

White River Field Office Record of Decision and Approved Resource Management Plan Amendment For Oil and Gas Development



Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.



United States Department of the Interior

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Dear Reader:

We are pleased to announce the availability of the Bureau of Land Management (BLM) White River Field Office (WRFO) Record of Decision (ROD) and Approved Resource Management Plan Amendment (RMPA) for Oil and Gas Development. This document has been completed after many years of hard work and collaboration. The Approved RMPA resources for the future management direction and appropriate use of the WRFO, located in Rio Blanco, Moffat and Garfield counties, Colorado. The document contains land use planning decisions to guide the BLM's management of oil and gas development.

This ROD and Approved RMPA have been developed in accordance with the National Environmental Policy Act of 1969, as amended, and the Federal Land Policy and Management Act of 1976, as amended. The approval of this ROD serves as the final decision for all land use planning decisions described in the enclosed WRFO Approved RMPA.

The Proposed RMPA/Final Environmental Impact Statement (EIS) was released for a 30-day public protest period and 60 day Governor's Consistency Review on March 27, 2015. The BLM Director appropriately reviewed and resolved all protests. One protest was granted that did not result in modifications to the planning decisions, but required commitment to evaluate Areas of Critical Environmental Concern. Some clarifications were made and are discussed in the Proposed RMPA Protest Resolution section of the ROD.

The ROD/Approved RMPA are available at www.blm.gov/co/st/en/fo/wrfo.html. Limited printed copies and CD copies are available by request at the WRFO at 220 East Market Street, Meeker, Colorado, 81641.

The BLM greatly appreciates all of those who contributed to the completion of the WRFO Approved RMPA for Oil and Gas Development, particularly its cooperating agencies. The extensive public interest and involvement in this planning effort has ensured that the Approved RMPA is of substantial quality and will provide for the continued use and enjoyment of public lands and resources by present and future generations.

Sincerely,



Ruth Welch
State Director

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Record of Decision

Introduction

This Record of Decision (ROD) documents the approval of the White River Field Office (WRFO) Resource Management Plan Amendment (RMPA) for oil and gas development. The Approved RMPA has been prepared by the Bureau of Land Management (BLM) WRFO in Meeker, Colorado. These documents are the culmination of a multi-year planning effort to amend the 1997 White River Resource Management Plan (RMP) to address oil and gas development.

The WRFO Planning Area for this Approved RMPA includes all lands, regardless of surface management or ownership, within the WRFO geographic boundary. The WRFO Planning Area includes approximately 2.7 million acres of BLM, National Park Service (NPS), U.S. Forest Service (USFS), state, and private lands located in northwestern Colorado, primarily in Rio Blanco County, with additional tracts located in Garfield and Moffat counties. Within the WRFO Planning Area, the BLM administers approximately 1.5 million surface acres and 2.2 million acres of federal oil and gas minerals (subsurface) estate. Management decisions in the ROD and Approved RMPA would apply only to BLM-administered lands and subsurface minerals in the WRFO Planning Area.

Approximately 1.7 million acres of Federal oil and gas mineral estate is open to leasing and would be subject to lease stipulations and other management actions developed during this planning effort (i.e., are BLM-leasable acres and are not associated with Wilderness Study Areas or surface estate managed by the NPS or USFS).

Decision

The decision is hereby made to approve the attached RMPA for Oil and Gas Development in WRFO Planning Area. The Approved RMPA was prepared under the authority and regulations implementing the Federal Land Policy and Management Act (FLPMA) of 1976 (43 Code of Federal Regulations [CFR] 1600). An environmental impact statement was prepared for this plan amendment in compliance with the National Environmental Policy Act (NEPA) of 1969. The Approved RMPA with a few minor changes carries forward the land use planning decisions presented as Alternative E in the Proposed RMPA and Final Environmental Impact Statement (EIS) released to the public on March 27, 2015. Specific management decisions for public lands under the jurisdiction of the WRFO are presented by resource in Chapter 2 of the Approved RMPA and in Appendices 1 through 7.

Major decisions include:

- Using thresholds to promote clustered development in order to allow for year-round drilling while reducing habitat loss due to behavioral avoidance by big game;
- Identification of specific success criteria for reclamation;
- Adoption of the Dinosaur Trail Master Leasing Plan (MLP); and
- Using a tiered approach to managing lands with wilderness characteristics units.

Modifications and Clarifications

During preparation of the Approved RMPA, minor changes were made following the publication of the Proposed RMPA to correct errors and to clarify decisions. Additionally, some management actions were grouped together under different headings to reduce duplication and improve understanding of the management direction provided in the Approved RMPA for reclamation, travel management, and the Dinosaur Trail MLP. Clarifications and corrections made since the publication of the Proposed RMPA/Final EIS are described below and hereby adopted by this ROD and Approved RMPA.

Chapter 2 Management Decisions

Air and Atmospheric Values

In the Final EIS, the air and atmospheric values management action in Table 2-1, Record 10 specified, "At construction sites, interim reclamation would be required within two years." This should have been noted in the Final EIS as an assumption for analysis rather than a management action. It has not been carried forward into the Approved RMPA because it conflicts with direction provided in the Surface Reclamation Plan (Appendix 3, Section 3.1.2.1) and Onshore Order Number 1 (Section XII.B, 2007).

Vegetation – Reclamation

Management actions related to reclamation were found under various resource programs in the Final EIS, including vegetation (Table 2-3), big game (Table 2-4), special status animals (Table 2-9), special status plants (Table 2-10), minerals (Table 2-17), realty (Table 2-20), special designations (Table 2-21), and lands with wilderness characteristics (Table 2-22). To aid in implementation and to provide comprehensive management direction related to reclamation, all of the reclamation-related management actions are grouped together under Vegetation (Section 2.4.3) of the Approved RMPA.

Wildlife - Big Game

Language was updated in the management action in Section 2.5.3 and timing limitations for both big game severe winter and summer ranges (Appendix 1) that pertains to the areas defined by CPW as Restricted Development Areas. The clarification explains how these areas would be managed in context of the threshold strategies.

Wildlife – Grouse

In the Final EIS, the timing limitation stipulation for Columbian sharp-tailed grouse winter range habitat (as described in Chapter 2, Table 2-6, Record 21) was inadvertently omitted from Appendix A but has been included in Appendix 1 of the Approved RMPA.

Forestry and Woodland Products

As noted in Section 1.2.1 of the Proposed RMPA/Final EIS, many of the elements in the 1997 White River RMP remain valid and there would be no changes to those management decisions unless specifically identified in this ROD. In order to provide comprehensive management direction for oil and gas exploration and development and to continue to disclose to operators that they would not qualify for free use under 43 CFR 5510.0-3(b), the management action related to "purchase of

woodlands removed as a result of commercial development” on page 2-22 of the 1997 White River RMP has been included in Section 2.16.3 of the Approved RMPA.

Comprehensive Trails and Travel Management

Management actions related to effective road density, restrictions on the use of oil and gas access routes, and cross-country travel were found in various resource programs in the Final EIS, including big game (Table 2-4) and special status animal species (Table 2-9). To aid in implementation and to provide comprehensive management direction related to travel management, all of the access-related management actions are grouped together under Section 2.20.3, Comprehensive Trails and Travel Management, of the Approved RMPA.

Oil Spring Mountain Wilderness Study Area

The six wilderness study areas (WSAs) within the WRFO are closed to leasing. However, there are existing oil and gas leases within the Oil Spring Mountain WSA. Valid existing rights, such as mineral lease activities, that existed when the FLPMA was approved on October 21, 1976 may continue in the same manner and degree as on that date, even if the use would impair wilderness suitability.

The BLM’s recommendation to Congress was that the Oil Spring Mountain WSA should not be carried forward as wilderness. If Congress were to release the Oil Spring Mountain WSA from further wilderness review, it would be managed as the Oil Spring Mountain Area of Critical Environmental Concern and be available for leasing with a controlled surface use stipulation (see Appendix 1, WR-CSU-22).

