturbing activity is permitted by an exception, the activity would be subject to the best management practices (BMPs) and reclamation standards in Appendices C and E, respectively.

Controlled Surface Use (CSU) – Allows surface use and occupancy (unless restricted by another stipulation), but identified resource values require special operational constraints and may modify the lease rights. For example, a CSU stipulation for a specific area would allow BLM to require that a proposed well pad or other facility be shifted by more than the standard distance of 656 feet to protect a specific resource, but without precluding the activity.

Timing Limitation (TL) – Prohibits exploration, development, construction, and major maintenance activities during a specified period to protect identified resource values and habitat uses. This means that an area may be subject to long-term impacts, but that the impacts cannot occur during a specified season (e.g., raptor nesting, bald eagle winter roosting, and use of winter range by big game). The TLs do not apply to minor activities associated with ongoing operation and maintenance of production facilities or to emergency responses required to avoid, minimize, or mitigate a risk to human health and safety, private property, or vulnerable resources and permitted uses on public lands.

Standard Lease Terms – Comprise the suite of restrictions and limitations related to environmental protection in areas not subject to an NSO, TL, or CSU stipulation. Oil and gas leases give BLM the authority to require that oil and gas activities be conducted in a manner that minimizes adverse environmental impacts. Examples of measures that may be required under this authority, normally applied as lease notices or COAs (see below), include shifting the location of the proposed facility or activity by up to 656 feet or prohibiting the activity for a period of up to 60 days to minimize impacts.

Lease Notice (LN) – Provides more detailed information concerning limitations that already exist in laws, lease terms, regulations, or operational orders. An LN also addresses special items the lessee should consider when planning operations, but does not impose additional restrictions.

Condition of Approval (COA) – Conditions or provisions (requirements) under which an Application for a Permit to Drill (APD) is approved.

New stipulations would apply only to lands leased pursuant to the Proposed RMPA. COAs developed through the Proposed RMPA would apply to both new leases and, to the extent that they do not infringe on existing rights, existing leases.

The reader should note that:

> Many of the stipulations (i.e., restrictions on surface facilities and other ground-disturbing activities) that would apply to any new leases under the Proposed RMPA are based on existing stipulations, although they may differ somewhat in one or more details; and
>
> Stipulations are referred to by the resources to which they would be applied (e.g., slopes greater than 50 percent, bald eagle nest, winter roost sites.). Appendix B lists and describes the stipulations that would be applicable to new leases in the Planning Area.

New surface use restrictions would be applied not only to new oil and gas leases, but also to other types of land uses and management actions such as livestock grazing, range improvement actions, recreation, travel management, and use of rights-of-way (ROWs). The following terminology is used to refer to these generally applicable restrictions:

No Ground Disturbance (NGD) – Essentially equivalent to NSO. For example, an NGD designation would preclude construction of a new stock pond or communications tower, unless specific exception criteria were met. As with NSO stipulations for oil and gas operations, application of NGDs does not preclude temporary ground disturbances, except for the constraint on excessive or protracted disturbance that could affect a seasonally sensitive wildlife use.

Site-Specific Relocation (SSR) – Essentially equivalent to CSU. For example, an SSR designation would allow BLM to require that a proposed stock pond or communications tower be shifted by more than 656 feet from its proposed location to protect a specific resource.

Standard Restrictions and Limitations – Essentially equivalent to Standard Lease Terms, which allow BLM to require that the activity be conducted in a manner that minimizes adverse impacts.

Note that activities related to the underlying minerals (e.g., exploration and development of oil and gas) create a nexus for management by BLM. Because that authority includes managing surface activities such as constructing well pads, access roads, pipelines, or other surface facilities related to Federal minerals, the types of restrictions listed above, as well as TLs, apply to split estates with Federal minerals and private surface ownership.

Areas closed to oil and gas leasing would remain subject to non-oil and gas surface use restrictions. Surface use restrictions, both stipulations associated with oil and gas leases, as well as surface use restrictions for non-oil and gas activities are management decisions described as constituent actions.

BLM will require the use of BMPs (Appendix C) as part of oil and gas leasing and development to protect resource values. BMPs are to be applied on a site-specific basis and may evolve over time. As technologies improve, new BMPs may be developed and implemented. BMPs may be applied to oil and gas operations as COAs and could include a variety of measures to minimize impacts over both the short term and long term. Examples include measures to:

> Reduce the footprint of roads to the smallest safe standard;
>
> Implement dust suppression to minimize impacts to air, water, vegetation, and wildlife;

Use appropriate color, shape, size, and location of surface facilities to reduce visual impacts;

Install low-emission engines at compressor facilities to reduce air quality impacts;

Use centralized or automated facilities to reduce the length and frequency of travel; and

Collocate utilities in common corridors and align them along roadways to reduce habitat loss and fragmentation.

In addition to these generally applicable measures, BLM may require BMPs intended for specific resources and situations. Examples include requirements to:

Install appropriately sized culverts at stream crossings to avoid creating barriers to along-stream movement of aquatic species or impeding conveyance through the channel;

Use gravel or other surface material on roads, or use other dust-suppression techniques for the abatement of particulate emissions;

Use protective fencing to exclude livestock from sensitive areas or areas being revegetated;

Use biodegradable erosion blankets to stabilize disturbed soil and enhance revegetation;

Seed with native species;

Include native shrubs in reclamation seed mixes; and

Plant containerized shrubs during reclamation.

Where appropriate, these or other BMPs would be specified at the time of permitting of oil and gas drilling or related operations (as COAs) or of other activities (e.g., range improvements, road reclamation, etc.). For oil and gas development, the potential for these requirements may be specified in the lease documents as LNs

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3 EVALUATED SPECIES/CRITICAL HABITAT

3.1 INTRODUCTION

Eleven T&E species are addressed in this BA (Table 1). This chapter provides the following information for each species:

Species description;

Life history;

Status and distribution;

Environmental baseline;

Critical Habitat; and

Threats.

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed State or Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation process. The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of this consultation, the action area has been defined as the Planning Area, which includes 66,780 acres, and those areas nearby that could be affected by implementation of the Proposed RMPA. In the case of water depletions and the four endangered big river fish species, the action area extends downstream for the entire range of each species in the Colorado River.

3.2 LISTED SPECIES

The eleven listed species considered in this BA are described below. Known populations, Critical Habitat, and potential habitat for these species are illustrated in Figures 3 and 4.

3.2.1 Parachute Penstemon

Species Description

Parachute penstemon *(Penstemon debilis)*, which is also known as Parachute beardtongue, is a mat-forming perennial herb with thick, succulent, bluish leaves, each about 0.8 inch long and 0.4 inch wide. Plants produce shoots that run along underground, forming what appear as new plants at short distances away. The funnel-shaped flowers are white to pale lavender (USFWS 2011a).

Life History

Parachute penstemon is endemic to sparsely vegetated, steep talus slopes on the southern escarpment of the Roan Plateau in Garfield County, Colorado. The species was first discovered in 1986. Plants are found

only on the oil-shale rich Parachute Creek Member of the Green River Formation between 8,000 and 9,000 feet in elevation, although a small population was recently found on Green River shale alluvium at elevations ranging from 5,500 to 5,800 feet. Parachute penstemon is uniquely adapted to survive on steep and constantly moving talus slopes. The stems of Parachute penstemon elongate downslope from their initial rooting point as the leaves become buried by shifting shale shards. When these stems encounter a sufficiently stable surface, they may develop a new tuft of leaves, flower, and set seed. Vegetation on these talus slopes is generally quite sparse (less than 20 percent canopy cover), providing little competition for the Parachute penstemon (USFWS 2011a).

Rare species of plants are especially vulnerable to extinction when populations are few, have small numbers of individuals, and are fragmented; however, genetic diversity within and among Parachute penstemon populations are similar to genetic diversity found for other rare and endemic outcrossing plant species (i.e., reduced biological fitness in a given population as a result of inbreeding, or breeding of related individuals has not been observed) (Wolfe et al. 2014).

Parachute penstemon blooms between June and September. The plants produce a small number of seeds that are dispersed by gravity. Parachute penstemon require cross pollination, and have many different pollinators that vary between occurrences. None of the pollinators are specialists to this species or rare (USFWS 2011a).

Status and Distribution

The USFWS published a final rule on July 27, 2011, to list the Parachute penstemon as threatened under the ESA effective August 26, 2011 (76 Federal Register [FR] 45054). The historical range and distribution for this species is unknown. All of the currently known occurrences occupy approximately 92 acres on the Green River geologic formation in Garfield County, Colorado (USFWS 2011a). Although this formation is underground throughout most of the Piceance Basin, it is exposed on much of the southern face of the Roan Plateau, to which the plant is restricted. The total area of the plant's geographic range is approximately 2 miles wide and 17 miles long (Figure 3). Seven Parachute penstemon populations were found in surveys conducted between 1986 and 2009, two within the Planning Area: (1) Mt. Callahan (private surface); (2) Callahan Saddle (private surface); (3) Mt. Logan Mine (private surface and BLM); (4) Mt. Logan Road (BLM); (5) Anvil Mine Bench (BLM, Planning Area); (6) Anvil Rim Road (BLM, Planning Area), and (7) Smith Gulch (BLM). Two of these populations are no longer considered viable (USFWS 2012b) due to a reduction to one or two plants, each. One of these is the Anvil Rim Road population. This population is nevertheless included for consideration in this analysis. Total estimated population size comprises approximately 4,100 individuals. It is considered likely that unknown occurrences exist because many areas in potential habitat for this species are inaccessible to surveyors due to cliffside terrain or private lands.

Environmental Baseline

As noted above, two known populations of Parachute penstemon occur within the Planning Area (Figure 3) known as the Anvil Mine Bench and Anvil Rim Road populations. The Anvil Mine Bench population occurs on a bench below the plateau rim and adjacent to portals of the Anvil Points mine. This population appears to be stable and comprises approximately 500 to 1,000 individuals. Scattered plants occur above Anvil Points Mine Road and a few occur in the fill below. It may be that the road, itself being a flat, packed gravel surface, is limiting recruitment and establishment of additional individuals in this area. The second Anvil Rim Road population occurs on a steep open slope adjacent to Anvil Points Rim Road. First noted in 1991, this population is quite small and has steadily diminished over the past 25 years. Nearly 300 individuals were observed in this population in 1994. Seven plants were found in 1997. By 1998, only three individuals (McMullen 1998) were located, and from 2002 to 2014, only one or two plants have been observed.

CRVFO has conducted periodic surveys for parachute penstemon in areas of potential habitat on public lands, where it is accessible. The most recent surveys were conducted in in 2013. Surveys will continue to be conducted as time and resources allow, i.e., surveys performed in 2013 for a seismic project between Parachute and DeBeque documented at least four new locations comprising an estimated 1,200 additional individuals/rosettes covering roughly 1.5 acres. These new subpopulations were all in close proximity to previously known sites (often downslope of a previous site); therefore, the overall distribution of this species has not changed (BLM 2014a).

Surveys will also be conducted as part of environmental clearances prior to approving MDPs, APDs, or other proposed surface-disturbing activities. Site-specific surveys may also be required as part of any required future ESA consultation regarding specific activities.

Past and Present Impacts

The cause of the decline of the population on the steep slope adjacent to Anvil Points Rim Road in the Planning Area has not been determined. Livestock grazing is not thought to be a factor, as the area is steep and sparsely vegetated, and no evidence of livestock grazing within the immediate area has been observed. The steepness of these slopes also limits off-highway vehicle (OHV) use and subsequent infestation by noxious weeds (DeYoung 2016).

Outside the Planning Area, the three populations of the species that occur wholly or largely on private land are fairly large (greater than 500 plants each). The largest population on BLM-administered land in the CRVFO is estimated to support between 500 and 1,000 plants. Because of this plant's tendency to produce underground shoots that emerge from under the talus at some distance from the parent plant, it is difficult to determine the exact number of individuals within a population. Annual trend monitoring of this occurrence began in 2004. The data indicate that the population numbers (stem counts) at this site are relatively stable (BLM 2012c) and plants are in a variety of age-classes, indicating recruitment is occurring. A portion of the habitat at this site has been impacted by road maintenance activities.

The second largest population of Parachute penstemon on BLM-administered lands has declined from "hundreds of plants" in 1994 to two plants in 2010. The factors contributing to the decline of this population appear to be natural in origin as human-caused disturbances, such as road construction and mining that occurred decades prior to the population's discovery. Plants have colonized on talus rubble that has fallen onto the mine bench and some plants have colonized on the fill slope below the road, but few, if any, plants have colonized on the compacted road bed itself (DeYoung 2016). Livestock grazing is not thought to be a factor in the decline, as the area is too steep and sparsely vegetated to attract much livestock grazing. The steepness of the slope also restricts OHV use, and no noxious weeds or other invasive species have been documented at the site. This population and the small population along the Mount Logan road, which currently supports three plants, are not considered viable.

Critical Habitat

Critical Habitat for the Parachute penstemon was designated on August 13, 2012 (77 FR 48367) and comprises 4,880 acres in the Planning Area (Figure 3). Of this total, 3,630 acres are BLM surface and fee service/Federal minerals; this area is the topic of consideration for this BA. Critical Habitat primary constituent elements (PCEs) are physical or biological features essential to the conservation of a species. PCEs for Parachute penstemon Critical Habitat are detailed in Table 4.

Table 4. Primary Constituent Elements of Parachute Penstemon Critical Habitat

Features	*Description*
Suitable Soils and Geology	• Parachute Member and the lower part of the Green River Formation. • Appropriate soil morphology characterized by a surface layer of small to moderate shale channers (small flagstones) that shift continually due to the steep slopes and below a weakly developed calcareous, sandy to loamy layer with 40 to 90 percent coarse material.
Elevation and Climate	• Climatic conditions similar to those of the Mahogany Bench, including suitable precipitation and temperatures from 5,250 to 9,600 feet.
Plant Community	• Barren areas with less than 10 percent plant cover. • Presence of other oil shale endemics, including Roan Cliffs blazingstar (*Mentzelia rhizomata*), Cathedral Bluff meadow-rue (*Thalictrum heliophilum*), dragon milkvetch (*Astragalus lutosus*), Piceance bladderpod (*Lesquerella parviflora*), Osterhout's beardtongue (*Penstemon osterhoutii*), oil shale fescue (*Festuca dasyclada*), and mat penstemon (*Penstemon caespitosus*).
Habitat for Pollinators	• Pollinator ground and twig nesting habitats. Habitats suitable for a wide array of pollinators and their life history and nesting requirements. A mosaic of native plant communities generally would provide for this diversity (see Plant Community, above). These habitats can include areas outside of the soils identified in Suitable Soils and Geology, above. • Connectivity between areas allowing pollinators to move from one population to the next within units. • Availability of other floral resources. This would include other flowering plant species that provide nectar and pollen for pollinators. Grass species do not provide resources for pollinators (or include *P. caespitosus* here). • To conserve and accommodate these pollinator requirements, USFWS has identified a 3,280-foot area beyond occupied habitat to conserve the pollinators essential for reproduction.
High Levels of Natural Disturbance	• Very little or no soil formation. • Slow to moderate, but constant, downward motion of the oil shale that maintains the habitat in an early successional state.

Source: USFWS 2012d

Threats

All known locations of the Parachute penstemon share a number of characteristics that result from natural erosion processes and promote relatively continual disturbance. These include very steep slopes, unstable shale surface layers, and no surface soil. It has been noted that two of the largest populations, one being the Anvil Mines population, the larger population in the Planning Area, occur in the vicinity of human-caused disturbances that date to the decade previous to the populations' discovery (McMullen 1998). However, with no information about the condition of the populations prior to this disturbance, it is not clear how the species is responding to these disturbances, except to note that they continue to persist.

Potential threats to this species can be approximated by reviewing factors contributing to the decline of the smaller population in the Planning Area. It is noted that this population decline appears to be natural in origin as no human-caused factors have been observed. Livestock grazing is not thought to be a factor in the decline, as most of the occupied habitat is steep and too sparsely vegetated to attract much livestock grazing. The steepness of the slopes in this habitat also restricts OHV use, which could result in potential physical disruption to individual plants, as well as habitat. No noxious weeds or other invasive species have been documented in the vicinity of this population, although, establishment of weeds in a habitat area could pose a potential threat to a population.

To date, primary threats to the Parachute penstemon appear to arise from human activities that physically disturb individual plants and occupied habitat, or fragment habitat. In the Planning Area, these threats would potentially occur from oil and gas exploration and development and road maintenance.

3.2.2 DeBeque Phacelia

Species Description

DeBeque phacelia is a rare annual plant. This species is a low-growing, herbaceous, spring annual plant with a tap root. The stems are typically 0.8 to 3 inches long, often branched at the base, and mostly lying flat on the ground as a low rosette. Stems are often deep red and more or less hairy. Leaves are similarly hairy, reddish at maturity, egg-shaped or almost rectangular with rounded corners, with bases abruptly tapering to a wedge-shaped point. Leaf margins are smooth or toothed. The tube-shaped flowers are yellowish white on short stems (USFWS 2012c).

Life History

DeBeque phacelia is endemic to nearly barren, clay soils derived from the Atwell Gulch and Shire members of the Wasatch Formation in Mesa and Garfield counties, Colorado. These clay soils are found on moderately steep slopes, benches, and ridge tops adjacent to valley floors of the southern Piceance Basin in Mesa and Garfield Counties, Colorado. All occurrences consist of small patches of plants on uniquely textured, shrink-swell clay soil separated by larger areas of similar-appearing soils that are not occupied by DeBeque phacelia. DeBeque phacelia seeds usually germinate in early April and finish their life cycle by late June to early July after which time individual plants dry up and disintegrate or blow away, leaving no indication that the plants were present (USFWS 2012c). The seed bank is the mechanism by which the populations survive. The seeds can remain dormant for five years (and probably longer) until the combination and timing of temperature and precipitation are optimal (USFWS 2011a). It has been noted that the annual habit of the species allows it to respond dramatically to environmental conditions; in some years, several thousand plants may be observed and, in other years, the same site may produce no plants (CNHP 1995).

Status and Distribution

The USFWS listed DeBeque phacelia as a threatened species under a final rule published on July 27, 2011 (76 FR 45054). As of 2010, DeBeque phacelia was known from 22 occurrences distributed among nine populations spanning the Mesa and Garfield County line near DeBeque, Colorado. The total known distribution covers approximately 620 acres within an area 19 miles long and 11 miles wide (76 FR 45054). The number of plants varies widely from year to year, depending on climatic conditions. The fluctuation in numbers indicates that it is difficult to estimate the total population size.

Environmental Baseline

DeBeque phacelia is known from three sites in the CRVFO; however, none of these occur within the Planning Area. The extent of potential habitat for DeBeque phacelia in the Planning Area (27,900 acres)

was approximated by the Colorado Natural Heritage Program (CNHP), using their habitat modeling protocol (CNHP 2005) (Figure 3).

Past and Present Impacts

An example of indirect impacts to this species is known from one population site (3 to 5 individuals). A pipeline was installed immediately adjacent to the occupied habitat. The occurrence was fenced to exclude livestock grazing and deter any vehicular or foot traffic from impacting the site. The surface disturbance associated with the pipeline construction, and possibly the exclusion of livestock grazing, contributed to a dramatic increase in weedy species within DeBeque phacelia habitat. DeBeque phacelia is inherently vulnerable to habitat loss because of its restricted habitat and limited distribution within the Piceance Basin (Ladyman 2003). The habitat coincides with high-quality natural gas reserves and has been historically affected by activities associated with resource extraction. Current and future levels of resource extraction activity are likely to be substantial. Activities that lead to significant soil disturbance, or progressive soil erosion, would likely eliminate or sharply reduce the seed bank, which appears to be the mechanism by which populations survive.

Since this species does not germinate every year, the ability to identify and protect suitable habitat until a determination of occupancy can be made is important for the long-term conservation of this species. BLM and USFWS are collaborating on an effort to describe the characteristics of suitable habitat for DeBeque phacelia and CRVFO has plans to conduct extensive mapping of suitable habitat to focus future surveys and protection efforts.

Critical Habitat

Critical Habitat for the species was designated on August 13, 2012 (77 FR 48367; USFWS 2012d). No Critical Habitat units exist within the Planning Area. Outside the Planning Area, nine units totaling 25,484 acres were designated (22,013 acres on Federal land). The 277-acre Mount Logan Critical Habitat Unit (Unit 5) lies within the CRVFO, 2.7 miles north, northeast of DeBeque. All 277 acres are Federal mineral estate, including 247 acres of surface lands. Critical Habitats PCEs for DeBeque phacelia are described in Table 5.

Table 5. Primary Constituent Elements of DeBeque Phacelia Critical Habitat

Features	*Description*
Suitable Soils and Geology	• Atwell Gulch and Shire members of the Wasatch formation. • Within these larger formations, small areas (from 10 to 1,000 feet) on colorful exposures of chocolate to purplish brown, light to dark charcoal gray, and tan clay soils are especially important. These small areas are slightly different in texture and color than the similar surrounding soils. Occupied sites are characterized by alkaline (pH range from 7 to 8.9) soils with higher clay content than similar nearby unoccupied soils. • Clay soils that shrink and swell dramatically upon drying and wetting and are likely important in the maintenance of the seed bank.
Topography	• Moderately steep slopes, benches, and ridge tops adjacent to valley floors. Occupied slopes range from 2 to 42 degrees, with an average of 14 degrees.
Elevation and Climate	• Elevations from 4,600 to 7,450 feet. • Climatic conditions similar to those around DeBeque, Colorado, including suitable precipitation and temperatures. Annual fluctuations in moisture (and probably temperature) greatly influence the number of *Phacelia submutica* individuals that grow in a given year and are thus able to set seed and replenish the seed bank.

Table 5. Primary Constituent Elements of DeBeque Phacelia Critical Habitat

Features	*Description*
Plant Community	• Small (from 10 to 1,000 square feet) barren areas with less than 20 percent plant cover in the actual barren areas. • Presence of appropriate associated species that can include (but are not limited to) the natives pointed gumweed (*Grindelia fastigiata),* Gordon's buckwheat *(Eriogonum gordonii),* Nuttall's povertyweed *(Monolepis nuttalliana),* and tufted evening primrose (*Oenothera caespitosa)*. If sites become dominated by cheatgrass (*Bromus tectorum)* or other invasive non-native species, they should not be discounted because DeBeque phacelia (*Phacelia submutica)* may still be found there. • Appropriate plant communities within the greater pinyon-juniper woodlands that include: • clay badlands within the mixed salt desert scrub, or • clay badlands within big sagebrush shrublands.
Maintenance of the Seed Bank and Appropriate Disturbance Levels	• Within suitable soil and geologies (see Suitable Soils and Geology, above), undisturbed areas where seed banks are left undamaged. • Areas with light disturbance when dry and no disturbance when wet. Clay soils are relatively stable when dry, but are extremely vulnerable to disturbances when wet.

Source: USFWS 2012c

Threats

The primary threats to DeBeque phacelia include activities with potential to physically disrupt habitat, and seed banks. These activities include natural gas exploration and production, pipelines, utilities and other ROWs, OHV activity, and livestock grazing.

3.2.3 Colorado Hookless Cactus

Species Description

The taxonomy of Colorado hookless cactus has been described as being one of the most confused in the genus (Porter et al. 2012). The Colorado hookless cactus was formerly part of a complex of cactus species called the Uinta Basin hookless cactus (*Sclerocactus glaucus)*. The species was known to occur from western Colorado and into portions of eastern Utah. A taxonomic review of the species in 2007 determined that *S. glaucus* is actually three separate species: *S. glaucus, S. wetlandicus,* and *S. brevispinus* (74 FR 47112). *S. glaucus* occurs only in western Colorado and has been renamed Colorado hookless cactus, while *S. wetlandicus* and *S. brevispinus* occur only in Utah.

The Colorado hookless cactus is a barrel-shaped cactus that typically ranges from 1.2 to 4.8 inches tall, with exceptional plants up to 12 inches tall. The flowers are usually funnel-shaped, but sometimes bell-shaped; they usually have pink to violet sepals (USFWS 2010).

Life History

Populations of Colorado hookless cactus primarily occur on alluvial benches (soils deposited by water) along the Colorado and Gunnison rivers and their tributaries and on mesa tops and along the spines of ridges. Exposures vary, but Colorado hookless cactus is more abundant on south-facing slopes (USFWS 2010). Soils are usually coarse, gravelly river alluvium above the river flood plains, usually consisting of Mancos shale with volcanic cobbles and pebbles on the surface.

Most hookless cacti are found within the Wasatch Formation on fine-textured soils overlain with pebbles or channery fragments. Elevations range from 3,900 to 6,000 feet (USFWS 2010). Associated desert shrubland vegetation includes shadscale (*Atriplex confertifolia*), galleta grass (*Pleuraphis jamesii*), black-sage (*Artemisia nova*), and Indian rice grass (*Achnatherum hymenoides*) (USFWS 2010). Populations also exist in big sagebrush (*Artemisia tridentata*) or greasewood (*Sarcobatus vermiculatus*) dominated sites and in the transition zone from sagebrush to pinyon-juniper (*Pinus edulis* and *Juniperus osteosperma*) communities (USFWS 2010).

Status and Distribution

The Colorado hookless cactus was first listed as a threatened species in 1979 (44 FR 58868) as *Sclerocactus glaucus* (Uinta Basin hookless cactus). On September 15, 2009 (74 FR 47112), the USFWS officially recognized the taxonomic split of this species, as described above. The Colorado hookless cactus is now considered an endemic species limited to Delta, Montrose, Mesa and Garfield counties, Colorado. There are two population centers of Colorado hookless cactus: (1) on alluvial river terraces of the Gunnison River from near Delta, Colorado, to southern Mesa County, Colorado; and (2) on alluvial river terraces and mesa slopes of the Colorado River and Plateau and Roan Creek drainages in the vicinity of DeBeque, Colorado (USFWS 2010). The species has been documented at 98 occurrences, totaling approximately 19,000 individuals (CNHP 2010; Bio-Logic 2008, 2009).

Colorado hookless cactus has been assessed for genetic diversity within and among populations, genetic structure across the entire species range, species distinction for the closely related *S. parviflorus*, and location and frequency of hybridization with *S. parviflorus*. The results of this study indicate that hybridization between *S. glaucus* and *S. parviflorus* is occurring, but at a much lower rate than initially believed based on morphology (Schwabe et al. 2014).

Environmental Baseline

Between 1985 and 1988, the CRVFO conducted extensive surveys for Colorado hookless cactus across potential habitat in the FO. A total of 15 sites were identified at that time, with a total of 144 plants. Resurveys of these initial sites began in 1993 with all original sites revisited by 2009. CRVFO has conducted systematic annual survey and monitoring of Colorado hookless cactus populations since 2008. In 2015, 777 cacti, including pups, were documented at 25 sites on BLM land covering approximately 300 acres (DeYoung 2016). There are 19 currently or historically occupied Colorado hookless cactus sites in the CRVFO. No known populations of this species occur in the Planning Area.

Potential habitat for Colorado hookless habitat within the Planning Area comprises 65,540 acres (Figure 3). This potential habitat largely occurs at the base of cliffs up to an elevation of 6,000 feet. This potential habitat was approximated by BLM based on the maximum habitat elevation within the range of this species (Perkins 2016a).

Past and Present Impacts

Mortality rates for Colorado hookless cactus appear to be low from year to year, and most documented cases appear to be from natural causes, such as rabbit herbivory, insects, disease, and uprooting caused by wildlife trampling. Recruitment rates also appear to be low (BLM 2012c). At most sites, there is a trend toward older age-class plants with little recruitment to sustain the population. Declining habitat conditions may be partly responsible for the lack of seedling recruitment. Invasion by cheatgrass (*Bromus tectorum)* seems to be the most detrimental habitat change affecting the cactus. Cheatgrass has been noted at many of the cactus sites and is the dominant vegetation at several sites. Cacti are long-lived plants, and the older individuals seem to be able to survive in a dense canopy of cheatgrass, but recruitment of seedlings and young in this environment is difficult.

Additional monitoring needs to occur before long-term trends can be determined. Increasing natural gas development within the Planning Area is increasing pressure on the Colorado hookless cactus and its habitat. Pipelines and well pads are in close proximity to several cactus sites, which increases the risk of indirect impacts on the plants in the form of noxious weed invasions, herbicide applications, dust deposition, reduction in suitable habitat for population expansion, and reduction in habitat for pollinators.

A powerline constructed in the 1930s dissects some occupied habitat for the Colorado hookless cactus. During recent maintenance of the powerline, unauthorized off-route driving damaged a few Colorado hookless cactus individuals (Lincoln 2013). OHV use is expected to increase in the area where the cactus occurs as human populations in western Colorado increase. Unrestricted, this OHV activity could damage much of the occupied and potential habitat.

Cattle, sheep, and horses are not known to directly browse on hookless cactus plants, but moderate to heavy livestock grazing has been observed to cause physical damage to cactus plants through trampling (USFWS 1990a). Overgrazing by livestock can also have a negative impact on cactus habitat by changing vegetation composition, such as a reduction in shrub cover or establishment of noxious weeds, including cheatgrass. Colorado hookless cactus prefers to establish under the canopy of shrubs, particularly shadscale and greasewood. The shrubs may provide protection from grazing, shading, and improved moisture conditions, which aid the establishment of young cactus seedlings. Removal of shrub cover may create habitat conditions less suitable for the reproduction of cactus. Invasive species, such as cheatgrass, tend to outcompete native vegetation, including cacti. Cheatgrass is common in allotments that contain occupied hookless cactus habitat.

Critical Habitat

Critical Habitat has not been designated for Colorado hookless cactus (USFWS 2011b).

Threats

To date, primary threats to Colorado hookless cactus appear to arise from human activities that physically disturb individual plants and occupied habitat, or fragment habitat. In the Planning Area, these threats would potentially occur from oil and gas exploration and development, pipelines, utilities and other ROWs, OHV activity, livestock grazing and trampling. It is thought that herbicide and pesticide use, hybridization, illegal human collection, potential water developments, and climate change also represent threats to this species (USFWS 2010).

3.2.4 Ute Ladies'-Tresses

Species Description

Ute ladies'-tresses is a perennial, terrestrial orchid with erect, glandular-pubescent stems 6 to 20 inches tall arising from tuberous-thickened roots. Basal leaves are linear and persist at flowering time. Leaves become progressively reduced in size up the stem. The flower consists of a few to many small white to ivory flowers arranged in a spike formation at the top of the stem. The individual flowers face directly away from the stalk and are stout and rigid (USFWS 1992).

Ute ladies'-tresses first appears above-ground as a rosette of thickened grass-like leaves that can be difficult to distinguish from other plants. Some individuals remain underground or do not flower each year, and fluctuations in mature flowering adults do not necessarily correspond to population fluctuations or indicate habitat alterations (USFWS 1992).

Life History

Ute ladies'-tresses habitat is found along freshwater streams emerging from the flanks of mountains where the streambed is beginning to level out and meander within a developing floodplain. These streams are very dynamic and may be subject to seasonal flooding from snowmelt and intermittent heavy thunderstorms. Due to variations in snowpack, these streams experience fairly frequent severe (overbank) flooding sufficient to cause movement of the stream channel within its floodplain (USFWS 1992).

The orchid colonizes early successional riparian habitats such as point bars, sand bars and low lying gravelly, sandy, or cobbly edges. As the stream channel changes location and depth, the orchid persists in those areas where the hydrology provides continual dampness in the rooting zone throughout the growing season. These areas include old oxbows, side channels, or older stream channels that have been filled in with alluvial material, but which still have a hydrologic connection, through groundwater, to the stream system. The orchid is tolerant of a mix of wetland forb and grass species, is not tolerant of long-term standing water, and does not compete with emergent plant species (e.g., cattails) or aggressive species that form dense monocultures, such as Canada thistle (*Cirsium arvense*) or reed canarygrass (*Phalaris arundinacea*) (USFWS 1992).

Bumblebees *(Bombus* spp.) along with solitary native bees (Anthophora) are the primary pollinators for Ute ladies'-tresses, and non-native honeybees *(Apis mellifera)* are less frequent pollinators (USFWS 2012e). Many angiosperms have specialized adaptations to promote cross-pollination. Sipes and Tepedino (2006) found that the cross-pollination mechanism of *S. diluvialis* requires some minimum threshold of bee visits in order to work optimally; when bees are plentiful, cross-pollination is maximized.

Ute ladies'-tresses reproduces by seed. The orchid may not flower every year and may remain dormant below ground during years of drought. Ute ladies'-tresses produce cylindrical fruit containing numerous seeds with fruit maturation in late August to September (USFWS 2012e). A single plant may produce tens of thousands of seeds per year, although it is hypothesized that a symbiotic mycorrhizal relationship may be necessary before a seed can begin germination (USFWS 2012e).

Status and Distribution

Ute ladies'-tresses was listed as a threatened species under a final rule published in 1992 (57 FR 2048). A draft recovery plan was published in 1995 (USFWS 1995). No final plan has been published. Populations of Ute ladies'-tresses occur in three general areas of the western United States: near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and northcentral and central Colorado; in the upper Colorado River Basin, particularly in the Uintah Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, in north-central and western Utah and eastern Nevada (USFWS 1995). The species has been documented in the states of Nebraska, Wyoming, Utah, Colorado, Nevada, Idaho, Washington, and Montana (USFWS 2004).

Environmental Baseline

This orchid was first discovered in the CRVFO in 2007, on both public and private lands near Carbondale, Colorado. Elevations at the sites range from approximatively 6,000 to 6,300 feet. There are approximately 20 acres of known occupied habitat within the jurisdiction of the CRVFO. Multiple surveys have been performed for Ute ladies'-tresses in the CRVFO. In 2013, surveys in the Roaring Fork watershed documented numerous occurrences including a population of approximately 650 individuals on a parcel of BLM land. No Ute ladies'-tresses orchids were found in surveys along the Colorado River from State Bridge to Dotsero in 2014 (DeYoung 2016). In 2015, BLM performed surveys of additional potential habitat in the Colorado River drainage from Silt to Rulison, Colorado. No occurrences of the species were observed (Perkins 2016b).

No known populations have been documented within the Planning Area. Potential habitat for Ute ladies'-tresses habitat within the Planning Area comprises 32,430 acres (Figure 3). This potential habitat was approximated by BLM based on the inclusion of areas along perennial streams, wet meadows, irrigated fields, and/or ditches up to 6,800 feet in elevation (Perkins 2016c).

Past and Present Impacts

The two occurrences on BLM land are located along the Roaring Fork River on small isolated parcels surrounded by private land. Public access is only available by boating or floating the river. Very minimal recreational use has been noted at either site. Population numbers at the BLM occurrence have fluctuated annually, but generally have been stable or increasing. The BLM occurrences are fairly small, and are adjacent to larger occurrences on private lands. The known occupied habitat is located in areas with a low potential for oil and gas, and no leases currently exist.

Neither of the aforementioned BLM parcels are within authorized grazing allotments, but the parcels are unfenced and one of the parcels is contiguous with private lands that historically have been grazed in late winter and early spring. Potential impacts to private lands include a proposed residential development plan. The development plan includes proposed new trails immediately adjacent to the orchid population on public land. Impacts could include trampling from foot, horse, or bicycle traffic. Changes in hydrology may also be impacting the species, as some landowners are changing irrigation practices from flood irrigation, which often leads to sub-irrigated soils, to sprinkler systems, which use water more efficiently and tend to result in drier soil conditions not conducive to the orchid.

Critical Habitat

Critical Habitat has not been designated for Ute ladies'-tresses (USFWS 2011b).

Threats

This species is primarily threatened by habitat loss and modification, although its small populations and low reproductive rate make it vulnerable to other threats. The riparian and wetland habitats required by this species have been heavily impacted by urban development, heavy grazing, stream channelization, water diversions, and other watershed and stream alterations that reduce the natural dynamics of the stream system, recreation, and invasion of habitat by exotic plant species (USFWS 1995).

The effects of grazing are largely unknown. The largest populations of the species, in Utah and Colorado, are grazed during the winter, when the plant is dormant, with no noticeable effect on the species. It is plausible that moderate winter grazing, when the plant is dormant, may benefit the species by reducing competition from other riparian species.

Because of the Ute ladies'-tresses low reproductive rate, any loss of individual plants attributed to collection could have a major effect on the species' survival. Collection of individual plants or flowers could cause significant harm to the reproductive potential of the affected population (USFWS 1995).

Competition with exotic species is a threat to Ute ladies'-tresses, along with habitat conversion due to invasive weed species (Jennings 1990).

3.2.5 Colorado Pikeminnow

Species Description

The Colorado pikeminnow (formerly Colorado squawfish) is the largest cyprinid fish endemic to the Colorado River Basin. This species historically reached a maximum length of approximately 6 feet and a

maximum weight of 80 pounds (USFWS 2002a). Young are silvery and usually have a dark, wedge-shaped spot at the base of the caudal fin. Adults are strongly counter-shaded with a dark olive back and a white belly. Today, fish rarely exceed approximately 3 feet in length or weigh more than 18 pounds.

Life History

The Colorado pikeminnow is a long-distance migrator and top ecosystem predator. Colorado pikeminnow live in warm-water reaches of the Colorado River mainstem and larger tributaries, and require uninterrupted stream passage for spawning migrations and dispersal of young (USFWS 2002a). The species is adapted to a hydrologic cycle characterized by large spring peaks of snowmelt runoff and low, relatively stable base flows. High spring flows create and maintain in-channel habitats, and reconnect floodplain and riverine habitats, a phenomenon described as the spring flood-pulse. Throughout most of the year, juvenile, sub-adult, and adult Colorado pikeminnow use relatively deep, low-velocity eddies, pools, and runs that occur in nearshore areas of main river channels. In the spring, Colorado pikeminnow adults use floodplain habitats, flooded tributary mouths, flooded side canyons, and eddies that are available only during high flows. Such environments may be particularly beneficial for Colorado pikeminnow because other riverine fishes gather in floodplain habitats to exploit food and temperature resources, and may serve as prey. Such low-velocity environments also may serve as resting areas for Colorado pikeminnow. River reaches of high habitat complexity appear to be preferred. Young pikeminnow feed on insects and plankton (USFWS 2008); adults feed on other fishes.

Status and Distribution

The Colorado pikeminnow is listed as endangered under the ESA of 1973, as amended (16 U.S.C. 1531 et seq.). It was first included in the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 (32 FR 4001) and was considered endangered under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa). The Colorado pikeminnow was included in the United States List of Endangered Native Fish and Wildlife issued on June 4, 1973 (38 FR 14678), and it received protection as endangered under Section 4(c)(3) of the original ESA of 1973. The latest revised Colorado pikeminnow recovery plan was approved on August 1, 2002 (USFWS 2002a).

The Colorado pikeminnow is one of four endangered fish species addressed in a Recovery Implementation Program for the Upper Colorado River Basin that was initiated in January 1988 as a collaborative program comprised of Federal, state, and private cooperators. The program provides specific goals for the recovery of endangered Colorado River fish while promoting sustainable water development and use (USFWS 1987).

Colorado pikeminnow are currently restricted to the Upper Colorado River Basin and inhabit warm water reaches of the Colorado, Green, and San Juan rivers and associated tributaries.

Environmental Baseline

Occurrences of Colorado pikeminnow in the Planning Area consist of captures of translocated and stocked fish (Figure 4). Additional fish reside downstream in the mainstem Colorado River near the Colorado-Utah border in the Black Rocks area.

Past and Present Impacts

A number of factors contributed historically to the decline of the Colorado pikeminnow, including changes in flow regime (especially the timing and amplitude of high flows) associated with construction of dams and irrigation diversions, altered water quality and lower temperatures associated with dams and, in specific areas, chemical pollutants), interference with migration to/from spawning grounds due to dams and other in-stream features, and competition or predation on eggs, larvae, and juvenile fish by introduced

predatory game and non-game fishes. The impoundment of water and water depletions from the Colorado River and its tributaries have been large factors in the decline of this species.

Colorado pikeminnow are particularly affected by reduced flows. The “15-Mile Reach” located in Grand Junction, Colorado along the Colorado River is a known congregation area for spawning Colorado pikeminnow. Reduced flows are unable to effectively move sediment, and sediment buildup can reduce spawning habitat and impact reproduction and recruitment. Important micro-habitats, such as backwaters, can be dewatered or reduced in volume or lost due to reduced flows. The frequency of periodic flooding of river bottomlands located adjacent to the river can be reduced. Flooded bottomlands are important for riparian regeneration and maintenance and as seasonal foraging habitat. The existing habitat has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding and sheltering.

Stream flow regulation includes mainstem dams that cause the following adverse effects to Colorado pikeminnow and its habitat:

Blocking migration;

Changing flow patterns—reduced peak flows, changes in timing of snowmelt runoff;

Releasing cold water, making temperature regimes less than optimal;

Converting river habitat into lake habitat; and

In the Upper Basin, 435 miles of Colorado pikeminnow habitat has been lost by reservoir inundation from Flaming Forge Reservoir on the Green River, Lake Powell on the Colorado River, and Navajo Reservoir on the San Juan River. Cold water releases from these dams have eliminated suitable habitat for native fishes, including Colorado pikeminnow, from river reaches downstream for approximately 50 miles below Flaming Gorge Dam and Navajo Dam. In addition to main stem dams, many dams and water diversion structures occur in and upstream from Critical Habitat that reduce flows and alter flow patterns, which adversely affect Critical Habitat. Diversion structures in Critical Habitat divert fish into canals and pipes where the fish are permanently lost to the river system. It is unknown how many endangered fish are lost in irrigation systems, but in some years, in some river reaches, the majority of the river flow is diverted into unscreened canals. The high spring flows that maintain habitat diversity flush sediments from spawning habitat, increase invertebrate food production, form gravel and cobble deposits important for spawning and maintaining backwater nursery habitats have been reduced by flow regulation of dams and by water diversions (McAda 2002; Muth et al. 2000).

Predation and competition from non-native fishes have been clearly implicated in the population reductions or elimination of native fishes in the Colorado River Basin (Dill 1944; Osmundson and Kaeding 1989; Behnke 1980; Joseph et al. 1977; Lanigan and Berry 1979; Minckley and Deacon 1968; Meffe 1985; Propst and Bestgen 1991; Rinne 1992). Data collected by Osmundson and Kaeding (1991) indicated that, during low water years, non-native minnows capable of preying on or competing with larval endangered fishes greatly increased in numbers.

More than 50 non-native fish species were intentionally introduced in the Colorado River Basin prior to 1980 for sport fishing, forage fish, biological control, and ornamental purposes (Minckley 1982; Tyus et al. 1982; Carlson and Muth 1989). Non-native fishes compete with native fishes in several ways. The capacity of a particular area to support aquatic life is limited by physical habitat conditions. Increasing the number of species in an area usually results in a smaller population of most species. The size of each species’ population is controlled by the ability of each life stage to compete for space and food resources and to avoid predation. Some life stages of non-native fishes appear to have a greater ability to compete

for space and food and to avoid predation in the existing altered habitat than do some life stages of native fishes.

The Upper Colorado River Basin is home to 14 native fish species, including the endangered humpback chub, bonytail, Colorado pikeminnow, and razorback sucker. These four endangered fish are found only in the Colorado River system. In 1988, the Upper Colorado River Endangered Fish Recovery Program was established to help bring these four species back from the brink of extinction. The Recovery Program is a unique partnership of local, state, and Federal agencies, water and power interests, and environmental groups working to recover endangered fish in the Upper Colorado River Basin while water development proceeds in accordance with Federal and state laws and interstate compacts. This major undertaking involves restoring and managing stream flows and habitat, boosting wild populations with hatchery-raised endangered fish, and reducing negative interactions with certain non-native fish species. The goal of recovery is to achieve natural, self-sustaining populations of the endangered fish so they no longer require protection under the Federal Endangered Species Act.

The Recovery Program was initiated in 1988 with the signing of a cooperative agreement by the Governors of Colorado, Utah, and Wyoming, the Secretary of the Interior, and the Administrator of Western Area Power Administration. In 2001, these parties agreed to extend the cooperative agreement through September 30, 2013. The Recovery Program provides Endangered Species Act compliance for continued operation of Federal water and power projects in accordance with project purposes. With its demonstrated successes, the Upper Colorado River Endangered Fish Recovery Program has become a national model for its collaborative conservation efforts to protect endangered species. The CRVFO manages very few surface miles of habitat along the Colorado River for Colorado pikeminnow. As such, the amount of proactive habitat management and recovery action implementation conducted is limited. BLM staff do assist CPW and USFWS with select recovery plan actions, including removal of non-native fish from designated Critical Habitat for the Colorado pikeminnow and razorback sucker in the Colorado River. Staff also account for and reports annual water depletions made from the Colorado River Basin, which results in BLM paying into the Recovery Program to help fund efforts to recover the four endangered Colorado River fish species. BLM staff also conduct Land Health Assessments (LHAs) at a watershed scale to evaluate listed species habitat conditions, which helps direct habitat management for these fish species.

Critical Habitat

Critical Habitat was designated in 1994 within the 100-year floodplain of the Colorado pikeminnow's historical range. Designated Critical Habitat is located within and adjacent to the southern boundary of the planning area within the Colorado River and its 100-year floodplain. Occurrences of this species are rare in the planning area and consist of potentially wild as well as stocked fish. This species is more abundant downstream within the 15-Mile Reach in Grand Junction, CO and downstream Critical Habitat for all four endangered Colorado River fish species throughout their range was designated on March 21, 1994 (59 FR 13374). PCEs for all are described in Table 6.

Table 6. Primary Constituent Elements of Colorado Pikeminnow, Bonytail, Humpback Chub, and Razorback Sucker Critical Habitat

Features	*Description*
Water	This includes a quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species.

Table 6. Primary Constituent Elements of Colorado Pikeminnow, Bonytail, Humpback Chub, and Razorback Sucker Critical Habitat

Features	*Description*
Physical habitat	This includes areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. In addition to river channels, these areas also include bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year flood plain, which, when inundated, provide spawning, nursery, feeding, and rearing habitats, or access to these habitats.
Biological environment	Food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the species. Predation and competition, although considered normal components of this environment, are out of balance due to introduced non-native fish species in many areas.

Source: USFWS 1994a

Threats

The primary threats to Colorado pikeminnow include stream flow reduction and regulation, habitat modification, competition with and predation by non-native fishes, and pesticides and pollutants (BLM 2008b; USFWS 2002c).

3.2.6 Bonytail

Species Description

The bonytail is a large cyprinid fish (minnow family) endemic to the Colorado River Basin that can live 50 years. Adult bonytail are gray or olive-colored on the back with silvery sides and a white belly. The adult bonytail has an elongated body with a long, thin caudal peduncle. The head is small and compressed compared to the rest of the body. The mouth is slightly overhung by the snout, and there is a smooth low hump behind the head that is not as pronounced as the hump on a humpback chub. Adults attain a maximum length of about 21 inches and maximum weight of about 2.2 pounds (USFWS 2002a).

Life History

Little is known about the specific habitat requirements of bonytail because the species was extirpated from most of its historic range prior to extensive fishery surveys. The bonytail is adapted to mainstem rivers where it has been observed in pools and eddies. Similar to other closely related *Gila* spp., bonytail in rivers probably spawn in spring over rocky substrates. Spawning in reservoirs has been observed over rocky shoals and shorelines. Based on available distribution data, flooded bottomland habitats are likely important growth and conditioning areas for bonytail, particularly as nursery habitats for young. Flow recommendations have been developed that specifically consider flow-habitat relationship within historic habitat of bonytail in the upper basin, and were designed to enhance habitat complexity and to restore and maintain ecological processes (USFWS 2002b).

The bonytail's large fins and streamlined body are an adaptation to torrential flows. Of five specimens captured in the upper basin, four were captured in deep, swift, rocky canyon regions (Yampa Canyon, Black Rocks, Cataract Canyon, and Coal Creek Rapid), but the fifth was taken in a reservoir (Lake Powell). Also, all fish taken from the lower basin since 1974 were caught in reservoirs. Individuals found in reservoirs are believed to inhabit their former habitats now inundated by these impoundments. Vanicek (1967), who handled numerous bonytail, detected no difference in habitat selection from roundtail chub

(*Gila robusta*). These fish were generally found in pools and eddies in the absence of, although occasionally adjacent to, strong currents and at varying depths generally over silt and silt-boulder substrates. No quantitative habitat data are available for this species. Adult bonytail captured in Cataract Canyon and Desolation/Gray canyons were sympatric with humpback chub in shoreline eddies among emergent boulders and cobble and adjacent to swift current (USFWS 2002b).

Similarly, little is known of the food habits of the bonytail. They are reportedly largely omnivorous with a diet of terrestrial insects, plant matter, and fish. Several chubs were observed feeding on floating masses of debris washed by heavy rainfall. Vanicek (1967) reported that "Colorado chubs" fed mainly on terrestrial insects (mostly adult beetles and grasshoppers), plant debris, leaves, stems, and woody fragments (USFWS 2002b).

Status and Distribution

The bonytail is listed as endangered under the ESA under a final rule published on April 23, 1980 (45 FR 27710). A recovery plan was originally approved on September 4, 1990 (USFWS 1990b). Recovery goals were subsequently published in an amendment and supplement to the recovery plan dated August 1, 2002 (USFWS 2002a). The final rule for determination of Critical Habitat was published on March 21, 1994 (59 FR 13374), and the final designation became effective on April 20, 1994.

The bonytail is one of four endangered fish species addressed in a Recovery Implementation Program for the Upper Colorado River Basin (USFWS 1987) that was initiated in January 1988 and is described in Section 3.2.5.3

Until the 1950s, bonytail was historically common or abundant in warm water reaches of large rivers from Mexico to Wyoming. This species was found far downstream in the mainstem Colorado River near the Colorado-Utah border in the Black Rocks area (USFWS 2008). The last known riverine area where bonytail were common was the Green River in Dinosaur National Monument, where Vanicek (1967) and Holden and Stalnaker (1970) collected 91 specimens from 1962-1966. From 1977 to 1983, no bonytail were collected from the Colorado or Gunnison rivers in Colorado or Utah. However, in 1984, a single bonytail was collected from Black Rocks on the Colorado River. Several suspected bonytail were captured in Cataract Canyon from 1985 to 1987.