Lands with Wilderness Characteristics

The four lands with wilderness characteristics units adjacent to Wilderness Study Areas (WSA) have been renamed since the release of the Proposed RMPA/Final EIS to avoid confusion with WSAs when referencing these units. These units are renamed as follows:

Unit	Proposed RMPA/Final EIS Unit Name	Approved Unit Name
32	Willow WSA Adjacent	Willow Creek South
33	Bull WSA South Adjacent	Bull Canyon South
34	Bull WSA North Adjacent	Bull Canyon North
35	Oil Spring Mountain WSA Adjacent	Wild Rose

Dinosaur Trail Master Leasing Plan

All of the resource-based management decisions developed for the WRFO Planning area will also apply within the Dinosaur Trail MLP if those resources are present. (See Approved RMPA, Table 2.) Additionally, since the Dinosaur Trail MLP was not included in the Draft RMPA/EIS, there are several management actions that only apply to the MLP, but are found under other resource programs in the Final EIS, including vegetation (Table 2-3), special status animal species (Table 2-9), and cultural resources (Table 2-12). To reduce duplication and to improve understanding of how management in the MLP differs from that of the rest of the WRFO Planning Area, management actions that only apply within the MLP are found under the Dinosaur Trail MLP in Section 2.24 of the Approved RMPA, with the exception of management for black-footed ferrets. All of the ferret

management areas within the WRFO are found exclusively within the MLP, since management of ferrets is dependent upon management of white-tailed prairie dogs (which also occur outside of the MLP). Ferret habitat management can be found under Special Status Animal Species (Section 2.10 of the Approved RMPA).

Chapter 5 Section 5.2 Glossary

To improve understanding of the management direction in the Approved RMPA, the term “avoid” has been added to the glossary and the definition for right-of-way (ROW) “avoidance area” has been refined. The definition of the term “avoid” is based on the definition of “avoidance area” provided in the Proposed RMPA/Final EIS, where the intention is to relocate activities where feasible but to acknowledge that the BLM would consider allowing for activities in these areas if intensive mitigation was developed that would prevent adverse impacts. The definition of the term “right-of-way avoidance area” has been updated to be more consistent with the definition provided in BLM Manual Section 2800 and the Land Use Planning Handbook (H-1601-1).

Appendix 1 – Oil and Gas Lease Stipulations and Lease Notices

The definitions for no surface occupancy (NSO), controlled surface use (CSU), and timing limitations (TL) have been updated to be more consistent with the definition provided in the BLM Handbook H-1624-1 glossary; Planning for Fluid Mineral Resources.

Lease stipulations have been renumbered in the Approved RMPA to be consecutive with the 1997 White River RMP.

Appendix 2 – Best Management Practices

To avoid confusion about which management actions are required and which measures are recommended as Best Management Practices, management actions that were identified in Chapter 2 and duplicated in Appendix B of the Proposed RMPA/Final EIS are only shown as management actions in the Approved RMPA.

There were two BMPs in Appendix B of the Proposed RMPA/Final EIS that were very similar, but not verbatim, to the management action in Chapter 2, which specified that operators would be required to prevent migratory bird use of pits that store fluids, which may pose a risk to birds. The management action in the Approved RMPA eliminates redundancy and inconsistencies by providing comprehensive management direction on migratory bird use of oil and gas facilities that store fluids (see Section 2.8.3).

Appendix 6 - Hazardous Materials Management Plan

In Section 2.1 of Appendix 6, references to venting and flaring of natural gas were modified to be consistent with the management action for air quality that limits venting of natural gas to emergency situations (see Section 2.2.3 Approved RMPA).

Implementation Decisions

Implementation decisions (or activity-level decisions) are management actions tied to a specific location that implement land use plan decisions. Implementation decisions generally constitute the BLM’s final approval, allowing on-the-ground actions to proceed and require appropriate site-specific planning and NEPA analysis. Such decisions may be incorporated into implementation plans (activity or project plans) or may exist as stand-alone decisions. Unlike land use plan decisions, implementation decisions are not subject to protest under the planning regulations. Instead,

implementation decisions are subject to various administrative remedies, particularly appeals to the IBLA (under 43 CFR, 4.410). Examples of oil and gas implementation decisions would be issuing a lease or approval of a well. The Approved RMPA does not include any implementation decisions.

Valid Existing Rights

Because of the long history of public land management, numerous rights and privileges have been established on public lands under law, regulation, or planning decisions. The decisions included in this ROD and Approved RMPA supersede the 1997 White River RMP for oil and gas exploration and development. All BLM lands and Federal mineral estate within the WRFO remain subject to valid existing rights as well as the stipulations and conditions of approval (COAs) associated with the given right at the time it was granted. This includes the right of reasonable access to surface and sub-surface parcels leased for the development of the mineral interest.

Oil and gas lease stipulations and lease notices in the Approved RMPA will be applied as appropriate to mitigate resource concerns to all new leases and to expired leases that are reissued.

The BLM may apply mitigation measures to surface use activities associated with existing land use authorizations as a COA. The BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by scientific analysis. All mitigation/conservation measures not already required as stipulations will be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into conditions of approval of the permit, plan of development, and/or other use authorizations. In discussing surface use rights, 43 CFR 3101.1-2 states that the lessee has the right “to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource” but lessees are still subject to lease stipulations, nondiscretionary statutes, and “such reasonable measures as may be required by the Authorized Officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed”. Lessees are also required to conduct operations in a manner that not only “results in maximum ultimate economic recovery of oil and gas with minimum waste” but also “protects other natural resources and environmental quality” (43 CFR 3162.1). While it would not be consistent with lease rights granted to preclude any development of the lease, the BLM may require relocation of proposed operations by more than 660 feet and may prohibit surface disturbing operations for more than 60 days when such action has been deemed necessary, through a site-specific NEPA analysis, to minimize adverse impacts to other resource values, land uses, or users.

New lease stipulations resulting from the ROD and Approved RMPA could be applied to other oil and gas related authorizations (i.e., other than oil and gas leases operations) as COAs in order to maintain or achieve desired resource conditions. Lease suspensions could be used as a tool by the BLM as an incentive for operators to proactively manage drilling activities and operations. Circumstances that warrant a lease suspension are found under Section 17 or Section 39 of the Mineral Leasing Act (MLA), as amended. Lease suspensions, would be directed by the Authorized Officer or consented to by the lessee of active oil and gas leases in the interest of the conservation of natural resources or in cases where the lessee is prevented from operating by matters beyond the reasonable control of the lessee.

Additional NEPA Reviews

Additional environmental analyses will be conducted, as appropriate, for project- and site-specific actions proposed in the geographic area currently defined as the WRFO Planning Area (e.g., lease sales, Applications for Permits to Drill, Sundry Notices, and ROW applications, etc.). However, the site-specific evaluations would be facilitated by the planning and programmatic evaluation of impacts disclosed in the Final EIS supporting this ROD and Approved RMPA.

Alternatives Considered

This section summarizes the five alternatives analyzed in detail in the Proposed RMPA/Final EIS. These alternatives presented a range of reasonable management actions analyzed to assist decision makers and the public in understanding the potential environmental consequences of each alternative. In 2007 the BLM prepared an updated Reasonably Foreseeable Development (RFD) Scenario to project the maximum levels and types of industry activity, and the associated surface disturbance that could occur on all land ownerships in the WRFO Planning Area. The RFD Scenario is a “tool prepared by an interdisciplinary group of technical and scientific specialists” that “serves as an analytical baseline for identifying and quantifying direct, indirect, and cumulative impacts, which provide the premise for formulating alternatives to a proposed action and strategies for mitigating adverse impacts” (WO-IM-2004-89) (BLM 2004). The Interior Board of Land Appeals (IBLA) has stated, “Where BLM establishes a reasonably foreseeable development scenario for the purposes of land use planning and environmental review, that scenario is not a land use decision establishing a binding maximum to which BLM must conform. A subsequent decision to exceed such a scenario does not violate the land use plan, FLMPA, or the rules at 43 CFR Subpart 1610” (DOI OHA 2008).

Alternative A (No Action)

The management focus for Alternative A incorporates the current management goals, objectives, and direction as specified in the 1997 White River RMP; however, the analysis updates the 20-year development projection from the 1997 White River RMP to reflect the current rate of about 220 new drilling permits per year with modifications through plan maintenance consistent with 43 CFR 1610.5-4 guidance. The alternative continues current allowable uses and management actions for resources and resource programs under the levels and locations of future oil and gas development projected in the 2007 RFD Scenario.

Implementation of Alternative A assumed to result in up to 4,603 new wells on 550 new well pads and approximately 6,600 acres of associated disturbance from well pads, roads, and other facilities (i.e., gas plants, pipelines, and other infrastructure) during the 20-year period of analysis.

Alternative B

This alternative emphasizes conservation and protection of other resources and resource uses, concurrently with oil and gas production. The implementation of Alternative B would limit the duration and overall extent of development activities in order to maintain existing resource conditions throughout all phases of development (i.e., from initial construction through post-production). The BLM would apply additional management actions to further protect these resources.

The managed development approach utilized under Alternative B is a significant distinction from Alternative A. A key element of the managed development approach evaluated under this alternative is limiting the spatial extent of surface disturbance. The overall vision for a managed development approach described for this alternative would be to cluster, collocate, and consolidate surface facilities

and other ground disturbing activities to manage the acute or collective degree of effects from the proposed development. Limitations would be achieved in part by managing the extent of big game seasonal range subjected to cumulative adverse behavioral effects (e.g., harassment, avoidance) attributable to oil and gas activities. The managed development approach offers operator incentives for concentrated development. This approach includes establishing big game thresholds, for cumulative adverse behavior effects, to be applied by each Game Management Unit (GMU), by each mule deer seasonal range as defined by Colorado Parks and Wildlife (CPW) and the BLM (see Map 2-4), and by leaseholder (e.g., a threshold of a certain percentage of big game crucial winter range occurring within a leaseholding). Under Alternative B, the goal would be to manage big game habitat utility and suitability to sustain at least 90 percent of CPW long-term population objectives throughout active development.

Implementation of Alternative B is assumed to result in up to 9,191 new oil and gas wells on 1,100 new well pads and 13,200 acres of associated disturbance from well pads, roads and other facilities during the 20-year period of analysis.

Alternative C (Preferred Alternative in the Draft RMPA/EIS)

Alternative C emphasizes short-term use of the environment (i.e., in the construction/development phase) and the maintenance and enhancement of long-term community function and ecological integrity (from initial construction to post-production). The management focus for Alternative C is similar to Alternative B; however, Alternative C places management emphasis on maintaining long-term community function and ecosystem integrity. For example, disturbance thresholds for acute effects (i.e., short-term impacts associated with well construction, drilling, and completion) under this alternative would be higher, and more exceptions and modifications to lease stipulations may be granted compared to Alternative B.

Under Alternative C, the BLM's management goal for big game habitat would be to manage big game habitat utility and suitability to sustain at least 70 percent (versus 90 percent in Alternative B) of CPW's long-term population objective throughout active development. All seasonal big game ranges within the WRFO would be subject to timing limitations that could extend up to 90 days (versus 120 days in Alternative B) within established windows. Timing limitations would be applied through COAs for existing leases and through stipulations on new leases. Similar to Alternative B, exceptions to timing limitations would be offered contingent on development remaining within the thresholds for acute and collective cumulative adverse behavior effects (evaluated by total leaseholdings within a GMU).

Implementation of Alternative C is assumed to result in up to 15,042 new oil and gas wells on 1,800 new well pads and 21,600 acres of associated disturbance from well pads, roads and other facilities during the 20-year period of analysis.

Alternative D

The management focus of Alternative D is the development of oil and gas resources. Management under Alternative D emphasizes the production of oil and gas resources under the environmental protection for other resources afforded by applicable laws, regulations, and BLM policy. The BLM would not apply management actions to provide environmental protection for other resources other than what is consistent with applicable laws and policy (e.g., Clean Air Act regulations, Section 7 of the Endangered Species Act [ESA], National Pollutant Discharge Elimination System [NPDES] guidelines).

Implementation of Alternative D is assumed to result in up to 21,200 new oil and gas wells on 2,556 new well pads and about 30,700 acres of associated disturbance from well pads, roads and other facilities during the 20-year period of analysis.

Alternative E (Proposed Plan Amendment in the Proposed RMPA/Final EIS)

The BLM considered issues identified from public comments, the established planning criteria, and resource management goals and objectives in formulating this alternative. Management of oil and gas development under this alternative combines elements of Alternatives A, B, C, and D. In acknowledging a trend for an increasing number of wells per pad, Alternative E reflects surface disturbance associated with development that would be similar to Alternative B (1,100 well pads or 13,200 acres) while allowing for well numbers anticipated under Alternative C (15,040 wells). The majority of development is expected to occur within the Mesaverde Play Area (MPA), with approximately 972 well pads within the MPA and 128 well pads outside the MPA.

Under Alternative E, the BLM's management goal for big game habitat would be to ensure big game habitats provide components and conditions necessary to sustain big game populations at levels commensurate with multiple use objectives and state-established population objectives (as in Alternative A). All seasonal big game ranges within the WRFO would be subject to timing limitations that could extend up to 120 days (as in Alternative B) within established windows. Timing limitations would be analyzed and applied as warranted through COAs for existing leases and through stipulations on new leases. Similar to Alternatives B and C, exceptions to timing limitations would be offered contingent on development remaining within the thresholds for acute and collective cumulative adverse behavior effects (evaluated by total leaseholdings within a GMU).

Alternatives Considered but not Carried Forward for Detail Analysis

The Council on Environmental Quality (CEQ) regulations for implementing the NEPA requires Federal agencies to analyze all "reasonable" alternatives that substantially meet the purpose and need for the proposed action. Also, for alternatives considered but eliminated from detailed analysis in an EIS, CEQ regulations require a brief explanation as to why they were eliminated (40 CFR 1502.14).

Current Management using 1997 Reasonable Foreseeable Development Scenario

The BLM considered an alternative that reflected the continuation of current management under the projections for oil and gas activity presented in the 1997 RFD Scenario (BLM 2007). However, the BLM determined that such an alternative would not meet the purpose and need for the RMPA/EIS, which is, in part, to address the substantial changing oil and gas resource conditions in the WRFO Planning Area and the need to manage the impacts of the projected increase in oil and gas activity in relation to other resources within the WRFO Planning Area.

Phased Development in the Piceance Basin

The BLM considered applying the concepts for "phased development" of oil and gas resources as an alternative to addressing the duration, intensity, and extent of development activity in the Piceance Basin. Traditionally, "phased development" refers to prescribing the sequence of drilling operations by geographic area to allow for the development of certain areas while resting or temporarily restricting development of other areas. Subsequent development occurs as areas developed earlier are completed and reclaimed. After further consideration, the BLM determined that phased development was not feasible for the WRFO Oil and Gas RMPA/EIS, since the majority of acres within the Planning Area are already leased.

Single Well Pads

The BLM considered an alternative that would evaluate the impacts of the use of (only) single well pads, as was considered in the 1997 White River RMP. However, information obtained from oil and gas operators in updating the 2007 RFD Scenario (BLM 2007) indicated most oil and gas companies plan to implement technology for multi-well drilling from each well pad, as this has become economically feasible. Federal regulations (43 CFR §3160) require lessees to attain maximum economic recovery of the leased resource. The regulations also require the operator to exercise due care and diligence to assure that leasehold operations do not result in undue damage to surface or subsurface resources or surface improvements. Therefore, an alternative based on single well pads was dropped from detailed analysis as it would not meet the economic criteria of the federal regulations or reduce impacts.