Bonytail are so rare that it is currently not possible to conduct population estimates. A stocking program is being implemented to reestablish populations in the upper Colorado River basin. From 1996 through 2004, 44,472 sub adult bonytail were stocked in the Green and upper Colorado River sub-basins. The recovery goals (USFWS 2002b) call for reestablished populations in the Green River and upper Colorado River sub-basins, each with more than 4,400 adults that are self-sustaining with recruitment.

Environmental Baseline

Bonytail is the rarest native fish in the Colorado River. These fish reside downstream in the mainstem Colorado River near the Colorado-Utah border in the Black Rocks area. They have been reintroduced along the Colorado River (near and downstream of the planning area on a few occasions), in and adjacent to the Planning Area (USFWS 2016; Figure 4).

Past and Present Impacts

The past and current impacts on bonytail are similar to those described above for Colorado pikeminnow.

Critical Habitat

Critical Habitat has been designated for the bonytail, but none of it is located within the Planning Area (Figure 4). Critical Habitat occurs on the Yampa River in Colorado continuing on the Green River into Utah, on the Colorado River from Mee Canyon in Colorado to the confluence with Coach Creek (Dry Gulch) in Utah, on the Colorado River in southeastern Utah to Lake Powell, and on the Colorado River in Arizona from South Canyon Point to Cape Solitude in the Grand Canyon.

Threats

The primary threats to bonytail include stream flow reduction and regulation, habitat modification, competition with and predation by non-native fishes including stocked species, and pollutants and pesticides.

3.2.7 Humpback Chub

Species Description

The humpback chub is a medium to large cyprinid fish that is endemic to the Colorado River Basin (Miller 1946). Adults have a pronounced dorsal hump, a narrow, flattened head, a fleshy snout, and small eyes. They are silvery with a brown or olive back. Adults attain a maximum size of about 1.5 feet and about 2.5 pounds in weight (Valdez and Ryel 1997), and can live for 30 years.

Life History

The humpback chub is omnivorous, feeding on aquatic arthropods, smaller fishes, and algae. Adults require eddies and sheltered shoreline habitats maintained by high spring flows. Young require low-velocity shoreline habitats, including eddies and backwaters. Humpback chub live and complete their entire life cycle in canyon-bound reaches of the Colorado River mainstem and larger tributaries. These reaches are characterized by deep water, swift currents, and rocky substrates. Sub-adults use shallow, sheltered shoreline habitats, whereas adults primarily use offshore habitats of greater depths (USFWS 2002d).

Status and Distribution

The humpback chub is currently listed as endangered under the ESA. It was first included in the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 (32 FR 4001) and was considered endangered under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa). The humpback chub was included in the United States List of Endangered Native Fish and Wildlife issued on June 4, 1973 (38 FR 14678), and this species received protection as endangered under Section 4(c)(3) of the original ESA of 1973. The humpback chub recovery plan was approved on September 19, 1990 (USFWS 1990c). Recovery goals were subsequently published in an amendment and supplement to the recovery plan dated August 1, 2002 (USFWS 2002d). The final rule for determination of Critical Habitat was published on March 21, 1994 (59 FR 13374), and the final designation became effective on April 20, 1994.

The humpback chub is one of four endangered fish species addressed in a Recovery Implementation Program for the Upper Colorado River Basin (USFWS 1987) that was initiated in January 1988 and is described in Section 3.2.5.3.

The historical distribution of the humpback chub is not well known because it was not described as a species until 1946. The original distribution of this species was presumably limited to swift, deepwater areas in the mainstem Colorado River Basin, downstream to below the Hoover Dam site. In the Upper Basin in Colorado, the humpback chub has been found in the Yampa, Gunnison, Green, and Colorado

rivers. The greatest numbers of humpback chub in Colorado are found at the Black Rocks area of the Colorado River, downstream of Grand Junction, and in Utah along the Westwater section of the Colorado River (BLM 2012d).

Today, the largest populations of this species occur in the Little Colorado and Colorado Rivers in the Grand Canyon, and in Black Rocks and Westwater Canyon in the upper Colorado River. Hybridization with roundtail chub (*Gila robusta*) and bonytail, where they occur with humpback chub, is recognized as a threat to humpback chub. A larger proportion of roundtail chub has been found in Black Rocks and Westwater Canyon during low flow years (Kaeding et al. 1990; Chart and Lentsch 2000), which increase the chances for hybridization.

Environmental Baseline

This species is not known to occur in the Planning Area. These fish reside downstream in the mainstem Colorado River near the Colorado-Utah border in the Black Rocks area.

Past and Present Impacts

The impoundment of water and water depletion from the Colorado River and its tributaries has been a large factor in the decline of these fish. The existing habitat has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Survival rates in young (less than two years) humpback chub are thought to be less than one in 1,000 (USFWS 2008).

Critical Habitat

Critical Habitat has been designated for humpback chub, but none is located within the Planning Area (Figure 4). Humpback Chub Critical Habitat occurs on the Yampa River in Colorado continuing on the Green River into Utah, on the Colorado River from Mee Canyon in Colorado to the confluence with Coach Creek (Dry Gulch) in Utah, on the Colorado River in southeastern Utah to Lake Powell, and on the Colorado River in Arizona from South Canyon Point to Cape Solitude in the Grand Canyon. PCEs are described in Table 5.

Threats

The primary threats to humpback chub include stream flow reduction and regulation, habitat modification, competition with and predation by non-native fishes, and pollutants and pesticides (BLM 2008b; USFWS 2002d).

3.2.8 Razorback Sucker

Species Description

The razorback sucker is a large catostomid (species with a downward mouth) fish endemic to the Colorado River Basin. Adults attain a maximum size of about 39 inches and 11 pounds. It is the only sucker with a sharp-edged dorsal keel behind its head. These fish have reached lengths of over 3 feet and weigh as much as 10 pounds in the Lower Colorado River Basin. Fish in the upper Colorado River basin tend to be smaller than those in the Lower Colorado River Basin. They may live over 40 years (USFWS 2002e).

Life History

Adult razorback suckers occupy different habitats seasonally. Habitats required by adults in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring, runs and pools, often in shallow water associated with submerged sandbars in summer, and low-velocity runs, pools, and eddies in

winter. Spawning in rivers occurs over bars of cobble, gravel, and sand substrates during spring runoff at widely ranging flows and water temperatures, typically greater than 57 degrees Fahrenheit (USFWS 2002e). This species breeds in the spring, when flows in riverine environments are typically high. The razorback suckers diet primarily consists of algae, plant debris, and aquatic insect larvae (USFWS 2008).

Status and Distribution

The razorback sucker is currently listed as endangered under the ESA, under a final rule published on October 23, 1991 (56 FR 54957). A recovery plan was approved on August 1, 2002 (USFWS 2002e); a previous recovery plan was dated December 23, 1998 (USFWS 1998b).

The razorback sucker is one of four endangered fish species addressed in a Recovery Implementation Program for the Upper Colorado River Basin (USFWS 1987) that was initiated in January 1988 and is described in Section 3.2.5.3.

Historically, razorback suckers were found in the mainstem Colorado River and major tributaries in Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and Mexico. This species was reportedly once so numerous that it was commonly used as food by early settlers, while commercially marketable quantities were caught in Arizona as recently as 1949. In the Upper Basin, razorback suckers were reported to be very abundant in the Green River near Green River, Utah, in the late 1800s (USFWS 2008).

In the Upper Colorado River Basin, above Glen Canyon Dam, razorback suckers are found in limited numbers in both lentic (lake-like) and riverine environments. The largest populations of razorback suckers in the upper basin are found in the upper Green and lower Yampa Rivers (Tyus 1987). In the Colorado River, most razorback suckers occur in the Grand Valley area near Grand Junction, Colorado, but they are increasingly rare.

Environmental Baseline

Razorback sucker may reside in the Planning Area along the Colorado River, since downstream movement barriers have recently been modified to allow for greater fish passage potential. Multiple occurrences in the Planning Area consist of reintroductions of translocated and stocked fish (USFWS 2016; Figure 4).

Past and Present Impacts

The abundance and distribution of the razorback sucker have been dramatically reduced because of water developments, such as dams and water diversions. Dams have altered the timing, magnitude, and duration of flows that characterize the variation in annual runoff in unaltered, large rivers; altered flows resulting from dam operation can also affect the abundance and distribution of spawning and rearing habitats preferred by the razorback sucker. Historical water depletions and any new water depletions are likely to negatively affect population and habitat conditions downstream, although assessing the effects on species viability may be difficult. In addition, the introduction of non-native fishes to the historical habitats of the razorback sucker has almost eliminated their recruitment and survival. Incidental catch by recreational anglers may pose a threat resulting from stress-caused direct and delayed mortality (USFWS 2002e). The impoundment of water and water depletion from the Colorado River and its tributaries has been a large factor in the decline of these fish.

Critical Habitat

Within the Planning Area, the Colorado River and its 100-year floodplain along the southern boundary is identified as Critical Habitat. This extends downstream to Lake Powell, Utah. Critical Habitat PCEs are

described in Table 5. The final rule for determination of Critical Habitat was published on March 21, 1994 (USFWS 1994b), and the final designation became effective on April 20, 1994.

Threats

The primary threats to razorback sucker include water developments, such as dams and water diversions, water depletions, habitat alterations, reduction or loss of important micro-habitats, introduction of non-native fishes that compete for resources and can hybridize with this species, and pollutants and pesticides.

3.2.9 Colorado River Cutthroat Trout (Green Lineage)

Species Description

Green Lineage cutthroat trout are a small salmonid (trout and salmon) fish. Based on new genetics (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) there were 6 distinct lineages of Cutthroat Trout in Colorado, four of which persist today. Adult Green Lineage Colorado River Cutthroat Trout are greenish brown to olive-colored on the back with silvery to yellow sides and a white belly (red during spawning). This species has a crimson slash under each side of the lower jaw and low numbers of large spots concentrated toward the caudal fin.

Life History

Green Lineage Colorado River Cutthroat Trout, like all cutthroat subspecies, inhabit cold water streams and lakes with adequate spawning habitat present in the spring of the year. Spawning generally occurs when water temperatures reach 41 to 46 degrees Fahrenheit. Green Lineage Colorado River Cutthroat Trout feed on a wide variety of organisms, but their primary source of food is aquatic and terrestrial insects. Size and growth of Green Lineage Colorado River Cutthroat Trout varies based upon elevation and population size, but is typically 1 to 2 pounds maximum (USFWS 1998c).

Status and Distribution

Recent genetic (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) research indicates that two CRCT lineages exist in western Colorado where it was originally thought that only one existed. The two genetically distinct lineages of cutthroat trout are currently called the Blue Lineage (native to the Green, White, and Yampa river basins) and the Green Lineage (native to the Colorado, Dolores, and Gunnison river basins).

While the taxonomy of these fish has yet to be resolved, the USFWS is urging Federal agencies to treat Green Lineage cutthroat trout as threatened greenback cutthroat trout until such time as they complete a status assessment on the green lineage fish and make a formal interpretation and determination on the new genetic and meristic research on cutthroat trout in the state of Colorado. If an action may affect such a population, then initiation of Section 7 consultation is appropriate (USFWS 2012f). The USFWS also believes that implementation of the CRCT Conservation Strategies (CRCT Conservation Team 2006) in place to conserve and protect CRCT populations will also adequately protect any that happen to display the Green Lineage genetic fingerprint. Agencies should, therefore, include these activities in their BAs as conservation measures for Green Lineage populations (USFWS 2012f).

As part of ongoing cutthroat trout management in the Planning Area, CPW worked with the BLM to remove non-native brook trout (*Salvelinus fontinalis*) from the East Fork Parachute Creek watershed. Four miles of stream in the headwaters was reclaimed in 2014 (BLM 2014c). CPW stocked Green Lineage fish in the summer of 2015 in this treated reach. CPW plans to complete the removal of brook trout in the remainder of the watershed in 2017 in the 4-mile reach downstream of the constructed fish barrier. Pending a successful reclamation, they will repatriate the lower portion of the East Fork Parachute

Creek with Green Lineage cutthroat trout, and manage the entire watershed atop the plateau as a genetically pure Green Lineage cutthroat (Martin 2016). Eventually, the plan is to remove the constructed fish barrier, thus opening 8 miles of Green Lineage cutthroat trout habitat from the headwaters to the 200-foot waterfall where the creek exits the plateau.

Currently, Green Lineage cutthroat trout occur in the East Fork Parachute Creek upstream of the fish barrier, and JQS Gulch (Figure 4).

CRCT, as mentioned herein and in the stipulations, apply to Green Lineage for the purposes of this BA.

Environmental Baseline

One population of Green Lineage cutthroat trout currently resides within the Planning Area, in East Fork Parachute Creek and its tributaries. The upper 4 miles of East Fork Parachute Creek from the manmade barrier below Third Water Gulch and above Second Anvil Creek, including the headwater stream JQS Gulch, were stocked in the summer and fall of 2015 with a total of 4,932 Green Lineage cutthroat trout population, as follows:

> Stocked on July 7, 2014: 60 of the 2013 age class (5.8 inches) and 60 of the 2014 age class (9.2 inches);
>
> Stocked on October 27, 2015: 4,000 of the 2015 progeny of the 2012 age class (1.6 inches) and 164 of the 2014 broodstock (8.4 inches); and
>
> Stocked on November 2, 2015: 648 of the 2015 progeny from the 2015 wild spawn take (2.1 inches).

Another 648 fish are planned for stocking during the summer of 2016. The intent is to create a self-sustaining population of Green Lineage cutthroat trout; however, it is too early to determine the success of this effort.

Critical Habitat

Critical Habitat has not been designated for Green Lineage cutthroat trout.

Past and Present Impacts

Green Lineage Colorado River Cutthroat Trout distribution and numbers of fish declined rapidly beginning in the 1800s. The introduction of non-native salmonids to support sport fisheries, notably brook trout in East Fork Parachute Creek, contributed to this decline. This caused declines in the CRCT population due to predation and competitive exclusion, including the Green Lineage fish. These stocking events were widely distributed on both the East Slope and West Slope in Colorado. This population decline was further exacerbated by the introduction of cutthroat trout of different linages than originally occupied a given drainage, leading to the current state of taxonomic complexity. Although competition with non-native trout species will always be an issue, work by CPW, BLM, the CRCT Recovery Team, and USFWS.

Atop the plateau within the Planning Area, 2 miles of streams were not meeting the Colorado Standards for Public Land Health for CRCT, specific to grazing impacts, including poor width to depth ratios, lack of vegetative cover, and bank trampling (BLM 2013b). Since the completion of that assessment, new fencing has been constructed and revised grazing authorizations have been issued.

Threats

The primary threat to Green Lineage Colorado River Cutthroat Trout is the presence and stocking of non-native salmonids for sport fishing, resulting in predation and competitive exclusion, as well as potential for hybridization with other *Oncorhynchus* species or subspecies.

Other threats include climate change, livestock grazing, water diversions and reduced flows, disease, and toxicity. Specific to the Planning Area, additional threats to Green Lineage cutthroat include oil and gas development, accidental spills or leaks of hazardous substances, and large wildfires.

3.2.10 Mexican Spotted Owl

Species Description

Mexican spotted owls (*Strix occidentalis lucida*) are identified by sight and sound. This owl is mottled in appearance with irregular white and brown spots on its abdomen, back, and head, and their brown tails are marked with thin white bands. Young owls less than five months old have a downy appearance. Females are larger than males (USFWS 2012g). Unlike most owls, spotted owls have dark eyes.

Adult male and female spotted owls are similar in their plumage, and are best distinguished by voice. Juveniles, sub-adults and adults can be distinguished by plumage characteristics. The Mexican spotted owl ranks among the largest owls in North America (USFWS 2012g).

Life History

This owl species is highly selective for roosting and nesting habitat, but will forage in a wider array of habitats (Bowden et al. 2015). Roosting and nesting habitat exhibit certain identifiable features, including large trees, uneven aged tree stands, multi-storied canopy, a tree canopy creating shade over 40 percent or more of the ground, and standing dead trees. Canopy closure is typically mixed-conifer dominated by Douglas fir, pine-oak, and riparian forests with high tree diversity (USFWS 2012g).

Foraging habitat includes a wide variety of forest conditions, canyon bottoms, cliff faces, tops of canyon rims, and riparian areas. It has been reported that these owls forage more frequently in unlogged forests than in managed forests. Mexican spotted owls eat a variety of prey, including small- to medium-sized rodents (such as wood rats, mice, and voles), bats, birds, lizards, snakes, and spiders. The primary prey species are woodrats (*Neotoma* spp.), peromyscid mice (*Peromyscus* spp.), and microtine voles (*Microtus* spp.) (USFWS 2012g).

Courtship begins in March, and eggs are laid in late March or, more typically, early April. Nestling owls fledge from four to five weeks after hatching, from early to mid-June in most cases. The young depend on their parents for food during the summer and will eventually disperse out of the natal area in the fall (USFWS 2012g).

Juvenile owls disperse in September and October into a variety of habitats ranging from high-elevation forests to pinyon-juniper woodlands and riparian areas surrounded by desert grasslands. Observations of long-distance dispersal by juveniles provide evidence that they use widely spaced islands of suitable habitat that are connected at lower elevations by pinyon-juniper and riparian forests. As a result of these movement patterns, isolated populations may have genetic significance to the owl's conservation. Owls have been observed moving across open low desert landscapes between islands of suitable breeding habitat. It is likely that contiguous stands or islands of suitable mixed-conifer, pine-oak, and riparian forests are important (USFWS 2012g).

Status and Distribution

The Mexican spotted owl was listed as threatened on March 16, 1993 (58 FR 14248). A final recovery plan was published in September 2012 (USFWS 2012h). This recovery plan replaces the previous plan dated October 16, 1995. The 1995 Recovery Plan subdivided the owl's range into 11 "Recovery Units": six in the United States and five in Mexico. These were renamed in the Final Recovery Plan as "Ecological Management Units" in accordance with current USFWS guidelines. On August 31, 2004, the USFWS published the final rule designating Critical Habitat for the owl. Over 8.6 million acres of Critical Habitat is designated within Arizona, Colorado, New Mexico, and Utah (69 FR 53182).

The Mexican spotted owl occurs in forested mountains and rocky canyonlands throughout the southwestern United States and Mexico (Gutierrez et al. 1995; Ward et al. 1995). This species inhabits steep, rocky canyons with exposed cliffs and ranges from Utah, Colorado, Arizona, New Mexico, and the western portions of Texas south into several states of Mexico; however, the Mexican spotted owl does not uniformly occur throughout its range but, rather, in disjunct areas that correspond with isolated mountain ranges and canyon systems. In the United States, the majority of owls are found in National Forests. In some areas of the Colorado Plateau Ecological Management Unit, owls are found only in rocky-canyon habitats, which primarily occur on USFS, National Park Service (NPS), and BLM lands. In the United States, 91 percent of the owls known to exist between 1990 and 1993 occurred on lands administered by the USFS and 2 percent occurred on lands administered by BLM (Ward et al. 1995).

The species' core range occurs in central Arizona and New Mexico. In Colorado, Mexican spotted owls occur in lower elevation forests, usually in deeply incised, rocky canyons in southern Colorado and along the Front Range. Surveys conducted to locate spotted owls in northern Colorado near Fort Collins and Boulder, where historical records exist from the early 1970s and 1980s, have been unsuccessful. Surveys conducted in the Book Cliffs of east-central Utah, where owls were recorded in 1958, have also been unsuccessful (USFWS 2011c). The highest number of owls ever counted in Colorado was 20, with seven breeding pairs counted in 1993 (BLM 2011).

Environmental Baseline

The documented geographic range of the Mexican spotted owl does not include the Planning Area or surrounding portions of Colorado (Kingery 1998). However, the BLM has mapped suitable habitat in the first mile extending downstream from the East Fork Parachute Creek waterfall (Figure 4). Potentially suitable habitat also occurs on private land in lower portions of the East Fork and East Middle Fork drainages and the Magpie Gulch area (Figure 4). It should be noted that a survey of biological resources of NOSR1 by CNHP (CNHP 1997, 1998) did not mention any occurrence of Mexican spotted owl in the Planning Area.

Past and Present Impacts

A central threat is habitat loss and disturbance from recreation (including birding), overgrazing, land and road development, catastrophic fire, timber harvest, and energy and mineral development (Irwin et al. 2015). Historical and current anthropogenic uses of Mexican spotted owl habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g., timber, oil, gas), and development. These activities reduce the quality of Mexican spotted owl habitat (USFWS 2011c). Currently, the greatest threat to habitat is timber extraction in the southwestern United States.

In addition to habitat pressures, the owl is threatened by competition from other owl species, overutilization for commercial, recreational, scientific, or educational purposes (USFWS 2012g), predation and disease, inadequacy of existing regulatory mechanisms, and other natural or manmade

factors including fire (anthropogenic or possibly naturally caused), silvicultural treatments, anthropogenic intentional injury to the bird, climate change and noise disturbance.

Critical Habitat

The USFWS designated Critical Habitat for the Mexican spotted owl on February 1, 2001 (66 FR 8530). This designation was later revised and finalized on August 31, 2004 (69 FR 53182). No designated Critical Habitat is located within the Planning Area. PCEs for Mexican spotted owl Critical Habitat are described in Table 7.

Threats

Threats to Mexican spotted owl (described in more detail in Environmental Baseline) include overgrazing, recreation, land and road development, catastrophic fire, and timber harvesting.

Table 7. Primary Constituent Elements of Mexican Spotted Owl Critical Habitat

Features	*Description*
Forest Structure	• A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches or more when measured at 4.5 feet from the ground; • A shade canopy created by the tree branches covering 40 percent or more of the ground. • Large dead trees (snags) with a trunk diameter of at least 12 inches when measured at 4.5 feet from the ground.
Maintenance of Adequate Prey Species	• High volumes of fallen trees and other woody debris. • A wide range of tree and plant species, including hardwoods. • Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.
Canyon Habitats	• Presence of water (often providing cooler and often higher humidity than the surrounding areas). • Clumps or stringers of mixed conifer, pine-oak, pinyon/juniper, and/or riparian vegetation. • Canyon wall containing crevices, ledges, or caves. • High percent of ground litter and woody debris.

3.2.11 Western Yellow-billed Cuckoo

Species Description

The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is brownish above and white below with rusty colored flight feathers. The species has a slender, long-tailed profile, with a fairly stout and slightly down-curved bill; the upper mandible of the bill is blue-black and the lower mandible is yellow. The underside of the tail has pairs of large white spots. This is a medium-sized bird about 12 inches in length weighing about 2 ounces. The tail feathers are boldly patterned, with black and white below. The legs are short and bluish-gray, and adults have a narrow, yellow eye ring. Juveniles resemble adults, except the tail patterning is less distinct, and the lower bill may have little or no yellow. Males and females differ slightly. Males tend to have a slightly larger bill, and the white in the tail tends to form oval spots, whereas in females the white spots tend to be connected and less distinct (USFWS 2011d).

Life History

Western cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods *(Populus* spp.*)* and willows *(Salix* sp.*)*. Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (USFWS 2013). Clutch size is usually two or three eggs, and development of the young is very rapid, with a breeding cycle of 17 days from egg-laying to fledging of young. Although yellow-billed cuckoos usually raise their own young, they are facultative (discretionary) brood parasites, occasionally laying eggs in the nests of other yellow-billed cuckoos or of other bird species (USFWS 2011d). Western cuckoos winter in South America. They feed on larger insects than any other insectivorous birds, with the possible exception of some raptors (PRBO Conservation Science 2012). Western yellow-billed cuckoos are primarily foliage gleaners, though they can catch flying prey or drop to the ground to catch grasshoppers or tree frogs.

Status and Distribution

The western yellow-billed cuckoo is listed as threatened under the ESA. The western yellow-billed cuckoos that occur in the western United States are a distinct population segment (79 FR 59992). This species historically occurred in portions of western Colorado, although this species was likely never common and is now extremely rare and is an uncommon summer resident. The available data indicate that cuckoos do not nest within this broad highlands region, and reveal few records of cuckoos at all in the mountainous region of the state (USFWS 2013).

Since 2000, detections of the western yellow-billed cuckoo Distinct Population Segment (DPS) have been limited in western Colorado. Consistent cuckoo observations have been recorded at only two locations in western Colorado. Western yellow-billed cuckoos have been detected annually in the San Luis Valley of south-central Colorado since 2001 in Conejos County, where breeding is suspected but not confirmed. Since 2003, this species has also been detected annually at the North Fork of the Gunnison River valley of west-central Colorado in Delta County; breeding was confirmed in 2008 near Hotchkiss. Reports of single western yellow-billed cuckoos have come primarily from the Grand Junction area and Mesa County in 2001, 2002, 2005, and 2008, with a report of more than one cuckoo at Orchard Mesa Wildlife Area in 2006. Additional reports include a cuckoo south of Montrose in Montrose County near the Uncompahgre River in 2009, a cuckoo along the Gunnison River near Gunnison in 2007, and detections by the Rocky Mountain Bird Observatory along the Yampa River near Craig in 2007 and 2008, and in far western Colorado near Nucla in 2005 and 2008 (USFWS 2011d).

Environmental Baseline

No individuals have been recorded or confirmed to nest on BLM lands within the Planning Area. The habitat was delineated first using the CRVFO vegetation layer to identify the general location of cottonwood (*Populus* sp.) stands within 0.5 miles of a lease boundary, then the GIS layer was verified by aerial photo. From there if the stands appeared to be larger than 10 acres in size, they were ground-truthed to assess the quality of the stands (Ringer 2016; Figure 4).

Past and Present Impacts

Western yellow-billed cuckoos have undergone catastrophic declines, especially in western Colorado (Wiggins 2005). Direct loss and degradation of low-elevation riparian woodland habitats are considered a primary cause for declines in the western portion of their range. Principal causes of riparian habitat losses are conversion to agricultural and other uses, dams and river flow management, alteration of flow schemes in rivers and streams (e.g., stream channelization and stabilization or diversion of water for agricultural and municipal purposes), and urban expansion.

Available breeding habitat for cuckoos has been substantially reduced in both area and quality by groundwater pumping and the replacement of native riparian habitats by invasive non-native plants, particularly tamarisk (*Tamarix* spp.) (USFWS 2011d). Other factors contributing to habitat loss and degradation include livestock grazing (which, in turn, affects understory vegetation and cottonwood/willow recruitment), off-road vehicle and other recreational uses, and pesticide applications impacting habitat. A potential factor contributing to declines across this species' range in North America is the loss of forested habitat on its wintering grounds in South America (Wiggins 2005).

In addition to habitat pressures, the cuckoo is threatened by predation and disease, inadequacy of existing regulatory mechanisms, and other natural or manmade factors including habitat alteration as described above, brood parasitism by the brown-headed cowbird, and pesticides that decrease local food supplies and potentially induce toxic accumulations in cuckoos (USFWS 2011d).

The majority of the habitat for the cuckoo is on private lands and continues to be lost or significantly altered. The threats affecting the species and its habitat are ongoing, and riparian habitat is continuing to be destroyed through land use conversion and grazing (PBRO Conservation Science 2012; Wiggins 2005; USFWS 2011d).

Critical Habitat

The USFWS proposed Critical Habitat for the western yellow-billed cuckoo on August 15, 2014 (79 FR 158). No proposed Critical Habitat is located within the Planning Area. PCEs for western yellow-billed cuckoo Critical Habitat are described in Table 8.

Threats

The primary threats to western yellow-billed cuckoo, described in more detail above in Environmental Baseline, are loss and degradation of low-elevation riparian woodland habitats from agricultural and other uses, dams and river flow management, alteration of flow schemes in rivers, and urban expansion, invasive non-native plants, particularly tamarisk, livestock grazing, off-road vehicle and other recreational uses, and pesticide applications.

The loss of forested habitat on its wintering grounds in South America is also a substantial threat (Wiggins 2005). In addition to habitat pressures, the cuckoo is threatened by predation and disease, inadequacy of existing regulatory mechanisms, brood parasitism by the brown-headed cowbird, and pesticides, which decrease local food supplies and potentially induce toxic accumulations in cuckoos.

Table 8. Primary Constituent Elements of Western Yellow-billed Cuckoo Critical Habitat

Features	*Description*
Riparian Woodlands	Riparian woodlands with mixed willow-cottonwood vegetation, mesquite-thorn-forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 325 feet in width and 200 acres or more in extent. These habitat patches contain one or more nesting grove, and are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.
Adequate Prey Base	Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.
Dynamic Riverine Processes	River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote

Table 8. Primary Constituent Elements of Western Yellow-billed Cuckoo Critical Habitat

Features	*Description*
	plant growth, maintenance, health, and vigor (e.g., lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old. These dynamic riverine processes are considered essential for developing and maintaining the primary constituent elements provided under “Riparian Woodlands” and “Adequate Prey Base,” in this table.

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4 EFFECTS ANALYSIS

4.1 INTRODUCTION

This BA analyzes the effects of a proposed Federal action, the Proposed RMPA. The Proposed RMPA is programmatic in nature. Stipulations (Appendix B) listed below would be applied to new oil and gas leases. Corresponding surface use restrictions would be applied to surface-disturbing, non-oil and gas authorized activities. BMPs (Appendix C) and conservation measures (Appendix D) would be applied on a site-specific basis. Separate Section 7 consultation would be completed at the project level for any action authorized by BLM that would possibly affect any population of listed species, or Critical Habitat. Conservation measures listed are not comprehensive, and new conservation measures may be developed during consultation.

This programmatic BA provides documentation and analysis for the Proposed RMPA to meet the Federal requirements and agreements set forth among Federal agencies for compliance with the ESA. BLM requests informal consultation for the effects of the Proposed RMPA on all of the T&E species listed in Table 1 and discussed below.

4.1.1 Definitions

The effects of implementing the Proposed RMPA can be categorized into direct, indirect, and cumulative effects. These three effect categories are defined differently under ESA and NEPA so that effects presented here will differ from those described in the Proposed RMPA/FSEIS. The analysis of all impacts includes the effects of interrelated and interdependent actions.

> **Direct effects** are those that are caused by the proposed action and occur at the time of the action.
>
> **Indirect effects** are those that are caused by the proposed action and occur later in time, but are reasonably certain to occur.
>
> **Cumulative effects** include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BA. Future Federal actions that are unrelated to the proposed action are not considered in the cumulative analysis because they will be subject to separate consultation pursuant to Section 7 of the ESA.

Under the ESA, all effects of an action must be considered. As such, numerous adverse effects are analyzed below even if the net effect of the management actions in the Proposed RMPA are beneficial to T&E species in the Planning Area.

The following definitions are used for effect determinations:

> **No effect (NE)** — the appropriate conclusion when BLM determines its proposed action would not affect listed species. The principal factor in this determination is that the species and "suitable habitat" for the species does not exist in the analysis area or that the proposed action would involve no surface disturbances or other disruption to the species. In this situation, no further contact with the USFWS is required.
>
> **May affect, is not likely to adversely affect (NLAA-b, -i, -d)** — the appropriate conclusion

when effects on listed species are expected to be discountable (-d), or insignificant (-i), or completely beneficial (-b). This type of effect requires informal Section 7 consultation with the USFWS and concurrence with the determination.

May affect, is likely to adversely affect (LAA) — the appropriate conclusion if any adverse effect to the listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, the proper effect determination for the proposed action is "likely to adversely affect" the listed species. A "likely to adversely affect" determination requires formal Section 7 consultation with the USFWS.

4.1.2 Methods of Analysis

Data on known population locations, potential habitat, and Critical Habitat within the Planning Area are available and are illustrated in Figures 3 and 4. However, these data are not likely complete, nor comprehensive, for all T&E species and habitat that might exist within the Planning Area. Known locations, potential habitat, and Critical Habitat are considered in the analysis; however, the potential for species to occur outside these areas was also considered. Impacts were quantified, when possible. In the absence of quantitative data, best professional judgment based on scientific reasoning was used. As a result, some impacts are discussed in general terms.

No decision would be approved or authorized by the RMPA on BLM lands that would jeopardize the continued existence of species that are listed, proposed, or candidates for listing as threatened or endangered under the ESA. Implementation of the BLM special status species program is directed at preventing the need for listing of proposed or candidate species under the ESA, protecting special status species, and improving their habitats to a point where their special status recognition is no longer warranted (BLM 2008c).

Direct and indirect impacts of land uses on threatened, endangered, and candidate species are generally best mitigated by avoiding or minimizing the impact to the degree practicable, and emphasize maintaining or conserving T&E species and their habitat. These include the various management actions and allowable use decisions outlined in Section 2, stipulations described in Appendix B (e.g., NSO, CSU, and TL), BMPs listed in Appendix C, and conservation measures described in Appendix D.

As described in Appendix B, lease stipulations and lease notices developed under the Proposed RMPA would be applied to all new leases. On existing leases, site-specific mitigation measures that are supported by NEPA analysis are added during the implementation phase as COAs and other authorizations to achieve the resource objectives of the lease stipulations contained in the RMPA. The BMPs and conservation measures would be employed, as appropriate, to individual projects. The BMPs are factored into the assessment of impacts, including specified reclamation and revegetation practices and annual monitoring (Appendix E).

The potential adverse and beneficial impacts are assessed relative to the proportional area available for the impacts to affect T&E species. Impacts that cannot be avoided would be reduced by the application of BMPs as COAs, and potential conservation measures.

The analysis is based on the following assumptions:

Impacts on listed species can occur from actions that result in direct mortality, loss of habitat, or modifications to habitat suitability, and actions that displace individuals or disrupt behavior. Because T&E species have specific habitat requirements, and their habitats are

often diminishing, disturbance of the species or their habitat could result in population declines, which could adversely affect the viability of local populations.

Since T&E species populations are, by their nature, generally small and localized, the total area affected by other activities or restrictions is less important than where the activities or restrictions occur in relation to species populations and their habitat or Critical Habitat.

The health of T&E species populations is directly related to the overall health and functional capabilities of upland, aquatic, riparian, and wetland resources, which, in turn, are a reflection of overall watershed health.

Ground-disturbing activities could lead to modification (positive or negative) of habitat and loss or gain of individuals, depending on the nature of the activity, the intensity of the surface-disturbance, the amount of area disturbed, the location of the disturbance, and the species affected.

Road density in a given area (watershed) and the distance of roads from threatened, endangered, and candidate species habitat provide indications of the potential for impacts on these species. For fish and aquatic wildlife, roads are a measure of lands available for accelerated water transport and potential erosion and offsite sediment transport. For plants, roads also contribute to increasing exposure to dust, reducing pollinator habitat, and providing a niche for the invasion of noxious weeds. However, the actual impacts and degree of impacts are dependent on additional variables, such as the class of road (dirt, gravel, paved), road condition (rutted, bar ditched, properly drained), the type of vegetation between the road and occupied or suitable habitat, the topography, the ecological condition of the suitable or occupied habitat, and soil characteristics.

Species' health, population levels, and habitat conditions fluctuate in response to natural factors. Periods of drought or excessive moisture, and outbreaks of diseases that affect species directly or impact habitat (e.g., mountain pine beetle) would likely impact threatened, endangered, and candidate species population levels.

Implementation-level actions would be further assessed at an appropriate spatial and temporal scale. Additional field inventories would likely be needed to determine whether any such species could be present in the project area.

Land uses would be managed to maintain or move toward meeting the Colorado Standards for Public Land Health (BLM 1997) on a landscape basis. Site-specific NEPA and ESA analysis would assess whether management actions would contribute to the maintenance or achievement of land health standards or risk causing a decline in land health conditions.

All permitted activities that could potentially affect T&E species would be required to undergo ESA Section 7 consultation with the USFWS and would need to be mitigated to ensure that those species would not be adversely affected on a project-specific basis or at a cumulative level.

The BLM would implement measures to conserve BLM sensitive species and their habitats to reduce the likelihood and need for such species to become listed (BLM 2008d).

The BLM would implement the standard operating procedures and mitigation measures from the programmatic EIS for herbicide treatments on BLM lands in 17 western states and

conservation measures from the associated BA (BLM 2007c; Appendix D). These would mitigate the potential impacts from herbicide treatments.

Success of mitigation depends on the specific protective measures employed and the assumption that proper implementation of these measures would take place. Adaptive management would be used (i.e., changing techniques, as necessary) until success is achieved.

Many resources receive protection from NGD/NSO or SSR/CSU surface use restrictions/stipulations that extend beyond or overlap the NGD/NSO or SSR/CSU surface use restrictions/stipulations for the protection of T&E and special status species. Stipulations/surface use restrictions for other resources may indirectly protect T&E species habitat. For example, an NGD/NSO for steep slopes would prevent surface-disturbing activities in these areas, therefore also protecting species that co-occur on steep slopes. Additional indirect benefits such as reduced erosion, sedimentation, and weed invasion T&E species may also be realized by stipulations/surface use restrictions for other resources. However, exceptions for these other resource stipulations may be granted if that resource would be unaffected, thus, protections for T&E species would not be guaranteed.

Under each threatened or endangered species or species group below, the stipulations (Appendix B) that apply are listed. Three stipulations apply to all T&E species:

GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat

Stipulation: NSO to protect occupied habitat, designated Critical Habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the ESA or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, Critical Habitat, or immediately adjacent to potential habitat.

GS-LN-Roan-14: Master Development Plan (MDP)

Stipulation: An MDP will be required from oil and gas operators prior to exploration or development activities.

GS-LN-Roan-34: ESA Consultation

Stipulation: Endangered Species Act, Section 7 Consultation.

It is important to note that GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat would not be applied to designated Critical Habitat for Parachute penstemon on BLM surface and Federal minerals within the Planning Area, in the Proposed RMPA. An essential element of the Settlement Agreement, which is the basis of the oil and gas leasing and development components of the Proposed RMPA, includes the condition that such leases would be managed with stipulations reflective of what was attached to leases in 2008, per the 2007 ROD (BLM 2007b), even if there is new information. The designated Critical Habitat is considered new information in the FSEIS. However, it was not a component of the stipulations included in the 2007 ROD. BLM would fulfill its Section 7 consultation obligations through application of GS-LN-Roan-34: ESA consultation and GS-NSO-Roan-24 for known occupied habitat of any T&E species, including Parachute penstemon.

4.2 LISTED SPECIES

4.2.1 Plant Species

Assumptions and Methods of Analysis

Methods of analysis and assumptions are described above in Section 4.1.2.

Actions that affect T&E plant species can result in the following general impacts:

Direct Mortality. Mortality can result from crushing, trampling, or physically removing plants. Contact with herbicides or other chemicals, such as those associated with oil and gas development, can also cause direct mortality. In small occurrences, loss of a portion of the plants can compromise the viability of the occurrence. Loss of occurrences can compromise species viability due to reduced genetic diversity and a reduced ability to withstand natural or human-caused disturbance events.

Loss of Vigor or Reduced Reproductive Success. Trampling and contact with chemicals may not always result in direct mortality but can cause a reduction in vigor that affects the ability of the plant to reproduce and sustain the population. Herbivory (consumption of inflorescences, seeds, or stems and foliage of special status plants) can result in reduced reproductive success, or in some cases, death. Dust deposition on special status plants may reduce photosynthetic ability or the ability of pollinators to transfer pollen between plants.

Direct Loss of Potential or Occupied Habitat. Direct habitat loss results when habitat is physically destroyed or converted to a form that is unsuitable for the impacted species. Direct habitat loss can be short-term or permanent. Surface-disturbing activities, such as construction and use of roads, trails, parking lots, buildings, power poles, wind turbines, and ponds, may result in permanent loss of supporting listed plant populations and fragment remaining populations. Short-term habitat loss can occur with habitat improvement projects, such as mastication of encroaching junipers in sagebrush or salt desert shrub habitats. Closure or reclamation of disturbed areas may eventually restore lost habitat values; however, the disturbance can require years or decades for recovery to pre-disturbance conditions. If reclamation does not result in habitat suitable for sustaining special status plants, habitat may be permanently lost. For DeBeque phacelia, surface disturbance may result in changes to soil morphology and structure that could not be restored through reclamation and would be permanently lost.

Changes in Habitat Structure. A canopy cover of shrubs offers habitat characteristics that appear to be favorable for the germination and establishment of several special status plant species, such as Colorado hookless cactus. Shrubs may provide protection for some special status plants from herbivory or trampling and may provide improved moisture availability or reduced moisture loss under the canopy. Surface-disturbing activities that significantly reduce the percent canopy cover of shrubs may allow increased herbivory or moisture loss resulting in decreased vigor or mortality of special status plants.

Competition. Changes in species composition also affect listed plant populations. Proliferation of noxious weeds or other invasive plants may render habitat unsuitable by outcompeting listed plants for water and nutrients or by preventing seedling germination and establishment. Occupied Colorado hookless cactus habitat that is dominated by cheatgrass appears to inhibit germination of seedling cactus, thereby threatening the long-term viability of these populations. In some cases, increases in canopy cover and density of native species,

particularly grasses, can compete with listed plants for limited water and nutrients. Other species, such as Parachute penstemon, thrive in environments where vegetation is sparse and competition is low. Increases in vegetation cover (following disturbances, such as fire or mechanical treatments, or seeding) may cause competition with special status plants, resulting in decreased vigor or mortality.

Loss of Pollinators or Pollinator Habitat. Actions that disturb pollinators or destroy their habitat can have a detrimental impact on plant species. Long-term loss of pollinators can reduce the reproductive ability of these plant species and affect maintenance and genetic diversity of populations.

Habitat Fragmentation. Habitat fragmentation occurs when contiguous habitat is broken into smaller blocks by surface-disturbing activities, and distances between suitable habitat patches increase. Because pollinators fly only limited distances, they are less likely to utilize small and isolated patches of habitat, and habitat fragmentation can effectively isolate pollinators from special status plant occurrences. Smaller populations received fewer pollinator visits and therefore seed production was lower in small populations. Small population size decreases reproductive success and increases inbreeding and loss of genetic variation. As a result, fragmentation may lower population viability and increase local population extinction risk (Kolb 2008). Herbivory did not decrease with population size; therefore, herbivory enforces fragmentation effects by further reducing the number of flowering individuals (Kolb 2008). Closure and rehabilitation of roads within listed plant habitat may benefit the long-term survival of populations by decreasing habitat fragmentation.

Soil Compaction. Soil compaction resulting from heavy equipment or vehicle travel may reduce soil pore size, inhibit water infiltration, and restrict root penetration, thereby inhibiting maintenance or establishment of special status plants.

Erosion or Sedimentation. Special status plants may be washed away or have roots exposed by erosion from surface-disturbing activities, such as blading or bulldozing of roads. Special status plants may be buried by sedimentation resulting from disturbances upslope of special status plant populations.

Alteration of Hydrologic Conditions. Some special status plant species (such as Ute ladies'-tresses) that are dependent on seasonally flooded environments, sub-irrigated soils, or seeps may be adversely affected by changes in surface or groundwater flow. For example, construction of roads may redirect natural water flows, causing reduced (or increased) water flow downslope of the road.

Changes in Fire Regime. Changes in species composition, either within special status plant habitat, or in adjacent plant communities, may alter the natural fire regime to which the plants are adapted. Cheatgrass, a highly flammable annual grass, may drastically increase the fire frequency in special status plant habitat, thereby affecting the survivability and viability of the population.

Habitat Restoration. Habitat restoration can result from vegetation management projects, restoration of hydrologic function, removal of invasive species, restoration of historic fire regimes, alteration of grazing management, or other methods. However, any habitat restoration project for special status plants must be designed specifically for the individual plant species and its specific habitat and site conditions. Generalized habitat restoration

projects that do not focus on special status plant needs can have negative effects on these species.

Protective measures that either directly or indirectly minimize or eliminate the potential for negative effects on listed plants and their habitats are described under Conservation Planning, below.

Conservation Planning [Section 7 (a)(1) of the ESA]

The general management goal for ESA-listed species in the Proposed RMPA is to ensure against actions that would jeopardize the continued existence or recovery of currently listed, proposed, or candidate threatened or endangered species or contribute to the need to list additional species as threatened or endangered.

Stipulations/Surface Use Restrictions

Under the Proposed RMPA, the following stipulations would be applied to new oil and gas leases for the protection of T&E plant species occupied habitat and Critical Habitat, as well as other resources that co-occur or overlap with these habitats. An analysis of the overlap of these stipulations with designated Critical Habitat is detailed in Table 9. CSU stipulations would effectively be applied to protect actual occurrences and occupied habitat, but not necessarily prevent all indirect impacts to T&E plant species. These would be in addition to the two lease notice stipulations discussed in Section 4.1.2 (GS-LN-Roan-14 and GS-LN-Roan-34). Parallel surface use restrictions would be applied to non-oil and gas surface disturbing activities.

GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat

Stipulation: NSO to protect occupied habitat, designated Critical Habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the ESA or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, Critical Habitat, or immediately adjacent to potential habitat.

GS-NSO-Roan-22: Steep Slopes (>50%)

Stipulation: NSO on slopes greater than 50 percent. No ground-disturbing activities on slopes steeper than 50 percent.

GS-NSO-Roan-23: Riparian and Wetland Habitat

Stipulation: NSO to protect riparian or wetland vegetation. Ground-disturbing activities, including oil and gas facilities, roads, pipelines, electric transmission lines, communication facilities, and other sources of surface disturbance, are limited to areas beyond the outer edge of riparian or wetland vegetation.

GS-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim

Stipulation: NSO to protect important wildlife security areas below the rim, especially those for deer and elk. No ground-disturbing activities in approximately 6,830 acres that provide high-value habitats along and below the base of the Roan Cliffs.

GS-NSO-Roan-29: Colorado River Corridor

Stipulation: NSO to protect high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of

the high-water mark on either side of the river.

GS-NSO-Roan-30: I-70 Viewshed (VRM Class II)

Stipulation: NSO to protect the Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.

GS-CSU-Roan-04: Erosive Soils and Slopes Greater Than 30%

Stipulation: CSU for erosive soils with slopes greater than 30 percent. The BLM may require special analysis, design, construction, operation, mitigation, reclamation measures, monitoring, and/or relocation by more than 656 feet to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in areas with highly erosive soils on slopes steeper than 30 percent.

GS-CSU-Roan-07: Riparian and Wetland Habitat

Stipulation: CSU to protect riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 656 feet for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.

GS-CSU-Roan-09: Wildlife Security Areas Above the Rim

Stipulation: CSU to protect important wildlife security areas above the rim, especially deer and elk. Ground disturbing activities may be relocated more than 200 meters to avoid wildlife security areas above the rim.

GS-CSU-Roan-12: Habitat for BLM Sensitive Plant Species Populations and Significant Plant Communities

Stipulation: CSU to protect special status plant species or significant plant communities. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 656 feet for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within a watershed that would disturb, alter, or interrupt the hydrologic or ecological processes that support special status plant species or significant plant communities.

GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area

Stipulation: CSU to protect the Parachute Creek high-value watershed and Watershed Management Area (WMA). Provide resource protections through actions that minimize disturbance and habitat fragmentation, and protect key habitats from disturbance.

GS-CSU-Roan-14: VRM Class II Areas Below the Rim

Stipulation: CSU to protect VRM Class II areas. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class II areas below the rim to retain the existing landscape character and allow only limited changes.

GS-CSU-Roan-15: VRM Class III Areas Above the Rim

Stipulation: CSU to protect VRM Class III areas on top of the plateau. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class III areas.

CRVFO-CSU-Roan 18: Lease Area Below the Rim

Stipulation: Prior to exploration and/or lease development on it Base Leases, an operator shall submit a proposed MDP identifying its projected activities. Prior to submitting the MDP, an operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's MDP.

Direct and Indirect Effects

As indicated earlier, site-specific evaluations would be conducted for activities authorized under the Proposed RMPA. Mitigation for potential impacts to T&E plant species and their habitats would be designed during site-specific evaluations. Any activity with potential residual effects to T&E plant species or designated Critical Habitat would be addressed via Section 7 consultation at the project level.

Specifically regarding Parachute penstemon designated Critical Habitat, the area closed to oil and gas leasing and development, and stipulations/surface use restrictions under all management actions combined are shown in Table 9. Of the 3,630 acres of Parachute penstemon Critical Habitat on BLM surface and Federal minerals in the Planning Area, 2,790 acres are closed to oil and gas leasing and development. Of the remaining 840 acres of designated Critical Habitat, 690 acres would be managed under No Ground Disturbance/No Surface Occupancy (NGD/NSO) stipulations and surface-use restrictions. The remaining 150 acres would be covered by a number of overlapping Site-Specific Relocation/Controlled Surface Use (SSR/CSU) stipulations and surface use restrictions. Additional consideration and consultation would be required under lease notice (GS-LN-Roan-14) which requires Master Development Plans, and lease notice (GS-LN-Roan-34) which requires consultation under Section 7 of the ESA.