Reduced or Limited Pace of Oil and Gas Drilling

The BLM considered an alternative to set or control the pace of oil and gas development but determined, through a review of the federal regulations, that the holders of federal oil and gas leases have the right to develop those leases; consequently, it was dropped from detailed analysis as it does not meet the purpose and need in terms of responding to the changing conditions (i.e., the projected increase in oil and gas activity) within the WRFO Planning Area. 43 CFR §3101.1-2 states “the lessee shall have the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, and dispose of all the leased resource in a leasehold.” The 43 CFR §3160 regulations also require lessees to attain maximum economic recovery of the leased resource, and for leaseholders to conduct their operations in a manner that prevents undue and unnecessary impact. It is not possible at a planning level to determine whether a lease would actually be developed, and if it is what well spacing or level of development would be necessary to achieve the requisite maximum economic recovery of the oil and gas resource. Well spacing can vary from development area to development area. The pace of development would vary significantly between these scenarios. Pace of development, including reduced or limited rates of development, would be more appropriately projected and evaluated in project- or field-specific NEPA analysis.

Limit on Number of Well Pads or Wells

As stated in the previous section, federal regulations state that the holders of federal oil and gas leases have the right to develop those leases; consequently, this alternative was dropped from detailed analysis due to policy considerations. 43 CFR §3101.1-2 states “the lessee shall have the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, and dispose of all the leased resource in a leasehold.” The 43 CFR §3160 regulations also require lessees to attain maximum economic recovery of the leased resource. The number of well pads or wells would be more appropriately projected and evaluated in project- or field-specific NEPA analysis. Instead of limiting the number of wells or well pads, Alternatives B and C apply thresholds that could ultimately limit the number of wells or well pads that are developed.

Limiting Cumulative Total Surface Disturbance

The BLM considered an alternative that would limit the total acreage of surface disturbance associated with oil and gas activities at any one time. However, such an alternative would be difficult to apply equitably and monitor across the WRFO Planning Area, and would have limited effectiveness in achieving management objectives, as resource conditions vary throughout the planning area. The BLM would have to decide which areas to develop at any given time. In an area with multiple lessees, the BLM would also have to choose which lessee could drill at any given time, which could conflict with granted lease rights. This alternative is not consistent with the BLM’s oil

and gas leasing policies and regulations and could restrict the economic development of leases. Instead of limiting cumulative total surface disturbance, Alternatives B and C apply thresholds which may ultimately limit the number of acres that are disturbed.

Greater Sage-Grouse National Technical Team Report Alternative

The BLM published a Notice of Intent in the Federal Register on December 9, 2011, initiating a range-wide planning process that would analyze the National Technical Team (NTT) Report Alternative in detail. The BLM's Northwest Colorado District Office released the Northwest Colorado Greater Sage-Grouse Draft Land Use Plan Amendment and EIS on August 16, 2013, and a Proposed Plan Amendment and Final EIS on May 28, 2015. This document considered and analyzed this alternative in detail, which will address BLM-administered public lands in the White River Field Office Planning Area for activities.

The NTT Report presented guidance related to the fluid minerals program but also a wide range of other land use programs including travel and transportation management, recreation, lands and realty, range, wild horses, solid minerals, locatable minerals, salable minerals, vegetation treatments, and fire management. Addressing changes to other programs besides fluid minerals and the creation of special designations is outside the scope of this planning effort. Further, the BLM is not making allocation decisions related to areas open or closed to oil and gas leasing during this planning effort. Therefore, the Greater Sage-Grouse NTT Report Alternative has been considered but eliminated from detailed analysis for this planning process.

Master Leasing Plans Submitted by Citizen Groups

In August 2010, the Wilderness Society, the Southern Utah Wilderness Alliance, the Center for Native Ecosystems, and the Colorado Environmental Coalition submitted recommendations that the BLM prepare an Eastern Book Cliffs/Piceance Basin MLP and a Dinosaur Lowlands MLP. The Eastern Book Cliffs/Piceance Basin MLP proposal encompasses 847,500 acres within areas managed by the WRFO and the Vernal Field Office (VFO). The Dinosaur Lowlands MLP proposal encompasses 999,400 acres within areas managed by the WRFO, the VFO, and the Little Snake Field Office (LSFO).

In the Oil and Gas Development Draft RMPA/EIS, the BLM provided an extensive discussion of these two MLP proposals in Appendix I, which is incorporated by reference into this FEIS. In summary, there are four criteria to consider when evaluating MLPs. The BLM has determined that both MLP proposals meet three of the four criteria since there is a majority federal mineral interest; the oil and gas industry has expressed a specific interest in leasing and there is a moderate or high potential for oil and gas development confirmed by the discovery of oil and gas in the general area; and additional analysis or information is needed to address likely resource impacts. Neither MLP proposal meets the criterion that a substantial portion of the area is not currently leased.

Even if the proposals do not meet the criteria, the BLM may still choose to prepare MLPs or similar plans. The WRFO Oil and Gas Development RMPA/EIS is different than other types of amendments or plan revisions since the sole purpose of the planning effort is to examine management decisions related to oil and gas development. Thus, the BLM is able to conduct a much more detailed analysis of a range of development levels and management actions through the RMPA/EIS across the entire planning area. Since the RMPA/EIS considers protective measures designed to minimize resource conflicts both inside and outside of both the MPA and the MLPs, the WRFO does not intend to further develop either the Dinosaur Lowlands MLP or the Eastern Bookcliffs/Piceance Basin MLP.

However, the BLM has taken another hard look at the Dinosaur Lowlands MLP and adjusted the boundaries to create a new MLP proposal, the Dinosaur Trail MLP. The Dinosaur Trail MLP not only meets all four of the criteria outlined in WO-IM-2010-117 but also considers what areas are most likely to have the greatest resource conflicts. In creating the Dinosaur Trail MLP, the BLM also considered management feasibility of well-established and developed fields (e.g., the Coal Oil Basin and White River Dome areas) and did not include them in the MLP area.

Planning Process

The NEPA requires federal agencies to prepare an EIS for a major federal action significantly affecting the quality of the human environment. The environmental analysis of alternatives and the proposed RMPA are part of the resource management planning process to develop the proposed RMPA and related EIS which are published as a single document called the WRFO Oil and Gas Development Proposed RMPA/Final EIS. This EIS analyzes analyzed the impacts of five alternatives, including the No Action Alternative (current management). The CEQ regulations direct that an EIS explore and objectively evaluate a range of reasonable alternatives, including the Proposed Action and a No Action Alternative, and describe any alternatives considered, but eliminated from detailed analysis with the rationale for elimination (40 CFR 1502.14 (a)). Each action alternative represents different management decisions that fulfill the purpose and need, address unresolved conflicts related to the proposed action, and include relevant mitigation measures to avoid or minimize impacts associated with oil and gas development.

Consistency with Local Land Use Plans

The BLM's land use planning regulations require that RMPs be consistent with local land use plans so long as they are consistent with "the purposes, policies and programs of Federal laws and regulations applicable to public lands" (43 CFR 1610.3-2(a)). These regulations also require that these entities notify the BLM in writing of apparent inconsistencies (43 CFR 1610.3-2(a)).

Moffat, Rio Blanco, and Garfield Counties have identified that management of Tier 1 and Tier 2 lands with wilderness characteristics areas with NSO and CSU stipulations and as rights-of-way exclusion and avoidance areas are inconsistent with their local land use plans. Moffat and Rio Blanco counties also identify that deferring leasing of sage-grouse habitat within the Dinosaur Trail MLP until the BLM has issued a ROD for the Northwest Colorado Greater Sage-Grouse Land Use Plan Amendment is inconsistent with their plans. The Counties state that these proposed management approaches are inconsistent with their local land use plans because they interfere with oil and gas development and the right of federal, state, and private mineral interest owners and lessees to access their mineral rights. They claim that these restrictions and special designations conflict with their plan's support of mixed uses of the land and continued access to public lands for landowners and developers.

The Approved RMP has taken these apparent inconsistencies into consideration and has determined that the management decisions identified by the counties are necessary to meet our legal mandates under the FLMPA and the purposes for which this plan was developed. The FLPMA requires the BLM to consider both multiple use and sustained yield when managing public land. FLPMA authorizes the Secretary of the Interior to use land use planning as a mechanism for allocating resource use, including wilderness character management, amongst the various resources in a way that provides for current and future generations. It is BLM policy to identify and consider management of lands with wilderness characteristics and the WRFO has identified management intended to protect some areas for their wilderness characteristics consistent with BLM policy (BLM

Manual 6320). Additionally, the WRFO has analyzed and considered the potential impacts to access and resource development from the applied management prescriptions in the RMPA and considers these actions warranted to meet our legal mandates. The Approved RMPA acknowledges valid existing rights and allows for access consistent with our legal authorities.

Management Considerations

Extensive public involvement was provided and considered throughout the development of the Approved RMPA to assure compliance with NEPA as described in the Proposed RMPA/Final EIS. The BLM considered issues identified from public comments, the established planning criteria, and resource management goals and objectives in formulating the Approved RMPA. Management of oil and gas development under the Approved RMPA combines elements of the four alternatives addressed in the Draft RMPA/EIS, reflecting surface disturbance associated with development of 13,200 acres, while assuming development of 15,040 wells. Approximately 972 well pads are expected to occur within MPA, with 128 well pads occurring outside the MPA.

The Approved RMPA seeks the best combination of management decisions to meet the purpose and need for this land use plan amendment in consideration of the planning issues and management concerns identified through the planning process. It is prepared to ensure that the public lands in the planning area are managed in accordance with FLPMA under the principles of multiple use and sustained yield. The commitment to multiple use does not mean that all land will be open for all uses. Some uses may be excluded on some land to protect specific resource values or uses, as directed by FLPMA (43 USC 35§1712[c][3]). Any such exclusion however, will be based on laws or regulations or be determined through a planning process subject to public involvement.

As discussed in more detail below, the BLM completed consultation requirements with the Colorado State Historic Preservation Office (SHPO) and the U.S. Fish and Wildlife Service (FWS) regarding potential impacts to cultural resources and federally listed species, respectively. The BLM will continue to work cooperatively and collaboratively with government agencies, as well as with interested groups and individuals and other members of the public, in implementing the land use plan amendment. The BLM will also continue to provide for ongoing consultation with Native American tribal governments and strategies for protecting recognized traditional uses.

Mitigation Measures

All practicable means to avoid or minimize environmental harm, commensurate to the landscape-level of planning, are included in the Approved RMPA and appendices. In developing the alternatives, the BLM used a variety of management methods and tools, including the identification of allowable uses, temporal, spatial, and/or methodological restrictions on uses, where specific uses would be prohibited, and specific actions that are needed to achieve the goals and objectives. Restrictions on land uses include seasonal closures, stipulations on surface disturbances, and the application of best management practices (BMPs).

Appendix 2 provides a list of BMPs that are applicable to land use activities authorized by the WRFO. Best management practices are state-of-the-art mitigation measures that may be applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts of land use activities. The BMPs included in this Approved RMPA are not intended to be a complete list but are displayed to show project proponents examples of commonly used practices the WRFO may require to reduce impacts of surface-disturbing activities, use, or occupancy. More explicit BMPs, based on local conditions and resource-specific concerns, could be developed once a

specific proposal is being evaluated through the environmental analysis process. Additional BMPs can be proposed by project applicants for activities on BLM lands.

Plan Amendment Monitoring

The BLM planning regulations (43 CFR Part 1610.4-9) call for the monitoring of RMPs on a continual basis with a formal evaluation done at periodic intervals. Implementation of the Approved RMPA will be monitored over the life of the plan, and plan evaluations conducted periodically. The BLM may work in cooperation with local, state, and other federal agencies or use data collected by other agencies and sources when appropriate and available. Monitoring and the evaluation process are described in more detail in Chapters 4 and 5 of the Approved RMPA.

Consultations and Coordination

Section 7 Consultation with the U.S. Fish & Wildlife Service

Section 7 of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with FWS, to ensure that their actions do not jeopardize the continued existence of listed or proposed species or destroy or adversely modify critical habitat. The FWS has been a cooperating agency for this planning effort and has provided input to the BLM throughout the planning process, including input on endangered, threatened, proposed, and candidate species, and designated critical habitat in the WRFO that has been evaluated in the RMPA/EIS. The WRFO submitted a Biological Assessment (BA) based on the Proposed RMPA/Final EIS to the FWS on December 19, 2013 and a Revised Final BA on February 10, 2015. The BLM received a Letter of Concurrence from the FWS on March 18, 2015. If new information becomes available, new species are listed, or there are any changes to the Approved RMPA that alter its implementation or the extent of anticipated impacts from those described in the Revised Final BA, then the BLM would re-initiate Section 7 consultation with the FWS.

Tribal Consultation

The WRFO initiated consultation with Native American tribes for this planning effort in 2006. In addition to providing copies of the Draft RMPA/Draft EIS for review and comment, the WRFO Field Manager conducted formal face-to-face consultation with the Eastern Shoshone Tribe (July 2012), the Southern Ute Indian Tribe (September 2012), and the Ute Mountain Ute Tribe (September 2012, March 2013, and June 2013).

Coordination with the Colorado State Historic Preservation Office

The BLM cultural resource management program operates in accordance with the alternative procedures for 36 CFR 800 outlined under the National Programmatic Agreement, as implemented by the State Protocol (1997). Section IV of the Protocol requires the BLM to provide SHPO the opportunity to participate at the development stage and all subsequent phases of land use planning in accordance with 43 CFR 1610.3. The BLM coordinated with the SHPO on the Draft RMPA/Draft EIS. A copy of the Draft RMPA/Draft EIS was sent to the SHPO for review and comment.

Cooperating Agencies

The BLM coordinated with other agencies and the Northwest Resource Advisory Council during preparation of the RMPA/EIS. Cooperating agencies included the U.S. Army Corps of Engineers; the U.S. Fish and Wildlife Service; the U.S. Environmental Protection Agency (Region 8); the U.S.

Forest Service (White River National Forest); the U.S. Park Service (Intermountain Region); Moffat, Rio Blanco, and Garfield counties; and the towns of Meeker and Rangely. The State of Colorado was also a cooperating agency and the BLM coordinated with the following state agencies: the Department of Natural Resources (including Colorado Parks and Wildlife, Colorado Oil and Gas Conservation Commission, and the Colorado Natural Areas Program), the Department of Public Health and the Environment (including the Air Pollution and Water Quality Control Divisions), and the Department of Local Affairs. Other agencies that participated in the planning process included the U.S. Geological Survey, the Department of Energy, and History Colorado (the State Historic Preservation Office).

Governor's Consistency Review

The BLM initiated the Colorado Governor's Consistency Review required by 43 CFR 1610.3-2(e) by letter from the BLM State Director dated March 27, 2015. The Governor did not identify any inconsistencies with approved state or local plans, policies, or programs.

Proposed RMPA Protest Resolution

Pursuant to the BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the WRFO RMP amendment planning process and has an interest that may be adversely affected by the planning decisions may protest the proposed planning decisions within 30 days from the date the Notice of Availability (NOA) is published in the Federal Register by the United States Environmental Protection Agency (EPA). The 30-day protest period ended April 27, 2015. Eleven letters of protest, summarized below, were received by the BLM's Washington Office (WO), the office responsible for resolving the protest on behalf of the BLM Director. Of the 11 protesters all were determined to have standing as participants in the planning process.