Table 9. Parachute Penstemon Critical Habitat with Overlap of Stipulations and Areas Closed to Oil and Gas Leasing and Development

Stipulation or Closed Area	***Acres Overlap with Critical Habitat[1]***
Stipulations	
GS-NSO-Roan-24: Threatened, endangered, or candidate species habitat	130
GS-NSO-Roan-22: Steep Slopes (>50%)	550
GS-NSO-Roan-23: Riparian and Wetland Habitat	<1
GS-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim	240
GS-NSO-Roan-29: Colorado River Corridor	0
GS-NSO-Roan-30: 1-70 Viewshed (VRM Class II)	520
GS-CSU-Roan-12: Habitat for BLM Sensitive Plant Species Populations and Significant Plant Communities	410
GS-CSU-Roan-07: Riparian and Wetland Habitat	50
GS-CSU-Roan-04: Erosive Soils and Slopes Greater Than 30%	710

Table 9. Parachute Penstemon Critical Habitat with Overlap of Stipulations and Areas Closed to Oil and Gas Leasing and Development

Stipulation or Closed Area	*Acres Overlap with Critical Habitat*[1]
CRVFO-CSU-Roan 18: Lease Area Below the Rim	610
GS-CSU-Roan-09: Wildlife Security Areas Above the Rim	9.5
GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area (WMA)	42.4
GS-CSU-Roan-14: VRM Class II Areas Below the Rim	42.5
GS-CSU-Roan-15: VRM Class II Areas Above the Rim	108.4
Total Area of Critical Habitat on BLM surface and Federal Minerals	**3,630**
Area Closed to Oil and Gas Leasing and Development	**2,790**
Total Area Stipulations over Critical Habitat (with stipulation overlap removed)	**840**
- Managed under No Ground Disturbance/No Surface Occupancy (NGD/NSO)	**690**
- Managed under Site-Specific Relocation/Controlled Surface Use (SSR/CSU)	**150**

[1]Areas of overlap with Critical Habitat cannot be summed due to overlap of stipulations

Geologic Resources

The Proposed RMPA includes protective measures to preserve the existing scientific and historic geological values associated with the Anvil Points Claystone Cave and karst system and restrict activities that could cause direct or indirect impacts, such as structural collapse. An NGD/NSO surface use restriction/stipulation (GS-NSO-Roan-22) to protect soils on steep slopes greater than 50 percent would be applied to all surface-disturbing activities. This stipulation would directly benefit Parachute penstemon, which grows on steep talus slopes and may indirectly protect potential habitat for DeBeque phacelia, Colorado hookless cactus, and Ute ladies'-tresses from offsite erosion where these plants may occur at the base of steep slopes.

Water Resources

The Proposed RMPA seeks to establish baseline water quality data and a monitoring program for drainages prior to allowing surface-disturbing activities. This serves to assess disturbance-related water quality changes and prepare BLM to identify and implement mitigation measures, as needed, to meet water quality standards. An NGD/NSO surface use restriction/stipulation with a 0.5-mile buffer would be applied on major river corridors; i.e., Colorado River Corridor (GS-NSO-Roan-29) and would provide additional protections beyond the SSR/CSU buffer on riparian and wetland habitat (GS-CSU-Roan-07), which comprises some potential habitat for Ute ladies'-tresses.

Vegetation Resources

The Proposed RMPA places an emphasis on noxious weed inventory, detection, and monitoring in riparian and upland areas. Vegetation management includes a variety of treatments, such as: timber harvest; prescribed fire; unplanned fires managed for resource benefits; manual, mechanical, chemical, or biological vegetation treatments; riparian plantings; weed treatment; and seeding of disturbed or treated areas. Vegetation treatments may have beneficial or adverse effects on listed plants, depending on the type of treatment performed and the resultant structure and composition of the vegetation community.

Vegetation treatments that are not designed to meet T&E plant species objectives could have adverse impacts to potential habitat for Colorado hookless cactus, which grows in salt-desert shrub (semi-desert scrub) habitat, and favors the microclimate under the shrub canopy. Seedlings, in particular, find protection from trampling, shade, and increased moisture within the shrub canopy. Fire or other vegetation treatments that remove canopy cover may also adversely affect this species. The salt desert shrub community that supports the Colorado hookless cactus historically had a very infrequent and low-intensity fire regime. The invasion of cheatgrass into this community type has increased the potential for more frequent and higher-intensity wildfires. Intense fires would consume the shrub component that is a preferred nurse plant for the cactus and would increase the abundance of cheatgrass, a fire-adapted species that inhibits germination and establishment of cacti. Because of the altered fire regime, prescribed fire and unplanned fire for resource benefit would not be tools that would be employed within the salt desert shrub community. Before implementing any vegetation treatments that could create surface disturbance, surveys for listed plants would be conducted at the appropriate time of year, and mitigation would be applied to avoid impacts.

Weed management is conducted under the CRVFO IWMP and Environmental Assessment (EA) (BLM 2009), which is tiered to the programmatic EIS BA for use of herbicides on BLM Lands in 17 western states (BLM 2007c). Analysis of special status plant species and their habitats was addressed in both documents and each set the sideboards on treatment of weeds within and near special status plant habitats. The CRVFO would implement relevant Standard Operating Procedures (SOPs) and mitigation measures presented in the Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS (BLM 2007c) to ensure that adverse impacts to listed plants from weed treatments are avoided. In addition, the BLM would follow the conservation measures identified in the USFWS and National Marine Fisheries Service (NMFS) ESA Section 7 Consultation and Biological Opinion (BO) for the Programmatic EIS (BLM 2007d). The conservation measures include suitable buffer distances between treatment sites and populations of T&E plant species to avoid negative effects from aerial drift, runoff, or wind erosion during and following treatments. The buffer distances vary based on the herbicide formulation. Adherence to the SOPs and the mitigation and conservation measures would ensure that all practicable means to avoid or minimize harm to T&E species have been adopted by the CRVFO.

With proper implementation, all weed treatment methods would have long-term beneficial effects to T&E plant species. Elimination or reduction of noxious weeds would benefit T&E species by reducing competition. This would provide more resources (e.g., water and nutrients) to T&E plants, allowing them to maintain their populations in areas with new weed infestations, and to reestablish sites previously dominated by weeds.

Riparian/Wetland Resources

The Proposed RMPA would manage riparian areas to achieve a minimum condition rating of PFC and to improve riparian-related fisheries habitat atop the plateau based on site potential. This would result in beneficial impacts to potential habitat for Ute ladies'-tresses. NGD/NSO and SSR/CSU surface use restrictions/stipulations for riparian and wetland habitat would provide additional protections to this potential habitat.

Terrestrial and Aquatic Wildlife

Under the Proposed RMPA, activities in support of the fisheries and aquatic wildlife management program may include controlling or removing invasive aquatic species, improving aquatic habitat by installing instream habitat structures, construction of livestock, wildlife, and recreation exclosures within riparian habitats, or planting riparian vegetation. These habitat improvements could possibly result in short-term impacts to potential habitat for the Ute ladies'-tresses.

Since different species have different habitat requirements, have adapted to different natural disturbance regimes, and have varying capabilities to survive different types of habitat perturbations, efforts to improve terrestrial wildlife habitat could potentially impact potential habitat for T&E plant species. These effects on T & E species could range from positive to neutral to negative, depending on the specific species potential habitat location, the particular habitat characteristics, the type of habitat restoration activity implemented, and the time of year in which the activity is implemented. These effects can also range from temporary, to long-term, to permanent. Common types of wildlife habitat restoration include hand-cutting or mastication of junipers within sagebrush habitat, subsequent pile burning, sagebrush mowing, prescribed fire, herbicide treatment of cheatgrass and other noxious weeds, and seeding with plant species desirable for wildlife. The potential for direct impacts to individual plants or populations is negligible, as wildlife habitat restoration activities in potential habitat, or Critical Habitat, would require surveys for the listed plant species and would apply appropriate mitigation measures prior to implementation.

Most terrestrial wildlife habitat treatments are likely to occur in sagebrush, pinyon-juniper, mesic mountain shrub, or riparian habitats. Due to the lack of natural vegetation cover in DeBeque phacelia and Parachute penstemon habitat, these habitat types would be unlikely to be the target of any wildlife habitat treatments and, thus, would experience discountable or insignificant effects from terrestrial wildlife treatments. Potential habitat for Colorado hookless cactus could occur in sagebrush habitat, and for Ute ladies'-tresses in riparian areas, both of which could be the subject of habitat treatments. However, clearance surveys for these species, in their respective potential habitat, and application of appropriate mitigation measures would be required before these activities would be implemented.

Prior to implementing any surface-disturbing treatments in potential habitat for T&E plant species, clearance surveys would be required. These would be conducted at the appropriate time of year. If populations would be located, mitigation would be required to avoid impacts to these species.

Special Status Plants and Significant Plant Communities

The Proposed RMPA includes stipulations/surface use restrictions specific to special status plants and significant plant communities. These include GS-NSO-Roan-24 for Threatened, Endangered, or Candidate Species Habitat and GS-CSU-Roan-12 for habitat for BLM sensitive plant species populations and significant plant communities.

As noted above, indirect protections to T&E plant species would be derived from a number of NGD/NSO or SSR/CSU surface use restrictions/stipulations for other resources, such as slopes greater than 50 percent, wildlife seclusion areas below rim, and riparian and wetland habitat, among others previously mentioned.

Visual Resources

GS-NSO-30 protects the I-70 viewshed, and precludes ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity. Protection of these steep slope areas will indirectly also protect habitat for T&E plants where they overlap in potential habitat for these species.

Transportation and Travel Management

The Proposed RMPA would limit OHV use by restricting motorized and mechanized travel to designated routes, except for the Hubbard Mesa OHV Riding Area, and over-snow travel by snowmobiles in areas with at least 12 inches of snow cover. This would reduce the expansion of travel routes throughout the Planning Area that have the potential to introduce physical disturbance and noxious weeds in the vicinity of T&E plant species and significant plant communities. Combined with the closure and revegetation of existing routes, such as the Anvil Points Mine Road and those that currently bisect significant plant

communities, these proposed management actions would result in beneficial impacts to T&E plant species. However, standard reclamation protocols for closed roads may result in impacts to T&E plant species if outside seed is introduced in the vicinity of these species and communities, as required under standard road closure BMPs and COAs. Closure of existing routes in areas near T&E plant species would eliminate these potential adverse impacts.

Grazing and Rangeland Management

Under the Proposed RMPA, livestock grazing would be managed to conform to BLM grazing regulations and meet Land Health Standards as well as vegetation community objectives. A combination of administrative solutions, range improvement projects, and application of reclamation guidelines and BMPs would be applied to meet resource objectives and standards.

The primary potential impacts on T&E plants from the implementation of the livestock grazing program can occur from actual grazing of plants, trampling of habitat, herbicide application or from surface-disturbing actions related to range developments, such as the construction of fences, water pipelines, cattle guards, and livestock ponds. Potential impacts of livestock grazing vary by plant species and their habitats. Impacts also depend on the class of livestock and the particular grazing regime, with some species favored by particular regimes and others responding negatively.

Parachute penstemon grows in areas with naturally sparse vegetation cover on steep, talus slopes or in the upper reaches of intermittent drainages. Due to the lack of forage to attract livestock and the inaccessible nature of its habitat, Parachute penstemon habitat typically receives only incidental livestock use, and effects of grazing generally would be insignificant or discountable. Additionally, according to the BA (BLM 2014a), with the implementation of the conservation measures indicated in the BA, it was determined that grazing on the JQS allotment "may affect, [but] is not likely to adversely affect" Parachute penstemon.

DeBeque phacelia is unlikely to be the target of direct herbivory due to its small size and prostrate stature. Trampling can affect the plants through crushing or by burying the seeds so deeply that they can no longer germinate (Meyer et. al. 2006). Trampling may also affect DeBeque phacelia habitat indirectly by creating soil compaction. Soil compaction inhibits root growth and alters hydrologic processes (Fitch and Adams 1998). If soils have high clay content, such as those that support DeBeque phacelia, they are especially susceptible to compaction when wet. Late winter and early spring grazing are likely to be most detrimental. Effects of trampling are most likely in areas of concentrated use such as adjacent to livestock ponds or places where salt blocks or other supplements are placed. Implementation of conservation measures such as pasture rotation and monitoring would help reduce adverse impacts to DeBeque phacelia habitat.

Colorado hookless cactus occurs in sagebrush and salt desert shrublands and Ute ladies'-tresses occurs in riparian habitats that can receive heavy livestock grazing. Direct impacts are more likely to occur where livestock congregate. Grazing in these habitats could cause direct loss or trampling of T&E plant individuals or populations. Livestock grazing can also cause a decrease in total vegetation cover, an increase in areas of bare ground, a change in species composition, soil compaction, erosion, sedimentation, and an increased potential for weed invasion and spread, all of which could reduce the health and vigor of the T&E plant community, as well as alter the natural fire regime.

If listed plants are subsequently found on active grazing allotments, management of livestock grazing would comply with the Colorado Public Land Health Standards, Guidelines for Livestock Grazing, and the conservation measures from the grazing PBA (BLM 2014a). In areas where livestock grazing causes land health standards not to be met, changes would be made to make significant progress toward meeting

those standards. This would help reduce adverse impacts on listed plants by improving overall soil and vegetation conditions.

Oil and Gas Leasing and Development

Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Remaining areas open to leasing comprise 1,830 acres above the rim and 11,170 acres below the rim. These areas would be developed in compliance with specific terms and conditions.

Of all types of mineral and energy development, oil and gas development has the greatest potential for impacts on T&E plant species, given the current level of development and the high potential for oil and gas resources in areas occupied by Parachute penstemon (including Critical Habitat), Colorado hookless cactus, DeBeque phacelia, and Ute ladies'-tresses.

Direct impacts associated with fluid minerals development and seismic explorations could include direct mortality of T&E plants from construction equipment and vehicles operating in occupied habitats. In addition, habitat could be lost or modified by constructing well pads, pipelines, and associated facilities in occupied and suitable habitats, and by disturbing habitat of the species' pollinators. Mechanical or chemical weed treatments on disturbed areas could also cause direct mortality or injury to plants. In addition to direct human-caused mortality, indirect impacts could include changes in plant community structure and composition, weed introduction and spread, sedimentation, erosion, and dust deposition associated with construction of infrastructure and use of access roads.

NSOs, such as GS-NSO-Roan 24, for threatened, endangered, or candidate species habitat and additional mitigation actions outlined in the Proposed RMPA would also be applied to provide direct and indirect protections to T&E plants. Indirect protections to T&E plants include a number of NSOs for other resources, such as slopes greater than 50 percent, wildlife seclusion areas below rim, and riparian and wetland habitat, among others previously mentioned. Specifically, with regard to Parachute penstemon Critical Habitat, approximately 2,790 of the 3,630 acres of Critical Habitat under consideration in this BA would be protected from disturbance by oil and gas leasing and development due to the fact that it falls with the area closed to leasing. The remaining 840 acres of Critical Habitat would be managed under several NSOs. The remaining 150 acres of Critical Habitat would be protected by several CSUs (Table 9). In addition, all these areas of Critical Habitat would be subject to application of GS-LN-Roan-14, which requires MDPs, and GS-LN-Roan-34, which requires consultation under Section 7 of the ESA. Additionally, CRVFO-CSU-Roan-18 requires submittal of an MDP, which overlaps with GS-LN-Roan-14.

Areas of Critical Environmental Concern Management

Four Areas of Critical Environmental Concern (ACECs) included in the Proposed RMPA would receive special management prescriptions to protect botanical resources, including T&E species. Implementation of these prescriptions would be expected to result in beneficial impacts to T&E species potential habitat.

The entire portion of designated Critical Habitat area for Parachute penstemon on BLM surface is contained within the Anvil Points ACEC. The primary management objective for this ACEC is to *protect occupied and Critical Habitat, and identified suitable or marginally suitable habitat, and the immediately adjacent ecosystem processes that support federally listed and candidate plants.* This objective, and several others, would be accomplished by several specific management prescriptions, including the following:

> Apply NGD/NSO restrictions within occupied habitat, Critical Habitat, identified suitable habitat, or within the immediately adjacent ecosystem processes that support federally listed

plants.

Apply SSR/CSU restrictions within potential habitat/ecosystem processes outside of designated Critical Habitat for Federally listed plants.

Revegetate using only native species (preferably locally adapted), unless in areas with a high risk of becoming dominated by cheatgrass or other undesirable species under conditions where only non-native species have been proven effective and not within a 0.62 mile (1.0 kilometer) buffer around any TES plant species occurrence (as consistent with BLM Manual 1745 or Handbook 1742-1).

Manage significant grassland and shrubland communities to retain mid- to late-seral stage condition.

Minimize disturbance to habitat and ecosystem processes that support habitat for listed and rare plants, and significant plant communities. Where practicable, restore to a naturally functioning state any existing human-caused disturbance that is impairing natural ecosystem processes affecting habitat for rare plant species or significant plant communities. Actions may include burying pipelines and utilities in roads or relocation of facilities to minimize impacts.

Prohibit collection of plants, plant materials, and seeds, except for scientific or research purposes. Such collection must have no detrimental impact on long-term survival and reproduction of rare species or significant communities.

Control noxious weeds using integrated control techniques. Utilize focused control techniques in areas with rare species or significant plant communities to avoid damage to non-target species.

Manage livestock grazing within occupied or potential habitat for rare plants or significant plant communities to promote plant health, maintain sufficient residual vegetation, and sustain overall watershed functions, as defined in the Colorado Livestock Grazing Management Guidelines (BLM 1997a).

Fire Management

The Proposed RMPA would allow for a range of wildland fire management options from full suppression to use of naturally caused, unplanned wildfire to be managed for resource benefits in specific areas. In general, the top of the plateau and cliffs would be managed to allow use of wildfires for resource benefits – including protection and enhancement of T&E species and designated Critical Habitat for Parachute penstemon, while wildland fires in lower elevations (and the I-70 corridor) would generally receive prompt suppression action.

Wildland fire and suppression actions could affect T&E plant species in several ways. The fire itself could result in the death of individual plants or the alteration of their habitat. The construction of fire lines using hand tools or heavy machinery could also affect listed plants by crushing or uprooting individual plants, increasing erosion and sedimentation, and providing a vector for the invasion or expansion of noxious weeds. Direct mortality of listed plants due to fire can occur either from lethal surface flames or from lethal soil heating. Some species grow in habitats with such low fuel loading that they do not experience fire and, therefore, have no adaptations for surviving fires. At the same time, these listed plant species are unlikely to suffer direct mortality from fire if there continues to be inadequate fuels to carry

fire. However, if non-native species, such as cheatgrass, invade these habitats, they may create enough fuel loading to carry lethal fire to these listed species.

Parachute penstemon and DeBeque phacelia grow in nearly barren areas where fire is not a natural disturbance factor. Ute ladies'-tresses grows in riparian and wetland habitats that are generally resilient to fire due to higher moisture conditions that restrict fire occurrence or reduce fire intensities in this habitat type. Ute ladies'-tresses prefers early to mid-seral riparian habitat and does not compete well under a heavy canopy of woody species or a dense cover of herbaceous plants. Unless riparian habitats have been altered from their natural fire regime by invasion of noxious weeds and other non-native species, fires in this habitat would likely benefit Ute ladies'-tresses by reducing competing canopy cover.

In the CRVFO, Colorado hookless cactus primarily occurs in salt desert shrub habitat, which historically had a very infrequent and low-intensity fire regime due to the sparse vegetative cover (Chambers et. al. 2009). Therefore, fires in potential habitat for Colorado hookless cactus could potentially negatively impact individual plants, should they actually occur there.

Emergency stabilization and rehabilitation efforts in T&E plant species potential habitat would be designed to protect listed plants from direct impacts and restore habitat conditions conducive to maintenance of the populations.

Cumulative Effects

All of the environmental effects associated with implementation of the Proposed RMPA would be in addition to ongoing existing impacts on Federal lands in the Planning Area, private lands in the Planning Area, and both public and private lands adjacent to or near the Planning Area. A number of beneficial effects to T&E plant species would be anticipated to occur as a result of management actions such as travel, rangeland management, and noxious weed management actions under the Proposed RMPA.

The population of Parachute penstemon near the Anvil Points Mine is located near the interface of BLM and private lands in the south-central part of the Planning Area. A number of individual plants grow near the Anvil Points Mine portals and along road cut slopes. For the purpose of this analysis, it is assumed that the specific NGD/NSO surface use restriction/stipulation for T&E species would continue to be applied rigorously by BLM, to prevent adverse impacts from any ground-disturbing actions, including any possible additional remediation of this site. Additional mitigation measures, such as coordination with Garfield County and other communication(s) site users to relocate the communications site outside of potential habitat and allow the access road to revegetate may be required to protect this unique and rare resource from offsite impacts.

Regarding potential habitat for Ute ladies'-tresses, any potential adverse impacts to riparian communities in the Planning Area could be potentially cumulative to past and ongoing degradation of surrounding riparian areas due to livestock grazing, unregulated stream crossings, noxious weed proliferation, and drought effects. Localized impacts to potential habitat could result from agriculture and oil and gas development. It is important to note that these would cumulative impacts to potential habitat for this species, as there are no known occurrences of Ute ladies'-tresses in the Planning Area.

Several of the private land occurrences of Ute ladies'-tresses (or potential habitat) may be impacted by future residential development. Other occurrences are threatened by noxious weeds, such as common tansy, and other invasive species, such as white sweet clover. One occurrence of the orchid has been grazed by cattle during the winter and spring. This grazing during the dormant season does not appear to be detrimental to the Ute ladies'-tresses and may actually benefit the species by reducing competition from sedges and other riparian species that may compete with the orchid for resources.

CNHP reports that some sensitive plants are being heavily impacted by road construction and both residential and commercial development accompanying rapid human population growth and recreational use throughout the region (CNHP 2001). Threatened or endangered plant species that occur on private lands are not specifically protected under the ESA. Likewise, the State of Colorado provides no legal protection for any plant species other than the state flower, the blue columbine. Therefore, monitoring and protection of these species occur on a voluntary basis on private lands. If adverse impacts to these resources continue to increase as expected, the occurrences on public lands become even more important to their survival and continuation.

Climate change could affect the populations and habitat of any of the listed plant species. Changes are likely to include increased temperatures, increased potential for drought, changes in the season of precipitation and more intense rainfall events. Climate change could affect overall temperatures, fire ecology, erosion, and the behavior of other species, including invasive plant species. These species occur on restricted habitats within a narrow elevation range, and would have limited or no ability to adapt to climate change by establishing new populations in new areas. The amount of change and the ultimate effects are not known at this time.

As with the Ute ladies'-tresses discussed above, these would be cumulative impacts to potential habitat for DeBeque phacelia and Colorado hookless cactus only, as there are no known occurrences of either of these species in the Planning Area.

Cumulative impacts under the Proposed RMPA would include widespread beneficial impacts to potential habitat for T&E plants combined with some possible general adverse impacts from increasing noxious weed infestations and other localized impacts.

4.2.2 Colorado River Endangered Fishes

Assumptions and Methods of Analysis

The following assumptions apply throughout the assessment of effects of the Proposed RMPA on the four listed big river fishes (bonytail, humpback chub, Colorado pikeminnow, and razorback sucker):

Impacts on fish and habitats are not discrete because some actions may benefit one species while having a negative or beneficial impact on another.

Maintaining high-quality habitat conditions would have some influence on reducing the severity of outbreaks and subsequent losses from diseases, but the prevalence in the environment of various diseases could not be fully controlled, particularly at chronic levels of occurrence.

Impacts on fish are based on the following cause and effect premise: exposure—stressor—response:

- Exposure—the likelihood that a given stressor will affect a given species;
- Stressor—the portion(s) of an action that may cause some sort of a reaction by the species; and
- Response—the response (negative, positive, neutral) of the species to the stressor.

Unless otherwise noted, short-term impacts are defined as impacts expected to last 2 years or less.

Unless otherwise noted, long-term impacts are defined as impacts expected to last longer than

2 years.

The following primary impacts for the listed big river fish species and their habitats are the focus of the effects analysis:

Water Quality Alteration — actions, activities, or accidents (spills, leaks) that could alter important water quality parameters (e.g., pH, dissolved oxygen, temperature, alkalinity, and turbidity), cause direct mortality, sublethal effects of stress, reduced recruitment, reduced quality and quantity of food.

Water Depletions — loss of physical habitat, reduced water quality, increased sedimentation, loss of habitat structure and complexity, reduced recruitment, reduced food quality and quantity, disease, and stress.

Introduction and/or Spread of Aquatic Nuisance Species or Disease Vectors — competition for resources, displacement, predation, reduced recruitment.

Direct Mortality — potential direct mortality of eggs, larvae, and adults of fish in areas of low-water crossings.

All NSO stipulations that would limit ground-disturbing activities would minimize the risk of impacts on listed fish species. Primary protective measures that either directly or indirectly minimize or eliminate the potential for negative effects on listed fishes and their habitats are described below under Conservation Planning. The BLM manages very limited lands along the Colorado River where these fishes' habitat exists. However, in the larger watershed, BLM manages large acreages. Most potential impacts would be offsite and indirect.

Conservation Planning [As related to Section 7a(1) of the ESA]

The general management goal for ESA-listed species in the Proposed RMPA is to ensure against actions that would jeopardize the continued existence or recovery of currently listed, proposed, or candidate threatened or endangered species or contribute to the need to list additional species as threatened or endangered.

Stipulations

Under the Proposed RMPA, the following stipulations would be applied to new oil and gas leases for the protection of T&E wildlife species occupied habitat, as well as other resources that co-occur or overlap with these habitats. CSU stipulations would effectively be applied to protect actual occurrences and occupied habitat, but not necessarily prevent all indirect impacts to T&E wildlife species. These would be in addition to the two lease notice stipulations discussed in Section 4.1.2 (GS-LN-Roan-14 and GS-LN-Roan-34). Parallel surface use restrictions would be applied to non-oil and gas surface disturbing activities.

GS-NSO-Roan-22: Steep Slopes (>50%)

Stipulation: NSO on slopes greater than 50 percent. No ground-disturbing activities on slopes steeper than 50 percent.

GS-NSO-Roan-23: Riparian and Wetland Habitat

Stipulation: NSO to protect riparian or wetland vegetation. Ground-disturbing activities including oil and gas facilities, roads, pipelines, electric transmission lines, communication

facilities, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.

GS-NSO-Roan-29: Colorado River Corridor

Stipulation: NSO to protect high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of the high-water mark on either side of the river.

GS-NSO-Roan-30: I-70 Viewshed (VRM Class II)

Stipulation: NSO to protect the VRM Class II, I-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.

GS-CSU-Roan-07: Riparian and Wetland Habitat

Stipulation: CSU to protect riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 656 feet for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.

GS-CSU-Roan-04: Erosive Soils and Slopes Greater Than 30%

Stipulation: CSU for erosive soils with slopes greater than 30 percent. The BLM may require special analysis, design, construction, operation, mitigation, reclamation measures, monitoring, and/or relocation by more than 656 feet to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in areas with highly erosive soils on slopes steeper than 30 percent.

Direct and Indirect Effects

Water depletions associated with management action addressed in the Proposed RMPA are an issue for the Colorado pikeminnow, bonytail, humpback chub, and razorback sucker and their Critical Habitats. Water use associated with any specific project would be estimated at the project level, and then reported upon completion. To comply with the ESA, BLM has been accounting for water depletions via two programmatic Section 7 consultation efforts. For fluid minerals, the December 19, 2008 “Programmatic Biological Opinion (PBO) for Water Depletions Associated with Bureau of Land Management’s Fluid Mineral Program within the Upper Colorado River Basin in Colorado” (ES/GJ-6-CO-08-F-0006) (BLM 2008b) was completed. For small water depletions other than Federal fluid minerals, the February 25, 2009 “Programmatic Biological Opinion (PBO) for Water Depletions Associated with Bureau of Land Management (BLM) Projects (excluding Fluid Mineral Development) Authorized by BLM within the Upper Colorado River Basin in Colorado” (ES/GJ-6-CO-08-F-0010) (BLM 2008c) was completed.

Additional considerations are taken into account since the completion of the 2008 Federal fluid minerals consultation. In addition to conventional vertical and directional well drilling, BLM recognizes new technologies including horizontal well drilling, increased use of recycled water, and increased use of fracking technology. In addition, new data sources on reported water use exist and will now be used to obtain water use amounts for more accurate reporting.

As noted above, a number of oil and gas development activities can reduce the quantity of fresh water (depletions) in a given watershed. The following activities that result in water depletions, and which are typical oil and gas development, were analyzed in the BLM's 2008 Programmatic Biological Opinion for water depletions associated with BLM's Fluid Mineral Program within the Upper Colorado River Basin in Colorado (BLM 2008d):

Water used for access road dust abatement, including roads used for geophysical exploration;

Water used for hydrostatic testing of newly constructed pipelines;

Water used to drill and complete wells (drilling and fracturing fluids); and

Water associated with connected Federal actions (e.g., BLM authorization of a pipeline, road, or utility line across public lands that is connected to the action of developing privately owned fluid mineral estate located on private lands).

Average annual water depletions from within the Upper Colorado River basin from implementation of oil and gas leasing and development under the Proposed RMPA follow assumptions and methods in BLM 2008d. These calculations are summarized in Table 10 and are considered estimates. Water use and depletions would be further estimated and analyzed at the project level. These actual water use and depletions would be tracked and reported annually, as described below.

Table 10. Summary of Estimated Fresh Water Depletions from Oil and Gas Development Activities Under the Proposed RMPA[1]

Well Type	*Depletions (acre-feet/year)*
Federal wells	1,892
Non-Federal wells[2]	1,502

[1] Calculations follow BLM (2008d)
[2] Wells not associated with Federal oil and gas resources

BLM addressed water depletions from Federal fluid mineral development within the Upper Colorado River basin with an offset: by soliciting a one-time payment from the industry representative group Independent Petroleum Association of Mountain States (now Western Energy Alliance) on behalf of the oil and gas operators working in the Upper Colorado River basin. A one-time lump sum payment of $71,978.34, based on the 2008 depletion fee of $17.79 per acre-foot, was made. This amount was provided to the USFWS's designated agent, the National Fish and Wildlife Foundation. These funds are used to contribute to the recovery of endangered fish through habitat restoration, fish propagation, genetics management, instream flow protection, non-native fish management, research and monitoring, public education, and similar recovery actions. Under the PBO, these contributions to the recovery program are considered a conservation measure that helps to avoid jeopardizing the continued existence of the endangered fish in the upper Colorado River Basin.

The BLM will track and account for all fresh water use associated with all aspects of subsequent Federal fluid mineral development authorized under the RMP. The BLM will submit the totals to the USFWS in the annual basin-wide year-end report. The threshold amount consulted on in 2008 (4,046 acre-feet per year) is still valid, and all water use will be reported against this cap. The BLM will also report on all

water depletion amounts associated with non-Federal fluid mineral development to the USFWS on an annual basis.

Water Resources

The Proposed RMPA seeks to establish baseline water quality data and a monitoring program for drainages prior to allowing surface-disturbing activities. This serves to assess disturbance-related water quality changes and identify and implement mitigation measures, as needed, to meet water quality standards. An NGD/NSO surface use restriction/stipulation with a 0.5-mile buffer would be applied on major river corridors. i.e., Colorado River Corridor (GS-NSO-Roan-29) and would provide additional direct and indirect benefits to the T&E fish species in the Colorado River.

The effects of a potential leak, spill, or accident could range from lethal (death of individual fish) to sub-lethal. In the unlikely event of a leak, spill, or accident impacting the Colorado River and the endangered fish, emergency consultation would be implemented with USFWS.

Spill prevention/containment plans are required by operators through the use of BMPs and Emergency Response Plans as outlined in the Proposed RMPA.

Vegetation Resources

Vegetation goals would focus on improving the diversity, production, and native species composition of upland and riparian/wetland areas. Because the Proposed RMPA makes greater use of active management, which relies primarily on natural processes, the rate of improvement over existing vegetation and range conditions is expected to be more rapid, and would benefit T&E fish species. Stipulations GS-NSO-Roan-23 and GS-CSU-Roan-07 (and corresponding surface use restrictions) would apply measures to protect riparian habitat. GS-NSO-Roan-29 applies protection to 320 acres along the Colorado River Corridor. Others include GS-NSO-Roan-22 for steep slopes and GS-CSU-Roan-04 for erosive soils and slopes greater than 30 percent. Beneficial effects to riparian habitats from active vegetation management and changes in grazing would benefit T&E fish species by reducing bank erosion and sediment inflow and by increasing vegetation canopy cover for shade and as a source of insect prey or other food items. Over time, implementation of these management actions in the Proposed RMPA would have beneficial effects on vegetation condition, which, in turn, would benefit T&E fish species.

Terrestrial Wildlife

In the Proposed RMPA, there are a number stipulations/surface use restrictions for the protection of terrestrial, avian, and aquatic wildlife. There would be some indirect beneficial effects from this management action on T&E fish species.

Special Status Plants and Significant Plant Communities

In the Proposed RMPA, the management of these resources would improve riparian habitat and benefit T&E fish species by reducing erosion, stabilizing banks, and providing shade. GS-NSO-Roan-23 (and parallel surface use restriction) protects riparian and wetland habitat, which protects segments of tributaries to the Colorado River, and would provide a benefit to T&E fish species. These actions, altogether, are protective of T&E fish species habitat and would result in direct and indirect beneficial effects to these species.

Special Status Fish and Wildlife Species

In the Proposed RMPA, management of the Colorado River endangered fish species would be in accordance with existing recovery plans and consultations completed with the USFWS. The management of fish would be consistent with the Colorado Standards for Public Land Health and BLM direction for

the management of T&E fish species in BLM Manual 6840 (BLM 2008a). This specific management would result in benefits to T&E fish species.

Visual Resources

The Proposed RMPA includes an NGD/NSO to protect the VRM Class II, I-70 viewshed (GS-NSO-Roan-30). This would allow no ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These areas are within 5 miles of the highway, and would benefit water quality for T&E fish species by reducing erosion and sedimentation, and reducing the risk of introduction of weeds in the tributaries to the Colorado River.

Transportation and Travel Management

Benefits to T&E fish species under the Proposed RMPA would result from the restriction of motorized or mechanized travel to designated routes and from the closure and restoration of 23 miles of existing routes atop the plateau. Limiting an additional 54 miles of existing routes to administrative travel would also help offset the increased traffic associated with oil and gas activity. This would reduce sedimentation, dust, and the possibility of introduction of noxious weeds.

Grazing and Rangeland Management

Under the Proposed RMPA, livestock grazing would be managed to conform to BLM grazing regulations and meet Land Health Standards as well as vegetation community objectives. Successful enhancement of areas not meeting Land Health Standards due to livestock use could decrease runoff due to increased vegetation cover. The effect is generally beneficial because contributions to runoff as shallow subsurface flow following infiltration into a vegetated hillside are less “flashy” (i.e., frequency and rapidity of short-term changes in streamflow, especially during runoff events) and more protracted than in poorly vegetated situations, even if actual flow to the stream is reduced. The 1984 GSRA RMP allows for enhancing water yield by vegetation manipulation, which alters the timing, duration, and intensity of runoff. Treatments could include thinning of brush, prescribed fires, and timber harvests.

Oil and Gas Leasing and Development

Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Remaining areas open to leasing comprise 1,830 acres above the rim and 11,170 acres below the rim, and would be developed in compliance with specific terms and conditions.

Water depletions to the Colorado River from oil and gas leasing and development are addressed above. These depletions are covered by annual payments to the National Fish and Wildlife Foundation and are tracked and accounted for annually (BLM 2008b).

Potential pollution risks associated with generally highly saline produced water from drilling operations would be minimized by trucking the excess waters offsite for disposal at an approved location or, where risk of flow to surface water is not present, discharged into lined evaporation ponds. The potential also exists for onsite treatment of produced water and subsequent use to water livestock. Regardless of the method for disposing of produced water, BLM requirements would prohibit direct discharge into the Colorado River and other perennial streams.

The potential effects of an accidental spill are reduced, based on phased and clustered oil and gas development, special management designations, and NSO and CSU restrictions described above. These include protection of occupied stream reaches, as in NSO-Roan-23 and NSO-Roan 28, for riparian and fish habitat, and GS-LN-Roan-34 requiring ESA consultation, which would further serve to protect these species. In addition, any effects associated with development of Federal mineral resources on these

species would be addressed via Section 7 consultation at the MDP stage, as indicated in GS-LN-Roan-14. CSU-7 for riparian habitat and GS-CSU-Roan-04 for erosive soils greater than 30 percent would both provide some additional benefit to T&E fish in the Colorado River. The suggested BMPs to protect stream quality (Appendix C), as appropriate to individual projects, would further benefit endangered Colorado River fish by reducing the likelihood of spills, thus reducing the risk of impacts. The BMPs would also reduce the impacts of erosion potential, sedimentation, and increased turbidity due to development of well pads, roads, and pipelines.

Watershed Management Area

In the Proposed RMPA, water-depleting activities would include evaporative and consumptive loss from stockponds and spring developments and evapotranspiration from irrigation during reclamation. Because several stockponds or spring developments are already in place in the Planning Area, it is anticipated that no more than ten new water developments would be constructed during the life of the plan. Stockponds and spring developments are generally 0.1 acre in size or less and deplete an annual average of 0.425 acre-feet of water. Given this amount of depletion per development, average annual depletions from ten typical stockponds would equal 4.25 acre-feet.

The PBA and PBO were written to remain in effect for up to 15 years, or as long as the average annual depletion amount of 1,785 acre-feet per year is not exceeded. In the event this amount is exceeded, BLM would reinitiate consultation on a new depletion amount. Water use associated with BLM programs is tracked and reported annually.

Management of Streams Suitable for Management under the Wild and Scenic Rivers Act

In the Proposed RMPA, the BLM would determine all eligible rivers in the Planning Area as unsuitable for designation and would release them from interim management protections afforded eligible segments. No protective measures would be applied, and interim management protections would be removed. This management would have a minor adverse effect on T&E fish.

Offsite and Cumulative Impacts

Cumulative impacts for the four Colorado River endangered fishes takes-in the entire mainstem Colorado River, including its basin and tributaries downstream to the Colorado-Utah state line. Declines in the abundance or range of these fish species have been attributed to various human activities on Federal, state, and private lands and include: human population expansion and associated infrastructure development; construction and operation of dams along major waterways; water retention, diversion, or dewatering of springs, wetlands, or streams; recreation, including off-road vehicle activity; expansion of agricultural or grazing activities, including alteration or clearing of native habitats for domestic animals or crops; and introductions of non-native plant, wildlife, or aquatic species. Introduced fish can prey on juveniles or outcompete endangered fish species for space, optimal habitats, and food. Many of these activities are expected to continue on lands within the range of big river fish and could contribute to cumulative effects on these species within the Planning Area.

Water diversions were put in place when the first settlers to the region began to manage water for irrigation for crops, livestock, and domestic uses. As population centers within the Planning Area and beyond continued to grow, water demand increased. Several reservoirs and trans-mountain/basin water diversions were constructed to take water from headwater streams within the Colorado River Basin across the Continental Divide to Front Range municipalities. Many of these water diversions are in place today and have resulted in impacts on native flows, including the Colorado River. These activities have impacted T&E fish species and their habitats by reducing wetted physical habitat, sediment aggradation,

habitat alteration, reduced overall sediment input, reduction of streamside vegetation cover, and reduced habitat complexity and diversity.

Introductions of non-native fishes were common in the late 1800s and throughout the 1900s. Several species were stocked as sport fish and for food production, including rainbow trout (*Salmo trutta*), brown trout, brook trout, and Snake River and Yellowstone cutthroat trout (*Oncorhynchus clarkii* sp., and *O. c. bouvieri*). In addition, other non-native species, such as fathead minnows, white suckers, longnose suckers, channel catfish, and smallmouth bass, have arrived and often outcompete native species where they co-occur. These species prey on the native fishes, and some non-native fishes of the same genus can hybridize with native species, reducing their genetic integrity.

Land management activities, such as fire suppression, logging, livestock grazing, mining, natural gas development, conversion of native rangeland to agriculture, road construction, pipelines, power lines, railroads, and increasing urbanization, have resulted in cumulative impacts within watersheds that contain aquatic species. This includes habitat alteration, reduction of streamside vegetation, water quantity and quality impacts, and increases in sediment and turbidity.

Urbanization continues, as does the demand for limited water supplies, water diversions, and impoundments. New large-scale water developments are limited, but select projects are in the works. Large-scale mining is all but gone, but the potential for mining still exists in some specific areas. Livestock grazing and agricultural use continues. Natural gas development continues, as well as associated road construction. Prescriptive forest thinning treatments aimed at managing forests and other vegetation types for other uses (wildlife, watershed improvement, fuel reduction) can alter streamside habitat. Beetle-killed pine is extensive within forested habitats within the Planning Area and has the potential to increase the risk of large-scale fires. Nonnative fish stocking is limited, as emphasis has shifted to native species management.

Recreation has increased within Planning Area and beyond, including rafting, boating, hunting, fishing, hiking, camping, skiing, rock climbing, mountain biking, and four-wheeling. All of these activities will continue to result in cumulative impacts, including site-specific sediment loading and turbidity, habitat alteration, and water quality and quantity impacts. Restoration actions are more common as impacts are mitigated and degraded habitats are improved.

Urban development in the Eagle, Roaring Fork, and Upper Colorado River valleys is anticipated to have impacts on river flows, and agricultural water rights may be converted to municipal uses. Reduced water flows will impact big river fish by habitat alteration, sediment aggradation, reduced spawning habitat, reduced habitat complexity, and loss of important microhabitats including backwaters, flooded bottomlands, and side channels.

Climate change may impact big river fish by reducing suitable habitat, changing distributions, and altering food webs and water quality (temperatures). There may be changes in the severity and frequency of droughts, floods, and wildfires, as well as changes in the timing of snowmelt and peak flows. These changes affect spawning times and breeding success. Wildfires could result in debris and ash flow events that are impactful to these fish in select locations. Drought severity could further reduce flows and, when coupled with other water, depleting activities could result in cumulative effects.

4.2.3 Colorado River Cutthroat Trout (Green Lineage)

Assumptions and Methods of Analysis

Assumptions are similar to those described in Section 4.2.2.1 for big river fishes. Nonnative trout species are a concern for CRCT, but BLM does not manage the fishery resource, as CPW is the manager of Colorado's fish.

The following primary impacts for Green Lineage cutthroat trout and their habitats are the focus of the effects analysis:

> Sediment and Turbidity — increased sediment loading, stress, reduced recruitment, habitat loss, reduced quality and quantity of food.
>
> Habitat Alteration — changes in habitat that reduce functionality or make the habitat more conducive to competitive species, reduced bank and channel stability, reduced in-channel habitat structure and diversity, loss of complexity.
>
> Loss or Reduction of Streamside Vegetation Cover — increased temperatures, reduced productivity, reduced bank and channel stability, impacts on food webs.
>
> Water Quality Alteration — Actions, activities, or accidents (spills, leaks) that could alter important water quality parameters (e.g., pH, dissolved oxygen, temperature, alkalinity, and turbidity), direct mortality, sublethal effects of stress, reduced recruitment, reduced quality and quantity of food.
>
> Introduction and/or Spread of Aquatic Nuisance Species or Disease Vectors — competition for resources, displacement, predation, reduced recruitment.
>
> Direct Mortality — potential direct mortality of eggs, larvae, young, and adults of fish.

Protective measures that either directly or indirectly minimize or eliminate the potential for negative effects on cutthroat trout and their habitats are described under Conservation Planning, below. BMPs, conservation measures, and COAs would still be applied, as appropriate, to eliminate or reduce effects from fluid mineral development on the cutthroat populations.

Conservation Planning [As related to Section 7a(1) of the ESA]

The general management goal for ESA-listed species in the Proposed RMPA is to ensure against actions that would jeopardize the continued existence or recovery of currently listed, proposed, or candidate threatened or endangered species or contribute to the need to list additional species as threatened or endangered.

The Proposed RMPA is a landscape-level, programmatic document. The stipulations below are provided in Appendix B. Section 7 consultation at the project level would occur in addition to onsite surveys prior to any ground disturbance.

Stipulations

Under the Proposed RMPA, the following stipulations would be applied to new oil and gas leases for the protection of the population and reclamation efforts of Green Lineage cutthroat trout in East Fork Parachute Creek and its tributaries and headwaters, as well as other resources that co-occur or overlap with this habitat. CSU stipulations would effectively be applied to protect actual occurrences and

occupied habitat, but not necessarily prevent all indirect impacts to T&E species. These would be in addition to the two lease notice stipulations discussed in Section 4.1.2 (GS-LN-Roan-14 and GS-LN-Roan-34). Parallel surface use restrictions would be applied to non-oil and gas surface disturbing activities. The conservation measures from the CRCT Conservation Team (2006) would also be incorporated during the life of the Proposed RMPA.

GS-NSO-Roan-23: Riparian and Wetland Habitat

Stipulation: NSO to protect riparian or wetland vegetation. Ground-disturbing activities including oil and gas facilities, roads, pipelines, electric transmission lines, communication facilities, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.

GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat

Stipulation: NSO to protect occupied habitat, designated Critical Habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the ESA or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, Critical Habitat, or immediately adjacent to potential habitat.

GS-NSO-Roan-28: High-value Special Status Fish Species Habitat

Stipulation: NSO to protect CRCT from direct and indirect impacts in high-value habitat. No ground-disturbing activities that would result in loss or degradation of areas designated as high-value habitat for CRCT.

GS-CSU-Roan-07: Riparian and Wetland Habitat

Stipulation: CSU to protect riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 656 feet for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected. Note that this stipulation overlaps with GS-CSU-Roan-13, which covers more of the area of East Fork Parachute Creek.

GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area

Stipulation: CSU to protect the Parachute Creek high-value watershed and WMA. Provides resource protections through actions that minimize disturbance and habitat fragmentation, and protects key habitats from disturbance.

CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes

Stipulation: Prohibits surface occupancy and surface-disturbing activities during species-specific spawning periods to reduce impacts to breeding adults, eggs, emerging larval fish, and by avoiding stream channel disturbances. The purpose is to promote recruitment by protecting adult fish, redds (egg masses) in the gravel, and emerging fry during spawning periods.

Non-Special Status Species:

Rainbow trout: March 1 to June 15

Brown trout: October 1 to May 1

Brook trout: August 15 to May 1

Special Status Species:

Cutthroat trout: May 1 to September 1

Bluehead sucker: May 1 to July 15

Flannelmouth sucker: April 1 to July 1

Roundtail chub: May 15 to July 15.

Mountain sucker: May 1 to July 15

Several other stipulations, such as those protecting steep slopes, would indirectly reduce potential adverse effects on cutthroat trout in the Planning Area, as well.

Direct and Indirect Effects

Impacts on Green Lineage cutthroat trout from implementation of the Proposed RMPA are summarized by effects from management actions for each category in the following subsections. Where there is no effect, that management action category is eliminated from further discussion.

Vegetation Resources

Vegetation goals would focus on improving the diversity, production, and native species composition of upland and riparian/wetland areas. These actions would indirectly improve habitat for Green Lineage cutthroat trout. Beneficial impacts to riparian habitats would occur from active riparian and wetland management.

Aquatic Wildlife

The Proposed RMPA contains extensive stipulations for aquatic wildlife, and will serve to protect Green Lineage cutthroat trout.

Special Status Plants and Significant Plant Communities

The Proposed RMPA contains a number of protective surface use restrictions for this management action. Within the watershed management areas, disruption, alteration, or interruption of surface and subsurface water flows that support rare and/or significant natural plant communities would be prevented, and action would be taken to protect against invasion and establishment of noxious weeds or other aggressive exotic plants, including nonnative species used for reclamation or vegetation treatments. These actions may, when applied to riparian areas and to some degree, indirectly protect habitat for cutthroat trout.

Special Status Fish and Wildlife Species

These management actions in the Proposed RMPA would provide protective measures to Green Lineage cutthroat trout and include: management of the Colorado River endangered fishes in accordance with existing recovery plans and consultations completed with the USFWS; management of special status fish and wildlife consistent with the Colorado Standards for Public Land Health and BLM direction for the

management of special status species in BLM Manual 6840 (BLM 2008A); and implementation of the strategies outlined in the Conservation Agreement and Strategy for CRCT in the states of Colorado, Utah, and Wyoming (CRCT Conservation Team 2006).

In addition, the ongoing reclamation activities being conducted along East Fork Parachute Creek serve to exclude competitors of Green Lineage fish and reduce the potential introduction of disease. The future planned activities for reclamation, removal of the dam, and extension of the habitat for this species along 8 miles of creek plus tributaries serve a very beneficial effect towards the goal of maintaining a self-sustaining population of Green Lineage cutthroat trout.

Transportation and Travel Management

This management action contains restriction of motorized or mechanized travel to designated routes (except over-snow travel by snowmobiles), closure and restoration of 23 miles of existing routes atop the plateau, and the limitation of an additional 54 miles of existing routes to administrative travel. These actions would also help offset the increased traffic associated with oil and gas activity. They would reduce stream impacts to cutthroat trout, in terms of both limiting direct physical disturbance to specific crossing points and reducing the amount of fishing pressure in remote areas.

Grazing and Rangeland Management

Livestock grazing would be managed to conform to BLM grazing regulations and meet Land Health Standards as well as vegetation community objectives. Successful enhancement of areas not meeting Land Health Standards due to livestock use could decrease runoff due to increased vegetation cover. The result of this action would be beneficial because contributions to runoff as shallow subsurface flow following infiltration into a vegetated hillside are less “flashy” (i.e., frequency and rapidity of short-term changes in streamflow, especially during runoff events) and more protracted than in poorly vegetated situations, even if actual flow to the stream is reduced.

Proper livestock grazing with adequate monitoring has limited potential to impact streams and aquatic species or their habitats. Changes in grazing would reduce bank erosion and sediment inflow, and increase vegetation canopy cover for shade and as a source of insect prey or other food items. However, if done improperly, livestock grazing can adversely affect aquatic species, most notably the two cutthroat trout lineages. Poor grazing could result in the potential for weed infestations, disturbance of soils and streambeds, increased sediment loading and turbidity, siltation of substrates, and loss of vegetation for screening and thermal regulation. While conditions can and do fluctuate in a given year, grazing, as authorized under the Proposed RMPA (Chapter 2]), should be protective to cutthroat trout atop the plateau.

Oil and Gas Leasing and Development

Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Remaining areas open to leasing comprise 1,830 acres above the rim (two lease areas above the rim) would be developed in compliance with specific terms and conditions. Potential pollution risks associated with generally highly saline produced water from drilling operations would be minimized by trucking the excess waters offsite for disposal at an approved location or, where risk of flow to surface water is not present, discharged into lined evaporation ponds. The potential also exists for onsite treatment of produced water and subsequent use to water livestock. Regardless of the method for disposing of produced water, BLM requirements would prohibit direct discharge into surface water, including ephemeral or more persistent tributaries of the Colorado River and other perennial streams.