The protest letters were categorized into 19 issue topics. Some of the concerns raised by protestors included violating the Energy Policy Act of 2005 by failing to apply the least restrictive lease stipulations, improperly narrowing the purpose and need to focus only on oil and gas development, failing to use the best available science including greater sage-grouse NTT Report, unreasonably ruled out alternatives that would limit oil and gas development in certain sensitive areas, and failing to analyze cumulative environmental and economic impacts of overlapping wildlife seasonal restrictions.

In summary, the Director concluded that the BLM Colorado State Director followed the applicable laws, regulations, and policies and considered all relevant resource information and public input in developing the Proposed RMPA in 18 of the 19 issue topics. The Director granted in part one protest regarding the BLM's ACEC Manual provision that the BLM will conduct a timely evaluation of ACEC nominations. The BLM failed to conduct a timely evaluation of the Rocky Mountain Wild ACEC nominations, submitted on January 21, 2003, and on March 9, 2007, that are located within the boundaries of the WRFO. The BLM will evaluate these nominated areas within one year of this ROD to determine whether they satisfy the relevance and importance criteria consistent with BLM's planning regulations and provide interim management for those areas found to meet the criteria. Each protesting party was notified in writing of the Director's findings and the disposition of their protests. The BLM Director's decisions on the protests are summarized in the "Director's Protest Resolution Report, White River Oil and Gas Proposed Resource Management Plan Amendment and Final Environmental Impact Statement," available on the BLM website at: http://www.blm.gov/wo/st/en/prog/planning/planning_overview/protest_resolution/protestreports.html.

Approval

Field Office Manager Recommendation

Having considered a full range of alternatives, associated impacts, and public and agency input, I recommend the adoption and implementation of the Approved Resource Management Plan Amendment for Oil and Gas Development in the White River Field Office.

Recommended:

AUG 17 2015



Kent E. Walter
Field Manager
White River Field Office

Date

District Manager Concurrence

I concur with the adoption and implementation of the Approved Resource Management Plan Amendment for Oil and Gas Development in the White River Field Office.

Concurrence:

AUG 17 2015



Joe Meyer
District Manager
Northwest District Office

Date

State Director Approval

In consideration of the foregoing, I approve the Approved Resource Management Plan Amendment for Oil and Gas Development in the White River Field Office.

Approved:

AUG 17 2015



Ruth Welch
Colorado State Director

Date

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**APPROVED RESOURCE MANAGEMENT PLAN
AMENDMENT**

**For Oil and Gas Development
In the
White River Field Office**

Prepared by:

**U.S. Department of the Interior
Bureau of Land Management
White River Field Office
Meeker, Colorado**

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Chapter 1.0 Introduction

1.1 Purpose and Need for the Plan

The FLPMA requires the BLM “develop, maintain, and when appropriate, revise land use plans...” (43 United States Code [USC]§1712). The BLM has amended the 1997 White River RMP to address changing conditions in the WRFO Planning Area that have raised new issues and concerns since approval of the 1997 White River RMP. The CEQ regulations (40 CFR 1502.13) require an EIS to “briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.”

1.1.1 Purpose of the Action

The purpose of this Amendment to the 1997 White River RMP is to provide effective management direction for public lands administered by the WRFO based on an analysis of oil and gas exploration and development in excess of levels evaluated in the 1997 White River RMP. During the development of the Draft RMPA/EIS, the BLM reviewed the decisions contained in the 1997 White River RMP. Many elements of the 1997 White River RMP are adequate and remain valid; there will be no changes to those management decisions. Only those management decisions specifically identified in the ROD and Approved RMPA will supersede existing management decisions in the 1997 White River RMP.

The BLM must establish guidance, objectives, policies, and management actions for lands and resources under the jurisdiction of the WRFO, in accordance with valid existing rights and obligations, to guide decision making for future site-specific actions. Decisions may be evaluated and revised as necessary to reflect changing conditions; however, any major changes in management would require additional NEPA analysis, as described in Section 1.3.2 of the Proposed RMPA/Final EIS.

The BLM identified a MLP during the preparation of the plan. Master leasing plans are areas that possess a majority of federal interest with medium to high potential for oil and gas occurrence, and wherein industry has expressed an interest in leasing the area. Implementation of the Dinosaur Trail MLP will ensure orderly, effective, timely, and environmentally responsible leasing of federal oil and gas resources within this area.

1.1.2 Need for the Action

The BLM has determined that the level of oil and gas activities and the primary area of development evaluated in the 1997 White River RMP has changed considerably. The BLM has determined it needs to update the 1997 White River RMP to reflect a greater RFD Scenario developed in 2007, and changes to where the primary oil and gas development activity would occur. This would include establishing appropriate goals, objectives, management actions, priorities, and procedures to manage the projected increase in oil and gas activity in relation to other resources within the WRFO Planning Area and to address the potential environmental and socioeconomic impacts of the predicted oil and gas development.

The Energy Policy and Conservation Act (EPCA) Reauthorization of 2000 directed the Department of the Interior (DOI) to produce a scientific inventory of oil and gas resources and reserves underlying federal lands. The resulting EPCA inventory identified the Uinta-Piceance Basin (Colorado and Utah)

as one of five sub-basins in the continental United States with large resources of undeveloped oil and gas energy potential. In addition to the EPCA inventory, oil and gas price change, development of interstate transportation pipelines, and improved drilling technology have also influenced increases in exploration, development, and production of oil and gas resources in the WRFO Planning Area.

The 1997 White River RMP projected and analyzed an RFD Scenario of 1,100 potential oil and gas wells that would encompass 10 acres of disturbance per well (including roads and pipelines) developed at a rate of approximately 55 single well pads per year, totaling 1,100 single well pads for a 20-year period (1997 through 2017). Disturbance was estimated to be approximately 11,000 acres over a 20-year period. The 1997 RFD Scenario also projected that nearly two-thirds of the oil and gas development activity would take place in the Douglas Creek Arch south of Rangely, Colorado, with the remaining activity dispersed throughout the rest of the WRFO Planning Area. While this projection has been fairly accurate for the activity south of Rangely, there has been a substantial increase in natural gas exploration and development in the MPA, located generally within the Piceance Creek Basin in the central portion of the WRFO Planning Area (Map 1-1).

An updated RFD Scenario was prepared in 2007 as a result of the changing conditions in oil and gas development to present a 20-year forecast of drilling activity on federal, state, and private lands within WRFO boundaries (BLM 2007). The 2007 RFD Scenario for potential oil and gas development activities in the WRFO Planning Area projected the potential need for the construction of between 550 and 2,556 multiple well pads, averaging eight drilled wells per pad, over a 20-year period (2009 through 2028), with the majority of development occurring in the Piceance Creek Basin of the WRFO Planning Area. Disturbance is estimated to range from 6,600 to 30,700 acres with an average of approximately 12 acres of total disturbance per well pad (including roads and pipelines) (BLM 2007). The 2007 RFD Scenario predicted an increase in oil and gas activities above the level evaluated in the 1997 White River RMP.

The 2007 RFD Scenario emphasizes the changing conditions in the WRFO Planning Area and the BLM has identified the need to manage the potential impacts of the projected increase in oil and gas activity in relation to other resources within the WRFO Planning Area and the BLM's mission of multiple use and sustained yield. Therefore, the BLM has determined that it will amend the 1997 White River RMP.