Because the Green Lineage trout occupy small, discrete habitats, an accidental spill in one of these locations could have adverse impacts to the species. However, the potential impacts are reduced, based on

phased and clustered oil and gas development and the special management designations and NSO and CSU restrictions described above. These include protection of occupied stream reaches, as in GS-NSO-Roan-23 and GS-NSO-Roan-28 for riparian and fish habitat. In addition, any effects associated with development of Federal mineral resources on this species would be addressed via Section 7 consultation at the MDP stage, as indicated in GS-LN-Roan-14, and by required ESA consultation from GS-LN-Roan-34, GS-CSU-07 and GS-CSU-13 for riparian habitat and Parachute Creek high value watershed, and CRVSO-TL-1 for salmonid and native non-salmonid fish, which further limits surface-disturbing activities during spawning.

The suggested BMPs to protect stream quality (Appendix C), as appropriate to individual projects, would further benefit the trout by reducing the likelihood of spills, thus reducing the risk of impacts. The BMPs would also reduce the impacts of erosion potential, sedimentation, and increased turbidity due to development of well pads, roads, and pipelines. Examples of these include a requirement that new road crossings at streams use culverts or bridges, where feasible, to reduce impacts to streams and direct mortality of fish or eggs.

Areas of Critical Environmental Concern Management

The Proposed RMPA includes designation of two ACECs (along the East Fork Parachute Creek and Trapper/Northwater Creek valleys) and a WMA encompassing all of the Parachute Creek tributaries within BLM lands. Another two ACECs would be designated below the rim (Magpie Gulch and Anvil Points). The ACECs focus on the protection of sensitive aquatic and terrestrial species and habitats and the watershed processes that affect them. The WMA includes an emphasis on protection of water quality for human uses, but also provides protection of aquatic habitat and watershed processes, including the streams and minor tributaries and slopes that contribute runoff to them.

Special management to protect water quality, riparian and wetland vegetation, and watershed processes would benefit all aquatic species. Throughout the region, areas providing a combination of reliable surface moisture, lush forage, and structural complexity (different strata and types of vegetation) consistently support disproportionately high species density and diversity.

Management emphasis on preserving ecological values in the ACECs atop the plateau includes the application of BMPs (Appendix C), as appropriate to individual projects, and reclamation standards (Appendix E) for areas subject to ground-disturbing activities. One of the four ACECs to be designated in the Proposed RMPA is East Fork Parachute Creek. Resource management prescriptions for this area protects 7,110 acres for visual, fish/wildlife, and botanical/ecological resources. The management actions for this resource in the Proposed RMPA would have beneficial effects on cutthroat trout.

Watershed Management Area

The entire area atop the plateau, excluding a minor portion draining northward into the Piceance Creek basin, would be designated as the Parachute Creek WMA, with a total area of 33,010 acres. All portions of the Parachute Creek WMA not protected by an NGD/NSO for one or more resource values would have an SSR/CSU to provide BLM with flexibility in project locations and timing. These management actions provide a beneficial effect for Green Lineage cutthroat trout.

The goal for watershed management is to maintain or improve trout habitat. This may be accomplished by habitat improvement and by preventing or minimizing disruption to ecological function throughout the WMA. Almost the entire top of the plateau would be designated as the Parachute Creek WMA, with a CSU (GS-CSU-Roan-13) that would serve to improve water quality, natural stream flow, and stream ecological function throughout the WMA by preventing or minimizing direct, indirect, or cumulative adverse impacts to cutthroat trout or their habitat.

Streams suitable for management under the Wild and Scenic Rivers Act

BLM would determine all eligible rivers in the Planning Area as unsuitable for designation and would release them from interim management protections afforded eligible segments. Management would remain at its current level.

Fire Management

The Proposed RMPA allows for a range from full suppression to use of unplanned ignitions managed for resource benefits, and allows the use of naturally caused, unplanned wildfires to be managed for multiple objectives. In general, the top of the plateau and cliffs would be managed for resource benefit.

The construction of fire lines using hand tools or heavy machinery could affect sedimentation due to crushing or uprooting of plants, thus increasing erosion and sedimentation, and providing a vector for the invasion or expansion of noxious weeds. Cutthroat trout are unlikely to suffer direct mortality from fire. Overall, this management action is not likely to have much of an effect on trout.

Offsite and Cumulative Impacts

Under the Proposed Action, oil and gas leasing and development would be limited to two leases atop the plateau. These potential habitat losses are in addition to the direct and effective losses resulting from the ongoing human population growth in the region, with an annual increase of approximately 4.5 percent in western Garfield County. While some portion of this growth is related to oil and gas development in the Planning Area, most of the growth is unrelated to either the Planning Area or the oil and gas sector of the local economy.

Quantifying cumulative impacts that incorporate offsite lands is more difficult, due to uncertainties about the location, scale, and rate of oil and gas development on BLM lands, private lands, and other lands both inside and outside the Planning Area, as well as uncertainties about the application and effectiveness of environmental protections on these non-BLM lands. Under the Proposed RMPA, there would be a no lease area covering 82 percent of the BLM surface. Long-term disturbance acreages would be approximately 1 percent. A large number of general stipulations would be protective of aquatic wildlife.

One of the principal cumulative impacts would include the combination of oil and gas development on BLM lands with that on private lands within the Planning Area, and with both Federal and private lands in nearby areas. Because of assumed higher well densities and lower levels of ecological protection on private lands, the combined result would be direct and effective long-term habitat loss. However, a large percent of the cumulative (private plus Federal) habitat loss within the Planning Area would be in areas below the rim, not atop the plateau where the cutthroat trout occur.

Recreation has increased atop the plateau within the Planning Area and beyond, as urban development in the Eagle, Roaring Fork, and Upper Colorado River valleys increases. The increased human population creates increased hunting, fishing, hiking, camping, skiing, rock climbing, mountain biking, and four-wheeling activities in areas occupied by Green Lineage cutthroat trout. All of these activities will continue to result in cumulative impacts, including site-specific sediment loading and turbidity, habitat alteration, and water quality and quantity impacts. Restoration actions are more common as impacts are mitigated and degraded habitats are improved.

Climate change may impact T&E fish by reducing suitable habitat, changing distributions, and altering food webs and water quality (temperatures); the latter is notable in that Green Lineage cutthroat trout require cold water. There may be changes in the severity and frequency of droughts, floods, and wildfires, as well as changes in the timing of snowmelt and peak flows. These changes affect spawning times and breeding success. Wildfires could result in debris and ash flow events that are impactful to these fish in

select locations. Drought severity could further reduce flows and, when coupled with other water depleting activities, could result in cumulative effects.

4.2.4 Mexican Spotted Owl

Methods and Assumptions of Analysis

Limited potential habitat exists for Mexican spotted owl within the Planning Area. There are no known occurrences of Mexican spotted owl in the Planning Area. An estimated extent of potential habitat includes the first mile extending downstream from the East Fork Parachute Creek waterfall. Potential habitat also occurs on private land in lower portions of the East Fork and East Middle Fork drainages and the Magpie Gulch area. This impact analysis is based on how the Proposed RMPA would directly or indirectly maintain the condition of habitat that is potentially suitable and offer protections for the species should it occur in these areas.

Conservation Planning [As related to Section 7a(1) of the ESA]

One general objective directly related to T&E species, including Mexican spotted owl, is included in the Proposed RMPA: Protect and improve the integrity of occupied and suitable habitat for Federally proposed, candidate, threatened, and endangered species and protect occupied (and adjacent) habitat for BLM sensitive species necessary for:

> Maintenance and recovery of proposed, candidate, and threatened or endangered species; and
>
> Increased population numbers and distribution consistent with BLM policy on Special Status Species Management (BLM Manual 6840) (BLM 2008a).

No management actions specific to Mexican spotted owl are included in the Proposed RMPA.

Stipulations

GS-NSO-Roan-24 to protect T&E habitat and the two lease notices discussed in Section 4.1.2 (GS-LN-Roan-14 and GS-LN-Roan-34) would apply.

GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat

> Stipulation: NSO to protect occupied habitat, designated Critical Habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the ESA or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, Critical Habitat, or immediately adjacent to potential habitat.

GS-NSO-Roan-25: Raptor Nest Sties

> Stipulation to protect approximately 590 acres around raptor nest areas not protected by the ESA or other species-specific stipulation. No ground-disturbing activities within 0.125 mile of an active nest (i.e., containing eggs or young or being attended by adults in preparation for nesting).

GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I)

> Stipulation to protect East Fork Falls viewshed

Direct and Indirect Effects

Special Status Fish and Wildlife Species

In the Proposed RMPA, management of the Mexican spotted owl would be in accordance with existing recovery plans and consultations completed with the USFWS. The management of Mexican spotted owl would be consistent with the Colorado Standards for Public Land Health and BLM direction for the management of special status species in BLM Manual 6840 (BLM 2008a).

Oil and Gas Leasing and Development

Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Remaining areas open to leasing (1,830 acres in two lease areas above the rim) would be developed in compliance with specific terms and conditions. Almost half of the potential Mexican spotted owl habitat is in the area closed to oil and gas leasing and development (Figure 4). GS-LN-Roan-34 requiring ESA consultation would further serve to protect the species. Potential effects of oil and gas leasing are greatly mitigated by these actions and serve to protect the species, if it were to be found present in the future. In addition, any effects associated with development of Federal mineral resources on this species would be addressed via Section 7 consultation at the MDP stage, as indicated in GS-LN-Roan-14.

Offsite and Cumulative Impacts

Under the Proposed RMPA, two leases would be developed atop the plateau. Habitat losses from oil and gas development are in addition to the direct and effective losses resulting from the ongoing human population growth in the region, with an annual increase of approximately 4.5 percent in western Garfield County. While some portion of this growth is related to oil and gas development in the Planning Area, most of the growth is unrelated to either the Planning Area or the oil and gas sector of the local economy.

Quantifying cumulative impacts is uncertain due to unknown locations, scales, and rates of oil and gas development on BLM lands, private lands, and other lands both inside and outside the Planning Area, as well as uncertainties about the application and effectiveness of environmental protections on these non-BLM lands. Under the Proposed RMPA, there would be a no lease area covering 82 percent of the BLM surface. Long-term disturbance acreages would be approximately 1 percent.

Growth of population centers are expected to contribute to habitat fragmentation, fire suppression, and the spread of weeds. Portions of BLM land may become disconnected or isolated from other native habitats and ultimately adversely affect biological diversity within the Planning Area. Expansion of public recreation is expected to continue adjacent to local communities. Adjacent landowners have varied management of resources impacting habitat fragmentation, including weed spread, fire, wildlife, livestock grazing, OHV use, and development.

Surface disturbances associated with uses such as recreation, oil and gas, and urban development would result in cumulative effects over a larger scale and would continue into the future. The combined amount of surface disturbance of these past, present, and future actions would be detrimental to special status wildlife. Other surface-disturbing activities, such as road building and increased OHV use, would increase human access to sensitive areas where the special status wildlife species occur.

The combination of oil and gas development on BLM lands with that on private lands within the Planning Area, and with both Federal and private lands in nearby areas would result in cumulative habitat impacts. Because of assumed higher well densities and lower levels of ecological protection on private lands, the combined result would be direct and effective long-term habitat loss. However, a large percent of the cumulative (private plus Federal) habitat loss within the Planning Area would be in areas below the rim,

not atop the plateau where limited and potentially suitable Mexican spotted owl habitat occurs. No designated Critical Habitat occurs in the Planning Area. A stipulation prevents ground-disturbing activities within and adjacent to potential habitat identified in the Planning Area for Mexican spotted owl.

4.2.5 Western Yellow-billed Cuckoo

Assumptions and Methods of Analysis

No individuals of this species have been recorded or confirmed to nest on BLM lands within the Planning Area, and there is limited potential for western yellow-billed cuckoo habitat. Habitat analysis reveals that potentially suitable habitat occurs at two locations along the Colorado River in the Planning Area (Figure 4).

Conservation Planning [As related to Section 7a(1) of the ESA]

One general objective directly related to T&E species is included in the Proposed RMPA: Protect and improve the integrity of occupied and suitable habitat for federally proposed, candidate, threatened, and endangered species and protect occupied (and adjacent) habitat for BLM sensitive species necessary for:

> Maintenance and recovery of proposed, candidate, and threatened or endangered species; and
>
> Increased population numbers and distribution consistent with BLM policy on Special Status Species Management (BLM Manual 6840) (BLM 2008a).

Stipulations

GS-NSO-Roan-24 to protect T&E habitat, GS-NSO-Roan-29 to protect the Colorado River corridor, and the two lease notices discussed in Section 4.1.2 (GS-LN-Roan-14 and GS-LN-Roan-34) that apply to Oil and Gas Leasing and Development would apply for the western yellow-billed cuckoo:

GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat

> Stipulation: NSO to protect occupied habitat, designated Critical Habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the ESA or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, Critical Habitat, or immediately adjacent to potential habitat.

GS-NSO-Roan-29: Colorado River Corridor

> Stipulation: NSO to protect high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of the high-water mark on either side of the river.

Direct and Indirect Effects

Water Resources

The Proposed RMPA seeks to establish baseline water quality data and a monitoring program for drainages prior to allowing surface-disturbing activities. This serves to assess disturbance-related water quality changes, and identify and implement mitigation measures, as needed, to meet water quality standards. An NSO stipulation with a 0.5-mile buffer would be applied on major river corridors (i.e., Colorado River Corridor GS-NSO-Roan-29) and would provide additional benefit to the riparian habitat favored by the western yellow-billed cuckoo.

Special Status Fish and Wildlife Species

In the Proposed RMPA, management of the western yellow-billed cuckoo would be in accordance with existing recovery plans and consultations completed with the USFWS. The management of western yellow-billed cuckoo would be consistent with the Colorado Standards for Public Land Health and BLM direction for the management of special status species in BLM Manual 6840 (BLM 2008A).

Oil and Gas Leasing and Development

Under the Proposed RMPA, 48 percent of the Planning Area would not be available for oil and gas leasing. Remaining areas open to leasing (11,170 acres below the rim) would be developed in compliance with specific terms and conditions. There are two small areas of BLM land along the Colorado River that provide potential western yellow-billed cuckoo habitat of cottonwood gallery forests (Figure 4). GS-NSO-Roan-29 would protect a 0.5-mile buffer from the high-water mark with no ground-disturbing activities. GS-LN-Roan-34 requiring ESA consultation would further serve to protect this species. Potential effects of oil and gas leasing are greatly mitigated by these actions and serve to protect the species, if it were to be found present in the future. In addition, any effects associated with development of Federal mineral resources on this species would be addressed via Section 7 consultation at the MDP stage, as indicated in GS-LN-Roan-14. Potential effects of oil and gas leasing are greatly mitigated by these actions and serve to protect the species, if it were to be found present in the future.

Offsite and Cumulative Impacts

Cumulative impacts for the western yellow-cuckoo include the riparian habitats of the Colorado River, including its tributaries. This includes private and state lands to account primarily for cumulative effects associated with habitat loss associated with water diversions, overgrazing, agriculture, and conversion of native habitat to non-native species.

Riparian areas of the Colorado River have experienced losses associated with manmade features that alter watercourse hydrology. The natural processes that sustained riparian habitat in western North America are greatly diminished. Water diversions began when the first settlers to the region began to manage water for irrigation for crops, livestock, and domestic uses. As population centers within the Planning Area and beyond continued to grow, water demand increased. Several diversions were constructed to take water along the Colorado River. Many of these water diversions are in place today and have resulted in impacts on native flows. These activities have impacted western yellow-billed cuckoo habitat through habitat alteration, reduction of streamside vegetation cover, and reduced habitat complexity and diversity.

Habitat loss has occurred from livestock overgrazing and agriculture. These losses are worsened by the conversion of native habitat to primarily non-native vegetation. Livestock grazing changes understory vegetation, trampling existing plants, and eliminates new plants in riparian areas and thereby hampers the recruitment of canopy tree species that provide nest sites. Furthermore, cooler shady areas preferred by western yellow-billed cuckoos are also sought by livestock seeking shelter from the surrounding drier uplands, concentrating the trampling effects of livestock in riparian areas.

With the reduction of preferred habitat, the western yellow-billed cuckoo occurs mainly in smaller, widely-spaced populations. Smaller populations are under more stress from outside factors. Many of the small patches of cuckoo habitat are adjacent to agricultural and developed landscapes. These small riparian patches areas are more vulnerable to human-adapted predators, as well as impacts associated with pesticide overspray and agricultural runoff (Saab 1999).

Much of the current riparian habitat throughout the western yellow-billed cuckoo range consists of invasive tamarisk that does not support the species (Laymon and Halterman 1987). In other areas, non-native Russian olive dominates the canopy providing little value for western yellow-billed cuckoos.

5 EFFECTS DETERMINATION

5.1 PLANT SPECIES

5.1.1 Parachute Penstemon

Based on the effects analysis described above, implementation of the Proposed RMPA **may affect, but is not likely to adversely affect** Parachute penstemon populations within the Planning Area.

Rationale:

There are two documented occurrences of Parachute penstemon within the Planning Area occupying very small areas within extremely specific habitat comprising sparsely vegetated, steep, talus slopes.

Both documented populations in the Planning Area are within the Anvil Points ACEC boundary. This provides protection and special management for these and all other relevant and important botanical resources.

As noted in previous consultations, given the known high degree of specificity and fidelity of this species to its habitat there is little potential habitat on BLM land within the Planning Area which has not been surveyed for the presence of Parachute penstemon (BLM 2013a), except in inaccessible steep slopes and private lands.

Occupied habitat for Parachute penstemon is extremely steep and poorly vegetated, making access by livestock almost impossible, therefore minimizing the possibility of trampling or introduction of noxious weeds or undesirable plants.

Mitigation measures, such as fencing and restrictions on livestock grazing, bedding or trailing in the vicinity of the Parachute penstemon population along the Anvil Points Rim Road, have been implemented to protect this species from negative impacts from livestock grazing.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

The two documented occurrences are both within Areas Closed to Leasing for Oil and Gas (No Lease Area).

Application of NGD-Roan-24 for non-oil and gas activities.

Application of NSO-22 Steep Slopes and NSO-30 I-70 Viewshed cover much of the Parachute penstemon potential and Critical Habitat, reducing the likelihood of ground disturbance in these areas.

CSU-12 Habitat for BLM Sensitive Plant Species Populations and Significant Plant Communities allows the BLM to require special design and implementation measures to protect special status plant species when ground disturbance is approved within potential or occupied habitat.

BLM would require clearance surveys for Parachute penstemon in all identified potential habitat prior to approving any new surface-disturbing activities. All such activities would be subject to an NGD/NSO surface use restriction/stipulation for T&E species habitat (see above), as well as other surface use restrictions discussed in Section 4. Therefore, direct and indirect effects to Parachute penstemon populations from oil and gas development and all other surface-disturbing activities would likely be avoided or mitigated.

5.1.2 Parachute Penstemon Critical Habitat

The Proposed RMPA **may affect, but is not likely to adversely affect** designated Critical Habitat for Parachute penstemon within the Planning Area.

Rationale:

The PCEs of the Critical Habitat that support growth of Parachute penstemon plants are soils of the Green River Formation with a surface layer of shale channers (small flagstones). These elements occur primarily on the steep cliffs on the southern escarpment of the Roan Plateau and in alluvial outwash along the intermittent drainages that would be extremely unsuitable for siting of oil and gas facilities.

All designated Critical Habitat on BLM surface or Federal minerals is within the Anvil Points ACEC. This provides protection and special management for these and all other relevant and important botanical resources.

Other soil types included in the Critical Habitat in the Planning Area are not considered suitable habitat for Parachute penstemon, but may provide habitat for its pollinators. Any future disturbances within the designated Critical Habitat are likely to occur within these soil types as well. Although some pollinator habitat is likely to be affected by future disturbances such as grazing, the loss of habitat is anticipated to be small relative to the total pollinator habitat available.

Of the 3,630 acres of designated Critical Habitat for Parachute penstemon under consideration in this BA, 3,480 acres would be protected under NSOs and the No Leasing Area. The remaining 150 acres of Critical Habitat would be protected by several CSUs (GS-CSU-Roan-04, GS-CSU-Roan-07, GS-CSU-Roan-09, GS-CSU-Roan-12, GS-CSU-Roan-13, GS-CSU-Roan-14, and GS-CSU-Roan-15). In addition, these areas of Critical Habitat are subject to application of GS-LN-Roan-14, which requires MDPs, and GS-LN-Roan-34, which requires consultation under Section 7 of the ESA. Additionally, CRVFO-CSU-Roan-18 requires submittal of an MDP, which overlaps with GS-LN-Roan-14. Therefore, direct and indirect effects to designated Parachute penstemon Critical Habitat from oil and gas development and all other surface-disturbing activities would likely be avoided or completely mitigated.

5.1.3 DeBeque Phacelia

The Proposed RMPA **may affect, but is not likely to adversely affect** DeBeque phacelia within the Planning Area.

Rationale:

No known occurrences of DeBeque phacelia exist within the Planning Area.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

BLM would require clearance surveys for DeBeque phacelia in all identified potential habitat prior to approving any new surface-disturbing activities. All such activities would be subject to an NGD/NSO surface use restriction/stipulation for T&E species habitat (see above), as well as other stipulations/surface use restrictions discussed in Section 4. Therefore, direct and indirect effects to DeBeque phacelia from oil and gas development and all other surface-disturbing activities would likely be avoided or mitigated.

5.1.4 Colorado Hookless Cactus

The Proposed RMPA **may affect, but is not likely to adversely affect** Colorado hookless cactus within the Planning Area.

Rationale:

No known occurrences of Colorado hookless cactus exist within the Planning Area.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

BLM would be required to conduct clearance surveys for Colorado hookless cactus in all identified potential habitat prior to approving any new surface-disturbing activities. All such activities would be subject to an NGD/NSO surface use restriction/stipulation for T&E species habitat (see above), as well as other surface use restrictions/stipulations discussed in Section 4, including Section 7 consultation and COAs. Therefore, direct and indirect effects to Colorado hookless cactus from oil and gas development and all other surface-disturbing activities would likely be avoided or mitigated.

5.1.5 Ute Ladies'-Tresses

The Proposed RMPA **may affect, but is not likely to adversely affect** Ute ladies'-tresses within the Planning Area.

Rationale:

No known occurrences of Ute ladies'-tresses exist within the Planning Area.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

BLM would be required to conduct clearance surveys for all Ute ladies'-tresses identified potential habitat prior to approving any new surface-disturbing activities. All such activities would be subject to an NGD/NSO surface use restriction/stipulation for T&E species habitat (see above), as well as other surface use restrictions/stipulations discussed in Section 4 including NGD/NSO and SSR/CSU surface use restrictions/stipulations for riparian and wetland habitat. Therefore, direct and indirect effects to Ute ladies'-tresses from oil and gas development and all other surface-disturbing activities would likely be avoided or mitigated.

5.2 COLORADO RIVER ENDANGERED FISHES

The Proposed RMPA **may affect, but is not likely to adversely affect** the Colorado pikeminnow, bonytail, humpback chub, and razorback sucker in the Planning Area (other than through water depletions, which are discussed below).

Rationale:

> The potential indirect effects of small site-specific increases in sediment would be negligible and within the variable amounts carried by the Colorado River. The broad expanse of flat topography between the vast majority of Federal lands within the Planning Area, and the Colorado River, is expected to reduce sediment loading, especially when coupled with identified BMPs, to undetectable.
>
> Fluid minerals have the potential for accidental spills and leaks of hazardous substances associated with their application on BLM lands, and the BLM does not authorize these "accidents." The Proposed RMPA and this BA contain protective measures to reduce the risk of these occurrences near Critical Habitats for these fish, including, but limited to speed limits and spill prevention/containment plans. In the rare and unlikely event of a spill, BLM would initiate emergency consultation with USFWS.
>
> To comply with the ESA, BLM will complete consultation for water depletions under two programmatic Section 7 consultation efforts. Water depletion quantities would be estimated at the project stage and reported to the USFWS through annual reports. New drilling technology, use of recycled water, and improved data sources provide more accurate reporting and decreased water use.
>
> Estimated average annual water depletions over the life of the Proposed RMPA are detailed in Table 10. These total depletions would fall within the limits of the PBOs described above.
>
> The BLM has been accounting for the adverse impacts of water depletions associated with Federal fluid mineral development within the Upper Colorado River basin soliciting a one-time payment from the industry representative group to contribute to the recovery of endangered fish through habitat restoration, fish propagation, genetics management, instream flow protection, non-native fish management, research and monitoring, public education, and similar recovery actions. BLM would track and report all water use annually to USFWS per the two programmatic consultation efforts.
>
> The BLM is meeting Colorado Public Land Health Standards – in particular Standard 4 regarding improved management of riparian habitats through the use of grazing BMPs.

5.3 COLORADO RIVER CUTTHROAT TROUT (GREEN LINEAGE)

The Proposed RMPA **may affect, but is not likely to adversely affect** the Green Lineage cutthroat trout and its habitat within the Planning Area.

Rationale:

> The stream segment occupied by the Green Lineage cutthroat trout is within the No Lease area, as well as the East Fork Parachute Creek ACEC.

Application of GS-NSO-Roan-28: High-value Special Status Fish Species Habitat, to protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

Application of GS-LN-Roan_34: Endangered Species Act, Section 7 Consultation.

Application of GS-LN-Roan-14: An MDP will be required from oil and gas operators prior to exploration or development activities.

Application of NGD-Roan-24 for non-oil and gas activities.

The BLM is meeting Colorado Public Land Health Standards – in particular Standard 4 regarding improved management of riparian habitats through the use of grazing BMPs.

Two leases would be retained atop the Planning Area in a small portion of the lower end of East Fork Parachute Creek and the cutthroat trout habitat will be protected via overlapping NSO stipulations in that area.

Fluid mineral development has the potential for impacts as disclosed, but with the stipulations in place on the lease notices, select BMPs, conservation measures, and COAs, potential impacts to these streams and Green Lineage cutthroat trout are substantially reduced.

Accidental spills and leaks are possible; however, the risks associated with these are mitigated to the extent possible by BLM with BMPs, COAs, and select conservation measures. These incidents are rare, and the likelihood of occurrence is not reasonably foreseeable given the location of the retained leases, likely development scenarios, location of the fish, and all of the protective stipulations and BMPs. Accidental spills and leaks of hazardous substances, if determined to impact a listed species, would be treated similarly as wildfires where emergency consultations would be conducted on actions to control, repair, or mitigate effects of an accident.

Climate change is an unknown factor regarding long-term persistence of some cutthroat trout populations. However, given the global means by which effects are occurring, it is impossible to detect effects from actions authorized in the Proposed RMPA. Managing stream and riparian habitats to their full potential will help to offset impacts associated with global climate change.

5.4 MEXICAN SPOTTED OWL

The Proposed RMPA **may affect, but is not likely to adversely affect** the Mexican spotted owl and its habitat.

Rationale:

No known occurrences of Mexican spotted owl exist within the Planning Area.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

Application of GS-LN-Roan-34: Endangered Species Act, Section 7 Consultation.

Application of GS-NSO-Roan-25, Raptor Nest Sites, to protect raptor nest areas not protected by the ESA or other species-specific stipulation.

Application of GS-NSO-Roan-28: High-value Special Status Fish Species Habitat.

Application of GS-NSO-Roan-29: Colorado River Corridor, to protect high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of the high-water mark on either side of the river.

Application of GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I), a ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards.

Application of GS-LN-Roan-14: An MDP will be required from oil and gas operators prior to exploration or development activities.

Almost half of the potential Mexican spotted owl habitat in the Planning Area is located within the area closed to oil and gas leasing and development.

Potential protection of habitat area within the East Fork Parachute Creek ACEC.

Fluid mineral development has the potential for impacts as disclosed, but with the stipulations in place on the lease notices, select BMPs, conservation measures, and COAs, potential impacts to the species are substantially reduced.

5.5 WESTERN YELLOW-BILLED CUCKOO

The Proposed RMPA **may affect, but is not likely to adversely affect** the threatened western yellow-billed cuckoo. The Proposed RMPA would have no effect on Critical Habitat because none has been designated within the Planning Area.

Rationale:

No known occurrences of western yellow-billed cuckoo exist within the Planning Area.

Application of GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat to all new oil and gas leases.

Application of GS-NSO-Roan-29: Colorado River Corridor, to protect high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of high-water mark on either side of river.

Potential habitat for western yellow-billed cuckoo does not overlap with oil and gas lease and development areas on Federal surface, per the Proposed RMPA.

Resource protection measures will be incorporated into site-specific projects designed under the Proposed RMPA in suitable habitat.

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APPENDIX A

FIGURES

Figure 1: General Location Map, Roan Plateau RMPA/SEIS BA

Figure 2: Land Status Map, Roan Plateau RMPA/SEIS BA

Figure 3: Threatened and Endangered Plant Species: Locations of Critical Habitat, Potential Habitat, and Known Populations

Figure 4: Threatened and Endangered Wildlife Species: Habitat and Known Locations

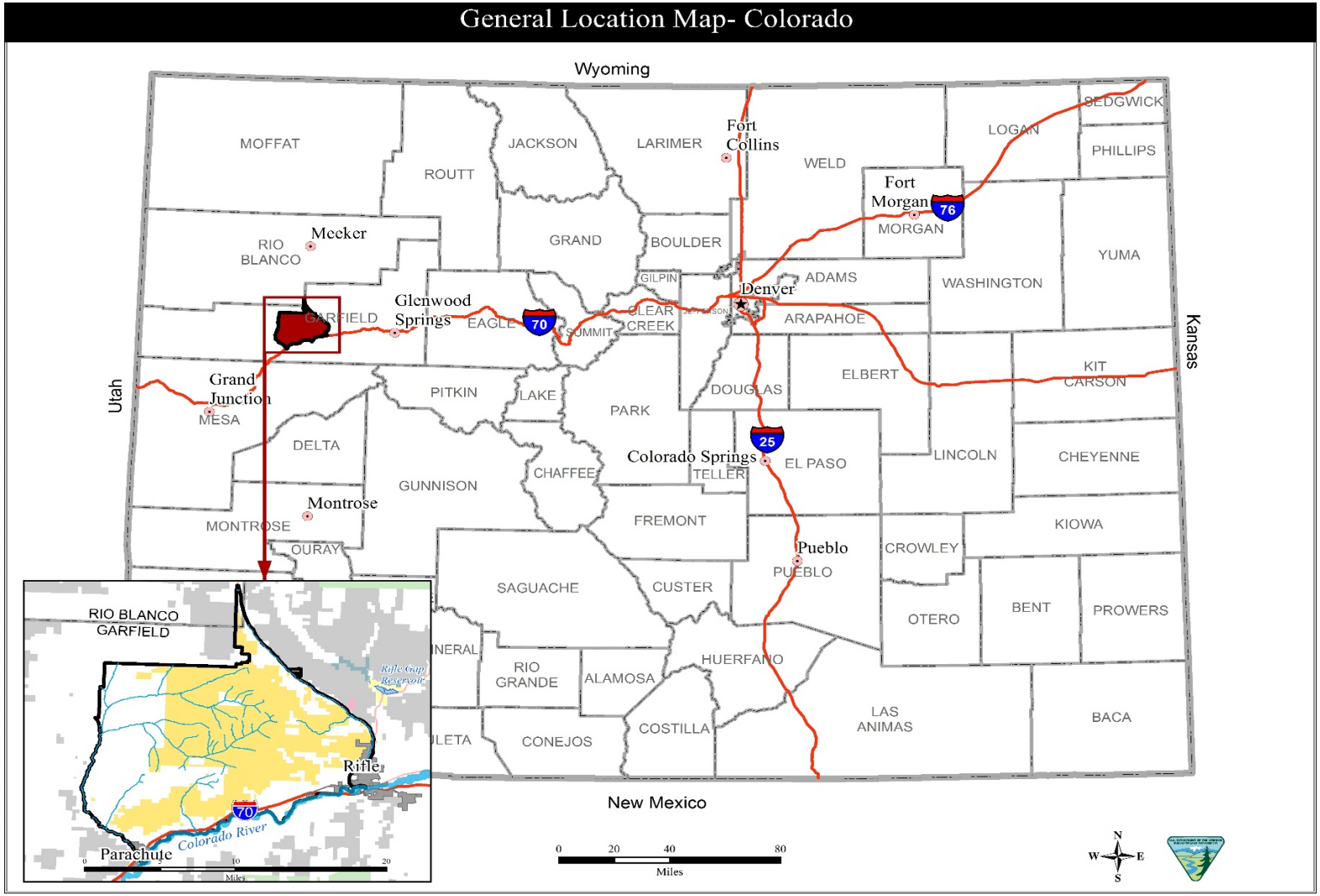

Figure 1. General Location Map, Roan Plateau RMPA/SEIS BA

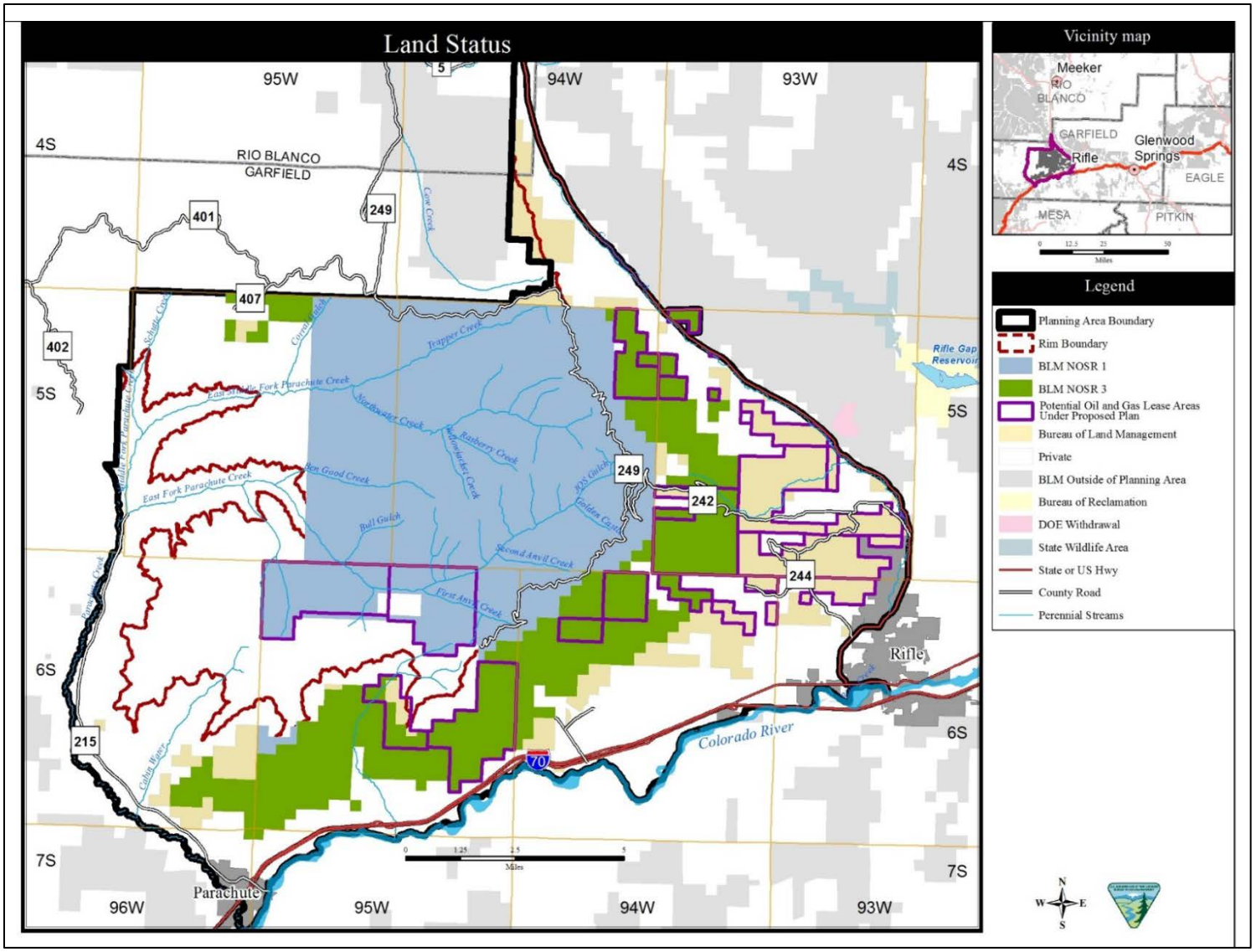

Figure 2. Land Status Map, Roan Plateau RMPA/SEIS BA

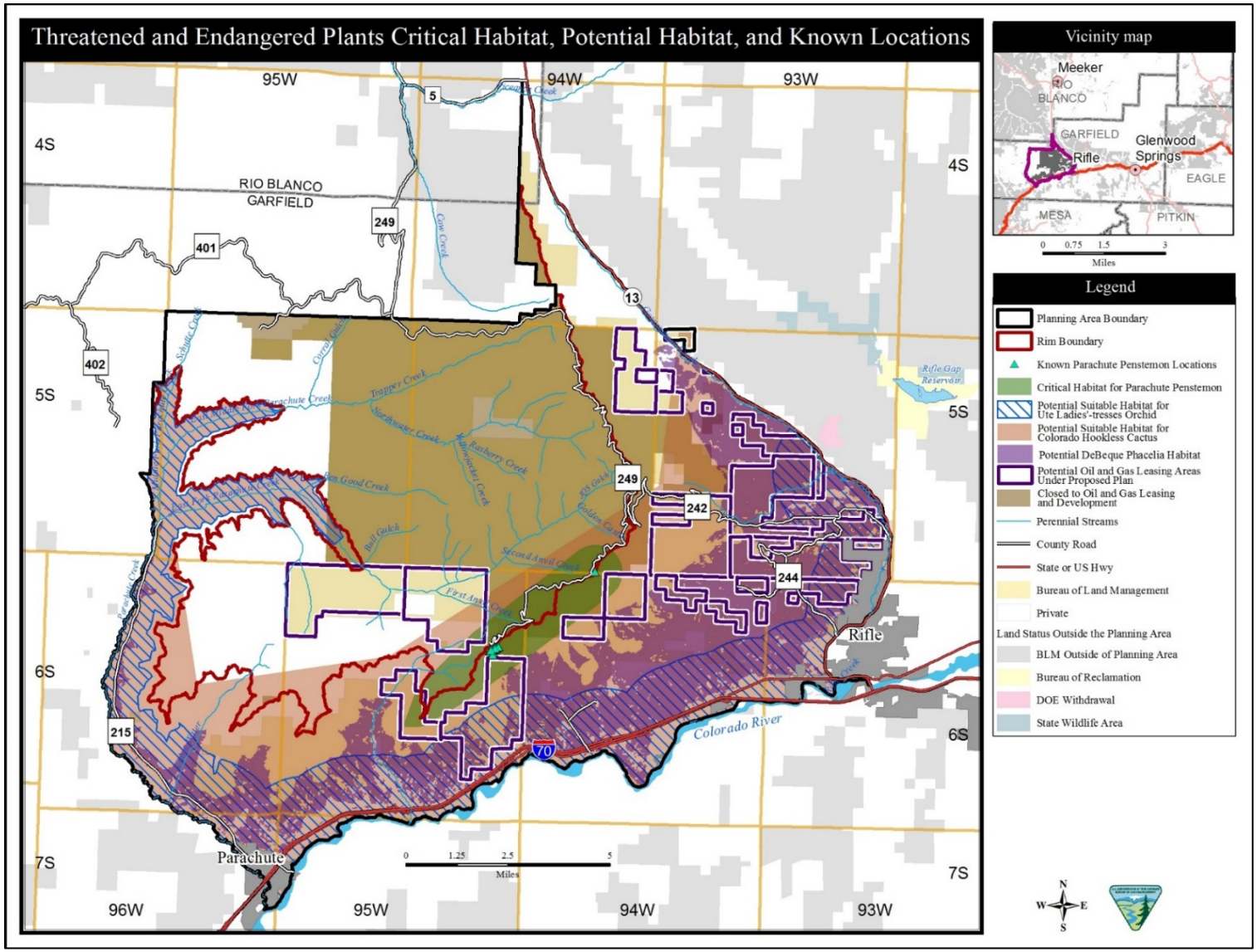

Figure 3. Threatened and Endangered Plant Species: Location of Critical Habitat, Potential Habitat, and Known Populations

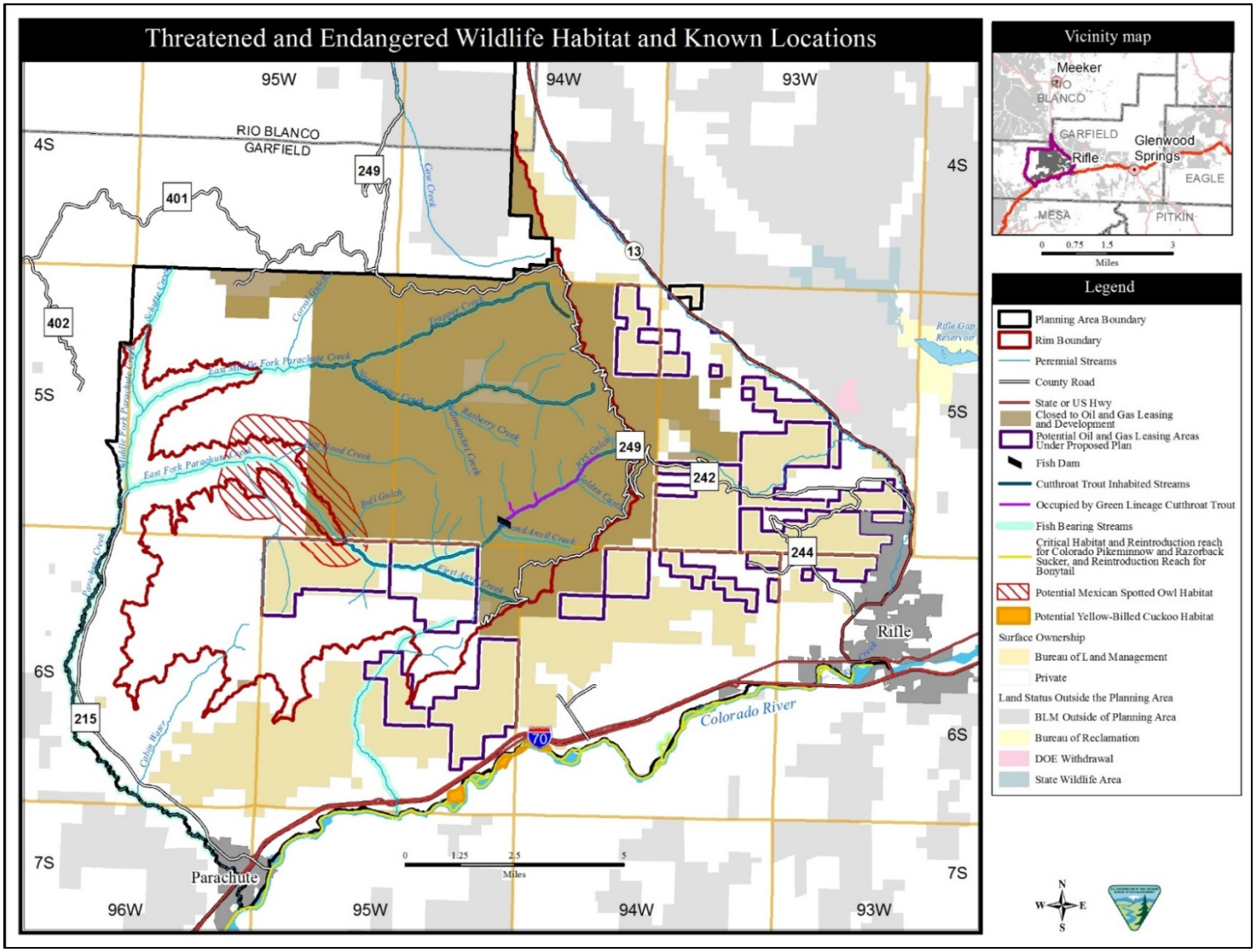

Figure 4. Threatened and Endangered Wildlife Species: Potential Habitat and Known Locations

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APPENDIX B

STIPULATIONS APPLICABLE TO NEW OIL AND GAS LEASES UNDER THE PROPOSED RMPA

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

No Surface Occupancy (NSO) Stipulations	
GS-NSO-Roan-22: Steep Slopes (>50%), 13,840 acres	
Stipulation	**Standards**
NSO on slopes greater than 50 percent. No ground-disturbing activities on the 13,840 acres of slopes steeper than 50 percent.	1. No ground-disturbing activities will be granted in areas of steep slopes that also are designated as wildlife movement corridors. 2. Ground-disturbing activities in areas with slopes steeper than 50 percent will not be granted for access to areas with slopes less than 50 percent. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards detailed in Appendix I.
GS-NSO-Roan-24: Threatened, Endangered, or Candidate Species Habitat, 290 acres	
Stipulation	**Standards**
NSO to protect occupied habitat, designated critical habitat, and immediately adjacent potential habitat crucial for the maintenance or recovery of species listed under the Endangered Species Act (ESA) or by the State of Colorado as threatened or endangered (including proposed or candidate species under the ESA). No ground-disturbing activities within approximately 290 acres of habitat currently mapped as occupied, critical habitat, or immediately adjacent to potential habitat.	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of

	resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Ground-disturbing activities must avoid a 0.25-mile buffer around Mexican spotted owl nest sites year-round, with seasonal avoidance of active nests and a 0.5-mile buffer from February 1 - August 15. 3. If species affected by this stipulation is removed from the federal list, this stipulation would not apply to that specie. Other requirements, however, will apply if the species remains classified as sensitive, or is otherwise protected. 4. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, must be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 5. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-25: Raptor Nest Sites, 590 acres	
Stipulation	**Standards**
NSO to protect approximately 590 acres around raptor nest areas not protected by the ESA or other species-specific stipulation. No ground-disturbing activities within 0.125 mile of an active nest (i.e., containing eggs or young or being attended by adults in preparation for nesting).	1. Site-specific ground-disturbing activity near active raptor nest sites will not be allowed between February 1 and August 15 unless the BLM determines, following consultation with CPW, that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure; abandonment of the nest;

	mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species, or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

GS-NSO-Roan-26: Bald Eagle Nest or Winter Roost Sites, 380 acres	
Stipulation	**Standards**
NSO to protect approximately 380 acres of bald eagle nest, winter roost sites, and winter range. No ground disturbing activities within 0.25 mile of designated bald eagle nesting or roosting habitat, within bald eagle winter range, or within 0.25 mile of Fravert Reservoir (subject to valid existing rights and authorizations).	1. Ground-disturbing activity may be permitted if the BLM determines, following Section 7 consultation with USFWS or with CPW for State-listed species, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. standards, criteria, plans, and practices detailed in Appendix I.

	3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation
CSU-NSO-Roan-27: Wildlife Seclusion Areas Below the Rim, 6,830 acres	
Stipulation	**Standards**
NSO to protect important wildlife security areas below the rim, especially those for deer and elk. No ground-disturbing activities in approximately 6,830 acres that provide high-value habitats along and below the base of the Roan Cliffs.	1. Ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance or recovery of the species. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an

	adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-28: High-value Special Status Fish Species Habitat, 1,820 acres	
Stipulation	**Standards**
NSO to protect Colorado River cutthroat trout from direct and indirect impacts in high-value habitat. No ground-disturbing activities in approximately 1,820 acres that would result in loss or degradation of areas designated as high-value habitat for Colorado River cutthroat trout.	1. Prior to implementing any ground-disturbing activity or other project component in areas designated as high-value habitat for Colorado River cutthroat trout, the proponent must provide an assessment of potential impacts if any, to this resource value. The assessment will be based on current baseline data, collected by the proponent as approved by the BLM; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. Ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with maintenance of the species of interest. In making this determination, the BLM will consider the following resource factors: habitat conditions needed for feeding, spawning, survival of eggs and larvae, and refugia during high or low flow. Impairment could include siltation of substrate; changes in flow regime (e.g., localized damming); loss of overhanging vegetation canopy; reduction in bank stability; reduction in water quality; and direct mortality of trout or trout eggs; behavioral and ecological relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species of interest or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases, approval for such activities must be granted (or extended)

	annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-23: Riparian and Wetland Habitat, 130 acres	
Stipulation	**Standards**
NSO to protect approximately 130 acres of riparian or wetland vegetation. Ground-disturbing activities including oil and gas facilities, roads, pipelines, electric transmission lines, communication facilities, and other sources of surface disturbance are limited to areas beyond the outer edge of riparian or wetland vegetation.	1. A ground-disturbing activity may be permitted only if BLM determines that (a) the activity will not cause loss of riparian vegetation or, if riparian vegetation is lost, that the loss is limited to no more than 0.1 acre, and 100 linear feet, per mile of stream; (b) any temporarily disturbed areas must be revegetated with existing or similar species, including use of containerized nursery stock rather than seeds to replace woody plants on a one-to-one basis (trees) or area-for-area basis (shrubs); (c) revegetation success will be achieved within 2 years;

	(d) the activity will not impair water quality, flow regime, aquatic habitat quality, and channel and bank stability; and (e) no practicable alternative is available. Resource factors include topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or enhancement of the resource values. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such instances approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

GS-NSO-Roan-30: I-70 Viewshed (VRM Class II), 9,780 acres	
Stipulation	**Standards**
NSO to protect 9,780 acres of the Visual Resource Management (VRM) Class II, Interstate (I)-70 viewshed. No ground-disturbing activities on slopes steeper than 30 percent with high visual sensitivity in the I-70 viewshed. These are lands within 5 miles of the highway, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in contrast can be easily noticed by the casual observer on I-70.	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

	3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-31: East Fork Falls Viewshed (VRM Class I), 600 acres	
Stipulation	**Standards**
NSO to protect East Fork Falls Viewshed (VRM Class II).	1. A ground-disturbing activity may be permitted if the BLM determines that the requested activity would not impair values associated with VRM Class II objectives or degrade the visual characteristics of the viewshed below Class II standards. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an

	adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-21: Anvil Points Claystone Cave, 120 acres	
Stipulation	**Standards**
NSO to protect 120 acres encompassing the Anvil Points Claystone Cave. No ground disturbing activities in the area encompassing the cave opening, subsurface features, and watersheds overlying the caves.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. 2. A ground-disturbing activity may be permitted only if the BLM determines that a proposed activity would not impair the cave values, supported by a demonstration of such, based on monitoring data or another method with a high degree of scientific reliability, and considering the type, amount, duration, and timing of the activity; and after consultation with CPW regarding wildlife habitat values. 3. During and subsequent to the ground-disturbing activities covered by this provision, ongoing monitoring data will be collected using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified; and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

	4. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-NSO-Roan-29: Colorado River Corridor, 320 acres	
Stipulation	**Standards**
NSO to protect approximately320 acres of high-quality habitat and wildlife areas, water quality benefits, and scenic qualities along the Colorado River. No ground-disturbing activities within 0.5 mile of high-water mark on either side of river.	1. A specific activity may be allowed if the BLM determines that (a) the specific activity or requested change would not impair water quality, high-quality habitat, and scenic qualities after considering the vegetation, topography, existing habitat impacts, and other site-specific or activity-specific factors and the amount, type, and duration of surface disturbance proposed, and (b) any lost vegetation would be replaced with the same or similar species within 3 to 5 years. 2. Short-term (reclaimed within two years of initiation) activities may be permitted if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GRSG-NSO-46e1: *NSO within 2 miles of active GRSG leks, in GRSG ADH, no exceptions anticipated*	
Stipulation incorporates stipulation NSO-46e(1) from the NCGSG Proposed LUPA/FEIS by reference	
GRSG-NSO-46e2: *Exceptions, modifications, and waivers on the remainder of PHMA. Authorized Officer could grant and exception or modification in consultations with the State of Colorado.*	
Stipulation incorporates stipulation NSO-46e(2) from the NCGSG Proposed LUPA/FEIS by reference	

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

CRVFO-NSO-Roan 4: Designated Municipal Watershed, 70 acres	
Stipulation: Prohibit surface occupancy and surface-disturbing activities within: 1) the primary zone of a source water protection area for a permitted public water system; or 2) 1,000 horizontal feet of either side of a classified surface water supply stream segment (measured from the average high water mark) for a distance of 5 miles upstream of a public water supply intake with the classification "Water Supply" by the State of Colorado used as a public (municipal) water supply. A permitted public water system will have a number assigned by the State of Colorado. A watershed that serves a public water system as defined by the State of Colorado is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. **Purpose:** To protect the watershed that serves a drinking water supply for a permitted public water system from potential contamination. **Exception:** BLM may consider use of new technology or engineered plans designed to protect water supply streams and intakes from operations located closer than specified in the stipulation. Consideration of special technology or designs will be coordinated with appropriate water authorities and owners (e.g. municipalities, home owners associations, source water protection stakeholder groups, etc.). In addition, activity may be permitted if the Authorized Officer determines, in consultation with the appropriate water authorities and owners, that the applicant's proposal would not cause a decrease in water quality. **Modification:** The water supply or water intake is altered. **Waiver:** The water intake is not used as a public water supply.	
CRVFO-NSO-Roan-32: Anvil Points Spent Shale Repositories, 10 acres	
Stipulation	**Standards**
Prohibit surface occupancy and surface-disturbing activities for spent shale repositories.	1. Recommend modification of the current oil shale withdrawal affecting the transferred lands to allow for land tenure actions while keeping land closed to mineral location and entry, but retain oil shale withdrawal (without modification) for Anvil Points Facility Repositories 1 and 2 for consistency with perpetual ROW on repositories. 2. Recommend withdrawal of Anvil Points Oil Shale Facility Repository 3 3. Retain BLM ROW on Anvil Points Facility Repositories 1, 2, and 3.

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

Controlled Surface Use (CSU) Stipulations	
GS-CSU-Roan-12: Habitat for BLM Sensitive Plant Species Populations and Significant Plant Communities, 8,030 acres	
Stipulation	**Standards**
CSU to protect approximately 8,030 acres of special status plant species or significant plant communities. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources for disturbance within a watershed that would disturb, alter, or interrupt the hydrologic or ecological processes that support special status plant species or significant plant communities. Special status plants include the following: DeBeque milkvetch (*Astragalus debequaeus*), DeBeque phacelia (*Phacelia submutica*), hanging garden sullivantia (*Sullivantia hapemanii*), Parachute penstemon (*Penstemon debilis*), Piceance bladderpod (*Lesquerella parviflora*), Roan Cliffs blazingstar (*Mentzelia rhizomata*), sun-loving meadowrue *(Thalictrun heliophilum*), and Utah fescue (*Argillochloa dasyclada*).	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values associated with species health and ecological function of associated habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the status of the population; ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of the population or community; the effects on both individuals of the species and populations; the relationship to topography and other vegetation; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or community. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or nonimpairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

	3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-07: Riparian and Wetland Habitat, 3,770 acres	
Stipulation	**Standards**
CSU to protect 3,770 acres of riparian and wetland habitat. The BLM may require special design, construction, operation, mitigation, or reclamation measures, and/or relocation by more than 200 meters for any ground-disturbing activities, electric transmission lines, and other sources of disturbance within 500 feet of riparian or wetland vegetation to protect the values and functions of these areas. Measures required will be based on the nature, extent, and value of the area potentially affected.	1. The BLM will consider the following resource factors: proper hydrological and ecological functioning; protection of habitat supporting fish and wildlife resources; ecological requirements to maintain the riparian area; the type, amount, and duration of the surface disturbance; the relative extent and condition of the riparian area; the relationship to topography and surrounding vegetation; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or condition of the riparian area. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from

	which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-08: Peregrine Falcon Cliff Nesting Complex, 10 acres	
Stipulation	**Standards**
CSU to protect approximately 10 acres of peregrine falcon cliff nesting complex. Ground-disturbing activities may be relocated outside of the cliff-nesting complex along the Roan Cliffs.	1. A site-specific ground-disturbing activity may be allowed within the CSU only if, following consultation with CPW, the BLM determines that the specific activity or requested change would not impair behaviors, habitat use and quality, and reproductive success of the peregrine falcon present within the area. In making this determination, the BLM will consider the status of the nest (active or inactive); behavioral and ecological requirements of the species; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.

	3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-09: Wildlife Security Areas Above the Rim, 2,020 acres	
Stipulation	**Standards**
CSU to protect important wildlife security areas above the rim, especially deer and elk. Ground disturbing activities may be relocated more than 200 meters to avoid approximately 2,020 acres of wildlife security areas above the rim.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of the species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated

	mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-10: Big Game Migration Corridors, 580 acres	
Stipulation	**Standards**
CSU to protect contiguity and extent of big game migration corridors. Ground-disturbing activities may be relocated more than 200 meters to avoid approximately 580 acres of big game migration corridors.	1. A site-specific ground-disturbing activity may be permitted if BLM determines, following consultation with CPW, that the requested activity will not impair values, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of big game species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an

	adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-11:Sensitive Bat Species Habitat, 120 acres	
Stipulation	**Standards**
CSU to protect and preserve bat habitat values of the Anvil Points Claystone Cave. Special design, construction, implementation, and/or mitigation measures including relocation of operations by more than 200 meters to protect approximately 120 acres of habitat may be required for those species listed as sensitive by the BLM.	1. If the BLM, in consultation with CPW, determines that a proposed surface disturbing activity will unacceptably impair resource values associated with sensitive bat species habitat, the BLM will modify or relocate the proposed activity. In making this determination, the BLM will consider the following resource factors: behavioral and ecological requirements of sensitive bat species; the type, amount, and duration of the surface disturbance; the relative extent of available habitat; the relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect maintenance or recovery of the species or cause habitat to become unusable. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects

	are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-04: Erosive Soils and Slopes Greater Than 30 %, 23,550 acres	
Stipulation	**Standards**
CSU for erosive soils with slopes greater than 30 percent. The BLM may require special analysis, design, construction, operation, mitigation, reclamation measures, monitoring, and/or relocation by more than 200 meters to protect the soil resource, minimize impacts to other resources, and ensure reclamation success in the 23,550 acres with highly erosive soils on slopes steeper than 30 percent.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to preserve soil stability and productivity and minimize adverse impacts from soil erosion. The BLM's determination will be based on site-specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities.

	3. BMPs (Appendix H) and reclamation standards (Appendix I) will be used to mitigate soil impacts. 4. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-13: Parachute Creek High Value Watershed and Watershed Management Area, 4,450 acres	
Stipulation	**Standards**
CSU to protect 4,450 acres within the Parachute Creek high-value watershed and Watershed Management Area (WMA). Provide resource protections through actions that minimize disturbance and habitat fragmentation, and protect key habitats from disturbance.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with the WMA, or relocation or modification of such activity is found to be acceptable If the BLM determines that a proposed surface-disturbing activity will unacceptably impair resource values, the BLM will modify or relocate the proposed activity. The BLM will consider the following resource factors: protection of ecological, hydrological, and habitat functions and resources; the type, amount, and duration of the surface disturbance; relationship to naturally occurring conditions; topography; type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset any adverse effects; and other factors that may affect the paleontological resource. Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity will provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. The BLM will determine what level of protection available under this stipulation is required to protect Colorado River cutthroat trout and habitat, rare and/or significant natural plant communities, and municipal water supply and quality. The BLM's determination would be based on site-specific conditions and the type, amount, and duration of the associated impacts. 2. Prior to, during, and subsequent to the ground-disturbing activities covered

	by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. This monitoring may specifically include but not be limited to monitoring of surface and groundwater. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM will be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures to be applied to future proposed activities. 3. Short-term (reclaimed within two years of initiation) activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-14: VRM Class II Areas Below the Rim, 23,740 acres	
Stipulation	**Standards**
CSU to protect approximately 23,740 acres in VRM Class II areas. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class II areas below the rim to retain the existing landscape character and allow only limited changes.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class II objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with

	their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually or as required by the BLM. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-15: VRM Class III Areas Above the Rim, 4,190 acres	
Stipulation	**Standards**
CSU to protect 4,190 acres of VRM Class III areas on top of the plateau. The BLM may require special design, construction, operation, mitigation, or reclamation measures, or relocation by more than 200 meters in VRM Class III areas.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values associated with VRM Class III objectives, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: retention of the overall landscape character on both a site-specific and cumulative basis including line, form, color, and texture; the extent to which the activity blends with characteristics of the natural landscape; the type, amount, and duration of the surface disturbance; the relative extent of viewshed characteristics and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects including line, form, color, and texture; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the visual and aesthetic quality. Authorized ground disturbing activities will be

	reviewed annually; if needed BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project component. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan -16: Hubbard Mesa Open OHV Riding Area, 2,320 acres	
Stipulation	**Standards**
CSU to protect recreation opportunities and settings in the Hubbard Mesa Off-Highway Vehicle (OHV) Riding Area 2,320- acre Special Recreation Management Area (SRMA). The BLM may require special design, construction, operation, mitigation, and reclamation measures, including relocation by more than 200 meters.	1. A site-specific ground-disturbing activity may be permitted if the BLM determines that the requested activity will not impair values with OHV opportunities within the Hubbard Mesa area, or if relocation or modification of such activity is found to be acceptable. In making this determination, the BLM will consider the following resource factors: existing OHV use; existing OHV riding opportunities; anticipated future use; management of OHV use; type, amount, and duration of the surface disturbance; the relative extent of OHV use and current conditions; the relationship to topography and vegetation screening; the type, location, duration, and intensity of potential adverse effects; mitigation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect OHV riding opportunities.

	Authorized ground-disturbing activities will be reviewed annually; if needed the BLM will adjust authorizations in order to meet resource objectives. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
GS-CSU-Roan-18: Sharrard Park Paleontological Resources, 1,020 acres	
Stipulation	**Standards**
CSU to protect 1,020 acres of the Sharrard Park paleontological resource. The BLM may require special survey, design, construction, operation, and reclamation measures, or relocation by more than 200 meters in identified portions of Wasatch Formation outcrops in Sharrard Park. Prior to any ground disturbing activity, the operator must have the paleontological resources surveyed within 200 feet of the proposed disturbance by a BLM approved paleontologist. Other special measures include requirements that (a) on-site personnel are informed of the potential for fossils, (b) the proponent will notify the BLM if any fossils are found, and (c) activities do not disturb fossils in any way.	1. Prior to implementing any ground-disturbing activity or other project component in the area covered by this stipulation, the proponent must provide an assessment of potential impacts to this resource value. The assessment will be based on current baseline data; the type, location, duration, and intensity of potential adverse effects; and mitigation measures proposed to avoid, minimize, or offset the adverse effects. The BLM will determine the level of protection available under this stipulation required to protect, preserve, and/or recover the fossil resources at specific sites or for specific activities within this area. The BLM determination will be based on site specific conditions and the type, amount, and duration of the associated impacts.

	2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be notified promptly, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through adaptive management to refine the project components and associated mitigation measures that will be applied to future proposed activities. 3. Ground-disturbing activities may be permitted without relocation by more than 200 meters if they will result in a limited surface disturbance area from which it can be demonstrated that no adverse impacts to the specifically protected resource would result. In situations where such a ground-disturbing activity is permitted, the activity would be subject to additional COAs and reclamation standards, criteria, plans, and practices detailed in Appendix I.
CRVFO-CSU-Roan 17: Lease Area Above the Rim, 4,640 acres	
A. No more than 7 well pads may be located on the Retained Leases; including pads drilled for either exploration or production activities. Subject to onsite inspection and approval by the BLM and other regulatory agencies, well pads shall be located approximately as depicted in the attached map. Exhibit 2.A. Each well pad may disturb no more than 10 acres of the surface when drilling operations are occurring, and may be limited to a smaller size if BLM determines 10 acres are not needed for projected drilling operations. Each well pad shall be limited to approximately 3 acres of unreclaimed surface during production. There shall be no more than four pads on the Retained Leases at any time that take up more than three acres each of un-reclaimed surface. Those four pads may take up to a total of approximately 40 acres of un-reclaimed surface, with drilling operations occurring on no more than two of the pads at any one time. For purposes of this requirement, surface is considered reclaimed if BLM determines that its interim reclamation requirements have been met. The Retained Leases are not required to be joined in a federal unit. B. Primary access shall be limited to designated roads approximately as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval. Operators may not use Cow Creek Road or the Rim Road east of the retained leases for access except in emergencies. For purposes of this requirement, an "emergency" means unforeseeable physical inaccessibility for other routes or an unforeseeable condition creating a significant risk of environmental harm or injury to persons. Limitations on contractual access from the south or west, or foreseeable delays in obtaining access for drilling, site preparation, completion activities, or regularly-scheduled maintenance and other activities, do not represent an emergency. Where an emergency situation exists, access for maintenance of on-going active drilling and completion operations, and service for existing production, is allowed. C. Pipeline and gathering line infrastructure, water lines, and utility lines, shall be collocated with designated access roads as depicted on the attached map, Exhibit 2.A., subject to BLM's onsite inspection and approval, and may depart from designated access roads if BLM determines that doing so reduces net	

disturbance or visual impacts. No less than 90 percent of the total pipeline length shall be collocated.

D. Prior to exploration and/or lease development on the Retained Leases, the operator must submit a proposed Master Development Plan ("MDP") identifying projected activity (including well locations, roads, pipelines, facilities and associated infrastructure) and appropriate monitoring and methodologies in conformance with the requirements of the resource management plan as adopted to incorporate the Settlement Alternative.

E. Prior to submitting the MDP, the operator shall consult with the Colorado Division of Parks and Wildlife and BLM to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's proposed MDP.

F. The following will be required in any approved MDP, and incorporated as conditions of approval for all drilling permits:

a. Road engineering standards to minimize disturbance associated with road improvements;

b. Requirements for removing unnecessary infrastructure as soon as feasible;

c. The required reclamation plan will include reclamation processes that can be reasonably expected to meet the 5 year reclamation standard within 3 growing seasons;

d. Closed-loop drilling systems and/or tanks shall be used instead of pits, except for pits used solely to store fresh water;

e. Telemetry for remote monitoring of producing wells;

f. Wellheads to be subject to appropriate measures for visual impact mitigation;

g. Conveyance by pipeline of drilling water, water used for hydraulic fracturing and completions, and flowback water, to minimize truck traffic;

h. Centralized water management during drilling, completion and production (e.g., not every location will have pits);

i. Recycling of water used during well completions, and recycling of produced water while well completion activities are in progress;

j. Conveyance by pipeline of produced water and condensate to centralized facilities to minimize truck traffic;

k. Utilize centralized compression, storage, separation and dehydration facilities;

l. No more than 3 centralized facilities will be constructed for all centralized

management purposes in Paragraphs F.h., F.j. and F.k., and those facilities will be located

on three of the potential locations indicated on the attached map, Exhibit 2.A.;

m. Disclosure of all chemicals used during drilling and production activities. Chemicals used during completion activities shall be disclosed pursuant to Colorado Oil and Gas Conservation Commission rules;

n. Tier III equivalent or lower emissions for drill rigs for all wells;

o. Vapor combustors or vapor recovery on all condensate tanks, water tanks and dehydrators, and no/low-bleed control valves on all facilities;

p. Reduced-emission ("green") completions, as defined by 40 C.F.R. § 60.5430; and

q. Utilize liquids lifting practices to limit venting, including plunger lifts or alternative technologies that are at least as effective in limiting venting.

G. Potential conditions of approval identified in the applicable record of decision replace those identified in the 2006 Proposed Resource Management Plan Amendment/Final Environmental Impact Statement and associated records of decision.

CRVFO-CSU-Roan 18: Lease Area Below the Rim, 14,260 acres

Prior to exploration and/or lease development on it Base Leases, an operator shall submit a proposed master development plan ("MDP") identifying its projected activities. Prior to submitting the MDP, an operator shall consult with the Colorado Division of Parks and Wildlife and Bureau of Land Management to develop terms that minimize impacts to wildlife and other resources. Agreed-upon terms shall be included in the operator's MDP.

Timing Limitation (TL) Stipulations

GS-TL-Roan-13: Big Game Winter Range, 31,410 acres

Stipulation	Standards
TL to protect and maintain physical and biological components important to deer and elk winter range (approximately 31,410 acres) and the obligate species, both on federal lands and across the landscape as a whole, as opportunities present. This includes reducing or eliminating stress induced impacts to deer and elk associated with human activity during critical winter months when animals are already stressed by environmental factors and concentrated on limited winter range. Surface disturbance and human activities that lessen the quality of the deer and elk winter range will not be allowed from December 1 to April 30. Ongoing drilling and other activities and operations will be designed and implemented such that the well bore is adequately secured and that all drilling and surface-disturbing operations cease by December 1 in important and critical deer and elk winter habitats. In the event of unforeseeable and unplanned events, extensions not exceeding two weeks in duration may be authorized to ensure safe shutdown of drilling operations, and conservation of mineral resources. Human activities including visitations for production activities and well monitoring from December 1 to April 30 will be designed and carried out to minimize impacts.	1. Site-specific ground-disturbing activity in big game winter range may be allowed between December 1 and April 30 if the BLM determines, following consultation with CPW, that the requested activity would not impair values associated with the quantity and quality of the winter range for the species of interest. In making this determination, the BLM will consider the following resource factors: minimization of the footprint of activities; fragmentation; impacts to winter range across the Planning Area as a whole; effectiveness of voluntary off-site mitigation of habitat with respect to quantity, quality, and duration of both the surface-disturbing activity and mitigation; the relative extent of available winter range; relationship to topography and vegetation screening; current baseline data; the type, location, duration, and intensity of potential adverse effects; mitigation and conservation measures to avoid, minimize, or offset the adverse effects; and other factors that may affect the winter range or cause winter range to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; in such cases approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this

This includes well monitoring through telemetry, scheduling of all nonemergency well maintenance activities outside the December 1 to April 30 timeframe, conducting unavoidable and necessary on-the ground visits between the hours of 10:00 a.m. and 3:00 p.m., and minimizing on-the-ground visitations.	stipulation, and (b) considers the above-mentioned resource factors. 2. The big game winter range TL may not apply, and the restriction may be considered to be met, if the BLM determines, following consultation with CPW, that animals are not using the habitat, are not likely to use the habitat in a particular season, and that activities will not lessen overall habitat quality in future years. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-14: Raptor Nest Sites, 2,300 acres	
Stipulation	**Standards**
TL to protect approximately 2,300 acres of nesting and fledging habitat for raptors not protected by species-specific measures. This includes owls, northern harriers, accipiters, buteos, golden eagle, osprey, and falcons except the American kestrel. Within a 0.25-mile radius of a nest, no activities or other sources of disturbance with the potential to cause the nest not to be used or lead to nest failure, abandonment, or mortality of fledglings will be allowed. Stipulations will be applied annually from February 1 through August 15.	1. Site-specific ground-disturbing activity near active raptor nest sites may be allowed between February 1 and August 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or

	extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-15: Bald Eagle Nest or Winter Roost Sites, 510 acres	
Stipulation	**Standards**
TL to protect approximately 510 acres of nesting, fledging, and winter roost habitat of the bald eagle. Within a 0.5-mile radius of a nest, no activities or other sources of disturbance that could cause the nest not to be used or lead to nest abandonment, failure, or mortality of fledglings will be allowed. Stipulations will be applied annually from November 15 through June 15.	1. Site-specific ground-disturbing activity at bald eagle nests or winter roost sites may be allowed between November15 and June 15 if the BLM determines, following Section 7 consultation with the USFWS that the requested activity would not impair values associated with maintenance or recovery of the species; behaviors associated with winter roosting, nesting, and fledging; or fledging habitat. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); the type, intensity, and duration of disturbance; measures required by the USFWS; potential for the activity to cause the roost or nest not to be used; potential for nest failure, abandonment of the roost or nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect roosting or nesting success. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for

	such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. This TL will be applied to wells that are drilled directionally from private surface into Federal minerals for the Federal lease being developed. Where the Federal lease does not include a relevant TL stipulation (and a nest or roost site falls within the identified buffer), BLM would not approve any permits for Federal wells or grant a right-of-way across BLM land unless the proponent has agreed to a voluntary TL (allowing a determination of "No Effect") or until Section 7 consultation on proposed action has been completed and any associated terms and conditions agreed to by the proponent. 3. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-16: Peregrine Falcon Cliff Nesting Complex, 130 acres	
Stipulation	**Standards**
TL to protect approximately 130 acres of nesting and fledging habitat of the State-listed threatened peregrine falcon. Within a 0.5-mile radius of the cliff-nesting complex on the Roan Cliffs, no activities or other sources of disturbance that could cause abandonment of a nest or established territory will be allowed. Stipulations will be applied annually, from March 15 through July 31.	1. Site-specific ground-disturbing activity at the peregrine falcon cliff-nesting complex may be allowed between March 15 and July 31 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount,

	intensity, and duration of the surface disturbance; the relative extent of available nesting and fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GS-TL-Roan-17: Waterfowl and Shorebird Nesting Areas, 90 acres	
Stipulation	**Standards**
TL to protect approximately 90 acres of nesting and brood-rearing habitats at the Fravert Reservoir Watchable Wildlife Area. No ground-disturbing activities or other sources of disturbance, from April 15 through July 15, or until all young have hatched and dispersed from the production area, or that could cause waterfowl and shorebirds not to nest or lead to nest failure or abandonment within 0.25- mile of the nesting and production area of Fravert Reservoir will be allowed.	1. Site-specific ground-disturbing activity at the Fravert Reservoir Watchable Wildlife Area may be allowed between April 15 and July 15 if the BLM determines, following consultation with CPW that the requested activity would not impair values, behaviors, or habitat associated with nesting and fledging. In making this determination, the BLM will consider the following resource factors: meteorological or ecological conditions during the period requested; the status of the nest (active or inactive); hatching and dispersal of young from the production or nesting area; potential to cause the nest not to be used or lead to nest failure, abandonment of the nest, or mortality of fledglings; behavioral and ecological requirements of the species; the type, amount, intensity, and duration of the surface disturbance; the relative extent of available nesting and

	fledgling habitat; relationship to topography and vegetation screening; current baseline data; the type, location, intensity, and duration of potential adverse effects; mitigation measures proposed to avoid, minimize, or offset the adverse effects; and other factors that may affect the species or cause habitat to become unusable. Approval of ground-disturbing activities granted in any given year will not constitute approval for subsequent years; approval for such activities must be granted (or extended) annually by the BLM. The proponent of any ground-disturbing activity must provide an assessment with their proposal that (a) documents anticipated compliance or non-impairment of resource values protected by this stipulation, and (b) considers the above-mentioned resource factors. 2. Prior to, during, and subsequent to the ground-disturbing activities covered by this provision, monitoring data will be collected by the proponent using widely accepted scientific methods as approved by and reported to the BLM not less often than annually. If unanticipated types or levels of adverse effects are noted during monitoring, the BLM must be promptly notified, and corrective measures, as approved by the BLM, will be identified and implemented by the proponent. This information will be used through an adaptive management process to refine the project components and associated mitigation measures that will be applied to future proposed activities.
GRSG-TL-46e: *No activity associated with construction, drilling, or completions within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).*	
Stipulation incorporates stipulation GRSG-TL-46e from the NCGSG Proposed LUPA/FEIS by reference.	
GRSG-TL-PHMA-ROW-TL: Prohibit surface occupancy and surface disturbing activities associated with BLM ROW permits within 4 miles from active leks during lekking, nesting, and early brood rearing (March 1- July 15).	
Stipulation incorporates stipulation GRSG-TL-PHMA-ROW-TL from the NCGSG Proposed LUPA/FEIS by reference.	

Appendix B. Descriptions of Surface-Use Stipulations Applicable to New Oil and Gas Leases Under Alternative IV, Settlement Alternative

CRVO-TL- Roan 1: Migratory Bird Nesting Season
Stipulation: Prohibit surface occupancy and surface-disturbing activities from May 15 to July 15. The stipulation would be applied based on biological surveys and species habitat preferences. **Purpose:** To protect use of nesting and fledgling habitat for birds of conservation concern (BCC). **Exception:** Standard exceptions apply. The application of the timing limitation would consider: the type of equipment to be used, the scale, and the duration of the project; species potentially present; habitat types present; breeding phenology; weather conditions; elevation; distance to known nests; and terrain.. **Modification:** Standard modifications apply. **Waiver:** Standard waivers apply.
CRVO-TL- Roan 3: Elk Production Area, 500 acres
Stipulation: Prohibit surface occupancy and surface disturbing activities from April 15 to June 30 in mapped elk production areas to reduce behavioral disruption during parturition and early young rearing period. This stipulation does not apply to operation and maintenance of production facilities. **Exception:** The Field Manager may grant an exception if an environmental analysis indicates that the proposed action can be conditioned so as not to interfere with habitat function or compromise animal condition within the project vicinity. An exception may also be granted if the proponent, Bureau of Land Management, and Colorado Division of Wildlife negotiate compensation that would satisfactorily offset anticipated impacts to big game production or habitat condition, or an agreement can be reached where by a COGCC wildlife mitigation plan can be accommodated consistent with established RMP objectives and decisions. An exception may also be granted for actions intended to enhance the long term utility for availability of suitable habitat. **Modification**: The Field Manager may modify the size and time frames of this stipulation if Colorado Division of Wildlife monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation. **Waiver**: This stipulation may be waived if Colorado Division of Wildlife determines that the area is no longer utilized by big game for production purposes.
CRVFO-TL-1: Salmonid and Native Non-Salmonid Fishes
Stipulation: Prohibit surface occupancy and surface-disturbing activities during species-specific spawning periods to reduce impacts to breeding adults, eggs, emerging larval fish, and avoid stream channel disturbances: Non-Special Status Species: • Rainbow trout: March 1 to June 15 • Brown trout: October 1 to May 1 • Brook trout: August 15 to May 1.

Special Status Species:

- Cutthroat trout: May 1 to September 1
- Bluehead sucker: May 1 to July 15
- Flannelmouth sucker: April 1 to July 1
- Roundtail chub: May 15 to July 15
- Mountain sucker: May 1 to July 15.

Purpose: To promote recruitment by protecting adult fish, redds (egg masses) in the gravel, and emerging fry during spawning periods.

Exception: Standard exceptions apply (Section B.3).

Modification: Standard modifications apply (Section B.3).

Waiver: Standard waivers apply (Section B.3).

Lease Notices (LN) Stipulations

GS-LN-Roan-14: Master Development Plan (MDP)

Stipulation	Standards
A MDP will be required of oil and gas operators prior to exploration or development activities.	1. For all activities in each of the geographic areas atop the plateau and in areas being actively explored or developed below the rim, the operator must submit a MDP. The MDP must include all anticipated activities for a minimum of 2 years following the date of submission, for all operator-controlled federal leases or units. A longer term is encouraged and would be allowed under this standard to expedite the permitting process, provide for efficiencies as provided for in Standard 6 of this stipulation, and reduce costs to the operator for MDP preparation. 2. The boundaries of the geographic areas to be addressed atop the plateau, as identified by the BLM, may be modified with approval from the BLM. The boundaries of all other geographic areas must be proposed by the operator and must be approved by the BLM. 3. The MDP must identify all anticipated exploration, development, and production activities on federal leases within the area, identifying well locations, roads, pipelines, and any other exploration or production disturbance or facilities.

	4. The MDP must include all specific measures needed to comply with standards associated with all stipulations and any other decisions of this RMPA. 5. The MDP must include an analysis of site-specific and cumulative environmental effects and mitigation. The MDP must also address reasonable alternatives, and other information sufficient to satisfy the requirements of the National Environmental Policy Act (NEPA). The extent of the analysis will be dependent on the extent of surface ownership, extent of lease holdings, topography, access, resource concerns, and the ability to tier to the Roan Plateau Environmental Impact Statement (EIS), consistent with 40 CFR § 1500. The extent of the analysis needed to comply with 40 CFR § 1500 may appropriately vary when considering individual wells or small groups of exploratory wells or for directional wells drilled on previously developed wellpads. 6. To the extent practicable, the activities identified in the MDP must be presented in such a manner as to support the orderly and efficient exploration and development of mineral resources in an environmentally responsible manner. 7. MDPs may be modified by operators as needed, and shall be reviewed by the operators not less than annually. As appropriate, either a statement documenting that the MDP is current or a modified MDP shall be provided to the BLM.
GS-LN-Roan-34: ESA Consultation	
Stipulation	**Standards**
Endangered Species Act, Section 7 Consultation Stipulation.	1. The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not

	approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 USC § 1531 et seq., including completion of any required procedure for conference or consultation.
GRSG PHMA LN-46e: Any lands leased in PHMA are subject to the restrictions of 1 disturbance per 640 acres calculated by CO management zone to allow clustered development.	
Stipulation currently under development as part of the NCGSG RMP/EIS process	
GRSG PHMA LN -54e: Within PHMA operators would be encouraged to complete Master Development Plans in consultation with the State of Colorado, instead of single well Applications for Permit to Drill for all exploratory wells.	
Stipulation currently under development as part of the NCGSG RMP/EIS process	
CRVFO-LN-Roan-35: Emergency Response Plan	
The operator is required to prepare and maintain a current emergency response plan. The plan shall be provided to the BLM, Colorado State Patrol, the affected county and communities, and the general public. The plan shall contain information sufficient to describe the potential for emergency incidents related to fluid minerals development that pose an immediate danger to human health and safety and would normally require immediate actions by the operator to remove the threat, such as for hazardous materials spills; actions to be taken by the operator in the event of such an incident; and a communications plan to inform appropriate authorities and potentially affected citizens.	

APPENDIX C

BEST MANAGEMENT PRACTICES

APPENDIX C: BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are innovative, dynamic, and economically feasible mitigation practices that are applied on a site-by-site basis to reduce, prevent, or avoid adverse environmental or social impacts of development activities (BLM 2004). A number of BLM BMPs for oil and gas development are incorporated into the general oil and gas development requirements in the Proposed Plan. These include minimizing the number of pads by utilizing multiple well designs and directional drilling, minimizing road footprints, utilizing centralized support facilities such as tank batteries, collocating utilities and pipelines in common corridors and aligning them along roadways, and implementing interim reclamation practices. The BMPs identified in this Appendix represent the kinds of activities which may be required; actual BMPs required during the permitting process to mitigate impacts may vary. BMPs and specific methodologies associated with them are expected to change over time to reflect the results of monitoring and ongoing adaptive management efforts. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments, but would likely be analyzed as part of the NEPA analysis associated with the permitting process. Monitoring and adaptive management practices will be used to refine and clarify needed practices consistent with the goals and objectives of this plan.

The following or similar BMPs will be applied to all long-term ground-disturbing activities, as appropriate to each site and activity. This list is not all inclusive, but is presented to aid the reader in understanding BMPs.

Physical Site Protection/Water Quality Controls

- Employ dust suppression to minimize impacts to air, water, vegetation, and wildlife.
- Install silt fences to protect riparian areas, wetlands, and open water.
- Use closed compressor buildings or mufflers to minimize noise.
- Install catalytic converters to minimize emissions.

Air Quality Protection

- Implement the Comprehensive Air Resource Protection Protocol (CARPP); as part of the CARPP, and in addition to the CARPP, the following may be applicable as needed:
    - Apply best available control technology to minimize air pollutant emissions in order to comply with applicable local, state and federal laws, statutes, regulations, standards and implementation plans.
    - Adaptively manage air quality through baseline assessment, continuous monitoring, re-evaluation, and adjustment as necessary.
    - Cooperate in an interagency process to conduct regional air quality modeling and develop a comprehensive strategy to protect regional air quality.
    - Utilize regional air modeling and project-specific modeling to develop air resource protection strategies.
    - Consider the following factors to identify pollutants of concerns and the appropriate level of air analysis, monitoring and reporting for a proposed activity: magnitude of potential air emissions; duration of proposed activity and phases; proximity to Class I areas, Sensitive

Class II areas, population centers, or other sensitive receptors; proximity to non-attainment or maintenance area; meteorological and geographic conditions; existing air quality data; intensity of existing and projected regional development; and issues identified during scoping.

- As an operator, conduct one year of pre-construction baseline air quality monitoring within or adjacent to a proposed development area during the year immediately preceding the proposed project submittal. This includes siting, installing, operating, and maintaining the required air quality monitors.
- As an operator, conduct air quality monitoring for the life of the development project.
- Publicly disclose air monitoring data.
- As an operator, conduct project-specific air quality modeling for the pollutant(s) of concern in the absence of sufficient data to ensure compliance with laws and regulations or to determine the effectiveness of mitigation options.
- Manage the timing, pace, place, density, and intensity of leasing and development to meet air quality goals.
- As an operator, provide an emissions inventory as part of an application for a permit to drill.
- As an operator, obtain an air permit from the Air Pollution Control Division for the site as a whole or cover individual equipment under one of Colorado's general permits for oil and gas operations.
- If a project may cause a significant adverse air quality impact or exceed an air quality standard, develop an emissions reduction plan.
- Respond to monitored exceedances of the National Ambient Air Quality Standards (NAAQS) by: reviewing the metadata for quality assurance and quality control (QA/QC) and meteorological data for exceptional atmospheric events; and, if validated, conducting a screening analysis to determine the likely cause, source, and origin. Consult with appropriate agencies, mitigate the exceedance(s) and enforce compliance with the NAAQS.
- Prepare and publish an annual air quality summary report.
- Post and enforce reduced speed limits to decrease fugitive dust from vehicular traffic on unpaved roads.
- Reduce unnecessary vehicle idling to reduce combustion emissions, ozone formation, visibility impacts, and fuel consumption.
- Surface or stabilize roads and disturbed areas where soils are susceptible to wind erosion.
- Restrict surface-disturbing activities to periods when wind speeds are less than 25 miles per hour.
- Keep soil moist while loading into trucks.
- Keep soil loads below the freeboard of trucks.
- Minimize drop heights when loaders dump soil into trucks.
- Tighten gate seals on trucks.
- Cover truck loads before traveling on public roads.
- Cover construction materials and stockpiled soils if sources of fugitive dust.
- Train workers to handle construction materials and debris to reduce fugitive emissions.
- Centralize or consolidate gas processing facilities, liquids gathering systems (condensate and produced water), and water and/or fracturing liquids delivery systems to reduce volatile organic compound (VOC) and greenhouse gas (GHG) emissions from individual dehydration/separator units and to reduce vehicle emissions.

- Utilize dust suppression techniques on unpaved surfaces to prevent fugitive dust from vehicular traffic, equipment operations, and wind. Dust suppression techniques may include watering, applying BLM-pre-approved chemical suppressants, and adding gravel, particularly during the construction and well development phases.
- Initially apply at least six inches of compacted gravel to upgraded roads.
- Reduce trucking and service traffic through car pools, innovative work schedules, and centralized collection facilities in order to minimize fugitive dust and tailpipe emissions.
- Improve engine technology (Tier 2 or better) for diesel drill rig engines, as well as all mobile and non-road diesel engines, to reduce nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO) and VOC emissions.
- With regard to drill rig, hydraulic fracturing, and completion-related engines, comply with EPA Non-Road Tier II Emissions Standards in order to achieve compliance with short-term nitrogen dioxide (NO_2) air quality standards.
- Instead of diesel engines, utilize natural-gas-fueled engines to reduce NO_x emissions and reduce the formation of visibility-impairing compounds and ozone.
- Utilize ultra-low-sulfur diesel (e.g., in engines, compressors, construction equipment) to reduce emissions of PM and sulfates.
- Utilize closed-loop drilling systems to reduce VOC and methane emissions.
- Implement directional and horizontal drilling to reduce construction-related emissions and surface disturbance, thereby minimizing the road network, as well as dust and emissions from truck traffic and construction activities.
- Utilize “green completions” when feasible.
- Utilize “green workovers” to reduce VOC and methane emissions.
- Utilize enclosed tanks instead of open top tanks or pits to reduce VOC and GHG emissions.
- Confine fracturing fluids and condensates to lined pits or tanks.
- Utilize and maintain proper hatches, seals, and valves to minimize VOC emissions.
- Replace wet compressor seals with dry seals or use mechanical seals to reduce gas venting and decrease power requirements. Utilize a degassing recovery system for centrifugal compressors with wet seals.
- Utilize electricity or renewable power sources (e.g., solar panels) for wellhead compressors, pumps, and monitoring equipment to reduce truck trips, engine emissions, methane emissions from gas pneumatic pumps, and local fossil fuel combustion emissions.
- Utilize compressed air or nitrogen instead of natural gas for engine starting to reduce methane and VOCs emissions.
- Frequently replace rod packing to reduce emissions.
- Ideally, utilize flareless technology to reduce VOC and methane emissions; if not feasible, flaring the natural gas is preferable to venting.
- Improve capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units.
- Replace intermittent or continuously burning flare pilots with electrical sparking flare ignition devices.
- Reduce miscellaneous fugitive VOC emissions by: installing plunger lift systems with smart automated control systems to reduce methane emissions from well blowdowns; installing and maintaining low VOC-emitting seals, valves, and hatches on production equipment; initiating an equipment leak detection and repair program (e.g., including FLIR infrared cameras, grab samples, organic vapor detection devices, and/or visual inspection); installing or converting

gas-operated pneumatic devices to electric, solar, or instrument (or compressed) air-driven devices/controllers; utilizing "low" or "no-bleed" gas-operated pneumatic devices/controllers; utilizing a closed-loop system or thermal combustion for gas-operated pneumatic pump emissions; installing or converting gas-operated pneumatic pumps to electric, solar, or instrument (or compressed) air-driven pumps; and installing vapor recovery units on truck loading/unloading operations at tanks.

- Optimize glycol circulation and install a flash tank separator to capture and recycle methane, thereby reducing VOCs and methane emissions.
- Install selective catalytic reduction systems to convert NO_x into nitrogen and water vapor.
- Improve capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion to reduce VOC, HAP, and GHG emissions.
- Utilize zero-emissions dehydrators or desiccants dehydrators to reduce VOC, HAP, and GHG emissions.
- Improve capture and control of produced water, crude oil, and condensate tank emissions to reduce VOC and GHG emissions.
- Utilize inert gases and pigs to purge pipelines rather than vent natural gas to the atmosphere.
- Install a dedicated vapor recovery system to recover gas from pipeline pigging operations.
- Where underground cast iron or unprotected steel distribution pipelines cannot be replaced with plastic pipe (e.g., bridge crossings), utilize flexible plastic insert liners.
- Replace burst plates with secondary relief valves to reduce emissions of methane, VOCs and HAPs.
- Install excess flow valves to minimize emissions.
- Utilize pressurized storage/transport of condensate to avoid venting methane, VOCs, and hazardous air pollutants (HAPs) to the atmosphere.
- During condensate loading, flare or recover the low-pressure gas in the natural gas liquids storage tank to avoid methane emissions.
- Utilize telemetry and automation of wellhead equipment to remotely control and monitor production thereby reducing vehicle traffic and associated emissions.
- Adhere to manufacturers' equipment operation and maintenance requirements.
- Track and record the utilization of hazardous chemicals.
- Regularly inspect and maintain wells and facilities, including pressure safety valves, excess flow valves, compressor stations, flowlines, gas processing plants and booster stations.
- Prior to reclamation, either adequately treat potentially hazardous materials to remain onsite or dispose of them at an approved disposal area.
- Reclaim disturbed areas as soon as possible.

Noise Management

- Apply best available control technology to minimize noise in order to comply with applicable local and state laws, statutes, regulations, standards and implementation plans.

- Implement and enforce the Colorado Oil and Gas Conservation Commission's (COGCC's) day and nighttime noise level standards.

- Manage the timing, pace, place, density, and intensity of leasing and development to manage noise.

- Centralize or consolidate well pads, facilities, and systems to reduce the amount of disturbance and overall area impacted by elevated noise levels.
- Design and locate disturbance activities to minimize noise impacts to wildlife, livestock and the public.
- Design wells, drill pads, compressors, roads, and facilities with auditory buffers or screens (topography, vegetation, distance).
- Design road networks and manage road use (through car pools, innovative work schedules, and centralized collection facilities) to minimize traffic and reduce noise.
- Prohibit the utilization of horns, bells, or other-noise-making devices other than for safety measures.
- Post and enforce "no jake brake zones."
- Reduce unnecessary vehicle idling to reduce noise.
- Monitor noise levels of drilling, cementing, and completion activities.
- Between a noise source and a receptor, construct engineered sound barriers (tightly-spaced wooden fences, concrete fences, earthen berms, walls, sheds).
- Utilize electric-powered equipment rather than diesel-powered equipment to reduce noise.
- Utilize drilling rigs with noise dampening equipment.
- Utilize pneumatic pumps that produce little or no noise.
- Utilize "green completions" when feasible to reduce noise levels.
- Utilize telemetry and automation of wellhead equipment to remotely control and monitor production thereby reducing vehicle traffic and associated noise.
- Install suitable mufflers on all internal combustion engines and certain compressor components.
- Decrease continuous noise levels by installing multi-cylinder pumps and hospital-grade mufflers, carefully selecting the placement of exhaust systems, enclosing engines, and installing additional muffler exhaust suppression.
- Install suitable mufflers or otherwise control exhaust noise from pump jacks and compressors in order to not exceed 49 dB at 30 feet from the source.
- Implement compressor and pump-jack noise abatement (hospital-grade mufflers, design retrofits on older equipment, equipment location, high-grade mufflers on exhausts, electric power rather than diesel, progressive cavity pumps or other quiet-running artificial lift equipment instead of conventional pump jacks, enclosures with insulation).
- Adhere to manufacturers' equipment operation and maintenance requirements to minimize noise.
- Install monitoring devices where compressors are built within ¼ mile of sensitive receptors.

- Apply buffers and abide by timing restrictions to reduce noise impacts on bald eagles, owls, raptors, sage grouse, and songbirds.

- Limit noise to less than 10 dB above ambient levels (typically 20 to 24 dB) from two hours before until two hours after sunrise at the perimeters of a sage grouse lek during the active lek season.

- Utilize noise shields when drilling during the lek, nesting, brood-rearing, and wintering seasons.

Soil Management

- Protect soils and native vegetation by minimizing their disturbance.

- Consider site-specific soil and vegetative characteristics and reclamation potential in a project design and layout. To reduce soil disturbance, consider mowing or brush beating of vegetation for parts of the well location or access road where excavation is not necessary.

- Consider topography and landforms when proposing surface disturbance. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Cluster surface disturbance (rights-of-way will be shared, structures and facilities will be grouped, etc.).

- Avoid disturbance in areas with erodible soils, steep slopes, fragile soil (areas with erodible soils and slopes greater than 30 percent), saline soil, rugged terrain, sparse vegetation, previous mass wasting and unstable geologic conditions prone to mass wasting. If unavoidable, create and get approval of a specific development plan (covering erosion control, GIS modeling, and engineered survey and design) to minimize erosion and maintain productivity.

- Avoid disturbance in areas with cut slope challenges, surface or subsurface water issues, inadequate fill material, or reclamation limitations (e.g., little to no topsoil, saline soils).

- Design and construct each oil and gas pad in the shape of a tear-drop to maximize interim reclamation and minimize bare soils. Cluster infrastructure appropriately on the pad to facilitate the smallest disturbance footprint.

- Post and enforce reduced speed limits to decrease erosion on unpaved roads. Restrict surface-disturbing activities to periods when wind speeds are less than 25 miles per hour.

- Drive only on established routes.

- Stabilize slopes with retaining structures (loose rock, gabions, reinforced concrete, piles, crib walls, soil nails, mechanically stabilized soil walls with facings of geotextile/welded wire/timber/concrete blocks, etc.), buttresses, brush layering and drainage.

- Where applicable, cover entrances to construction locations with gravel to prevent sediment and weed seeds from being tracked in and out.

- Follow the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (commonly referred to as "The Gold Book") when conducting surface-disturbing activities associated with the development of fluid minerals.

- Following the initial clearing of large trees and salvaging of certain vegetation, etc., include all growth medium present at a site in topsoil stripping, as indicated by color or texture. The stripping and storage depth may be specified during the onsite inspection. Salvage, segregate, and store all stripped topsoil/growth medium in a stable manner that extends biological viability and mitigates erosion. Replace topsoil and all growth medium prior to seedbed preparation.

- Segregate and store topsoil separate from subsurface materials. Segregate thin or rocky topsoil from other topsoil.

- Stockpile, shred, and salvage with topsoil the cleared vegetation smaller than four inches in diameter. Scatter cleared vegetation larger than four inches in diameter over disturbed areas. Excessive vegetation larger than four inches in diameter may be removed from public land or shredded in place to be salvaged with topsoil. A wood cutting permit may be purchased from the BLM to remove material.

- Avoid surface disturbance near drainages and saline soils; however, if surface disturbance in sensitive areas is unavoidable, the disturbance will be minimized to the greatest extent practicable.

- Strip and salvage topsoil to a minimum depth of six inches at disturbance sites. An exception to this practice will be in disturbance areas infested with noxious weeds or other undesirable plants species, where deep burial of the infested topsoil may be preferable.

- To ensure successful vegetative growth, salvage topsoil during construction and re-spread to the greatest degree practical on cut slopes, fill slopes, and borrow ditches prior to seeding. Consider applying weed-free mulch or other erosion control measures to increase surface roughness and decrease erosion. Only utilize mulch when its potential benefits exceed its inherent risk of introducing undesirable plant species.

- Conduct stripping in stages to avoid topsoil compaction, beginning with a leading edge and moving in one consistent direction for subsequent loads.

- Prohibit the placement of soil and other material within floodplains.

- Prohibit the stripping or segregating of topsoil when saturated or frozen below the stripping depth unless a Winter Construction Plan is submitted and approved by the BLM Authorized Officer, thereby authorizing a Notice to Proceed with construction activities in frozen soils.

- Stockpile topsoil where no vehicle traffic will cross topsoil mounds. Protect stockpiles from wind and water erosion through the use of suitable weed-free mulch, weed-free seeding with native species appropriate to the site's native plant community, and other measures as necessary. Only utilize mulch when its potential benefits exceed its inherent risk of introducing undesirable plant species.

- Ensure stockpiles have appropriate heights and slopes to prevent wind and water erosion.

- As topographically appropriate (not on steep slopes or on minimally sized pads), windrow topsoil around the perimeter of the surface disturbance area to create a berm (no higher than five feet) that extends the viability of the topsoil, as well as limits and redirects storm water runoff. Windrow, segregate, and store topsoil along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Promptly seed topsoil berms with native species appropriate to the site's native plant community to maintain soil microbial activity, reduce erosion, and minimize weed establishment.

- Compact fills to minimize subsidence or slope failure. If excess material is present after fill areas are at grade, stockpile the excess material at approved locations.

- Prohibit the placement of drill rigs, tanks, heater-treaters, and other production equipment on uncompacted fill material.

- Locate mud tanks, generators, mud storage, and fuel tanks in areas with a slight slope or utilize a suitable alternative, such as ditching, to provide surface drainage from the work area to the pit.

- Prohibit the utilization of snow or frozen soil in fill areas, dikes, or berms.

- With the exception of active work areas, stabilize (as approved by the BLM) disturbed soils that remain exposed, unprotected, or un-reclaimed for longer than one month. Soil stabilization may include seeding with native seed or application of a covering, such as mulch, matting or hydromulch. Utilize certified weed-free mulch, and apply it only to sites where its potential benefit outweighs its inherent risk of introducing undesirable plant species.