1.1.3 Description of the Planning Area

The WRFO Planning Area for the RMPA includes all lands, regardless of surface management or ownership, within the WRFO boundary shown in Map 1-1. The WRFO Planning Area includes approximately 2.7 million acres of BLM, NPS, USFS, state, and private lands located in northwestern Colorado, primarily in Rio Blanco County, with additional tracts located in Garfield and Moffat counties. The WRFO administrative office is located in the town of Meeker in northwestern Colorado.

Within the WRFO Planning Area, the BLM administers approximately 1.5 million surface acres and 2.2 million acres of federal oil and gas minerals (subsurface) estate. Management decisions made as a result of this RMPA/EIS process would apply only to BLM-administered lands in the WRFO

Planning Area (including Federal mineral estate) (Map 1-1)¹. Table 1 presents a summary of land ownership status (including split estate) as well as BLM surface and subsurface land ownership within the WRFO Planning Area.

As of March 2015, approximately 61 percent of federal mineral estate available for oil and gas leasing by the BLM within the WRFO Planning Area has been leased, including 80 percent of the leasable acres within the MPA and 26 percent of the leasable acres within the MLP. Decisions adopted in the Approved RMPA would apply to new oil and gas leases. Lease stipulations on existing oil and gas leases disclosed in the 1997 White River RMP would continue to apply to these leases. New or additional surface protective measures equivalent to the lease stipulations identified in the Approved RMPA may be applied as COAs to existing leases at the time of the Application for Permit to Drill (APD) approval or to ROW grants as terms and conditions when deemed necessary and appropriate by a site-specific NEPA analysis. (See Valid Existing Rights section in the ROD.)

Table 1. Surface and Subsurface Management Status in the WRFO Planning Area

Surface Manager/Owner	Rio Blanco County (acres)	Moffat County (acres)	Garfield County (acres)	Total Acres
Surface				
Federal: BLM	1,151,100	232,700	74,300 ⁽¹⁾	1,458,100 ⁽²⁾
Federal: NPS – Dinosaur National Monument	0	71,500	0	71,500
Federal: FS – White River National Forest	246,900	0	129,200	376,100
State: Colorado Parks and Wildlife, Colorado State Parks, Colorado State Land Board	46,100	19,800	300	66,200
County	200	0	0	200
Private	480,500	99,800	124,900	705,200
TOTAL	1,923,100	423,700	328,700	2,675,600

¹ The Roan Plateau includes portions of the Colorado River Valley and White River Field Offices. The BLM is currently preparing a Supplemental EIS and RMP Amendment for management of the Roan Plateau. The Oil and Gas Development Approved RMPA does not amend or change any decisions made within the Roan Plateau RMP Amendment.

Table 1. Surface and Subsurface Management Status in the WRFO Planning Area

Surface Manager/Owner	Rio Blanco County (acres)	Moffat County (acres)	Garfield County (acres)	Total Acres
Subsurface – Federal Oil and Gas Mineral Estate				
Federal surface/Federal oil and gas minerals	1,398,100	303,800	203,500	1,905,400 ⁽³⁾
State surface/Federal oil and gas minerals	16,700 ⁽⁴⁾	0	0	16,700 ⁽⁴⁾
County surface/Federal oil and gas minerals	200	0	0	200
Private surface/Federal oil and gas minerals	195,400	48,400	60,000	303,800 ⁽²⁾
TOTAL	1,610,400	352,200	263,500	2,226,100

SOURCE: BLM 2006; BLM 2008; BLM 2015.

NOTES:

Sums may not equal totals due to rounding of individual cells. Acreages have been rounded to the nearest 100 acres.

⁽¹⁾The total acreage in Garfield County managed by the BLM includes 4,010 acres formerly managed by the Department of Energy (Naval Oil Shale Reserve).

⁽²⁾Current total adjusted for sales and exchanges.

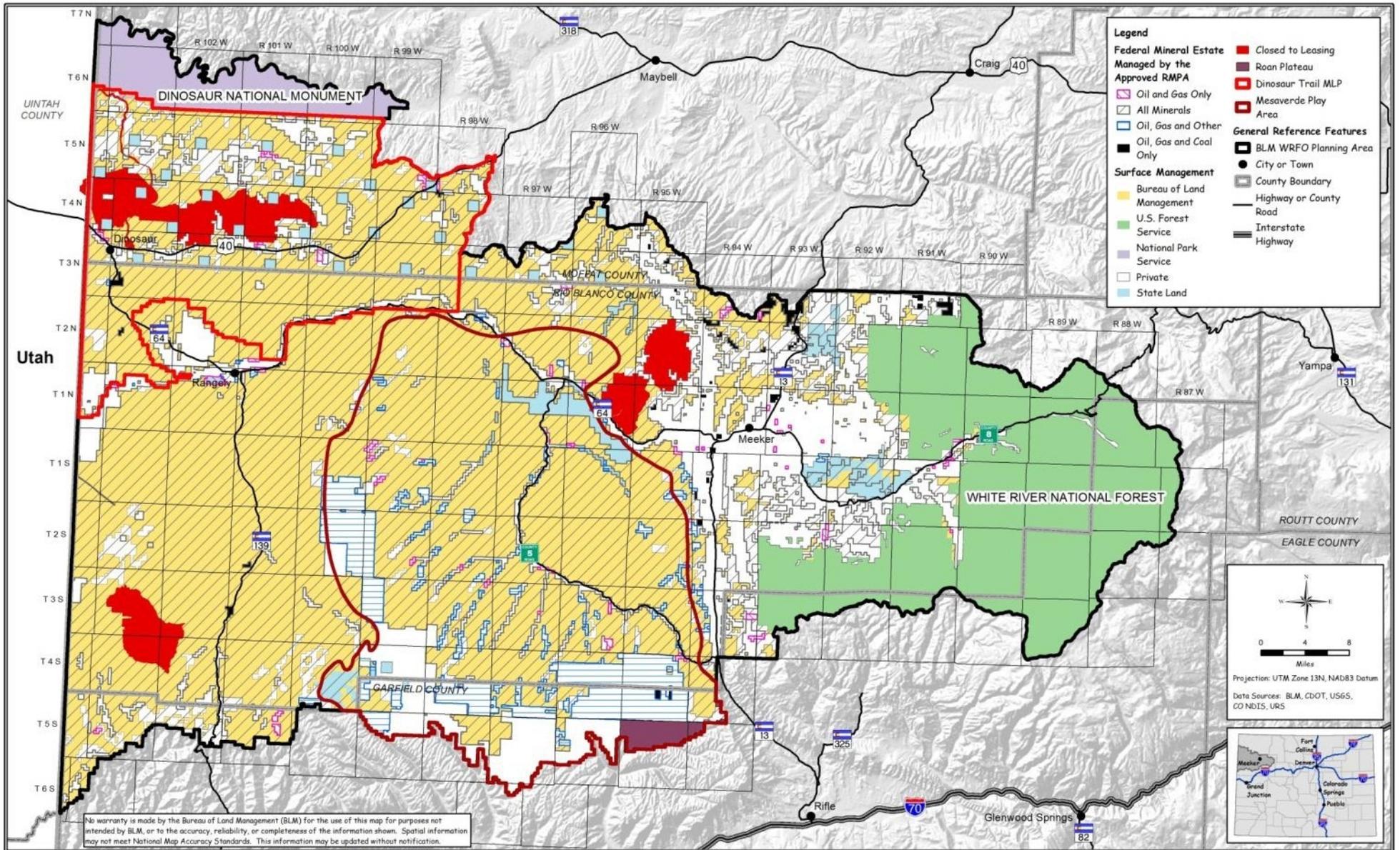
⁽³⁾Includes WSAs and NPS lands that are withdrawn from mineral entry, and mineral estate where the surface is managed by the FS.

⁽⁴⁾The state acres were adjusted to account for changes in Colorado Parks and Wildlife holdings.

1.1.4 Overall Vision

The BLM WRFO will provide for a level of oil and gas development that is appropriate to the Nation’s energy needs in a manner that respects local custom and culture and maintains the ecological integrity of the area and significant natural, cultural, social, and historical values.