- Utilize erosion reduction techniques, such as silt fencing, diversion terraces, rip-rap, matting, biodegradable mulch/hydromulch/netting/soil stabilizers, sediment traps, and water bars.

- Implement mitigation measures for sedimentation, erosion, slippage, settlement, and subsidence on moderate to steep slopes that are disturbed.

- Design roads with gradients of eight percent or less (except for pitch grades no longer than 300 feet) to minimize erosion. Obtain approval for roads with gradients greater than eight percent but not exceeding 16 percent.

- Build and maintain all routes to BLM Manual Section 9113 standards for road shape and drainage features, BLM Manual Section 9112 standards for bridges and major culverts, or BLM Manual Section 9115 standards for primitive roads. For drainage crossings, size culverts for the 25-year storm event or greater without development of a static head at the pipe inlet. Install culverts of at least 24 inches in diameter and in the bottom and middle of the natural channel. Site-specific conditions may warrant the BLM to require designs for larger events (e.g., 75-to-100-year storm events). (Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year storm event per the U.S. Army Corps of Engineers [USACE].) On perennial and intermittent streams, design culverts to allow for passage of aquatic biota.

- In areas where all-weather access is necessary, construct and maintain routes per BLM Manual Section 9113 standards. Apply gravel or other appropriate surfacing material to reduce environmental resource damage and provide safe all-weather access on "soft" road sections, steep grades, erosive soils, and clay soils.

- Initially apply at least six inches of compacted gravel to upgraded roads.

- Utilize and consider upgrading existing roads when feasible to minimize disturbance. Consider following topographic contours when designing and constructing new roads to minimize soil erosion.

- Utilize specialized low-surface-impact equipment (wide- or balloon-tired vehicles, all-terrain vehicles) or helicopters for activities in off-road areas to protect fragile soils or other resource values.

- Confine or route drainage (with ditches, berms or waterbars above cut slopes) from disturbed areas in order to minimize erosion, particularly within 100 feet of a waterway. Route runoff, including that from roads, through a sediment-trapping mechanism (native vegetation, anchored weed-free bales, catchments, sediment fences) prior to discharging into a waterway.

- Extend culvert outlets at least one foot beyond the toe of any slope. Utilize culvert outlet erosion control techniques (e.g., properly sized rip-rap) to slow water velocity and prevent soil erosion.

- Regularly inspect and maintain roads (compaction, dust abatement, etc.) and road drainage features (ditches, drainage dips, ditch turnouts, culverts, inslopes, etc.).

- Halt construction activities when saturated soil conditions exist on access roads or on location, or when road rutting becomes deeper than six inches, until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations.

- Prohibit the placement of fill on a frozen foundation.

- Utilize closed-loop drilling systems or line reserve pits with impermeable liners (synthetic, bentonite, clay) to prevent soil contamination.

- Locate and construct reserve pits in cut material and outside of natural watercourses, avoiding areas with shallow groundwater or with porous soils over fractured bedrock aquifers. Install a leak detection system or utilize self-contained mud systems with drilling fluids, mud, and cuttings disposed at approved disposal areas.

- Return shot-hole cuttings to the hole, or submit an alternative plan to the BLM for approval.

- After cessation of drilling and completion operations, remove and properly dispose of any visible or measurable oil in the reserve pit.

- Design and construct secondary containment to hold 110% of the largest single tank capacity and to be impervious to oil, glycol, produced water or other toxic fluid for 72 hours. To prevent seepage of a spill, construct earthen berms with fine material and compact them.

- Design and construct secondary containment with a sturdy corrugated metal wall, heavy impervious poly liner, and gravel surface. Install small plastic hoppers at all loadout connections to catch drips and small leaks.

- On tanks with a capacity of ten barrels or greater, label or post signage with the name of the Operator; Operator's emergency contact telephone number; tank capacity; tank contents; and National Fire Protection Association (NFPA) label. For each container with a capacity of less than ten barrels, label its contents and ensure the appropriate NFPA label is also visible.

- Only utilize topsoil for reclamation, and not for fill or for pipe bedding/padding during backfilling.

- Prohibit the placement of topsoil when in a frozen or muddy condition, when the subgrade is excessively wet (i.e., equipment creates ruts greater than six inches), or when the condition may otherwise be detrimental to proper grading or proposed sodding or seeding.

- Utilize best available science and technology to protect natural resources from undue degradation during interim and final reclamation.

- Maintain healthy, biologically active topsoil through timely reclamation (temporary, interim, final), and by adequately segregating and stockpiling topsoil (designed to maximize surface area to minimize microbial impacts). Stockpiles remaining less than two years facilitate microbial survival and native seed viability.

- Reclaim disturbed areas as soon as possible. Promptly reapply topsoil, prepare a seedbed (to retain moisture and foster vegetative growth), apply weed-free native seed of species appropriate for the site's native plant community, and utilize weed-free mulch for erosion control and soil moisture retention at lower elevation sites. Utilize straw mulch only in areas where potential benefits outweigh the potential risks of introducing undesirable plant species.

- Regularly monitor and adaptively manage soil stabilization measures and revegetation.

- Test soil samples to determine reclamation potential.

- During reclamation, amend the topsoil as necessary to foster native vegetative growth, thereby providing soil stability.

- Store chemicals and hazardous materials in a manner that does not allow contact with soil or exposure to weather. Properly label all containers. Keep containers closed when not being utilized; provide secondary containment.

- Utilize bioremediation techniques (e.g., landspreading, in-situ biotreatment, landfarming, composition) to treat contaminated soil. Optimize soil conditions (pH, nutrients, moisture, aeration) for microorganisms.

- With regard to contaminated soil, either treat or remove to an appropriate disposal site.

Water Resource Management

- Avoid the alteration of natural hydrologic function and condition in source areas for springs, seeps, wetlands, or other water bodies by relocating surface-disturbing activities.

- Avoid soil compaction or surface-disturbing activities in recharge areas that could impair the natural function of springs or seeps.

- Document the baseline characteristics of a stream channel or wetland/riparian area prior to disturbance.

- Direct overflow from water developments to a natural drainage in a manner that does not facilitate erosion or modify riparian habitats.

- Time construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g., buried pipelines, culverts) to avoid high-flow conditions. When construction disturbs a flowing stream, utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

- Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year event per USACE.

- Bore/bury pipelines installed beneath stream crossings a minimum depth of four feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, return the channel grade and substrate composition to pre-construction conditions. Apply the minimum width for rights-of-way where pipelines cross streams or riparian areas.

- Prohibit the permanent impairment of floodplain function as a result of surface-disturbing activities.

- Maintain appropriate vegetative/riparian buffers (at least 325 to 500 feet) around water features to slow runoff, trap sediments and protect water quality.

- Manage and manipulate invasive stands of brush and weeds on forest, range, and pasture land by mechanical, chemical, or biological means or by prescribed burning to improve watershed function and condition.

- Limit consumptive water use from Federal point source water rights on public lands that are not sustainable and/or would jeopardize discharge to streams, springs, seeps, wetlands, or downstream senior water rights.

- Utilize/establish off-stream watering facilities when possible (e.g., stock tanks, stock ponds, nose pumps). Where feasible, place grazing stock tanks and other watering facilities at least 400 meters (¼ mile) from riparian zones.

- Exclude livestock and vehicles from spring sources and riparian areas where on-site evaluation and/or monitoring data indicate degrading conditions or potential to degrade spring or riparian function.

- Implement range improvements in conformance with BLM Manual H 1740-2 and subsequent updates.

- Provide livestock with feed, salt, molasses and other supplements on uplands at least 400 meters (¼ mile) from riparian and wetland areas and on gently sloping land to encourage cattle to graze the uplands and move out of riparian areas. Locate supplementation sites at least 800 meters (½ mile) apart. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)

- Limit surface disturbance near drainage features and minimize surface disturbance on steep slopes, fragile soils, saline soils, and Mancos-shale-derived soils.

- Consider topography and landforms when proposing surface disturbance. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Cluster surface disturbance (rights-of-way will be shared, structures and facilities will be grouped, etc.).

- Follow the "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (commonly referred to as "The Gold Book") when conducting surface-disturbing activities associated with the development of fluid minerals.

- Build and maintain all routes to BLM Manual Section 9113 standards for road shape and drainage features, BLM Manual Section 9112 standards for bridges and major culverts, or BLM Manual Section 9115 standards for primitive roads. For drainage crossings, size culverts for the 25-year storm event or greater without development of a static head at the pipe inlet. Install culverts of at least 24 inches in diameter and in the bottom and middle of the natural channel. Site-specific conditions may warrant the BLM to require designs for larger events (e.g., 75-to-100-year storm events). (Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year storm event per the U.S. Army Corps of Engineers [USACE].) On perennial and intermittent streams, design culverts to allow for passage of aquatic biota.

- When designing protective/mitigative measures, consider the changes that may occur in the watershed hydrology and sedimentation over the design life of the measure. Moreover, design and construct roads that are self-maintaining and consider using road surfacing, such as gravel, when year-long access may be necessary.

- Initially apply at least six inches of compacted gravel to upgraded roads.

- Avoid cutting the toe of cut slopes when grading roads or pulling ditches.

- Grade road surfaces only as often as necessary to maintain a stable running surface and to retain the original surface drainage.

- Design and construct surface pipelines at drainage crossings at an adequate height above possible flood levels. Bore/bury pipeline crossings below the surface deep enough to remain undisturbed by scour and fill processes typically associated with peak flows. Complete a hydraulic analysis during the pipeline design phase to avoid repeated maintenance of such a crossing and eliminate costly repairs and potential environmental degradation associated with pipeline breaks at stream crossings. Utilize horizontal directional boring techniques below perennial water bodies and/or wetland complexes when environmental circumstances allow.

- X-ray pipeline welds within 100 feet of a perennial stream to prevent leakage into the stream. Where pipelines cross streams that support Federal or State-listed threatened or endangered species or BLM-listed sensitive species, utilize additional safeguards (such as double-walled pipe, and remotely-actuated block or check valves) on both sides of the stream.

- Prior to surface disturbance at a pad, access road, or facility, have an approved surface drainage plan with minimal clearing and grading, protection of waterways, phased activities to limit soil exposure, immediate stabilization of exposed soils, protection of steep slopes and cuts, installation of perimeter control to filter sediments, advanced sediment settling controls, contractor certification and training, site waste control, and inspection and maintenance of adaptive BMPs (e.g., run-on/run-off controls, such as surface pocking or re-vegetation, ditches or berms, and basins). Install pre-construction drainage BMPs as appropriate.

- Minimize crossing streams and wetlands/riparian areas with vehicles, heavy machinery and facilities.

- When activity in streams, wetlands, or riparian areas is unavoidable, first employ best available technology, such as eco-matting, to reduce impacts. Then restore modified or damaged areas as close as practicable to natural conditions to protect banks and wetlands, as well as to re-establish native riparian vegetation.

- Subject to BLM approval, professionally engineer (design, construct, and maintain) stream crossings affecting perennial streams or streams supporting riparian habitat.

- Avoid the placement of roads or facilities immediately adjacent and/or parallel to streams. If unavoidable, design and construct crossings perpendicular to streams in straight sections of stable reaches to handle (at a minimum) the 25-year flood and allow aquatic organism passage, and have the route immediately exit the riparian buffer zone.

- Maintain to the greatest extent practicable natural flow rates and chemical and physical properties of surface and groundwater during work within stream channels, floodplains, and/or riparian areas.

- Utilize low-water crossings where an access road crosses a small drainage or intermittent stream not requiring a culvert. Dip the road to the original streambed elevation of the drainage, and prevent blockage or restriction of the existing channel. Stockpile material moved from the banks of the crossing nearby for later use in reclamation. Gravel, riprap, or concrete bottoms may be required.

- Conduct activities in wetlands and watercourses during low-flow or no-flow conditions (e.g., prior to spring runoff or during late summer/early fall) and in a manner consistent with BMPs for biological resources. Note that high flows occur during late summer/ early fall as a result of high-intensity convective thunderstorm events.

- Armor low-water stream crossings, place properly sized culverts, and span streams as appropriate to protect riparian areas.

- Place energy dissipaters (e.g., rock piles and logs) where necessary at the downstream end of ditch relief culverts to reduce erosion and sedimentation.

- Regularly inspect and maintain drainage features. Keep road inlet and outlet ditches, catchments, and culverts free of obstructions, clean dips and cross-drains, repair ditches, and mark the location of culvert inlets, particularly before and during spring runoff. Minimize routine machine-cleaning of ditches during wet weather. Leave disturbed areas in a condition that provides drainage with no additional maintenance.

- Remove and reclaim temporary stream crossings immediately after utilization. Install cross-ditches at the ends of routes or rights-of-way to mitigate erosion/sedimentation from disturbed areas.

- Locate residue piles (e.g., sawdust, field chipping residue, disposal ponds) away from drainages where runoff may wash residue into water bodies or wetlands.

- Within 200 feet of a water body, prohibit activities using chemical processes (except for vegetation management) or pollutants. This includes equipment maintenance and the use of staging equipment for refueling. Prohibit the placement of staging areas for refueling, maintenance equipment, materials, operating supplies, and well borings in wetland/riparian areas.

- Confine or route drainage (with ditches, berms or waterbars above cut slopes) from disturbed areas in order to minimize erosion, particularly within 100 feet of a waterway. Route runoff, including that from roads, through a sediment-trapping mechanism (native vegetation, anchored weed-free bales, catchments, sediment fences) prior to discharging into a waterway.

- Avoid water courses when locating pipelines and flowlines; utilize road corridors wherever possible to minimize surface disturbance and provide better leak detection and access for installation and repair activities.

- Prohibit the pipeline construction from blocking, damming, or changing the natural course of a drainage.

- Test pipelines and flowlines for leak before backfilling trenches. Compact pipeline trenches during backfilling. Regrade cut-and-fill slopes to conform to adjacent terrain, and reclaim them.

- Avoid placing well pads near 100-year floodplains.

- Reduce the potential of water resource contamination where the environmental risk of a drilling fluid spill is heightened. Areas of heightened environmental risk include a ¼-mile buffer around the following: mapped alluvial, colluvial, and glacial deposits; springs and perennial water sources; Source Water Protection Areas, and Municipal Watersheds. In these areas, conduct the following:

  - Utilize closed-loop drilling systems;
  - Utilize gas-blocker additives during the cementing process;
  - Store flowback and stimulation fluids in tanks on the well pad with secondary containment;
  - Install secondary containment beneath and around crude oil, condensate and produced water storage tanks;
  - Collect baseline water quality data from downstream fresh water sources prior to drilling or the storage of potentially harmful substances (Parameters to be analyzed will be determined on a site-specific basis. A list of parameters will be submitted to and approved by the BLM prior to sampling.);
  - Identify potentially impacted Public Water Systems within 15 miles downstream;
  - Develop and submit to the BLM an emergency spill and response program, which requires approval prior to surface-disturbing activities.

- Locate and construct reserve pits in cut material and outside of natural watercourses, avoiding areas with shallow groundwater or with porous soils over fractured bedrock aquifers. Install a leak detection system or utilize self-contained mud systems with drilling fluids, mud, and cuttings disposed at approved disposal areas.

- When constructing dikes for pits or impoundments with fill embankment, excavate a keyway or core trench to a minimum depth of two to three feet below the original ground level. Then construct the core of with compacted, water-impervious material.

- Locate mud tanks, generators, mud storage, and fuel tanks in areas with a slight slope or utilize a suitable alternative, such as ditching, to provide surface drainage from the work area to the pit.

- Within portions of municipal watersheds and source water protection areas available for fluid minerals development, develop and implement a watershed protection plan that includes characterization and monitoring of baseline hydrologic/hydrogeologic conditions (such as, but not limited to, water quality, water quantity, groundwater flow patterns, connectivity between geologic formations, and communication between surface and ground water). Collaborate with all watershed stakeholders regarding the development and implementation of the watershed protection plan.

- When conducting oil and gas drilling operations within municipal watersheds, source water protection areas, or locally important fresh water aquifers, utilize methods and materials to prevent the degradation of underlying groundwater. This may include practices such as surface and intermediate casing through potential fresh water zones, gas blocker additives in cement, green fracturing fluids, and closed-loop drilling. Document the utilization of "green" fracturing fluids in the form of Material Safety Data Sheets (MSDSs) to be reviewed by the operator for compliance prior to use. Keep the MSDSs on-site at all times such chemicals are present.

- Utilize anti-backflow devices when drafting fresh water from streams, springs, reservoirs and wells.

- Prohibit the utilization of hazardous substances in drilling, testing, or completion operations, as well as in the reserve or cuttings pit. Confine fluids to pits or tanks. Pits that may contain liquids will be lined to protect groundwater. Liners will be maintained in good condition, with no tears or holes, until they are removed when the reserve pit is closed.

- Substitute less toxic, yet equally effective products, for conventional drilling products.

- Design and construct pits to eliminate drainage into them. Maintain fluid levels at least two feet below the lowest point of containment.

- Subject to BLM approval, dispose of produced water by subsurface injection, pits, surface discharge into channels or impoundments or other methods, including beneficial use, in accordance with the requirements of Onshore Order No. 7, Disposal of Produced Water, and other Federal and State regulations.

- At pits, water impoundments, and surface discharges that present a potential hazards to humans, livestock, wildlife and other resources, install appropriate mitigation, such as fencing, netting, caging, or covers.

- Prohibit shot-hole seismic testing near aquatic habitats.

- Dispose of spoil material from clearing, grubbing, and channel excavation in a manner that will not interfere with the function of the channel and in accordance with all local, state, and federal laws and regulations. Prohibit the casting of fill material over hilltops and into drainages.

- Locate stockpiles outside of active floodplains.

- Prohibit concentrated flows of surface water (natural drainage ways, graded swales, downspouts) on the face of cut or fill slopes.

- Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet conditions.

- With regard to the discharge of surface and ground water to surface drainages, comply with the Federal Water Pollution Control Act (as amended through P.L. 107–303, November 27, 2002), obtain a pre-approval by the BLM, and meet the following criteria:

  - Discharge operations will not negatively impact downstream beneficial uses;
  - Discharge soil/water interactions will not facilitate the mobilization of water quality contaminants (e.g., salt, selenium [typically associated with Mancos-shale-derived soils], sediment, metals) above natural rates in surface and/or ground water;
  - Discharge will be limited to well-defined major channels (away from major erosional features), to reduce the potential of discharged water dissolving and transporting salts from the stream channel and to reduce the concentration of salts in alluvium;
  - Discharge will be limited to a volume no greater than the naturally occurring mean annual peak flow (which is roughly equivalent to a two-year, 24-hour storm peak) conveyed by the natural channel under anticipated conditions;
  - Discharge points will be located in stable channels or reservoirs away from any downstream head-cuts or other major erosional features as determined by the BLM (The outfall design may include discharge aprons and downstream stabilization of channel side slopes to prevent erosion and provide energy dissipation.);
  - Subject to BLM approval, establish and monitor water-quality thresholds for both surface and ground water during discharge operations and cease operations if thresholds are exceeded;
  - Monitor surface- and ground-water quantity and quality during discharge operations and for at least two years following the cessation of discharge operations (The monitoring locations will be subject to BLM approval.).

- Prohibit the utilization of subsurface explosives and vibrosis buggies within 0.25 miles of all spring sources and perennial streams.

Riparian and Wetland Habitats Management

- Minimize surface disturbance in areas prone to flooding and near wetland edges, lowland bottoms, drainages, open water, wetlands, riparian areas, and sensitive habitats.

- Establish staging, refueling, and storage areas outside of areas prone to flooding, wetland edges, lowland bottoms, drainages, open water, wetlands, riparian areas, and sensitive habitats.

- Mitigate activities that degrade wetlands or riparian areas.

- Avoid the alteration of natural hydrologic function and condition in source areas for springs, seeps, wetlands, or other water bodies by relocating surface-disturbing activities.

- Conduct activities in wetlands and watercourses during low-flow or no-flow conditions (e.g., prior to spring runoff or during late summer/early fall) and in a manner consistent with BMPs for biological resources. Note that high flows occur during late summer/ early fall as a result of high-intensity convective thunderstorm events. Particularly in cold-water systems, maintain a minimum flow.

- Avoid soil compaction or surface-disturbing activities in recharge areas that could impair the natural function of springs or seeps.

- Manage vegetation in riparian areas to provide wildlife habitat, adequate shade, sediment control, bank stability, and recruitment of wood into stream channels.

- Restrict disturbance of riparian habitat within ½ mile of owl and bald eagle habitat.

- Phase the size and timing of vegetation removal treatments within riparian areas to reduce soil and water temperatures, maintain bank and soil stability, and retain adequate wildlife habitat for cover and nesting.

- Phase the size and timing of vegetation removal treatments on uplands immediately adjacent to riparian areas, and buffer treatment boundaries away from riparian areas to reduce sedimentation and erosion in riparian zones. Allow for at least one year between vegetation removal treatments in uplands and in riparian/wetland areas.

- Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States.

- Maintain appropriate vegetative/riparian buffers (at least 325 to 500 feet) around water features to slow runoff, trap sediments and protect water quality.

- Document the baseline characteristics of a stream channel or wetland/riparian area prior to disturbance.

- Prohibit disturbance in areas adjacent to streams containing Colorado River cutthroat trout.

- Avoid riparian areas and wetlands when designing and constructing roads and trails (off-highway vehicle, horse, bicycle, hiking). If unavoidable, the roads and trails will be designed and constructed in accordance with "Managing Degraded Off-Highway Vehicle Trails in Wet, Unstable, and Sensitive Environments".

- Direct overflow from water developments to a natural drainage in a manner that does not facilitate erosion or modify riparian habitats.

- Utilize low-stress methods of stockmanship (e.g., herding, movements between pastures) to encourage cattle grazing away from riparian areas. Turn cattle out away from riparian areas when entering new pastures or allotments. Also guide cattle to appropriate bedding areas.

- Utilize/establish off-stream watering facilities when possible (e.g., stock tanks, stock ponds, nose pumps). Where feasible, place grazing stock tanks and other watering facilities at least 400 meters (¼ mile) from riparian zones.

- Cull individually identified cattle from the herd that congregate or preferentially graze a riparian area for extended periods of time.

- Avoid late summer or early fall grazing in areas with declining willow populations. If grazing during these time periods must occur, allow for at least one full year between grazing rotations.

- Utilize riparian pastures as appropriate to manage grazing activities in riparian areas by varying the timing, duration, and frequency of riparian pasture grazing. Actively move cattle to and from riparian pastures or pastures containing riparian habitat. Do not allow cattle to drift between pastures.

- Exclude livestock and vehicles from spring sources and riparian areas where on-site evaluation and/or monitoring data indicate degrading conditions or potential to degrade spring or riparian function.

- Prohibit the placement of fences on the immediate edge of riparian areas. Place fences away from riparian/wetland areas to decrease impacts of trailing along fences.

- Provide livestock with feed, salt, molasses and other supplements on uplands at least 400 meters (¼ mile) from riparian and wetland areas and on gently sloping land to encourage cattle to graze the uplands and move out of riparian areas. Locate supplementation sites at least 800 meters (½ mile) apart. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)

- Minimize crossing streams and wetlands/riparian areas with vehicles, heavy machinery and facilities.

- Install bridges and culverts in accordance with BLM Manual Section 9112.

- Due to the flashy nature of area drainages and anticipated culvert maintenance, design drainage crossings for the 100-year event per the USACE.

- Bore/bury pipeline crossings below the surface deep enough to remain undisturbed by scour and fill processes typically associated with peak flows. Apply the minimum width for rights-of-way where pipelines cross streams or riparian areas.

- When activity in streams, wetlands, or riparian areas is unavoidable, first employ best available technology, such as eco-matting, to reduce impacts. Then restore modified or damaged areas as close as practicable to natural conditions to protect banks and wetlands, as well as to re-establish native riparian vegetation.

- Subject to BLM approval, professionally engineer (design, construct, and maintain) stream crossings affecting perennial streams or streams supporting riparian habitat.

- Avoid the placement of roads or facilities immediately adjacent and/or parallel to streams. If unavoidable, design and construct crossings perpendicular to streams in straight sections of stable reaches to handle (at a minimum) the 25-year flood and allow aquatic organism passage, and have the route immediately exit the riparian buffer zone.

- Avoid stripping riparian canopy or stream bank vegetation. Crush or shear streamside woody vegetation rather than completely removing it.

- Segregate hydric topsoil from spoil.

- Maintain to the greatest extent practicable natural flow rates and chemical and physical properties of surface and groundwater during work within stream channels, floodplains, and/or riparian areas.

- Armor low-water stream crossings, place properly sized culverts, and span streams as appropriate to protect riparian areas.

- Within 200 feet of a water body, prohibit activities using chemical processes (except for vegetation management) or pollutants. This includes equipment maintenance and the use of staging equipment for refueling. Prohibit the placement of staging areas for refueling, maintenance equipment, materials, operating supplies, and well borings in wetland/riparian areas.

- On stream banks (lotic areas), maintain a minimum six-inch stubble height for the key specie(s) of the riparian area by the end of October or the winter grazing rotation. If the riparian system stability is dependent upon key riparian grasses and forbs, maintain an adequate stubble height to dissipate energy from spring runoff.

- In wet meadows (lentic areas), maintain a minimum four-inch stubble height for the key specie(s) of the riparian area by the end of October.

- Avoid placing well pads near 100-year floodplains.

- Prohibit shot-hole seismic testing near aquatic habitats.

- Locate residue piles (e.g., sawdust, field chipping residue, disposal ponds) away from drainages where runoff may wash residue into water bodies or wetlands.

- Relocate existing roads away from riparian areas as feasible during the requested permitting or authorization of routes. Reclaim abandoned portions of relocated roads back to natural conditions. Recontour routes to natural slopes as feasible, rip compacted soils (except for in close proximity to desirable trees), and seed disturbed areas.

- Regularly monitor seeps and springs near disturbance areas.

- Regularly monitor erosion, degradation and riparian health.

Reclamation

The objectives of temporary or interim reclamation are to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize loss of habitat, forage, and visual resources.

The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, standards will be enforced to meet objectives for site stability, visual quality, hydrological function, and vegetative productivity.

- Maintain healthy, biologically active topsoil through timely reclamation (temporary, interim, final), and by adequately segregating and stockpiling topsoil (designed to maximize surface area to minimize microbial impacts). Stockpiles remaining less than two years facilitate microbial survival and native seed viability.

- As topographically appropriate (not on steep slopes or on minimally sized pads), windrow topsoil around the perimeter of the surface disturbance area to create a berm (no higher than five feet) that extends the viability of the topsoil, as well as limits and redirects storm water runoff. Topsoil will also be windrowed, segregated, and stored along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Topsoil berms will be promptly seeded with native species to maintain soil microbial activity, reduce erosion, and minimize weed establishment.

- Implement dust abatement measures during reclamation.

- Reclaim disturbed areas as soon as possible. Promptly reapply topsoil, prepare a seedbed (to retain moisture and foster vegetative growth), apply native weed-free seed of species appropriate for the site's native plant community, and utilize weed-free mulch for erosion control and soil moisture retention at lower elevation sites. Utilize straw mulch only in areas where potential benefits outweigh the potential risks of introducing undesirable plant species.

- Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site-specific soil evaluation, including depth, chemical and physical characteristics. Identify stockpiles with appropriate signage.

- Seed soils to be stored more than one growing season with native weed-free seed of species appropriate for the site's native plant community.

- Protect salvaged soil from erosion, degradation and contamination.

- Prior to reclamation, either adequately treat potentially hazardous materials to remain onsite or dispose of them at an approved disposal area.

- Only utilize topsoil for reclamation, and not for fill or for pipe bedding/padding during backfilling.

- Recontour cut-and-fill slopes to the approximate original contour or consistent with the adjacent topography to maintain the approximate drainage pattern, profile, and dimension of nearby stable naturally functioning drainages.

- Thin and feather existing vegetation in areas where dense vegetation has been removed, and salvage/redistribute cleared trees, debris, and rock over recontoured cut-and-fill slopes or along linear features to: help mitigate the contrast of recontoured slopes; emulate the color, texture, and form of the natural landscape; and foster microclimates that encourage vegetative growth. Material should be placed so that it appears to be naturally deposited.

- Reduce compaction (e.g., ripping) prior to redistributing topsoil.
- Prohibit the placement of topsoil when in a frozen or muddy condition, when the subgrade is excessively wet (i.e., equipment creates ruts greater than six inches), or when the condition may otherwise be detrimental to proper grading or proposed sodding or seeding.
- Test soil samples to determine reclamation potential.
- During reclamation, amend the topsoil as necessary to foster vegetative growth, thereby providing soil stability.
- Redistribute soil materials in a manner that resembles the predisturbance soil profile.
- Prepare a seedbed to provide suitable surface and subsurface physical, chemical and biological properties to support the long-term establishment and viability of the desired plant community.
- Apply BLM-approved native weed-free seed of species appropriate for the site's native plant community.
- Protect the seed and seedling establishment by managing weeds, restricting livestock and wildlife activities through grazing management or fencing/cattleguards/gates, and restricting human activities.
- Minimize erosion and sedimentation on or adjacent to the reclaimed area by: minimizing surface disturbance; minimizing the duration of bare soils; surface roughening for moisture retention; applying mulch; revegetating; constructing/installing water bars/dips, mats/blankets, check dams, sediment basins, silt fences, etc.; and/or phasing reclamation.
- Regularly monitor reclamation success utilizing standard quantitative vegetation sampling protocols, with an adequate sample size to accurately assess plant cover by species across the site.
- Remove temporary BMPs once site stabilization and reclamation efforts have been deemed successful by the BLM.
- Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Realize that seeding or planting native plants may need to be repeated until deemed successful.
- Develop vegetation objectives that include desired plant composition, canopy and ground cover prior to conducting vegetation treatments or revegetation efforts.
- Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).
- Close and rehabilitate roads quickly when they are no longer needed.
- Build roads to the appropriate standard, no higher than necessary for use and safety, and utilize primitive or two-track roads rather than constructing new roads where feasible.
- Pipelines (and electrical power lines when possible) shall be placed within road corridors to minimize disturbance.
- Minimize disturbance to soil and native vegetation as much as possible.

- Stockpile topsoil for use in final reclamation. Topsoil shall be stored separately from other fill materials.

- When timely natural regeneration of the native plant community is not likely to occur, carefully select species that will not compete with or exclude native botanical resources for revegetation efforts. Bare sites shall be seeded as soon as appropriate to prevent establishment of undesirable plant species.

- Utilize appropriate sagebrush species/subspecies and important understory plants relative to site potential in seedings.

- Ensure that seed used for revegetation as well as straw and hay bales used for erosion control are certified free of noxious weeds.

- Monitor the long-term success of revegetation efforts (according to the Reclamation Plan or Vegetation Objectives of the vegetation treatment plan) to ensure successful establishment of desired species and detect any noxious weed infestations. If revegetation is unsuccessful, continue efforts to establish desired species in disturbed sites.

- In Salt Desert Shrub communities with biological soil crusts, require reclamation that includes, but is not limited to: broadcasting bacterial inoculants, planting native grass, forbs, and shrub seedlings, and installing exclosure fences.

- Road and pipeline reclamation, including seedbed prep and seeding of temporarily disturbed areas will be completed within 30 days following completion of construction.

- In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plats, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.

- Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines, and of topsoil piles and berms, shall be completed within 30 days following completion of construction. Any such area on which construction is completed prior to December 1 shall be seeded during the remainder of the early winter season instead of during the following spring, unless BLM approves otherwise based on weather. If road or pipeline construction occurs discontinuously (e.g., new segments installed as new pads are built) or continuously but with a total duration greater than 30 days, reclamation, including seeding, shall be phased such that no portion of the temporarily disturbed area remains in an unreclaimed condition for longer than 30 days. BLM may authorize deviation from this requirement based on the season and the amount of work remaining on the entirety of the road or pipeline when the 30-day period has expired.

- All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability.

- If requested by the project lead NRS for a specific pad or group of pads, the operator shall contact the NRS by telephone or email approximately 72 hours before reclamation and reseeding begin. This will allow the NRS to schedule a pre-reclamation field visit if needed to ensure that all parties are in agreement and provide time for adjustments to the plan before work is initiated.

- For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

- Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding, and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.

- Interim reclamation includes recontouring and revegetating the entire portion of the disturbed area except that part of the well pad needed for production activities.

- It will be completed within six months following completion of the last well planned for the pad or after a year has passed with no new wells drilled on the pad. All areas unnecessary to production activities will be revegetated, including the area within the remaining rig anchors. In special cases, an exception to this will be requested.

- Before interim reclamation is scheduled, the operator will meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to it.

- All parts of the area unnecessary for long-term operations will be reshaped to blend with natural topography, covered evenly with topsoil and a seedbed prepared.

- For cut-and-fill slopes, initial reclamation will typically consist of moving fill material back into cuts, back-filling and reshaping to achieve the configuration specified in the reclamation plan. Compacted areas will be well ripped in two passes at perpendicular directions. In fragile or loose soils, compaction techniques such as tread-walking may be necessary to prevent high erosion hazard. Topographic contours will be reshaped to blend with natural topography. These may include berms and swales to manage water drainage, support revegetation, mitigate visual impacts and maximize natural appearances.

- Seedbed Preparation. Good seedbed preparation is key to soil stabilization, moisture infiltration, and improving the chances for revegetation success.

- Following contouring, backfilled or ripped surfaces will be covered evenly with topsoil.

- Within 24 hours of broadcast seeding, the spread topsoil will be roughened by a method such as pitting, raking or harrowing before seeding, to break up any crust that has formed and ensure good seed-to-soil contact.

- To control erosion and enhance vegetative establishment on slopes steeper than 3:1, or to create a more natural looking landscape in areas of visual sensitivity, or if directed by the BLM, the operator shall implement measures following seedbed preparation (when broadcast-seeding or hydroseeding is to be used) to create small depressions to enhance capture of moisture and establishment of seeded species. Depressions shall be no deeper than 1 to 2 inches and shall not result in piles or mounds of displaced soil. Excavated depressions shall not be used unless approved by the BLM for the purpose of erosion control on slopes. Where excavated depressions are approved by the BLM, the excavated soil shall be placed only on the downslope side of the depression.

- Requests to use soil amendments, including fertilizer and soil conditioners, will be submitted to the BLM for approval. Submittal will include basic information on the amendment and the purpose of its use.

- If directed by the BLM, the operator shall conduct soil testing prior to reseeding to identify if and what type of soil amendments may be required to enhance revegetation success. At a minimum, the soil tests shall include texture, pH, organic matter, sodium adsorption ratio (SAR), cation exchange capacity (CEC), alkalinity/salinity, and basic nutrients (nitrogen, phosphorus, potassium [NPK]). Depending on the outcome of the soil testing, the BLM may require the operator to submit a plan for soil amendment. Any requests to use soil amendments not directed by the BLM shall be submitted to the CRVFO for approval.

- Seed Mixes. Seed mixes will typically consist of native, early-succession species, or species with the ability to establish quickly in disturbed soil areas. Non-native species shall not be used, except under rare circumstances and with prior written approval from the BLM.

- Seed mix composition will be calculated based on the number of Pure Live Seed per pound rather than percentage by weight. Seeding rate in pounds per acre will be based on the total number of Pure Live Seeds per square foot.

- Weed free seed will be used. It will contain no prohibited or restricted noxious weed seeds and no more than 0.5 percent by weight of any other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. To maintain quality, purity, germination, and yield, only tested, certified seed for the current year, with a minimum germination rate of 80 percent and a minimum purity of 90 percent will be used unless otherwise approved by BLM in advance of purchase. Seed shall be viability-tested in accordance with State law(s) and within nine months before purchase.

- Seed mixes for temporary use must contain only native species, except under rare circumstance and with prior written approval from the BLM.

- For private surfaces, the operator shall use a BLM-approved native seed mix unless specified otherwise by the private landowner.

- Seed tags or other official documentation of the seed mix will be supplied to the BLM for approval at least 14 days before the date of proposed seeding. Seed that does not meet the above criteria will not be applied to public lands. A Sundry Notice describing the completed work, the weed-free certification, and the seed tag(s) will be submitted BLM within 30 days after seeding.

Seeding Procedures:

- Seeding will be conducted no more than 24 hours following completion of final seedbed preparation (see Seedbed Prep).

- Where practical, seed will be planted by drill-seeding to a depth of 0.25 to 0.5 inch along the contour of the site. Drill seeding will be followed by culti-paction to enhance seed-to-soil contact and prevent losses of both. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover. An exception to these seeding requirements shall be made for seeding of sagebrush. Sagebrush seeding shall occur prior to winter snowfall, or on top of snow. Sagebrush may be sown either by broadcast seeding, or, if not on snowpack, by placing the seed in the fluffy seed box of a seed drill, with the drop tube left open to allow seed to fall out on the ground surface.

- Hydro-seeding and hydro-mulching may be used in temporary seeding or in areas where drill-seeding or broadcast-seeding/ raking are impracticable. Hydro-seeding and hydro-mulching must be conducted in two separate applications to ensure adequate seed-to-soil contact.

- If interim revegetation is unsuccessful, reseedings will be repeated annually until satisfactory vegetative cover has been achieved. Requirements for reseeding of temporary areas will be considered on a case-by-case basis. Seeding will be considered successful when the site is protected from erosion and revegetated with a vigorous, self-sustaining, and diverse cover of native (or otherwise approved) plant species. BLM shall not require reseeding during periods that have proven less than optimal.

- Mulch shall be applied within 24 hours following completion of seeding in project areas within pinyon-juniper, sagebrush shrubland, and/or salt desert shrub habitat types. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil. Mulch shall not be used within mountain shrub or spruce-fir forest habitat types, unless requested or approved by the BLM.

- Hydro-mulching may be used in areas of interim reclamation where crimping is impractical, in areas of interim reclamation that were hydroseeded, and in areas of temporary seeding regardless of seeding method.

- Mulch will not be applied in areas where erosion potential necessitates use of a biodegradable erosion-control blanket (straw matting).

- Cut and fill slopes will be protected against erosion by contour grading, microbasins or other measures approved by the BLM. Well anchored BMPs such as biodegradable matting, weed-free bales or wattles may also be used on cut-and-fill slopes and along drainages to protect against soil movement.

- The reclaimed pad will be protected from disturbance by a fence to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. Seeded species will be considered firmly established when perennial grass and forb species are at least 80% cover of that of the surrounding or reference area.

- Monitoring. Because weed and reclamation management activities are components of a long-term process, monitoring and reporting are integral to and long-term commitment to land health.

- The operator shall conduct annual monitoring surveys of all sites categorized as "operator reclamation in progress" and shall submit an annual monitoring report of these sites, including a description of the monitoring methods used, to the BLM by December 31 of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM

- Monitoring shall be performed using a standard quantitative vegetation sampling protocol, with a sampling pattern and sufficient to represent the vegetative diversity across the site. Sampling shall include percent canopy cover by plant species, as well as percent bare ground.

- All sites considered as "operator reclamation in progress" will be routinely monitored for reclamation success. Reports will be submitted to the BLM by December 1 of each year. Annual reports will include whether accomplishment of objectives appears likely and of not, what corrective actions are proposed.

- All sites will be routinely monitored for the presence of noxious weeds or other undesirable plant species as set forth in the joint BLM/US Forest Service Noxious and Invasive Weed Management Plan for Oil and Gas Operators. Pesticide Use Proposals will be approved by the BLM before application of herbicides. Annual weed monitoring reports shall be submitted to the BLM by December 1. They will include weed species found (listed by common names), total acres infested with weeds, total acres treated, treatment methods, and total pounds of active ingredient of pesticides applied. All Noxious Weed Inventory and Pesticide Application records for that year will be included with the report. Weed reports shall include BLM Pesticide Application Records (PARs) for all weed treatments, as well as GPS data with data fields for all weed treatments sufficient to meet the requirements of the BLM NISIMS database.

- To the extent practical, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. Cleared trees and rocks may be salvaged for redistribution over reshaped cut-and-fill slopes or along linear features.

- Above-ground facilities will be painted a non-reflective natural color selected to minimize contrast with adjacent vegetation or rock outcrops. Colors may be specified by the BLM on a project-by-project basis.

- Adaptive management techniques may be applied before or after construction to mitigate straight-line visual contrast effects of pad margins, cut and fill slopes, pipeline alignments or other cleared vegetation. This could include additional tree removal along contrasting edges, to create irregularly shaped openings or more natural-looking mosaic patterns, or treating surfaces to mitigate visual contrasts in color or surface texture.

- Trees and vegetation will be left along the edge of surface disturbance whenever feasible to provide screening.

- To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, debris, and rock over recontoured cut and fill slopes.

- To reduce the view of project facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (such as ridgelines and hilltops).

- Project facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum recontouring of cut and fill slopes.

- All long-term above ground structures will be painted in a non-reflective finish to blend with the environment. Colors will be selected (from the BLM "Standard Environmental Colors") in the field at the proposed project location, considering viewer's likely observation points and the time of year with the greatest number of viewers. Selected colors will be one to shades darker than those naturally occurring in the background landscape.

- Projects should be located to take advantage of existing vertical features, such as landforms or existing stands of vegetation to provide visually screening.

- Projects should not be located in visually exposed locations, such as ridgelines and hilltops.

- Projects should be located in areas that will minimize the amount of cut-and-fill needed to meet natural grade.

- Linear disturbances (roads and pipelines) should follow the natural contours of the landscape as much as possible.

- Project design should take into consideration any existing vegetation surrounding the project that can be used for visual screening. Care should be taken to preserve the integrity of the vegetation and the vegetation should remain standing and undamaged when the cut-and-fill slopes are recontoured.

- Thinning and feathering of existing vegetation may also be used in areas where clearing within dense vegetation is required. Thinning and feathering will reduce the hard line between new construction and existing vegetation and will emulate the forms of natural clearings.

- Project facilities should be placed to maximize recontouring of the cut-and-fill slopes and interim reclamation. Facilities should be oriented in the direction that is least visually obtrusive and should be clustered to reduce the overall impact and the area that will need to be visually mitigated. Facilities should be located away from the cut-and-fill slopes and, if possible, near a road to maximize the total surface area that can be reclaimed.

- Cut-and-fill slopes should be recontoured to the approximate original contour or consistent with the adjacent topography so that the reclaimed landscape features blend into the natural surroundings.

- Berms may be utilized to provide visual screening, but should be used only when it makes sense when viewing the surrounding natural environment and should blend with the adjacent topography.

- Cleared vegetation and rocks salvaged during construction should be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features to emulate the color and texture closer to that of the natural landscape and to help create microclimates to encourage vegetation growth. The material should be placed so that it appears to be naturally deposited.

Site Stabilization, Reclamation and Monitoring

- During interim reclamation contour land forming will be used to create a visual barrier to the permanent structures location on the site.

- Re-topsoil and revegetate access road cut & fill slopes, backslopes and road shoulders, and borrow ditches. Also, revegetating the travel surface of surfaced roads and turnarounds, where practical. With low traffic roads, this will result in a hardpan, two-track road that is stable and requires less maintenance.

- Reclamation plans would contain specifics such as elevation, pre-disturbance plant community species and habitat type, soil type, soil testing, topsoil management, seed mix and/or container stock species, mulch, site preparation, soil amendments including fertilizer, mycorrhizal and/or bacterial inoculum, organic material and/or carbon amendments, etc.

- Require that all mulch used in reclamation activities be certified weed free.

Special Status Species – General

- The CRVFO will consult agency species management plans and other conservation plans as appropriate to guide management and devise mitigation measures when needed. Examples of these plans include, but are not limited, to the Colorado Wildlife Action Plan, Colorado Sagebrush: A Conservation Assessment and Strategy, National, range-wide, statewide and local working group conservation plans for Gunnison and greater sage grouse, Sharing the land with pinyon-juniper birds, Birds in a sagebrush sea: managing sagebrush habitats for bird communities, North American Landbird Conservation Plan, North American Waterbird conservation Plan, National and Colorado Partners in flight Bird Conservation Plans, Colorado Gunnison's and White-tailed Prairie Dog Conservation Strategy and Recovery plans for federally listed species, and Colorado Rare Plant Conservation Initiative's Recommended Best Management Practices for Plants of Concern.

- Lessees will be notified when a lease parcel contains potential habitat for threatened, endangered, proposed, candidate or BLM sensitive plants, fish and wildlife.

- Limit flaring operations when well pads are within 100 m of occupied special status species habitat.

- Surveys for raptor nests, sensitive plant and animal species and cultural resources will be conducted prior to construction activities following BLM survey standards. Survey results will be submitted to the BLM for analysis and recommendations before project approval.

Special Status Species – Plants

- Prior to approving any ground-disturbing activities, suitable habitat for special status plants will be identified based on existing plant location records, soil or geological mapping, USFWS Section 7 range maps, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work. Surveys will be performed in compliance with the latest CRVFO survey protocols.

- For surface-disturbing activities with the potential to affect special status species, surveys in core habitat for T&E species will generally extend at least 200 meters (656 feet) beyond the edge of disturbance and at least 100 meters (328 feet) beyond the edge of disturbance outside of core habitat. For linear features such as roads and pipelines, surveys will extend at least 100 meters (328 feet) beyond the edge of the proposed ground disturbance along each side of the right of way. If special status plants are found within the survey area, the contractor will endeavor to determine the complete areal extent of the occurrence and the approximate number of individuals within the occurrence.

- For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of current or historically occupied plant habitat wherever possible and where geography and other resource concerns allow. (Historically occupied habitat is habitat where plants were known to occur within the past 15-20 years and a viable seedbank may remain). Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

- For BLM sensitive species surface-disturbing activities will be avoided within 100 meters of occupied plant habitat wherever possible and where geography and other resource concerns allow. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

- Where surface-disturbing activities are allowed within 100 meters of occupied habitat for special status plant species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.

- Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but it is unlikely that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).

- Transplantation of potentially affected plants will not be used as a rationale to defend a “not likely to adversely affect” or a “no effect” determination for listed plant species.

- Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

- Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Reclamation seeding within special status plant habitat should consist of native species only. If possible, seeds will be from locally collected genotypes. Realize that seeding or planting native plants may need to be repeated until deemed successful by the Authorized Officer.

- Rigorously monitor and control all infestations of noxious weeds and other non-native invasive plant species in and adjacent to occupied habitat for special status plants.

- Control noxious weeds using integrated techniques. Limit chemical control in areas with special plant species to avoid damage to non-target species. Mechanical or chemical control in and near special status plant habitat shall only be implemented by personnel familiar with the rare plants.

- Broadcast spraying of herbicides, either by ground or aerial methods, shall comply with the Conservation Measures from the Biological Assessment for the Vegetation EIS. The conservation measures are specific to the herbicide to be used, the desired mode of application, and the conditions of the site. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to listed or proposed plant species in the vicinity. Additional precautions during spot treatment of vegetation within these buffers shall be employed to avoid pesticide drift in those cases.

- Prevent plumes of dust and particulate matter from impacting special status plants. While new roads should not be built within 200 meters of special status plants, preexisting roads with an expected increase in traffic should be graveled (or paved) in these areas. The operator is encouraged to apply water for dust abatement to such areas during the flowering period. Magnesium chloride or other additives should not be used in special status plant habitat.

- The use of deicers and dust suppressants, other than water, within 100 meters of roadside occurrences of special status plant species will require prior approval from the BLM.

- Prohibit collection of rare plants or plant parts, except as permitted by the BLM Authorized Officer for scientific research.

- When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

- Surface disturbances (including wildfire and prescribed fires) within lower-elevation salt desert shrub and pinyon-juniper woodland habitat should review the need for cheatgrass control and/or restoration seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.

- Protection of T & E plant occurrences from use of non-native seed with a 1 km restriction buffer around TES plant occurrences where native seed is required

- Limit flaring operations when well pads are within 100m of occupied special status plant habitat.

- Surface disturbances (including wildfire and prescribed fires) within potential habitat for listed or proposed plant species (i.e. salt desert shrub and Wyoming big sagebrush habitat west of Rifle) should review the need for cheatgrass control and/or seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.

- Prior to approving any ground-disturbing activities, suitable habitat for special status plants will be identified based on existing plant location records, soil or geological mapping, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work.

- For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of occupied plant habitat1 wherever possible and where geography and other resource concerns allow. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

- Where development is allowed within 100 meters of occupied habitat for listed, proposed, candidate or BLM sensitive species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.

- Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but we do not expect that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).

- Transplantation of potentially affected plants will not be used as a rationale to defend a “not likely to adversely affect” or a “no effect” determination for listed plant species.

- Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

- When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

- All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (June 2007).

- Within mapped occupied and suitable habitat for Colorado hookless cactus, DeBeque phacelia or Parachute penstemon, wildland fire management actions will be conducted in the following manner:

- Minimize surface disturbance by using retardant, water, engines/wet lines, etc in known habitat rather than dozers or hand crews.
- Unless firefighter safety is jeopardized, construct fire line outside the perimeter of known cactus populations.
- Avoid cross-country use of motorized vehicles and mechanical equipment within known populations of federally listed or proposed plants.

Visual Resource Management

- Limit surface disturbance to the minimum area necessary

- Use natural features such as trees, rock formations, or terrain, to conceal disturbed areas. Constructed berms that blend with the terrain may be useful for concealment.

- Minimize contrast of the structure or activity with the surrounding terrain by using the visual resource management principles of form, line, color, and texture.

- Paint structures a color that blends with the surrounding vegetation.

- Remove unnecessary equipment, structures, and debris from the site that are not necessary for daily operation.

- All new surface-disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations during project design as a reasonable attempt to meet the Visual Resource Management (VRM) class objectives for the area and minimize the visual impacts of the proposal. Visual design considerations will be incorporated by:

  - Using the VRM contrast rating process (required for proposed projects in highly sensitive areas, high impact projects, or for other projects where it appears to be the most effective design or assessment tool), or by
  - Providing a brief narrative visual assessment for all other projects that require an environmental assessment or environmental impact statement.
  - Measures to mitigate potential visual impacts could include the use of natural materials, screening, painting, project design, location, or restoration (See Appendix H; BLM Handbook H-8431-1, Visual Resource Contrast Rating; or online at http://www.blm.gov/nstc/VRM/8431.html, for information about the contrast rating process).

- All new roads will be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use. Roads will follow the contour of the land where practical. Existing oil and gas roads that are in eroded condition or contribute to other resource concerns will be brought to BLM standards within a reasonable period of time.

- Impacts to dark night skies will be prevented or reduced through the application of specific mitigation measures identified in activity level planning and NEPA level review. These measures may include directing all light downward, using shielded lights, using only the minimum illumination necessary, using lamp types such as sodium lamps (less prone to atmospheric scattering), using circuit timers, and using motion sensors.

- Any facilities authorized will use the best technology available to minimize light emissions

- Any new permits/authorizations, including renewals, will be stipulated to use the best technology available to minimize light emissions as compatible with public health and safety.
- Restrict visual intrusion in VRM Class I and II areas and within 0.25-mile of historic trails.
- Screening facilities from view and avoiding placement of production facilities on steep slopes, hilltops, and ridgelines.
- Paint all facilities a color that best allows the facility to blend with the background (Operator-committed BMP).
- Gravel of road color shall be similar to adjacent dominant soil colors.
- Reduce impacts on visual resource management class II and class III areas.
- Bury distribution powerlines and flow lines in or adjacent to access roads.
- Repeat form, line, color, and texture elements to blend facilities with the surrounding landscape
- All aboveground facilities including power boxes, building doors, roofs, and any visible equipment will be painted a color selected from the latest national color charts that best allows the facility to blend into the background.
- Perform final reclamation recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.
- To the extent opportunities are practicable, extreme visual contrast created by past management practices or human activities will be minimized. Examples include right-of-way amendments, mineral material sites, abandoned mines, and areas impacted by unauthorized off-road driving.
- Reclaim unused well pads within one year.
- Final reclamation of all oil and gas disturbance will involve re-contouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography and revegetating all disturbed areas
- The use of submersible pumps will be strongly encouraged, especially in VRM Class I, II or III areas or any area visible by the visiting public.
- The use of partial or completely below-grade wellheads will be strongly encouraged in high visibility areas as well as VRM Class I, II or III areas.
- The placement of production facilities on hilltops and ridgelines will be prohibited where they are highly visible.

Livestock Management

- Implement management tools such as fencing, stock ponds, and salt licks to manage livestock distribution as needed, and discourage grazing in unwanted areas such as riparian vegetation and sensitive wildlife habitat.
- Adjust livestock grazing in heavily used areas to allow native vegetation a period of recovery.

- Restoring temporarily disturbed areas, using native species, planting woody species, or use a biodegradable erosion-control fabric to enhance germination and seedling establishment

- Drill-seed at a rate of Pure Live Seeds per square foot as needed to establish healthy vegetation (rate may be double for broadcast-seeding or hydroseeding) and be preceded by adequate site preparation, including decompaction of soil and control of annual or biennial weeds

- Fence revegetated areas to exclude livestock for at least two full growing seasons

- Use culverts or hardened crossings for use of roads that cross streams

- Use erosion control devices around culverts as needed to reduce erosion and gulley formation.

- Construct fences and gates to ensure that livestock do not enter areas being protected for another resource that would be diminished by grazing or trampling

- Construct alternative water sources to disperse livestock use and reduce dependence on natural streams and riparian corridors

Noxious and Invasive Weed Management

- Rehabilitation disturbed sites as quickly as possible following interim or final rehabilitation guidelines as appropriate.

- Allow on supplementary livestock feed and revegetation mulches that are certified weed free.

- Clean vehicles regularly using water or air spray to reduce the chance of transporting weed seed from affected areas to non-affected areas.

- All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (June 2007).

Pre-Project Planning

- Environmental analyses for projects, vegetation treatments, and maintenance programs should assess weed risks, analyze high-risk sites for potential weed establishment and spread, and identify prevention practices.

- Determine site-specific restoration and monitoring needs and objectives at the onset of project planning.

- Inventory all proposed projects for weeds prior to ground-disturbing activities. If weeds are found, they should be treated (if the timing is appropriate) or removed (if seeds are present) to limit weed seed production and dispersal.

- Wash vehicles and other equipment to reduce the spread of noxious weeds from weed-contaminated areas to non-contaminated areas. Portable wash stations would be ideal in areas of heavy oilfield traffic and in areas where noxious weeds are an issue.

- Locate and use weed-free project staging areas. Avoid or minimize travel through weed infested areas, or restrict travel to periods when spread of disseminules is least likely.

- Identify sites where equipment can be cleaned. Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts should be collected and incinerated when possible.

- If certified weed-free gravel pits become available in the county, the use of certified weed-free gravel will be required wherever gravel is applied to public lands (e.g., roads).

- Maintain stockpiled, non-infested material in a weed-free condition. Topsoil stockpiles should be promptly revegetated with native species to maintain soil microbial health and reduce the potential for weeds.

- Use native seed mixes appropriate to the ecological site and those species that are demonstrated to be best at inhibiting weed establishment, except when other resource values dictate a less-competitive mix.

- A certified seed laboratory shall test each seed lot according to the Association of Official Seed Analysts standards (which include an all-state noxious weed list) and provide documentation of the seed inspection test. The seed shall contain no prohibited or restricted noxious weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended.

Project Implementation

- Minimize soil disturbance. To the extent practicable, native vegetation should be retained in and around project activity areas, and soil disturbance kept to a minimum.

- If a disturbed area must be left bare for a considerable length of time, cover the area with weed barrier until revegetation is possible.

- Clean all equipment before leaving the project site when operating in weed infested areas.

- Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal means bagging and incinerating seeds and plant parts or washing equipment in an approved containment area.

- Require pressure-washing or an equivalent seed removal process on all vehicles and equipment prior to entry of all ground-disturbing project areas, and upon exit of project areas infested with noxious weeds.

- Revegetate disturbed soil where appropriate to optimize plant establishment for that specific site. Define revegetation objectives for each site. Revegetation may include topsoil replacement, planting, seeding, fertilization, and certified weed-free mulching as necessary. Native materials should be used except under rare circumstances and with prior written approval from the BLM.

- Monitor sites where seed, hay, straw, or mulch has been applied. Eradicate weeds before they form seed. In contracted projects, contract specifications could require that the contractor control weeds for a specified length of time.

- Inspect and document all ground-disturbing activities in noxious weed infested areas for at least three growing seasons following completion of the project. For ongoing projects, continue to monitor until reasonably certain that no weeds are present. Plan for follow-up treatments based on inspection results.

Roads and Utilities - Pre-Project Planning

- Communicate with contractors, local weed districts or weed management areas about projects and best management practices for prevention.

- Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts shall be collected and incinerated when practical, or washed off in an approved containment area.

- Avoid acquiring water for road dust abatement where access to water is through weed-infested sites.

- Treat weeds on travel rights-of-ways before seed formation so construction equipment doesn't spread weed seed.

- Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. When it is necessary to blade weed-infested roadsides or ditches, schedule the activity when disseminules are least likely to be viable.

Roads and Utilities - Project Implementation

- Retain shade to suppress weeds by minimizing the removal of trees and other roadside vegetation during construction, reconstruction, and maintenance; particularly on south aspects.

- Do not blade or pull roadsides and ditches infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure weeds remain onsite. Blade from least infested to most infested areas.

Roads and Utilities - Post-Project

- Clean all equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before leaving the project site if operating in areas infested with weeds. Seeds and plant parts shall be collected and incinerated when possible.

- When seeding has been specified for construction and maintenance activities, seed all disturbed soil (except travel route) soon after work is completed.

- Use a certified weed-free seed mix suitable for local environmental conditions that includes fast, early growing native species to provide quick revegetation. Consider applying weed-free mulch with seeding in salt desert shrub, sagebrush, and pinyon-juniper woodland habitat types.

- Periodically inspect roads and rights-of-way for noxious weeds. Train staff to recognize weeds and report locations to the local weed specialist. Follow-up with treatment when needed.

- When reclaiming roads, treat weeds before roads are made impassable. Inspect and follow up based on initial inspection and documentation.

- To avoid weed infestations, create and maintain healthy plant communities whenever possible, including utility rights-of-ways, roadsides, scenic overlooks, trailheads, and campgrounds.

Recreational Activities

- Inspect and clean mechanized trail vehicles of weeds and weed seeds.
- Wash boots and socks before hiking into a new area. Inspect and clean packs, equipment, and bike tires.
- Avoid picking unidentified "wildflowers" and discarding them along trails or roadways.
- Maintain trailheads, campgrounds, visitor centers, boat launches, picnic areas, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. Consider high-use recreation areas as high priority sites for weed eradication.
- Sign trailheads and access points to educate visitors on noxious and invasive weeds and the consequences of their activities.
- In areas susceptible to weed invasion, limit vehicles to designated, maintained travel routes. Inspect and document travel corridors for weeds and treat as necessary.
- Encourage use of pelletized feed for backcountry horsemen and hunters. Pelletized feed is unlikely to contain weed seed.

Outfitting / Recreation Pack and Saddle Stock Use

- Allow only certified weed-free hay/feed on BLM lands.
- Inspect, brush, and clean animals (especially hooves and legs) before entering public land. Inspect and clean tack and equipment.
- Regularly inspect trailheads and other staging areas for backcountry travel. Bedding in trailers and hay fed to pack and saddle animals may contain weed seed or propagules.
- Tie or contain stock in ways that minimize soil disturbance and prevent loss of desirable native species.
- Authorized trail sites for tying pack animals should be monitored several times per growing season to quickly identify and eradicate new weeds. Trampling and permanent damage to desired plants are likely. Tie-ups shall be located away from water and in shaded areas where the low light helps suppress weed growth.
- Educate outfitters to look for and report new weed infestations.

Wildlife Habitat Projects

- Incorporate weed prevention into all wildlife habitat improvement project designs.

Watershed Management

- Frequently and systematically inspect and document riparian areas and wetlands for noxious weed establishment and spread. Eradicate new infestations immediately since effective tools for riparian-area weed management are limited.

- Promote dense growth of desirable vegetation in riparian areas (where appropriate) to minimize the availability of germination sites for weed seeds or propagules transported from upstream or upslope areas.

- Address the risk of invasion by noxious weeds and other invasive species in watershed restoration projects and water quality management plans.

Grazing Management

- Consider prevention practices and cooperative management of weeds in grazing allotments. Prevention practices may include:

  - Altering season of use
  - Minimizing ground disturbance
  - Exclusion
  - Preventing weed seed transportation
  - Maintaining healthy vegetation
  - Revegetation
  - Inspection
  - Education
  - Reporting

- When authorized, provide certified weed-free supplemental feed in a designated area so new weed infestations can be detected and treated immediately. Pelletized feed is unlikely to contain viable weed seed. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer.)

- If livestock may contribute to seed spread in a weed-infested area, schedule livestock use prior to seed-set or after seed has fallen.

- If livestock were transported from a weed-infested area, annually inspect and treat entry units for new weed infestations.

- Consider closing infested pastures to livestock grazing when grazing will either continue to exacerbate the condition or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.

- Manage the timing, intensity (utilization), duration, and frequency of livestock activities to maintain the competitive ability of desirable plants and retain litter cover. The objective is to prevent grazers from selectively removing desirable plant species and leaving undesirable species.

- Exclude livestock grazing on newly seeded areas with fencing to ensure that desired vegetation is well established, usually after 2-3 growing seasons.

- Reduce ground disturbance, including damage to biological soil crusts. Consider changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.

- Inspect areas of concentrated livestock use for weed invasion, especially watering locations and other sensitive areas that may be particularly susceptible to invasion. Inventory and manage new infestations.

Fire Management Plans

- Prescribed fire plans should include pre-burn invasive weed inventory and risk assessment components as well as post-burn mitigation components.

- Integrate prescribed fire and other weed management techniques to achieve best results. This may involve post-burn herbicide treatment or other practices that require careful timing.

- Include weed prevention and follow-up monitoring in all prescribed fire activities. Include in burn plans the possibility for post-burn weed treatment.

- For prescribed burns, inventory the project area and evaluate potential weed spread with regard to the fire prescription. Areas with moderate to high weed cover should be managed for at least 2 years prior to the prescribed burn to reduce the number of weed seeds in the soil. Continue weed management after the burn.

- Ensure that a weed specialist is included on a Fire Incident Management Team when wildfire or prescribed operations occur in or near a weed-infested area. Include a discussion of weed prevention operational practices in all fire briefings.

- Use operational practices to reduce weed spread (e.g., avoid weed infestations when locating fire lines).

- Identify and periodically inspect potential helispots, staging areas, incident command posts, and base camps and maintain a weed-free condition. Encourage network airports and helibases to do the same.

- Develop a burned-area integrated weed management plan, including a monitoring component to detect and eradicate new weeds early.

Fire-Fighting

- Ensure that all equipment (including borrowed or rental equipment) is free of weed seed and propagules before entering incident location.

- When possible, use fire suppression tactics that reduce disturbances to soil and vegetation, especially when creating fire lines.

- Use wet or scratch-lines where possible instead of fire breaks made with heavy equipment.

- Given the choice of strategies, avoid ignition and burning in areas at high risk for weed establishment or spread.

- Hose off vehicles on site if they have traveled through infested areas.

- Inspect clothing for weed seeds if foot travel occurred in infested areas.

- When possible, establish incident bases, fire operations staging areas, and aircraft landing zones in areas that have been inspected and are verified to be free of invasive weeds.

- Cover weed infested cargo areas and net-loading areas with tarps if weeds exist and can't be removed or avoided.

- Flag off high-risk weed infestations in areas of concentrated activity and show weeds on facility maps.

- If fire operations involve travel or work in weed infested areas, a power wash station should be staged at or near the incident base and helibase. Wash all vehicles and equipment upon arrival from and departure to each incident. This includes fuel trucks and aircraft service vehicles.

- Identify the need for possible fire rehab to prevent or mitigate weed invasion during fire incident and apply for funding during the incident.

Post-Fire Rehabilitation

- Have a weed specialist review burned area rehabilitation reports to ensure proper and effective weed prevention and management is addressed.

- Thoroughly clean the undercarriage and tires of vehicles and heavy equipment before entering a burned area.

- Treat weeds in burned areas. Weeds can recover as quickly as 2 weeks following a fire.

- Schedule inventories 1 month and 1 year post-fire to identify and treat infestations. Eradicate or contain newly emerging infestations.

- Determine soon after a fire whether revegetation is necessary to speed recovery of a native plant community, or whether desirable plants in the burned area will recover naturally. Consider the severity of the burn and the proportion of weeds to desirable plants on the land before it burned. In general, more severe burns and higher pre-burn weed populations increase the necessity of revegetation. Use a certified weed-free seed mix.

- Inspect and document weed infestations on fire access roads, equipment cleaning sites, and staging areas. Control infestations to prevent spread within burned areas.

- Seed and straw mulch to be used for burn rehabilitation (e.g., for wattles, straw bales, dams) shall be certified weed-free.

- Prevent seeded species from being grazed during the first two growing seasons (>18 months) following seeding, or until site-specific analysis and/or monitoring data indicates that vegetation cover, species composition and litter accumulation are adequate to support and protect watershed values, meet vegetation objectives and sustain grazing use.

Recreation

- Special Recreation Permits will contain noxious weed management stipulations (e.g., pre-event inventories to avoid infested areas, event management to avoid or isolate activities that could cause weed introduction or spread, monitoring and treatment of infestations exacerbated by the activity, and other appropriate noxious weed management stipulations).

- Promote the seven standard principles of Leave No Trace outdoor ethics through print and electronic media, and through personal communications with recreationists participating in non-motorized recreation activities on BLM-managed public lands. (www.lnt.org)

- Promote the principles of Tread Lightly outdoor ethics through print and electronic media, and through personal communications with recreationists participating in recreation activities on BLM-managed public lands. (www.treadlightly.org)

- Apply Recreation Management Guidelines to Meet Public Land Health Standards on BLM Lands in Colorado. Website: http://www.blm.gov/co/st/en/BLM_Information/newsroom/2000/recguidefnr /guide_final.html.

- Apply Guidelines for a Quality Built Environment. Website: http://www.blm.gov/style /medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images/national_programs/VRM.Par.62809.File.dat/GQBE_WEB.pdf.

- Route design, construction and maintenance will follow: BLM guidelines, guidelines established in the Gold Book (BLM 2007) and technical recommendations of partner groups (e.g. International Mountain Bicycling Association (IMBA), Volunteers for Outdoor Colorado - Crew Leader Manual, Backcountry Horsemen, National Off-Highway Vehicle Conservation Council (NOHVCC)).

Lands and Realty

- Power lines shall be constructed in accordance to standards outlined in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (Avian Power Line Interaction Committee 2006). Right-of-way applicants shall assume the burden and expense of proving that proposed pole designs not shown in the above publication are “raptor safe.” Such proof shall be provided by a raptor expert approved by the BLM Authorized Officer.

- Rights-of-way and other lands and realty authorizations, including power lines, pipelines, transmission corridors, energy development sites and related development, and gravel pits, will contain noxious and invasive plant management terms or stipulations for all ground-disturbing actions. These will include conducting a pre-disturbance noxious weed inventory, designing to avoid or minimize vegetation removal and weed introduction or spread, managing weeds during the life of the right-of-way or authorization to prevent or minimize weed introduction or spread, abandoning the right-of-way or authorization to establish competitive vegetation on bare ground areas, and monitoring revegetation success and weed prevention and control for a reasonable number of years.

- Rights-of-way will be constructed to avoid physical damage to range improvements and rangeland study areas.

- No signs or advertising devices shall be placed on the premises or on adjacent public lands, except those posted by or at the direction of the BLM Authorized Officer.

- The Holder shall promptly remove and dispose of all waste caused by its activities. The term “waste” as used herein means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, petroleum products, ashes, and equipment. No burning of trash, trees, brush, or any other material shall be allowed.

- The Proponent shall notify all existing right-of-way holders in the project area prior to beginning any surface-disturbance or construction activities. The Holder shall obtain an agreement with any existing right-of-way holders or other parties with authorized facilities that cross or are adjacent to those of the holder to assure that no damage to an existing right-of-way or authorized facility will occur. The agreement(s) shall be obtained prior to any use of the right-of-way or existing facility.

- The Holder shall participate in the formation of a Road User's Association for the road if new rights-of-way are granted for use of the existing road. All new users will be required to join the association.

- The Holder will provide a performance bond for the authorized facility, acceptable to the BLM Authorized Officer, in the amount of $(_) that must be maintained in effect until restoration of the right-of-way has been accepted by the BLM Authorized Officer. The bond shall be furnished by the holder within 30 days of signing the grant (__) and shall be applied to all additional authorizations associated with the project as necessary.

- Incorporate conditions of approval and mitigation measures from the Final Programmatic EIS on Wind Energy Development on BLM-administered Lands in the Western US, as applicable (BLM 2005).

- Incorporate conditions of approval and mitigation measures from the Solar Energy PEIS, as applicable (pending completion of Solar PEIS).

- All construction activities shall be confined to the minimum area necessary. The exterior boundaries of the construction area shall be clearly flagged prior to any surface-disturbing activities.

- Existing roads will be used wherever possible. Additional roads shall be kept to the minimum. Route locations must be approved by the BLM prior to construction.

- When blasting is necessary, the following precautions will be used:

  - In areas of human use, blasting blankets will be used.
  - Landowners or tenants in close proximity to the blasting will be notified in advance of the blasting so that livestock and other property can be removed adequately protected.
  - Access to the blasting area will be restricted by construction personnel stationed at each end of the area to be blasted.
  - Blasting within 0.25-mile of federally-owned or controlled springs and flowing water wells must be approved in writing by the area manager.
  - No blasting will be permitted within 0.25-mile of historic trails, natural areas, identified archaeological sites, and recreation areas.
  - Powder magazines will be located out of sight or at least 0.5-mile from roads. Loaded shot holes will not be left unattended. Approval from the area manager will be obtained for the magazine locations.

- Roads will be constructed and maintained to BLM road standards (BLM Manual 9113 [BLM 2012]). All vehicle travel will be within the approved driving surface.

Best Management Practices for Pipeline Projects

- A preconstruction field conference shall be requested by the grantee at least five working days prior to any construction activities unless otherwise agreed upon by the BLM Authorized Officer.

- Once the pipeline is constructed, the grantee/operator shall restore the existing roadway to meet or exceed conditions prior to construction. The preconstruction width of the driving surface shall also be restored and erosion control structure installed subject to approval of the BLM Authorized Officer. The grantee/operator shall be responsible for road maintenance from the beginning to completion of operations. This may include, but not be limited to, blading the roadway, cleaning ditches and drainage facilities, dust abatement, or other requirements as directed by the BLM Authorized Officer.

- Construction width shall include the existing road. The pipeline shall be located two to three feet from the edge of the ditch along the existing road. The existing road shall be on the working side of the trench.

- The grantee shall accomplish the crossing of the pipeline owned by (company name) in accordance with an agreement between the grantee/operator.

- Pipeline location warning signs shall be installed within five days of construction completion. Each sign shall be permanently marked with the right-of-way serial number.

Geophysical Exploration

- The operator will furnish a map with the Notice of Intent showing approximate line to be used. A map will also be filed with the Notice of Completion showing the completed line. The map will be of a minimum scale of 0.5-inch equals 1.0 mile.

- Rehabilitation of disturbed areas is to be done concurrent with the geophysical operations.

- Blasting or vibrating within 0.25-mile of federally-owned or controlled springs and flowing water wells or cultural resource sites must be approved in writing by the area manager.

- Plugging of drill holes will conform to the Colorado Reclamation Standards Abandoned Drill Holes Act. Drill hole cuttings will be returned to the hole. LR

- No blading or other dirt work will be allowed without written permission from the area manager.

- Standard Terms and Conditions described in BLM Handbook H-3150-1: Onshore Oil and Gas Geophysical Exploration Surface Management Requirements (BLM 1994 Rev. 2007).

- Coordinate with the Colorado Parks and Wildlife early in the sale process on proposals to sell public land encumbered by a small capacity wildlife water development.

Wildlife, Aquatic

- Consider the following options regarding erosion control to limit sedimentation into

  - perennial, ephemeral, and intermittent drainages:
  - Placement of straw waddles
  - Construction of silt fencing

- Placement of geo-textile matting/fabrics
- Timely and appropriate reseeding methods and species
- Hydro-mulching
- Topsoil stockpiling
- Recontouring slopes at a minimum of 2:1 to facilitate revegetation
- Hay bales
- Sediment retention dams
- Water dips

- Avoid direct discharge of pipeline hydrostatic test water to any reservoir, lake, wetland, or natural perennial or seasonally flowing stream or river.

- When constructing stream crossings or other in-channel structures, divert water around the construction site to minimize sedimentation.

- Avoid low water crossings of live streams, but if done, armor crossings with appropriate sized native substrate to limit sedimentation and maintain water depths for fish passage.

- For perennial stream crossings use professional engineering to design and consider using bridges or appropriately sized culverts of at least bank-full flow width.

- When possible, design road crossings of streams and riparian corridors at right angles and preferably along straight, stable stream reaches to minimize the area and amount of disturbance. However, when needed, place culverts in alignment with natural stream sinuosity.

- Address aquatic organism passage and appropriate life-stage requirements of target species when designing new or modifying existing road/stream crossings.

- Identify and protect access to ephemeral/temporary pools and ponds to provide breeding, aestivating, and hibernating habitat for amphibians.

- To avoid spread of aquatic nuisance species and disease vectors clean and disinfect all equipment and gear used in water by one of the following methods:

  - By spraying with 409, bleach, or a similar germicide solution and let equipment thoroughly dry.
  - Wash/spray equipment and gear with hot tap water > 140 degrees Fahrenheit for 10 minutes and then drain onto the ground, not down a drain or into another water body.

- Improve stream conditions associated with past, ongoing, and future planning, construction, and maintenance actions in the I-70 mountain corridor as per Stream and Wetland Ecological Enhancement Program (SWEEP) MOU.

- Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications (e.g., Rosgen). Upon identification of limiting factors, prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings, tamarisk removal), or by changing management of other program activities (e.g., changing livestock grazing season of use) to achieve desired future condition.

- Identify in-channel features (e.g., culverts, water diversion structures) that block aquatic organism movement and/or impair stream connectivity and replace, modify, or remove these impediments as they are identified and as opportunities allow. Consider and address aquatic organism passage and appropriate life-stage requirements when designing new or modifying existing stream crossings. Where in-channel barriers are needed to protect native fish species from competitive species and/or disease vectors, consider placement in coordination with CPW Aquatic Biologists and BLM staff.

- Minimize the spread of aquatic nuisance species including but not limited to zebra mussels, New Zealand mud snails, quagga mussels, and rusty crayfish, as well as disease vectors including whirling disease, and chytrid fungus when working in water and do the following:

  - Before leaving a particular water or entering a new water body, inspect and clean equipment and gear used in the water, including heavy equipment, watercraft (boats, canoes, kayaks, rafts, etc.), trailers, oars, nets, waders, wading boots, sandals, and life jackets. Remove vegetation, mud, grit, algae, etc. and drain water from boats and other gear.

Fire Management:

- In wildland fire situations work with the Fire Resource Advisor(s) during suppression efforts in the CRVFO to address water use and spread of aquatic nuisance species and disease vectors:

  - If possible, avoid the use of these water sources for use in fire suppression actions (i.e., helicopter bucket dips, water pumps, etc.). If these waters are used for fire suppression, screen water pump intakes with ¼ inch mesh to avoid entrainment of fish.
  - Clean and disinfect all fire suppression equipment including water hoses, water pumps, pumpkins, blivets, helicopter buckets, etc. between suppression incidents to avoid the transfer of aquatic nuisance species and disease vectors into the Colorado River and ponds, reservoirs, and lakes within 0.5 miles of the river.
  - Do not release unused water from water tenders, fire engines, or aircraft into the Colorado River or ponds, reservoirs, or lakes within 0.5 miles of the river. Discharge unused water on upland habitats away from these water sources to avoid possible spread of aquatic nuisance species and disease vectors.

- Avoid dropping fire retardant or foam within 300 feet of water bodies and avoidlocating staging, fire retardant chemicals, refueling sites, or other chemicals within 300 feet of these waters.

- When fighting fires within 300 feet of occupied stream/lake drainages containing conservation populations of cutthroat trout, use water located from within the drainage for all suppression efforts..

- When obtaining water from the Colorado River the following actions should be taken:

  - The best method to avoid entrainment of fish is to pump from off-channel locations (e.g., ponds, lakes, and diversion ditches), not directly connected to the mainstem streams or rivers even during high spring flows.
  - If the pump head must be located in the river channel where larval fish are known to occur, the following measures apply:

    - Do not situate the pump in a low-flow or no-flow area as these habitats tend to concentrate larval or young-of-year fishes. Instead place the pump into fast moving/riffle habitat;
    - Limit the amount of pumping, to the greatest extent possible, during that period of the year when larval fish may be present (June 1 to August 15); and avoid pumping, to the greatest extent possible, during the pre-dawn hours (two hours prior to sunrise) as larval fish drift studies indicate that this is a period of greatest daily activity.
    - Screen all pump intakes with ¼" or finer mesh material.
  - Report any fish impinged on any intake screens to the Fish and Wildlife Service (970.243.2778) or the Colorado Parks & Wildilfe Department:

    Northwest Region
    711 Independent Ave., Grand Junction, CO 81505
    Phone: (970.255.6100)

- Require spill Prevention Plans for all pipeline companies and fluid mineral companies

- and their sub-contractors who haul or transport hazardous substances.

- Require Spill Contingency Plans for all pipeline companies and fluid mineral companies and their sub-contractors who haul or transport hazardous substances.

- When developing or improving water sources, consider development designs such as water wells and guzzlers, rather than surface impoundments, to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

- Pro-actively manage special status species aquatic habitats. Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications. Upon identification of limiting factors, prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings) or by changing management of other program activities (e.g., changing livestock grazing season use) to achieve desired future condition.

Transportation

- Oil and gas development roads will be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards [USDI and USDA 2007] as outlined in BLM Manuals 9113, Roads Design Handbook [BLM 2011a] and 9113-2, Roads National Inventory and Condition Assessment Guidance and Instructions Handbook [BLM 2011b].

  - All vehicle travel will be within the approved driving surface.
  - All construction activities will be confined to the minimum area necessary.
  - The exterior boundaries of the construction area will be clearly staked or flagged prior to any surface-disturbing activities.
  - If requested by the BLM representative, the operator will schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that construction plans and/or any unresolved issues are fully addressed prior to initiation of surface-disturbing activities.
  - Initial gravel application shall be a minimum of 6 inches.

- The operator shall provide timely year-round road maintenance and cleanup on the access roads.
- A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement.
- When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.

■ Other BLM resource roads that do not serve oil and gas development or do not serve as primary (collector) roads within the transportation system will be designed, constructed, and maintained as outlined in BLM Manual 9115-1, Primitive Road Handbook [BLM 2012a] and 9115-2, Primitive Roads National Inventory and Condition Assessment Guidance and Instructions Handbook [BLM 2012b].

- All vehicle travel will be within the approved driving surface.
- All construction activities will be confined to the minimum area necessary.
- The exterior boundaries of the construction area will be clearly staked or flagged prior to any surface-disturbing activities.
- If requested by the BLM representative, the operator or proponent will schedule a pre-construction meeting, including key representative(s) and contractor personnel, to ensure that construction plans and/or any unresolved issues are fully addressed prior to initiation of surface-disturbing activities.

■ In order to ensure public access and safety, CRVFO shall continue an active road maintenance program including, but not limited to, road redesign or realignment, blading, brush or tree removal for sight distance and safety concerns, scarification, graveling, water barring, low water crossings, spur ditching, seeding and installation or cleaning of culverts and cattleguards. Such road maintenance work will adhere to standards and guidance outlined in appropriate BLM Road Handbooks

Wildlife

Planning

■ Design plans of development to consolidate activity during wildlife sensitive times into geographic areas approved by the regulatory agencies in order to minimize impact.

■ Where possible, develop existing or previously disturbed surface locations to reduce impacts on undisturbed areas and minimize impact to wildlife habitat.

■ Design power lines to minimize raptor attraction.

■ Install perch guards on utility lines to reduce risk of raptor electrocution and discourage raptor perching on utility poles by the use of anti-perching devices, or bury new utility lines.

■ Minimize noise by using appropriate noise reduction devices.

■ Require all refuse containers employ a bear-proof design and be emptied on a regular basis.

■ Initiate an education program that reduces bear conflicts

- Adjust tower changes, material deliveries, and all other recurring transportation activity to and from the well pad to occur between 9:00 am and 4:00 pm and between 9:00 pm and 4:00 am, excluding emergencies.

- Use carpooling for activities like crew rotations and shift changes.

- Monitor and enforce speed limits using multiple techniques.

- Implement dust control BMPs in a timely manner.

- Reinforce wildlife training of employees and contractors at worksite tailgate meetings, monthly safety meetings, and the Environmental Health and Safety (EHS) hazard identification program, and through the use of signs.

    - Prohibit pets on all locations.
    - Prohibit possession of firearms by all employees and contractors on all locations.

Drilling

- Implement drilling technology improvements, such as directional and horizontal drilling, to maximize resource recovery and minimize environmental impacts.

- Use natural gas drilling rigs to reduce emissions.

- Use dual-fuel natural gas/diesel engines, reducing diesel delivery to the well site by as much as 70%.

- Implement closed-loop drilling systems on all active rigs with only a small cuttings mixing area on each location.

- Conduct pre-rig move meetings with all parties to discuss access and concerns to reduce impacts to environment and landowners, to ensure a safe and efficient rig move.

- Net all oil and gas reserve and permanent pits to exclude birds; enclose pits within an 8-foot-high fence to exclude ungulates; enclose pits within a 2-foot solid barrier buried 6 inches into the soil to exclude small mammals and reptiles, and lined to prevent infiltration to groundwater.

Completions

- Restrict venting of natural gas to the atmosphere during new well completions.

- Require secondary spill containment for pump trucks on all active completions operations (e.g., portable containment, not earthen berms).

- Use permanent buried or temporary surface water delivery lines to reduce truck traffic.

- Optimize completion operations to minimize impact. Techniques include:

    - Use simultaneous drilling and completion operations (SIMOPS) to minimize the operating time on the well pad.
    - Remote completion operations using nearby existing well pads minimizes overall surface disturbance.

- Recycle all water used in completion activities to meet water needs for completion of subsequent wells on location; this will reduce fresh water consumption and reduce truck traffic.

Production

- Reduce visits to well sites through remote monitoring (i.e., SCADA) and the use of multi-function contractors.

- Use solar panels as an alternative energy source for on location production equipment, to limit trips to the location for production maintenance.

- Monitor wildlife as needed to document impacts of planned development on population dynamics or behavior; and develop and implement mitigation based on the results of monitoring.

- All stacks, vents, or openings must have screens to prevent wildlife entry.

Well Pad Construction and Reclamation

- Use advanced reclamation techniques to reclaim pads and pipeline construction within 6 months or less after completion activities are finished to establish desirable vegetation more effectively. Advanced reclamation techniques include:

  - Hydraulic erosion-control mulch on topsoil and wind-row perimeter control
  - Landform grading and hydraulic erosion-control mulch on steeper slopes
  - Use of crimped straw mulch on shallower slopes

- Use integrated vegetation management techniques to simultaneously control weeds while developing successful reclamation.

- Construct well pads prior to onset of winter to minimize additional displacement of wildlife utilizing the area

- Use the Colorado Parks and Wildlife recommendations for wildlife friendly fence whenever fencing is required.

- If appropriate, employ habitat enhancement in suitable areas to offset habitat loss or fragmentation caused by the planned development.

- Prepare third party Biological Assessment Reports (BAR) completed for all new disturbances to customize the reclamation plan and to optimize the topsoil segregation, seed mix, and soil amendments to improve reclamation success.

Pipelines

- Expand the water distribution system to efficiently move water in pipelines, reducing truck traffic for drilling and completion activities.

- Install gathering lines adjacent to roads wherever possible.se multiple gathering lines placed in a single trench to minimize disturbance and construction costs.

- Install trench plugs (sloped to allow wildlife or livestock to exit the trench should they enter) at known wildlife or livestock trails to allow safe crossing on long spans of open trench.

- Install pipeline crossings at right angles to the drainages, wetlands, and perennial waterbodies.
- Install equipment bridges for pipeline construction made from either clean rock and flume pipes or timber equipment mats with flume pipes.
- Use horizontal directional boring techniques under perennial waterbodies and/or wetland complexes.
- Enforce all In-stream construction activity to 24-hour periods for waterbodies less than 10 feet wide and to 48 hours for waterbodies greater than 10 feet wide at locations where horizontal boring is not possible.
- Maintain a minimum of 5 feet of soil cover between the pipeline and the lowest point of any drainage or water body channel.
- Restrict refueling equipment within 100 feet of a drainage, stream, or wetland during pipeline construction and employ secondary containment (e.g., portable containments).

Roads

- Use existing roads instead of new construction segments wherever feasible.
- Create topsoil windrows on all new facility construction for perimeter control to divert to terminal discharge points.
- Strategically apply fugitive dust control measures to reduce coating of vegetation and deposition in water sources, including enforcing speed limits on BLM and private roads.
- Install toe berms of adequate size on all fill slopes facing and or adjacent to potential water to contain any erosion from the fill slope.
- Implement stormwater perimeter control(s) on all new facility construction adequate to contain a 100-year storm event.
- Use hydraulic erosion control mulch or armoring on all exterior slopes adjacent to waterways.
- Seed all access roads and facilities other than well pads seeded in a timely manner after construction has been completed and seeding of all topsoil on pad construction.

Cultural Resources

- The operator/holder/applicant is responsible for informing all persons who are associated with the project that they will be subject to prosecution for knowingly disturbing archaeological sites or for collecting artifacts.
- If any archaeological materials are discovered as a result of operations under this authorization, activity in the vicinity of the discovery will cease, and the BLM WRFO Archaeologist will be notified immediately. Work may not resume at that location until approved by the AO. The operator/holder/applicant will make every effort to protect the site from further impacts including looting, erosion, or other human or natural damage until BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, BLM will evaluate the cultural resources and, in consultation with the State Historic Preservation

Office (SHPO), select the appropriate mitigation option within 48 hours of the discovery. The operator/holder/applicant, under guidance of the BLM, will implement the mitigation in a timely manner. The process will be fully documented in reports, site forms, maps, drawings, and photographs. The BLM will forward documentation to the SHPO for review and concurrence.

- Pursuant to 43 CFR 10.4(g), the operator/holder/permittee/applicant must notify the AO, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4(c) and (d), and the operator/holder/permittee/applicant must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.

Appendix D

Conservation Measures for Federally Listed Species

APPENDIX D: CONSERVATION MEASURES FOR FEDERALLY-LISTED SPECIES

Conservation measures are actions that the action agency and applicant agree to implement to minimize negative effects of the action and to further the recovery of the species under review. Any of the following actions could be selected to be applied during the individual Section 7 Consultation for protection of species listed as threatened or endangered under the Endangered Species Act (ESA). These actions are derived from the various documents listed under Consultation History in the Biological Assessment, and are listed by the specific reference source.

1. **Colorado Cutthroat Trout (CRCT) Conservation Team. 2006. Conservation Agreement for Colorado River Cutthroat Trout (*Oncorhynchus clarkii pleuriticus*) in the States of Colorado, Utah, and Wyoming. Colorado Division of Wildlife, Fort Collins. 10p.**

   OBJECTIVES

   Objective 1: Identify and characterize all CRCT core and conservation populations

   Identify all waters with CRCT populations and monitor known populations to detect changes. Complete genetic analyses on known or potential CRCT populations.

   Objective 2: Secure and enhance conservation populations

   Secure and if necessary enhance all known and suspected genetically pure CRCT populations. These efforts might include, but are not limited to:

   - Restricting introduction of non-native fish species
   - Restricting spread of disease and invasive species
   - Removing non-native fish species
   - Regulating angling and enforcing regulations
   - Constructing in-channel barriers
   - Maintaining sources of genetically pure CRCT

   Objective 3: Restore populations

   Increase the number of stream populations by restoring CRCT within their native range. Local restoration goals and approaches will be developed to meet this objective.

   Objective 4: Secure and enhance watershed conditions

   Strive to improve watershed conditions for CRCT, including development of protocols for monitoring.

   Objective 5: Public outreach

Develop and implement a public outreach effort specifically addressing CRCT conservation.

Objective 6: Data sharing

Continue to build and maintain the CRCT geographic information system (GIS) so that information can readily be shared between and among jurisdictions.

Objective 7: Coordination

Maximize effectiveness of CRCT conservation efforts by coordinating signatory agency efforts toward achieving a common goal.

CONSERVATION ACTIONS

The Conservation Strategy clearly outlines the actions to be implemented for the conservation of CRCT over the next five years. In addition, four general administrative actions (outlined below) will be implemented.

Coordinating Conservation Activities

- Administration of the Agreement will be conducted by the CRCT Conservation Team.

The team shall consist of one designated representative from each state and tribal wildlife agency, one from the U.S. Fish and Wildlife Service (USFWS or Service), one each from the Bureau of Land Management (BLM) and the U.S. Department of Agriculture Forest Service. The team may also include technical and legal advisors and other members as deemed necessary by the signatories.

- The designated team leader may rotate annually among the representatives from the three state wildlife agencies involved.

- Authority of the Conservation Team shall be limited to making recommendations for the conservation of CRCT to the administrators of the signatory agencies.

- The Conservation Team will meet at least annually to develop range-wide priorities, review the annual conservation work plans developed for each state, coordinate tasks and agency resources to most effectively implement the work plan, and review and revise the Strategy as needed. Updates to the CRCT GIS will also occur on an annual basis.

- The Conservation Team will produce a range-wide status assessment during the last year of this agreement. It will include information on the current distribution, genetic status, presence of competing and hybridizing species, disease and other threats to CRCT. This information will be used to evaluate the foreseeable risks and general population health of existing conservation populations. The status assessment will also discuss progress towards meeting objectives in the Conservation Strategy. Based on the assessment, the Conservation Team will make recommendations on the need for extending the Agreement and making revisions to the Strategy.

- Conservation Team meetings will be open to the public. Meeting decision summaries and progress reports will be available to the Conservation Team and other interested parties.

Implementing a Conservation Schedule

- The Status Assessment (Hirsch et al. 2006) will be updated at five-year intervals. The need to extend the Agreement for another five-year cycle will be driven by results summarized in that document.

- Conservation actions and information will be shared annually at Conservation Team meetings. Activities to be conducted during the next five years are listed in the Strategy. The Strategy is a flexible document and will be revised as necessary.

- Each signatory to the Agreement will coordinate, implement, and monitor conservation actions they and their cooperators are responsible for. Accomplishments will be reviewed at Conservation Team meetings to establish progress toward Strategy goals and objectives that will be summarized in the subsequent five-year status assessment.

Funding Conservation Actions

- Funding for the Agreement will be provided by a variety of sources. Federal, state, and local sources will need to provide or secure funding to initiate procedures and tasks of the Agreement and Strategy.

- It is understood that all funds required for and expended in accordance with this Agreement are subject to approval by the appropriate local, state, or federal appropriations. This instrument is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this instrument will be handled in accordance with applicable laws, regulations, and procedures, including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for noncompetitive awards to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

Conservation Progress Assessment

- The Conservation Team will provide a five-year status assessment to the signatory agencies. Copies will be made available to cooperators and interested parties upon request. Annual progress toward achieving Strategy goals will be compiled from Conservation Team meetings, and all new relevant information will be incorporated into the CRCT GIS annually.

2. **Bureau of Land Management (BLM). 2007. Final Biological Assessment Vegetation Treatments on Bureau of Land Management Lands in 17 Western States. Prepared by Nevada State Office, Reno, Nevada. June 2007.**

As dictated in BLM Manual 6840 (Special Status Species Management), local BLM offices are required to develop and implement management plans and programs that will conserve listed species and their habitats. In addition, National Environmental Policy Act (NEPA) documentation related to treatment activities (i.e., projects) will be prepared that identify any threatened and endangered plant (TEP) species or their critical habitat that are present in the proposed treatment areas, and that list the measures that will be taken to protect them. Many local BLM offices already have management plans in place that ensure the protection of these plant species during activities on public land. However, a discussion of these existing plans is outside the scope of this programmatic Biological Assessment (BA). The following general guidance applies to all management plans developed at the local level. Required steps include the following:

- A survey of all proposed action areas within potential habitat by a botanically qualified biologist, botanist, or ecologist to determine the presence/absence of the species.

- Establishment of site-specific no activity buffers by a qualified botanist, biologist, or ecologist in areas of occupied habitat within the proposed project area. To protect occupied habitat, treatment activities would not occur within these buffers.

- Collection of baseline information on the existing condition of TEP plant species and their habitats in the proposed project area.

- Establishment of pre-treatment monitoring programs to track the size and vigor of TEP populations and the state of their habitats. These monitoring programs would help in anticipating the future effects of vegetation treatments on TEP plant species.

- Assessment of the need for site revegetation post treatment to minimize the opportunity for noxious weed invasion and establishment. At a minimum, the following must be included in all management plans:

    - Given the high risk for damage to TEP plants and their habitat from burning, mechanical treatments, and use of domestic animals to contain weeds, none of these treatment methods should be utilized within 330 feet of sensitive plant populations UNLESS the treatments are specifically designed to maintain or improve the existing population.

    - Off-highway use of motorized vehicles associated with treatments should be avoided in suitable or occupied habitat.

    - Biological control agents (except for domestic animals) that affect target plants in the same genus as TEP species must not be used to control target species occurring within the dispersal distance of the agent.

    - Prior to use of biological control agents that affect target plants in the same family as TEP species, the specificity of the agent with respect to factors such as physiology and morphology should be evaluated, and a determination as to risks to the TEP species made.

    - Post-treatment monitoring should be conducted to determine the effectiveness of the project.

In addition, the following guidance must be considered in all management plans in which herbicide treatments are proposed to minimize or avoid risks to TEP species. The exact conservation measures to be included in management plans would depend on the herbicide that would be used, the desired mode of application, and the conditions of the site. Given the potential for off-site drift and surface runoff, populations of TEP species on lands not administered by BLM would need to be considered if they are located near proposed herbicide treatment sites.

- Herbicide treatments should not be conducted in areas where TEP plant species may be subject to direct spray by herbicides during treatments.

- Applicators should review, understand, and conform to the "Environmental Hazards" section on herbicide labels (this section warns of known pesticide risks and provides practical ways to avoid harm to organisms or the environment).

- To avoid negative effects to TEP plant species from off-site drift, surface runoff, and/or wind erosion, suitable buffer zones should be established between treatment sites and populations (confirmed or suspected) of TEP plant species, and site-specific precautions should be taken (refer to the guidance provided below).

- Follow all instructions and Standard Operating Procedures (SOPs) to avoid spill and direct spray scenarios into aquatic habitats that support TEP plant species.

- Follow all BLM operating procedures for avoiding herbicide treatments during climatic conditions that would increase the likelihood of spray drift or surface runoff.

The following conservation measures refer to sites where broadcast spraying of herbicides, either by ground or aerial methods, is desired. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to TEP plant species in the vicinity. Additional precautions during spot treatments of vegetation within habitats where TEP plant species occur should be considered while planning local treatment programs, and should be included as conservation measures in local-level NEPA documentation.

The buffer distances provided below are conservative estimates, based on the information provided by Ecological Risk Assessments (ERAs), and are designed to provide protection to TEP plants. Some ERAs used regression analysis to predict the smallest buffer distance to ensure no risks to TEP plants. In most cases, where regression analyses were not performed, suggested buffers extend out to the first modeled distance from the application site for which no risks were predicted. In some instances the jump between modeled distances was quite large (e.g., 100 feet to 900 feet). Regression analyses could be completed at the local level using the interactive spreadsheets developed for the ERAs, using information in ERAs and for local site conditions (e.g., soil type, annual precipitation, vegetation type, and treatment method), to calculate more precise, and possibly smaller buffers for some herbicides.

2,4-D

- Because the risks associated with this herbicide were not assessed, do not spray within 0.5 mile of terrestrial plant species or aquatic habitats where TEP aquatic plant species occur.

- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.

- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within 0.5 mile downgradient from the treatment area.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Bromacil

- Do not apply within 1,200 feet of terrestrial TEP plant species.

- If using a low boom at the typical application rate, do not apply within 100 feet of an aquatic habitat in which TEP plant species occur.

- If using a low boom at the maximum application rate or a high boom, do not apply within 900 feet of an aquatic habitat in which TEP plant species occur.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Chlorsulfuron

- Do not apply by ground methods within 1,200 feet of terrestrial TEP species.

- Do not apply by aerial methods within 1,500 feet of terrestrial TEP species.

- Do not apply by ground methods within 25 feet of aquatic habitats where TEP plant species occur.

- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic habitats where TEP plant species occur.

- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic habitats where TEP plant species occur.

- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Clopyralid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not apply by ground methods at the typical application rate within 900 feet of terrestrial TEP species.

- Do not apply by ground methods at the typical application rate within 0.5 mile of terrestrial TEP species.

- Do not apply by aerial methods within 0.5 mile of terrestrial TEP species.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Dicamba

- If using a low boom at the typical application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 1,050 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Diflufenzopyr

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 500 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Diquat

- Do not use in aquatic habitats where TEP aquatic plant species occur.
- Do not apply by ground methods within 1,000 feet of terrestrial TEP species at the maximum application rate.
- Do not apply by ground methods within 900 feet of terrestrial TEP species at the typical application rate.
- Do not apply by aerial methods within 1,200 feet of terrestrial TEP species.

Diuron

- Do not apply within 1,100 feet of terrestrial TEP species.
- If using a low boom at the typical application rate, do not apply within 900 feet of aquatic habitats where TEP aquatic plant species occur.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 1,1000 feet of aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Fluridone

- Since effects on terrestrial TEP plant species are unknown, do not apply within 0.5 mile of terrestrial TEP species.

Glyphosate

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species.

- Do not apply by ground methods at the typical application rate within 50 feet of terrestrial TEP plant species.

- Do not apply by ground methods at the maximum application rate within 300 feet of terrestrial TEP plant species.

- Do not apply by aerial methods within 300 feet of terrestrial TEP plant species.

Hexazinone

- Since the risks associated with using a high boom or an aerial application are unknown, only apply this herbicide by ground methods using a low boom within 0.5 mile of terrestrial TEP plant species and aquatic habitats that support aquatic TEP species.

- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.

- Do not apply by ground methods at the maximum application rate within 900 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Imazapic

- Do not apply by ground methods within 25 feet of terrestrial TEP species or aquatic habitats where TEP plant species occur.

- Do not apply by helicopter at the typical application rate within 25 feet of terrestrial TEP plant species.

- Do not apply by helicopter at the maximum application rate, or by plane at the typical application rate, within 300 feet of terrestrial TEP plant species.

- Do not apply by plane at the maximum application rate within 900 feet of terrestrial TEP species.

- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic TEP species.

- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic TEP species.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Imazapyr

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Metsulfuron Methyl

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Overdrive®

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 900 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Picloram

- Do not apply by ground or aerial methods, at any application rate, within 0.5 mile of terrestrial TEP plant species.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within 0.5 mile downgradient from the treatment area.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Sulfometuron Methyl

- Do not apply by ground or aerial methods within 1,500 feet of terrestrial TEP species.
- Do not apply by ground methods within 900 feet of aquatic habitats where TEP plant species occur, or by aerial methods within 1,500 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Tebuthiuron

- If using a low boom at the typical application rate, do not apply within 25 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate or a high boom at the typical application rate, do not apply within 50 feet of terrestrial TEP plant species.
- If using a high boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Triclopyr Acid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species.
- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications at the maximum application rate of this herbicide within 0.5 mile of aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species.
- Do not apply by ground or aerial methods at the maximum application rate within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- If applying to aquatic habitats in which aquatic TEP plant species occur, do not exceed the targeted water concentration on the product label.
- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

Triclopyr BEE

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not apply by ground or aerial methods at the maximum application rate within 0.5 mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.

- In areas where wind erosion is likely, do not apply within 0.5 mile of TEP plant species.

The information provided in Table 4-4 of the BA (BLM 2007) provides a general guideline as to the types of habitats in which treatments (particularly fire) may be utilized to improve growing conditions for TEP plant species. However, at the local level, BLM must make a further determination as to the suitability of vegetation treatments for the populations of TEP species that are managed by local offices. The following information should be considered: the timing of the treatment in relation to the phenology of the TEP plant species; the intensity of the treatment; the duration of the treatment; and the tolerance of the TEP species to the particular type of treatment to be used. When information about species tolerance is unavailable or is inconclusive, local offices must assume a negative effect to plant populations, and protect those populations from direct exposure to the treatment in question. Treatment plans must also address the presence of and expected impacts on noxious weeds on the project site. These plans must be coordinated with BLM weed experts and/or appropriate county weed supervisors to minimize the spread of weeds. In order to prevent the spread of noxious weeds and other unwanted vegetation in occupied or suitable habitat, the following precautions should be taken:

- Cleared areas that are prone to downy brome or other noxious weed invasions should be seeded with an appropriate seed mixture to reduce the probability of noxious weeds or other undesirable plants becoming established on the site.

- Where seeding is warranted, bare sites should be seeded as soon as appropriate after treatment, and at a time of year when it is likely to be successful.

- In suitable habitat for TEP species, non-native species should not be used for revegetation.

- Certified noxious weed seed free seed must be used in suitable habitat, and preference should be given to seeding appropriate plant species when rehabilitation is appropriate.

- Straw and hay bales used for erosion control in suitable habitat must be certified weed- and seed-free.

- Vehicles and heavy equipment used during treatment activities should be washed prior to arriving at a new location to avoid the transfer of noxious weeds.

When BAs are drafted at the local level for treatment programs, additional conservation measures may be added to this list. Where BLM plans that consider the effects of vegetation treatments on TEP plant species already exist, these plans should be consulted, and incorporated (e.g., any guidance or conservation measures they provide) into local level BAs for vegetation treatments.

3. **Bureau of Land Management (BLM). 2008. Programmatic Biological Assessment for BLM's Fluid Minerals Program in Western Colorado re: Water Depletions and Effects on the Four Endangered Big River Fishes: Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), Bonytail Chub (*Gila elegans*), and Razorback Sucker (*Xyrauchen texanus*). November 3.**

BLM agrees to incorporate the following conservation measure as a condition of any BLM authorized water-use project (excluding fluid mineral development):

- Water may be extracted directly out of the Colorado, Gunnison, White, Yampa, or Green Rivers, which all have occupied and critical habitat for the four endangered Colorado River fish. The eight western slope BLM Field Offices/Administrative Units have committed to implement the following measures to minimize direct impacts to federally listed species from pumping water directly out of these rivers:

1. The best method to avoid entrainment is to pump from off-channel locations (e.g., ponds, lakes, and diversion ditches) not directly connected to the mainstream rivers even during high springs flows.

2. If the pump head must be located in the river channel where larval fish are known to occur (generally within Designated Critical Habitat), the following measures apply:

    a) Do not situate the pump in a low-flow or no-flow area as these habitats tend to concentrate larval fishes. Instead, place the pump into fast moving/riffle habitat.

    b) Restrict the amount of pumping, to the greatest extent possible, during the period of the year when larval fish may be present (June 1 to August 15).

    c) Avoid pumping, to the greatest extent possible, during the pre-dawn hours (two hours prior to sunrise) as larval fish drift studies indicate that this is a period of greatest daily activity.

3. Screen all pump intakes with 0.25 inch or finer mesh material.

4. Report any fish impinged on any intake screens to the USFWS at (970) 243-2778, the Colorado Division of Wildlife's Northwest Region, 711 Independent Avenue, Grand Junction, Colorado, 81505, (970) 255-6100, or the Colorado Division of Wildlife's Southwest Region, 415 Turner Drive, Durango, Colorado, 81303, (970) 375-6700.

The above conservation measures (1 through 4) will be implemented via BLM working with the individual companies, their sub-contractors, and industry representative groups to inform and educate on-the-ground personal of the need to implement these conservation measures. In addition, these conservation measures will be added to all Applications for Permit to Drill (APDs) as a condition of

approval (COA) prior to commencement of development activity.

As a means of offsetting the impacts associated with the proposed action, BLM proposes to secure a one-time contribution from and industry representative group in the form of a monetary payment to the National Fish and Wildlife Foundation on behalf of the Recovery Program in the current amount of $18.29 per acre-foot of the project's average annual depletion. These funds are used by the Upper Colorado River Endangered Fish Recovery Program to contribute to the recovery of endangered fish through habitat restoration, propagation and genetics management, instream flow identification and protection, program management, nonnative fish management, research and monitoring, and public education (UCREFRP 2006).

Water depletion in the Colorado and Yampa River sub-basins has been addressed in previous programmatic biological opinions. These opinions require water users to sign Recovery Agreements that state that the water users will not interfere with the implementation of recovery actions and the USFWS will provide ESA compliance. BLM will ensure Recovery Agreements are signed by individual operators, or on the behalf of individual operators via industry representative groups.

The following excerpts from the Cooperative Agreement to implement the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (USFWS 1987) are pertinent to this consultation because they summarize portions of the Recovery Program that address depletion impacts, Section 7 consultation, and project proponent responsibilities:

> All future Section 7 consultations completed after approval and implementation of this program (establishment of the Implementation Committee, provision of congressional funding, and initiation of the elements) will result in a one-time contribution to be paid to the Service by water project proponents in the amount of $10.00 per acre-feet based on the average annual depletion of the project . . . . This figure will be adjusted annually for inflation [the FY-2009 figure is $18.29 per acre-feet].

It is important to note that these provisions of the Recovery Program were based on appropriate legal protection of the instream flow needs of the endangered Colorado River fishes. The Recovery Program further states:

> . . . it is necessary to protect and manage sufficient habitat to support self-sustaining populations of these species. One way to accomplish this is to provide long term protection of the habitat by acquiring or appropriating water rights to ensure instream flows . . . . Since this program sets in place a mechanism and a commitment to assure that the instream flows are protected under State law, the Service will consider these elements under section 7 consultation as offsetting project depletion impacts.

Thus, the USFWS has determined that project depletion impacts can be offset by: (a) the water project proponent's one-time contribution to the Recovery Program in the amount of $18.29 per acre-foot of the project's average annual depletion, and (b) appropriate legal protection of instream flows pursuant to state law, and c) the accomplishment of activities necessary to recover the endangered fishes as specified under the Recovery Implementation Program Recovery Action Plan.

BLM has committed to offset the impacts of the proposed action by soliciting a one-time payment from an industry representative group. At the time of this consultation, BLM has identified an average

annual depletion of 4,046 acre-feet per year (averaged over the next 15 years) associated with the proposed action. For Fiscal Year 2009 (October 1, 2008, to September 30, 2009), the depletion charge is $18.29 per acre-foot. Thus, based on the calculated average annual depletion, a one-time payment of $74,001.34 will be required to offset the depletions caused by the proposed action through 2024.

This amount will be provided to the USFWS's designated agent, the National Wildlife Foundation. The balance will be paid by the industry representative group. The funds will be used to support recovery activities for the Colorado River endangered fishes. The one-time payment will be made to the National Fish and Wildlife Foundation:

National Fish and Wildlife Foundation

ATTN: Donna McNamara, Finance Department

1133 15th Street, NW, Suite 1100

Washington, D.C. 20005

The payment will be accompanied by a cover letter that identifies the projects and biological opinion number (ES/GJ-6-CO-08-F-0006) that requires the payment, the amount of payment enclosed, check number, and the following notation on the check: "Upper Colorado Fish Recovery Program, NA.1104". The cover letter also shall identify the name and address of payer, the name and address of the federal agency responsible for authorizing the project, and the address of the USFWS office issuing the biological opinion. This information will be used by the Foundation to notify BLM, the lead federal agency, and the USFWS that payment has been received. The Foundation is to send notices of receipt to these entities within 5 working days of its receipt of payment.

Recovery Agreements (Appendix A) are also required for depletions within the Colorado and Yampa River Basin as specified in the Colorado River and Yampa River Programmatic Biological Opinions (PBOs). Individual operators or industry representative groups on behalf of individual operators will sign Recovery Agreements as appropriate.

4. U.S. Fish and Wildlife Service (USFWS). 2009. Programmatic Biological Opinion (PBO) for Water Depletions associated with Bureau of Land Management (BLM) Projects (excluding Fluid Mineral Development) Authorized by BLM within the Upper Colorado River Basin in Colorado. February 25.

- Spring developments will ensure that riparian areas associated with the spring are maintained and excess water will be allowed to bypass or pass through any troughs or holdings tanks.

- Stock ponds will be designed to allow excess water to bypass or pass through the pond.

- As a means of offsetting the impacts associated with the proposed action, BLM proposes to make annual contributions in the form of a monetary payment to the National Fish and Wildlife Foundation on behalf of the Recovery Program based on the cumulative average annual depletion for all BLM projects statewide. The current amount (FY 09) is $18.29 per acre-feet of the project's average annual depletion. These funds are used by the Upper Colorado River Endangered Fish Recovery Program to contribute to the recovery of endangered fish through habitat restoration, propagation and genetics management, instream flow identification and protection, program management, nonnative fish management, research and monitoring, and

public education (UCREFRP 2006).

- Water depletions in the Colorado and Yampa River sub basins have been addressed in previous PBOs. These opinions require water users to sign Recovery Agreements that state that the water users will not interfere with the implementation of recovery actions and the USFWS will provide ESA compliance. BLM will ensure Recovery Agreements are signed by project proponents (if other than BLM).

BLM state office will track all projects that result in water depletions from the Upper Colorado River Basin. BLM will complete and submit a log of all water depleting projects by river sub basin to the USFWS by October 31 of each year.

The following excerpts from the Cooperative Agreement to implement the Recovery Implementation Program from Endangered Fish Species in the Upper Colorado River Basin (USFWS 1987) are pertinent to this consultation because they summarize portions of the Recovery Program that address depletion impacts, section 7 consultations, and project proponent responsibilities.

> All future Section 7 consultations completed after approval and implementation of this program (establishment of the Implementation Committee, provision of congressional funding, and initiation of the elements) will result in a one-time contribution to be paid to the Service by water project proponents in the amount of $10.00 per AF based on the average annual depletion of the project…. This figure will be adjusted annually for inflation [the FY 09 is $18.29 per AF].

It is important to note that these provisions of the Recovery Program were based on appropriate legal protection of the instream flow needs of the endangered Colorado River fishes. The Recovery Program further states:

> …it is necessary to protect and manage sufficient habitat to support self-sustaining populations of these species. One way to accomplish this is to provide long term protection of the habitat by acquiring or appropriating water rights to ensure instream flows…. Since this program sets in place a mechanism and a commitment to assure that the instream flows are protected under State law, the Service will consider these elements under section 7 consultation as offsetting project depletion impacts.

Thus, the USFWS has determined that the project depletion impacts can be offset by: (a) BLM's contribution to the Recovery Program based on the project's average annual depletion amount, and (b) appropriate legal protection of instream flows pursuant to state law, and accomplishment of activities necessary to recover the endangered fishes as specified under the RIPRAP.

The annual depletion fees will be provided to the USFWS's designated agent, the National Wildlife Foundation. The funds will be used to support recovery activities for the Colorado River endangered fishes. The fees will be sent to the National Fish and Wildlife Foundation.

National Fish and Wildlife Foundation
ATTN: Donna McNamara, Finance Department
1133 15th Street, NW, Suite 1100
Washington, D.C. 20005

The payment will be accompanied by a cover letter that identifies the projects and Biological Opinion (BO) number (ES/GJ-6-CO-08-F-0010) that requires the payment, the amount of payment enclosed, check number, and the following notation on the check: "Upper Colorado Fish Recovery Program, NA.1104". The cover letter also shall identify the name and address of the federal agency responsible for authorizing the project, and the address of the USFWS's office issuing the BO. This information will be used by the Foundation to notify BLM and the USFWS that payment has been received. The Foundation is to send notices of receipt to these entities within 5 working days of its receipt of payment.

5. U.S. Fish and Wildlife Service (USFWS). 2012. Programmatic Biological Opinion for Effects to Listed Plant Species from the Bureau of Land Management Livestock Grazing Program: Colorado hookless cactus (*Sclerocactus glaucus*), Clay-loving wild buckwheat (*Eriogonum pelinophilum*), DeBeque phacelia (*Phacelfa submutica*). November 15, 2012.

Conservation measures are non-discretionary actions that BLM agrees to implement to further the conservation and recovery of listed species. The beneficial effects of conservation measures are taken into consideration for determining both jeopardy and adverse modification analyses. (Note: The following list reflects various agreements made following receipt of the BA for this project, as described in the *Consultation History* section (USFWS 2012).)

The terms and conditions of grazing permits that include habitat occupied by Colorado hookless cactus, clay-loving wild buckwheat, or DeBeque phacelia will include conservation measures designed to avoid, minimize, and/or remediate effects to species in mapped occupied habitat. Some measures are specific to individual allotments. Conservation measures to be implemented include, but are not limited to, the following:

1. In areas where there is a concern that Colorado hookless cactus, clay-loving wild buckwheat, and DeBeque phacelia may be present, a survey will be conducted prior to any livestock management actions such as range improvements or maintenance, or weed management. The BLM Threatened, Endangered, and Sensitive species specialist will determine the need for a survey and survey scope and intensity.

2. Maps will be provided to permittees that identify sensitive areas where restrictions may apply to particular grazing-related activities for the Colorado hookless cactus, clay-loving wild buckwheat, and DeBeque phacelia (individual occurrences or populations plus a 200-meter [656-foot] buffer). As new information becomes available, and as necessary, maps will be updated by BLM and provided to permittees each year if new occurrences are found. (Note: Maps provided to permittees will include sufficient buffers and randomized perimeters to avoid disclosing exact species locations.)

3. The permittee is required to notify the BLM Rangeland Management Specialist prior to any surface disturbing range project maintenance activity (fences, stock ponds, spring developments, etc.) in any allotment (standard condition for all BLM allotments). Surveys and avoidance measures will be required where effects to listed plants may occur.

- Construction of new range developments (e.g., fences, ponds, water troughs) would be designed to avoid impacts to listed species whenever feasible. New range developments that may affect listed species would not be permitted until completion of an additional tiered

consultation.

4. If a permittee wishes to apply an herbicide treatment, they must obtain prior approval from BLM. Appropriate applicator licenses must be obtained, copies of the appropriate *Pesticide Use Proposal* must be obtained from BLM, and a *Pesticide Application Record* must be completed and returned to BLM no later than 10 days after herbicide application (standard condition for all BLM allotments).

- The permittee must consult with the BLM Rangeland Management Specialist and Biologist/Ecologist prior to applying herbicides or pesticides within 200 meters (656 feet) of individual plants or populations. Such treatments may be restricted or modified to avoid effects to the three listed species. Depending on the Field Office and weed program restrictions (see following bullet), additional section 7 consultation may be required prior to applying herbicides. Based on existing consultations, treatments near occupied habitat may not be covered under section 7.

- All treatments will comply with the approved Integrated Weed Management Plan (IWMP) and section 7 consultation (completed for the Grand Junction Field Office (GJFO) and Colorado River Valley Field Office [CRVFO], in progress for UFO). Not all treatments are covered under those consultations and would, therefore, require separate section 7 consultation. The three field offices' IWMPs differ slightly in their requirements for avoidance distances and triggers for reinitiation of consultation. Please refer to those documents for details.

5. Within 200 meters (656 feet) of listed plants, motorized access for livestock grazing operations will be limited to existing roads and routes. Any additional access proposed for grazing operations would require additional surveys and section 7 consultation.

6. As a standard permit term and condition within occupied habitat, seasonal utilization levels on palatable perennial forage will be limited to 40 percent to the extent possible, and average utilization will not exceed 50 percent (currently the approximate level of forage utilization in most areas on public lands). These areas will be monitored by the BLM Rangeland Management Specialist and Biologist/Ecologist to ensure compliance.

7. Permits for trailing through occupied habitat will only be issued for existing livestock trailing areas identified in Appendix I, Figure 1, of the BA (USFWS 2012).

- Where trailing occurs, minimization measures such as the following will be implemented to reduce impacts:

  - BLM will encourage the avoidance of known individuals or populations during livestock herding and trailing activities on BLM administered lands. Maps would be provided to permittees to facilitate avoidance.

  - In areas where trailing activities cannot be avoided (e.g., Escalante Canyon), monitoring of affected populations will be established. Where monitoring suggests population decline then the following measures will be considered by BLM to achieve appropriate protection:

    - Use additional herders/cowboys to direct livestock away from populations.

- Trail smaller herds through at any given time.
- Use temporary fencing/barricades to inhibit livestock from trailing through populations during trailing activities.
- Should all other attempts to reduce impacts from trailing not be successful, permanent drift fences may be considered.

  - Permittee will be required to notify the BLM office at least 24 hours in advance of the trailing activity.
  - Require that trailing activity be concentrated within existing road corridors as much as practicable and in a timely and efficient manner. Overnighting of livestock within occupied habitat is prohibited unless the area has been cleared for threatened, endangered, and special status species prior to overnight activity.
  - Trailing will not be allowed during flowering or germination periods where possible.

- Any future identified trailing activities through occupied habitat will be managed according to the above stated conservation measures.

8. No concentrations of livestock activities including but not limited to herding, routine trailing, bedding, salt or supplement, portable watering, and new stock ponds will be allowed within 200 meters (656 feet) of individual plants or populations, except as provided below:

- Concentration may be allowed where separated by a fence or topographic feature (cliff) that will render the impacts to listed plants insignificant, discountable, or if impacts are wholly beneficial (distribute livestock away from listed plants).
- In allotments in which sheep bedding must occur within the 200-meter (656-foot) buffer, only dispersed bedding will be allowed. Dispersed bedding allows sheep to bed however the band has dispersed throughout the day, rather than gathering or congregating the band in any one common locale.
- To minimize sheep grazing impacts in allotments containing clay-loving wild buckwheat, limit sheep grazing within 200 meters (656 feet) of occupied habitat to 5 nights per use area.
- The BLM Rangeland Management Specialist will collaborate with the permittee to develop and employ appropriate grazing strategies for the allotment pastures and use areas to meet Colorado Public Land Health Standards, specifically standard 3 for upland plant communities and standard 4 for TES species. Where possible, grazing should be limited to 15 days or less in each pasture or use area during the germination, flowering, and fruiting period for the three focus species to ensure reproduction and recruitment.

9. Monitoring will be conducted (e.g., Land Health Assessments (LHAs), utilization, trend, Ecological Site Inventory) to evaluate rangeland health. If monitoring/LHAs conclude that an allotment with occupied habitat is not meeting the standards for special status plants, vegetation, or soils, and livestock grazing is identified as a significant causal factor in not meeting those standards, grazing permit modifications, mitigation, or other prescriptive measures will be

required by BLM, such as:

- The BLM Rangeland Management Specialist will work with the permittee to pursue opportunities to allow portions of the allotment(s) to receive yearlong rest or deferment in order to increase plant vigor.

- Exclosures or drift fences may be considered in certain areas where individual plants or populations require special protections from livestock grazing or associated activities, as determined by BLM.

- Permit terms and conditions may be modified to minimize impacts to listed plants (e.g., improved distribution, changes in season of use/class of livestock).

10. BLM will seek to implement monitoring programs to assess grazing-related impacts to the species. Results from the monitoring will be used to inform future grazing management.

- BLM Field Offices will continue to partner with the BLM Colorado State Office and other organizations (e.g., the USFWS, Denver Botanic Gardens [DBG], Colorado Natural Heritage Program [CNHP], Colorado Native Plant Society, Colorado Natural Areas Program [CNAP]) to monitor listed plants.

- In areas where grazing has been identified as a threat to individuals or populations, BLM will explore opportunities to modify existing monitoring and develop new monitoring to assess grazing-related impacts to the species.

11. To ensure the conservation of the three listed species, BLM will coordinate with the USFWS to identify important areas for species conservation. This coordination may result in actions to improve species conservation, initiate adaptive management strategies to reduce grazing impacts to the three listed species, or place greater management emphasis on their conservation through BLM's planning and decision process.

12. BLM intends to continue a similar annual inventory effort as in recent years (between 2,000 and 10,000 acres) across the three species' ranges, consistent with funding and priorities. Results will be submitted to the CNHP to ensure data is compiled in a centralized database.

13. BLM will provide the USFWS with monitoring data collected and will work with the USFWS to develop a cooperative monitoring strategy that will capitalize on partnerships to augment existing monitoring studies and data. With the USFWS's assistance, BLM will work on creating partnership opportunities to design and carry out additional monitoring needs.

14. BLM will report conservation actions taken annually to the USFWS highlighting the adaptive management occurring in the grazing programs. Future BLM actions, monitoring (trend, grazing utilization, and LHA), and decisions covered under or related to this programmatic consultation will be reported annually to the USFWS.

15. BLM Field Offices will individually schedule coordination meetings throughout the year with the USFWS and will work to address grazing impacts to listed plants.

If impacts to any of the three plant species occur that were not analyzed in this consultation, or

are found likely to occur due to future grazing-related activities, further section 7 consultation will occur.

6. **Bureau of Land Management (BLM). 2013. Biological Assessment, Colorado River Valley Field Office Resource Management Plan Revision. February 2013.**

T&E-GEN-1: The CRVFO will consult agency species management plans and other conservation plans, as appropriate, to guide management and devise mitigation measures when needed. Examples of these plans include, but are not limited to, the Colorado Wildlife Action Plan; the Colorado Sagebrush: A Conservation Assessment and Strategy; national, range-wide, statewide and local working group conservation plans for Gunnison and greater sage grouse; the Sharing the Land with Pinyon-Juniper Birds; the Birds in a Sagebrush Sea: Managing Sagebrush Habitats for Bird Communities; the North American Landbird Conservation Plan; the North American Waterbird Conservation Plan; the National and Colorado Partners in Flight Bird Conservation Plans: the Colorado Gunnison's and White-tailed Prairie Dog Conservation Strategy and Recovery plans for federally listed species; and the Colorado Rare Plant Conservation Initiative's Recommended Best Management Practices for Plants of Concern.

T&E-PLT-2: Prior to approving any ground-disturbing activities, suitable habitat[1] for special status plants will be identified based on existing plant location records, soil or geological mapping, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience, and knowledge of the species prior to starting work.

T&E-PLT-3: For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of occupied plant habitat[1] wherever possible and where geography and other resource concerns allow[2]. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

T&E-PLT-4: Where development is allowed within 100 meters of occupied habitat for listed, proposed, candidate, or BLM sensitive species, unauthorized disturbance of plant habitat will be avoided through on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the USFWS. In such instances, a monitoring plan approved by the USFWS will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.

[1]Occupied habitat includes areas historically or currently supporting plants and/or soils containing a viable seed bank. Suitable habitat is defined as an area that contains or exhibits the specific components or constituents necessary for plant persistence, as determined by existing maps plus field inspection and/or surveys. It may or may not be occupied by plants or a seed bank. Potential habitat is defined as an area that satisfies the broad criteria of the species' habitat description. It is usually determined by preliminary in-house assessment.

[2] An avoidance buffer helps to minimize dust transport, weed invasion, unauthorized vehicular activities, chemical and produced-water spills; and helps to protect pollinator habitat.

T&E-PLT-5: Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but we do not expect that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts). In some cases, disturbances well beyond 20 meters from the listed plant will be considered an adverse effect.

T&E-PLT-6: Transplantation of potentially affected plants will not be used as a rationale to defend a "not likely to adversely affect" or a "no effect" determination for listed plant species.

T&E-PLT-7: Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

Travel Management: T&E-PLT-8: When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

Weed Management

T&E-PLT-9: All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

Wildland Fire Management: T&E-PLT-10: Within mapped, occupied, and suitable habitat for Colorado hookless cactus, DeBeque phacelia or Parachute penstemon, wildland fire management actions will be conducted in the following manner:

- Minimize surface disturbance by using retardant, water, engines/wet lines, etc. in known habitat rather than dozers or hand crews.
- Unless firefighter safety is jeopardized, construct fire line outside the perimeter of known cactus populations.
- Avoid cross-country use of motorized vehicles and mechanical equipment within known populations of federally listed or proposed plants.

Federally-Listed Fish Species

T&E-TER-20: Close and immediately reclaim all roads that are redundant, not used regularly, or have been abandoned to the maximum extent possible to minimize disturbance and habitat fragmentation.

7. Bureau of Land Management (BLM). 2014. Biological Assessment: Effects on Parachute

penstemon (*Penstemon debilis*) of Livestock Grazing on the JQS Allotment, Colorado River Valley Field Office, Silt, CO. April 2, 2014.

The following conservation measures are designed to avoid, minimize, and/or remediate effects to Parachute penstemon occupied habitat and critical habitat and will be added to the terms and conditions of the JQS grazing permits:

1. Maps will be provided to permittees that identify sensitive areas where restrictions may apply to particular grazing-related activities for the Parachute penstemon (including a 200 meter (656 feet) buffer around occurrences). Maps provided to permittees will include sufficient buffers and randomized perimeters to avoid disclosing exact species locations.

2. The permittee is required to notify the BLM Rangeland Management Specialist prior to any surface disturbing range project maintenance activity (standard for all BLM allotments). Surveys and avoidance measures will be required where effects to listed plants may occur.

   - Construction of new range developments (e.g., fences, ponds, water troughs) would be designed to avoid impacts to listed species wherever feasible. New range developments that may affect listed species would not be permitted until completion of additional consultation.

3. If a permittee wishes to apply an herbicide treatment, they must obtain prior approval from BLM. Appropriate applicator licenses must be obtained, copies of the appropriate *Pesticide Use Proposal* must be obtained from BLM, and a *Pesticide Application Record* must be completed and returned to BLM no later than 10 days after herbicide application (standard for all BLM allotments).

   - The permittee must consult with the BLM Rangeland Management Specialist and Botanist/Ecologist prior to applying herbicides or pesticides within 200 meters (656 feet) of individual plants or populations. Such treatments may be restricted or modified to avoid effects to Parachute penstemon.

   - All treatments will comply with the CRVFO Integrated Weed Management Plan (BLM 2009) which tiers to the Vegetation treatment EIS for 17 Western States.

4. Within 200 meters (656 feet) of listed plants, motorized access for livestock grazing operations will be limited to existing roads and routes. Any additional access proposed for grazing operations would require additional surveys and Section 7 consultation.

5. No concentrations of livestock activities including but not limited to herding, bedding, trailing, salt or supplement, portable watering, and new stock ponds will be allowed within 200 meters (656 feet) of individual plants or populations, except as provided below:

   - Concentration may be allowed where separated by a fence or topographic feature (cliff) that will render the impacts to listed plants insignificant, discountable, or if the impacts are wholly beneficial (distribute livestock away from listed plants).

   - Trailing will be allowed along the Anvil Rim Road to access the Anvil Pasture.

6. No salt will be placed on or east of the Anvil Rim Road.

7. No sheep grazing will be allowed east of the Rim Road until surveys for Parachute penstemon have been completed and no occurrences have been located. If occurrences are located on or above the cliff rim during these surveys, the same protections will be applied to these new populations as to the existing population.

8. The existing fence around the known population of Parachute penstemon in T5S, R94W, S34 and T6S, R94W, S5 will be reconstructed and extended to the cliff to exclude sheep grazing within occupied habitat. The fence encloses an area of approximately 100 meters by 70 meters and includes all of the potential habitat at the site.

9. The Anvil and Golden Castle Pastures will not be grazed at the same time of year for more than 2 consecutive years in order to allow rest from grazing during critical growth stages.

10. Monitoring (e.g., LHAs, utilization, trend, Ecological Site Inventory) will be conducted as needed to evaluate rangeland health. If monitoring/LHAs conclude that the JQS allotment is not meeting or making significant progress towards meeting the standards for special status plants, vegetation, or soils, and livestock grazing is identified as a significant causal factor in not meeting those standards, grazing permit modifications, mitigation, or other prescriptive measures will be required by BLM, such as:

    - The BLM Rangeland Management Specialist will work with the permittee to pursue opportunities to provide yearlong rest or deferment from grazing within critical habitat during the critical growing season to increase plant vigor and allow forbs, in particular mat penstemon, which is considered an important food sources for pollinators, to flower and set seed.

    - Exclosures or drift fences may be considered in certain areas where individual plants or populations require special protections from livestock grazing or associated activities as determined by BLM.

    - Permit terms and conditions may be modified to minimize impact to listed plants (e.g., improved distribution, changes in season of use/class of livestock).

11. BLM will continue periodic monitoring of the Parachute penstemon population within the JQS allotment to assess any grazing-related impacts to the population.

12. BLM will identify at least one new key area within the critical habitat unit to monitor grazing-related impacts to the pollinator habitat (forb utilization and weed invasions). Results from the monitoring will be used to inform future grazing management.

13. Utilization of forbs, especially mat penstemon, within the Anvil Points Critical Habitat Unit will not exceed 50% of current year's growth/flowers. Livestock will be removed from this pasture when this utilization limit is reached.

REFERENCES

Bureau of Land Management (BLM). 2007. Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States. Prepared by Bureau of Land Management Nevada State Office Reno, Nevada June 2007.

Bureau of Land Management (BLM). 2009. Integrated Weed Management Plan and Programmatic Environmental Assessment Glenwood Springs Field Office. June 2009. 95 pp.

Hirsch, C.L., M.R. Dare, and S.E. Albeke. 2010. Range-wide status of Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*): 2010. Colorado River Cutthroat Trout Conservation Team Report. Colorado Parks and Wildlife, Fort Collins. July 2013.

Upper Colorado River Endangered Fish Recovery Program (UCREFRP). 2006. Available at: http://www.coloradoriverrecovery.org/documents-publications/technical-reports/research-monitoring.html. Accessed: 24 March, 2016.

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APPENDIX E

DISTURBED SITE RECLAMATION STANDARDS AND IMPLEMENTATION, MONITORING, AND EVALUATION

(from Colorado River Valley Field Office Proposed Resource Management Plan (PRMP)/Final Environmental Impact Statement (FEIS))

http://www.blm.gov/style/medialib/blm/co/field_offices/crvfo/crvfo_proposed_rmp.Par.0827.File.dat/35%20Appendix%20S%20Monitoring.pdf

DISTURBED SITE RECLAMATION STANDARDS, MONITORING AND SUCCESS CRITERIA

1 INTRODUCTION AND SUCCESS CRITERIA

The goal of the following reclamation standards and success criteria is to mitigate anticipated impacts to vegetation, soil and water resources from ground-disturbing activities by re-establishing a self-sustaining, diverse vegetation community composed of species native to the region in sufficient species density and diversity to closely approximate natural, undisturbed vegetation potential.

This Appendix supplements the discussion found in "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (BLM 2006), commonly referred to as "The Gold Book". All ground-disturbing activities will be subject to these reclamation standards and monitoring requirements. These include resource improvements initiated by BLM, as well as permitted activities such as fluid and solid mineral development activities, including oil and gas development.

BLM is responsible for implementing these standards and compliance with monitoring requirements. Project proponents for all permitted activities will typically perform the reclamation work, and effect on-the-ground implementation. Projects must meet both interim and final reclamation objectives in order to retrieve any associated bonds, or for reclamation to be considered successful. For oil and gas development activities within the Federal Unit atop the plateau, five-year interim criteria must be met in order to have areas released from the total maximum disturbance area for the unit, or in order to move to the next development area. Interim reclamation objectives and success criteria have been split into short- term (two-year) and long-term (five-year) groupings. Two-year criteria are to be met in two or fewer years, while five-year criteria must be met in five or fewer years. For example, five-year criteria may be met in a little as two years, but must be met within five years for reclamation to be considered successful.

1.1 SHORT-TERM (TWO YEAR) INTERIM RECLAMATION OBJECTIVES AND SUCCESS CRITERIA

Interim reclamation refers to those actions taken immediately after cessation of ground-disturbing activities. Interim actions are typically taken to stabilize a portion of a site that is no longer undergoing disturbance while activities simultaneously continue to disturb other portions of the same area. For example, interim reclamation may be conducted in perimeter areas of a natural gas well site when the larger footprint required for the development is reduced in area to that necessary for production. The following interim reclamation success requirements will be used to determine success after two years (two complete growing seasons):

a. Re-grade the site to approximate pre-disturbance topography to the extent practicable, in order to minimize disturbance, and lessen erosion potential.

b. Stabilize disturbed soil surface areas to reduce erosion and runoff to or below naturally occurring levels.

c. With the exception of active work areas, all disturbed soils that remain exposed, unprotected, or unreclaimed for longer than one month will be stabilized as approved by BLM. This may be done through the use of a BLM approved native seed appropriate for the site's native plant community, or application of a covering such as mulch or matting,

d. Establish and maintain a healthy and diverse composition of the species which are or should naturally grow on the site, according to the Ecological Site Description or reference site plant community, which will provide for natural plant and community succession.

e. Prevent establishment of noxious weeds and undesirable plants on the disturbed areas and expansion onto adjacent uninfected areas.

f. Restore wildlife habitat and livestock forage.

g. Reduce visual contrast to meet established visual resource management objectives in all reclaimed areas.

1.2 LONG-TERM (FIVE YEAR) INTERIM AND FINAL RECLAMATION OBJECTIVES AND SUCCESS CRITERIA

Final reclamation will occur when no more ground-disturbing activities are expected to occur. The following reclamation success requirements will be used to determine success after five years (five complete growing seasons):

a. Stabilize the disturbed soil surface to reduce erosion and runoff to or below natural background levels. Flow pattern development will not have resulted in rills deeper than three inches, or spaced closer than on adjacent undisturbed hillsides. Activities do not contribute to pre-existing gullies actively down cutting or head cutting. No slumping or subsidence will occur as a result of surface disturbing activities.

b. With the exception of active work areas, all disturbed soils that remain exposed, unprotected, or unreclaimed for longer than one month will be stabilized as approved by BLM. This may be done through the use of a BLM approved native appropriate for the site's native plant community, or application of a covering such as mulch or matting.

c. Re-grade the site to approximate pre-disturbance topography to the extent practicable, in order to minimize disturbance, and lessen erosion potential.

d. Achieve or exceed the pre-disturbance cover and diversity of native species on the site. Total cover will be at least 80 percent of the reference area and have a similar composition of trees, shrubs, grasses, and forbs. Frequency of the most dominant species will be at least 80 percent of their relative contribution on the reference site. Vegetative composition and density will include the following: 1) Grass and forb species, by percent cover, 2) Litter accumulation as determined by percent ground cover, 3) Bare ground as determined by percent ground cover, 4) Noxious weed species, by percent cover (with a treatment objective of zero percent relative cover) 5) Other non- native and invasive species (with a treatment objective of actual cover of less than five percent), and 5) Soil surface stability as determined by the absence or limited degree of surface erosion and plant pedestals.

e. State of Colorado A, B, or C listed noxious weeds or other undesirable plant species will be absent (including kochia and Russian-thistle), with an exception for cheatgrass. It may be necessary to treat adjacent infestations of noxious and undesirable species prior to disturbance. If cheatgrass is present adjacent to the disturbed area in overall concentrations of less than 50 percent vegetative cover, the percentage vegetative cover of cheatgrass on the reclaimed site will not exceed five percent. In areas where adjacent lands have greater than 50 percent cheatgrass cover, the percentage cover on reclaimed lands will not exceed 20 percent.

f. Restore visual quality, reduce visual contrast and enhance aesthetic values to meet visual resource management objectives on all areas of surface disturbance.

2 RECLAMATION PLANS

Reclamation plans will be submitted for BLM review and approval prior to surface disturbing activities. Reclamation plans will be considered as COAs for oil and gas leases and reviewed and approved through activity or project specific planning for other resource management activities. Reclamation plans will address the following requirements in sufficient detail to demonstrate an understanding of the potential reclamation site and activities required to achieve the stated success criteria. These plans will incorporate the following reclamation topics and fully develop appropriate site-specific BMPs for each permitted action and location.

2.1 SITE-SPECIFIC BASELINE INFORMATION:

a. Pre-disturbance terrain and contour

g. Pre-disturbance land use

h. Seasonal weather patterns

i. Topsoil depth and other limitations to plant root growth

j. Vegetation type, dominant species cover, density, and productivity by strata

2.2 REFERENCE SITE SELECTION AND DOCUMENTATION:

a. Appropriate reference sites will be assessed, selected, and characterized following Ecological Site Inventory (ESI) methods and standards, or an approved equivalent system (see Attachment A for an example).

b. Reference sites will be approved by BLM prior to a permitted disturbance.

2.3 SITE-SPECIFIC REVEGETATION PLAN:

a. Size of disturbed versus reclaimed area

b. Proposed surface finish and grades

c. Proposed topsoil handling and treatment

d. Proposed seed mix (seeding rate, species, and variety)/container stock planting (container size and off- center spacing)

e. Treatment of noxious and undesirable species

f. Proposed seeding/mulching techniques

g. Ongoing maintenance activities expected

h. Monitoring plan

2.4 BOND AGREEMENT INFORMATION (IF APPLICABLE), OR CONDITIONS FOR FUTURE ACTIVITY

Bonds to be held against achievement of reclamation success criteria will be negotiated on a site-by-site basis. In general, the amount of a bond will be considered a percentage of the total reclamation costs for a project sufficient to ensure reclamation success. These costs will be demonstrated in the reclamation plan. Documentation of compliance with bonding requirements sufficient to assure reclamation will also be included as part of the approved reclamation plan.

Future associated development activities may be precluded until successful reclamation is achieved for a given area or project.

3 RECLAMATION PRACTICES AND STANDARDS

The following practices and standards are intended to be applied simultaneously to all appropriate BMPs to all reclamation sites. Some standards are only appropriate for interim or final reclamation, while others will be used in either situation. Practices and standards are intended to provide direction and clarify BLM's intent for reclamation activities. The intent of BLM's land use planning (RMP) process is to identify standards and objectives to be met on public lands. Specific methodologies are considered to be activity or implementation level planning decisions and not RMP decisions. As such, practices are provided to clarify BLM's intent for reclamation activities. The following list is not considered to be all-inclusive, but rather is presented to provide a sense of the minimum requirements that will be required to produce acceptable reclamation outcomes. Additional practices may be required, practices may be withdrawn, or practices may be modified during activity, implementation, or project level planning; this may be done without future land use plan (RMP) decisions or amendments. Monitoring and adaptive management practices will be used to refine and clarify needed actions consistent with the goals and objectives of this plan. Reclamation practices and standards are listed below.

3.1 INTERIM RECLAMATION PRACTICES AND STANDARDS

a. Limit surface disturbance to the minimum area necessary by avoiding development of roads, pipelines, and well pads on steep slopes; minimize the potential for surface disturbance through careful planning; grouping facilities to the extent possible; and sharing rights-of-way such as burying pipelines along roadways.

b. Stockpile topsoil when possible and prudent (not in areas of seleniferous or erosive soils, or in areas with noxious weed populations), following all topsoil salvage and storage BMPs; or if directed by BLM plan for salvage, direct-haul, and application (live handling) of topsoil from a disturbance site to a site undergoing concurrent revegetation.

c. Minimize the area necessary for construction activities; determine the minimal area needed to facilitate necessary activities, and initiate interim reclamation as quickly as practicable after construction.

d. Silt fencing will be necessary in areas in proximity to water features such as streams, ponds, and wetlands or in other situations where wind or water erosion may otherwise move sediments into sensitive or valuable surrounding habitat.

e. Interim reclamation will include recontouring of the disturbed surface to blend with surrounding terrain, spreading salvaged or stockpiled topsoil evenly on areas to be reclaimed, and revegetating with native plants.

f. Use BLM approved seed mixes containing native, early-successional species, or species with ability to readily establish quickly in recently-disturbed soil areas. In areas subject to occasional vehicle travel, interim revegetation will include species selected to accommodate occasional activity such as vehicle travel, vehicle parking, or temporary staging areas.

g. Drill seed the disturbed area with a seed mix of species native to the local area at a rate sufficient to achieve site stabilization and achieve desired cover based on reference sites (rate would be doubled for broadcast or hydroseeding where drill seeding is impracticable) following adequate soil preparation that includes removal of weeds and undesirables species, decompaction ("fluffing") of compacted soil, and harrowing to prepare the seedbed. If the seed mix contains sagebrush or small seeded species, this seed will be broadcast sown rather than drill seeded. Planting of containerized stock may also be required.

h. Mulching will be required to stabilize soil, maximize moisture infiltration, and improve the chances for revegetation success. Mulch seeded areas in salt desert shrub, sagebrush, and pinyon-juniper habitats with certified weed-free native hay or straw, or with hydromulch, at a rate sufficient to achieve site stabilization and establish native species. If physical conditions preclude use of straw or hay mulch, such as on steep slopes, apply appropriate hydromulch with a non-asphalt tackifier. Hay or straw mulch should not be used in mountain shrub or subalpine sites, but hydromulch may be used in these habitats on steep slopes.

i. Control and eradicate all State of Colorado A-, B-, and C-listed noxious weeds and undesirable species within reclaimed areas, with the exception of cheatgrass in areas where cheatgrass is a component of the adjacent undisturbed vegetation. One aspect of reducing the potential for noxious weed establishment is consideration of the sequence and timing of revegetation.

j. Fencing will be required to limit wildlife and livestock grazing for a minimum of two growing seasons or until plants are sufficiently established to persist under some physical disturbance. Seeded species will be considered established when at least 50 percent of plants are producing seeds. Fencing will be installed after dirtwork, grading, and seeding are completed and prior to livestock turnout on the allotment. The use of less-palatable grasses and forbs or fencing will be used as approved by BLM to limit wildlife and livestock presence along roadways, pipelines, or other disturbed areas.

3.2 LONG-TERM (FIVE YEAR) INTERIM AND FINAL RECLAMATION PRACTICES AND STANDARDS

a. Remove all equipment, debris, and surface structures that are not necessary for the intended use of the site. Remaining structures will blend in to the extent possible with the surrounding terrain. At final reclamation, all structures will be removed. Consider the use of natural features such as trees, rock formations, terrain, or berms to conceal roads, pipelines, and well pads. Paint structures a color that blends with the surrounding vegetation.

b. Recontour all disturbed areas to blend with the surrounding terrain to the extent practicable. Areas that have received heavy equipment use such as roads and well sites will be ripped to a depth sufficient to accommodate the establishment of native vegetation similar to the surrounding undisturbed area.

c. As soon as practicable, spread salvaged or stockpiled topsoil to a uniform depth across all disturbed areas. The surface must blend with the surrounding non-disturbed area. (A rough surface will accommodate broadcast seeding better than a smooth surface.)

d. Revegetate with BLM approved native plant species similar in mix and kind to the appropriate reference plant community, including grasses, forbs, and shrubs. The type of cultural material (seeding or planting) used will depend on the attributes of the site and revegetation goals. As needed, utilize a combination of seeding and containerized nursery stock planting.

e. Drill seed the disturbed area with a seed mix of species native to the local area at a rate sufficient to achieve site stabilization and achieve desired cover based on reference sites (rate would be doubled for broadcast or hydroseeding where drill seeding is impracticable) following adequate soil preparation that includes removal of weeds and undesirables species, decompaction ("fluffing") of compacted soil, and harrowing to prepare the seedbed. If the seed mix contains sagebrush or small seeded species, this seed will be broadcast sown rather than drill seeded.

f. Seed disturbed areas in fall or early winter (depending on elevation) to exploit elevated moisture normally available in winter and spring as an aid in germination and seedling establishment, or as approved by BLM.

g. Mulching will be required to stabilize soil, maximize moisture infiltration, and improve the chances for revegetation success. Mulch seeded areas in salt desert shrub, sagebrush, and pinyon-juniper habitats with certified weed-free native hay or straw, or with hydromulch, at a rate sufficient to achieve site stabilization and establish native species. If physical conditions preclude use of straw or hay mulch, such as on steep slopes, apply appropriate hydromulch with a non-asphalt tackifier. Hay or straw mulch should not be used in mountain shrub or subalpine sites, but hydromulch may be used in these habitats on steep slopes.

h. State of Colorado A-, B-, or C-listed noxious weeds or other undesirable plant species will be absent (including kochia and Russian-thistle), with an exception for cheatgrass. It may be necessary to treat adjacent infestations of noxious and undesirable species prior to disturbance. If cheatgrass is present adjacent to the disturbed area in concentrations of less than 50 percent vegetative cover, the percentage vegetative cover of cheatgrass on the reclaimed site will not exceed five percent. In areas where adjacent lands have greater than 50 percent cheatgrass cover, the percentage cover on reclaimed lands will not exceed 20 percent.

i. Plant containerized native shrubs and trees (as appropriate based on the surrounding plant community) when conditions warrant following successful noxious weed control, in natural-appearing groups at a spacing that approximates the structure of local plant communities.

j. Fencing will be required to limit wildlife and livestock grazing for a minimum of two growingseasons or until plants are sufficiently established to persist under some physical disturbance. Seeded species will be considered established when at least 50 percent of plants are producing seeds. Fencing will be installed after dirtwork, grading, and seeding are completed and prior to livestock turnout on the allotment. The use of less-palatable grasses and forbs or fencing may be required or approved by BLM to limit wildlife and livestock presence along roadways, or other disturbed areas.

4 MONITORING

Annual monitoring and reporting of results will be required for all reclaimed areas. Monitoring will occur annually for either a minimum of five years or until performance standards are achieved, whichever is longer. Monitoring methods and reporting standards will be included in reclamation plans and approved by BLM prior to disturbance. Current monitoring methods are outlined below. Required monitoring methodology may change over time in accordance with changes in CRVFO monitoring protocols. An example of a potential foreseeable change would be implementation of the BLM's new Assessment, Inventory, and Monitoring Program (AIM) monitoring protocols.

4.1 METHODS

Monitoring methods will be approved as part of a site reclamation plan, prior to site disturbance. In general, methods must be used that will yield appropriate quantitative measures by which to address success criteria parameters against a reference site.

a. Plant species composition and cover will be sampled using either point intercept transect or plot sampling at a sufficiency to demonstrate statistical adequacy at the 85 percent level.

b. Woody species (tree and shrub) density and survivorship will be assessed using plot or belt transect sampling.

c. Fixed photo points (location to be determined and used during baseline conditions sampling).

4.2 MONITORING REPORTS

Reports of annual monitoring efforts will be submitted annually to BLM for approval. Each report will address the results of the monitoring in terms of each success criterion and compared to the same parameters for the reference site. Additionally, each report will address the following items:

a. Text and data to illustrate trends in terms of site conditions against each of the agreed-upon success criteria

b. Tabulated woody (tree and shrub species) containerized planting survivorship

c. Quantitative percent cover data by species for all plant species present on the site, including planted and seeded species, native volunteer species, non-native species, and noxious weeds

d. Annotated photographs from fixed photo points illustrating conditions before and after mitigation activities are completed

e. A figure showing locations of fixed photo points and data sampling locations

f. A brief discussion of the overall mitigation success, incorporating monitoring data. Problem areas identified during the monitoring session will be discussed and adaptive management remediation activities will be recommended, as necessary.

g. A description of any adaptive management activities performed since the previous annual report for the site as well as planned actions to be taken if plant establishment efforts are sub-standard or completely fail. For these circumstances, the cause of failure must be stated and how corrective actions will mitigate these causes.

ATTACHMENT A:

Alternative Approach to ESI Reference Sites

Example of a Quantitative Success Sampling Assessment Tool

FLORISTIC QUALITY INDEX

I. Floristic Quality Indices (after Taft et al., 1997)

1. For the reference species list, assign an index based on the affinity to "natural areas". Individual species assignment range from 0-10 with "10" being considered the highest fidelity to natural areas. This index is termed the coefficient of conservatism (C). General categories for species assignments consist of the following:

X 0-1: Taxa that are adapted to severe disturbance, particularly anthropogenic. Disturbance occurs so frequently that often only brief periods are available for growth and reproduction. Generally considered ruderal species/opportunistic invaders.

X 2-3: Taxa within this category are associated with more stable, though degraded habitat. Generally considered ruderal-competitive species, found in a variety of habitats.

X 4-6: Taxa that have a high consistency of occurrence within a given community type and will include many dominant or matrix species for several habitats. Species will persist under moderate disturbance.

X 7-8: Taxa associated mostly with natural areas but can persist where the habitat has been somewhat degraded. Increases in the intensity or frequency of disturbance may result in reduction in population size, or taxa may be subject to local extirpation.

X 9-10: Taxa exhibiting a high degree of fidelity to a narrow range of synecological parameters. Species within this category are restricted to relatively intact natural areas.

Assignment of the "C" value should be based upon field experience of principal investigators (A- Team), consultation with local or regional plant ecologist/ taxonomists, description of habitat preferences in floristic manuals or published synecological or autecological studies. Values to be assigned should be considered in the context of the defined reference domain (geographic distribution) and range of variability (disturbance gradient) within the HGM subclass of interest.

2. Calculation of the Floristic Quality Index

X Determine the mean coefficient of conservatism ($\bar{C}$) by summarizing all coefficients in the inventory unit (reference site or sample within the reference site) and dividing by the number of taxa (N), or $\bar{C} = \Sigma C/N$.

X Multiply the mean coefficient of conservatism ($\bar{C}$) by the square root of the total number of taxa. The floristic quality index is then indicated by:

$FQI = \bar{C} (\sqrt{N})$

From:

Taft, J.B., G.S. Wilhelm, D.M. Ladd, and L.A. Masters. 1997. Floristic quality assessment in Illinois; a method for assessing vegetation integrity. Erigenia 15:3-95

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