Within the Dinosaur Trail MLP, the BLM will minimize impacts from oil and gas exploration and development to the area’s important natural resources and special areas including Areas of Critical Environmental Concern, Wilderness Study Areas, and Dinosaur National Monument by managing leasing opportunities in a phased approach in order to take advantage of new information and the best available technology.



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White River Field Office
Bureau of Land Management



Map 1-1
White River Field Office Planning Area and Mineral Estate

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Chapter 2.0 Management Decisions

2.1 Introduction

The BLM, with input from relevant agencies and the public, identified desired outcomes expressed in terms of specific goals and objectives for resources and resource uses. The BLM then identified allowable uses (land use allocations) and management actions to achieve the goals and objectives.

Desired outcomes are the future conditions expected to be produced by implementation of identified management actions. Goals and objectives provide overarching direction for the BLM's actions in most effectively meeting legal mandates, numerous regulatory responsibilities, national policy, and other resource or social needs.

- **Management goals** are broad statements of desired outcome, but are generally not measurable. An example of such a management goal would be to preserve and protect cultural and historic resources to ensure those resources are available for appropriate uses by present and future generations.
- **Management objectives** identify more specific desired outcomes for resources, and should include a measurable or quantifiable component and an established timeframe for achievement, if possible. Objectives are anticipated to achieve the stated management goals. An example of such a management objective would be to reduce imminent threats to cultural and historic resources from natural or human-caused deterioration or potential conflict with oil and gas activities.

Allowable uses identify surface lands and federal subsurface oil and gas mineral estate where uses are allowed, including any protective measures that would be needed to meet desired outcomes, and could exclude certain land uses to protect resource values.

- **Management actions** represent the actions anticipated to achieve desired outcomes. These actions include proactive measures or limitations intended to guide day-to-day activities occurring on public land (e.g., limiting vehicle use on BLM vehicle access networks in areas of concentrated development to that directly associated with oil and gas development, production, and maintenance).

These goals, objectives, and management actions are presented in this chapter (Sections 2.2 through 2.24) for each resource. Additional management decisions are found in Appendices 1 through 7.

2.2 Air and Atmospheric Values

2.2.1 Goals

Manage oil and gas activities to protect air resources from adverse impacts associated with BLM authorized/permitted actions in accordance with the methodology and provisions outlined in the Comprehensive Air Resource Protection Protocol (CARPP) (see Appendix 5).

Manage oil and gas activities to protect air quality and, within the scope of the BLM’s authority, minimize emissions that cause or contribute to violations of air quality standards or that negatively impact air quality-related values (AQRVs) (e.g., acid deposition, visibility).

Manage oil and gas activities to minimize emissions of greenhouse gases.

2.2.2 Objectives

Work cooperatively with local, state, federal, and Tribal agencies to enhance air monitoring efforts in order to provide a broader measure of spatially distributed air pollutant concentrations for the purposes of evaluating atmospheric conditions with respect to ambient air quality standards and air quality related values.

Limit air quality degradation from authorized activities on BLM-administered lands by providing appropriate analyses for compliance with applicable Colorado and National Ambient Air Quality Standards, applicable federal, state, and local air quality laws, rules, regulations, and implementation plans, and applicable federal land management guidance documents (e.g., FLAG 2010).

2.2.3 Management Actions

Implement adaptive management strategy for protecting air resources, to include the preceding actions, and tracking project specific emissions for comparison against the most recent regional air quality model results, as a means to provide context for any contemporaneous development period. Provide an annual activity and air quality summary report as described in the CARPP (see Appendix 5).

Well completions and recompletions would require use of green completion technology unless the need for an exemption could be documented. During well completions that do not use green completion technology, flaring of natural gas would be required. Venting of natural gas would not be allowed, except during emergency situations. Requirements would be consistent with New Source Performance Standard (NSPS) OOOO Regulations.

In addition to fugitive dust control plan implementation, construction sites and resource roads would be treated with water and/or a chemical dust suppressant during construction and drilling activities so that no dust plume is visible from construction sites or behind vehicles. All vehicles would abide by company or public speed restrictions.

Emission controls would be required for glycol dehydrators, condensate tanks, and produced water tanks, without regard to the location of the equipment or the quantity of uncontrolled volatile organic compound (VOC) emissions from the equipment.

Develop COAs for project specific surface-disturbing activities to prevent BLM permitted actions from causing or contributing to exceedances of ambient air quality standards or causing significant adverse impacts on air quality related values.

Drill rig engines and fracturing (frac) pump engines would meet EPA requirements. See Appendix 5, Section 3.5 Mitigation regarding COAs where the BLM may require all new and existing drill rig engines to meet EPA generator set Tier 4 (or more stringent) emission standards at the Project-level stage by year 2015.

Engines at field compression facilities would be required to meet applicable Colorado Department of Public Health and Environment (CDPHE), Air Quality Control Commission (AQCC) regulations, and EPA emission standards.

Where feasible, promote the use of three-phase gathering systems to transport natural gas, condensate, and produced water to consolidated facilities where dehydration, temporary tank storage, and truck loading would occur.

At Project-level analyses, the BLM will evaluate possible emissions control effectiveness for permitting any actions and any requirements would be applied as COAs.

A Lease Notice (LN) will be attached to new oil and gas leasing agreements to provide notice to operators of analysis and mitigation requirements that will be determined on a case-by-case basis at the permitting/development stage. (See Appendix 1, WR-LN-04.)

Participate in, conduct, or require air modeling analyses as described in the CARPP (see Appendix 5) as part of a comprehensive strategy to prevent BLM permitted activities from causing or contributing to violations of ambient air quality standards or causing significant adverse impacts on air quality related values.

2.3 Soil and Water Resources

2.3.1 Goals

Maintain and improve water quality and quantity in order to be compatible with existing and anticipated uses, to comply with applicable state and federal water quality standards, and to meet the goals contained in Standard 5 of the Colorado Public Land Health Standards.

Prevent, control, or remediate sources and causes of water pollution on federal lands in cooperation with other federal, local, and state agencies and private entities.

Identify and implement treatments for fragile watershed areas and minimize or control elevated levels of salt and sediment contribution from federal lands to river systems in the Planning Area.

Prevent impairment of soil productivity due to accelerated erosion and physical or chemical degradation resulting from surface use activities and maintain or improve soil productivity, including retention of topsoil quality and reestablishing soil capability, potential, and functionality when disturbed.

2.3.2 Objectives

Manage surface land use with oil and gas activities to maintain the timing, magnitude, and duration of peak, high, and low flows by minimizing surface disturbance, erosion, and sedimentation of streams.

Manage oil and gas activities to maintain the hydrologic and water quality conditions needed to support riparian and wetland areas; water quality standards; stream channel integrity; minimize levels of salt and sediment loading in watersheds; and complement meeting or achieving BLM's Colorado Public Land Health Standards.

Maintain surface and groundwater quality to achieve or exceed standards promulgated by the State Water Quality Control Commission.

Manage oil and gas activities to maintain soil quality and reestablishing soil function when disturbed.

2.3.3 Management Actions

The use of existing pipeline corridors and roads are requested and may be required depending on site-specific analysis.

Encourage, through planning, the implementation of produced water piping infrastructure to transport water to treatment and disposal locations.

Encourage, through planning, the implementation of detailed access route plans for specific geographic areas.

When submitting a development plan, operators will submit a water management plan by federal lease or unit area(s) that describes:

- Predicted water use for drilling, construction, and operations;
- Storage needs and methods;
- Recycling, treatment; and
- Disposal methods for fresh and produced water needed to develop or explore identified mineral resources.

Plans would be subject to BLM approval.

Use of evaporation facilities for the disposal of produced water would be evaluated on a case-by-case basis.

The BLM actions affecting surface waters will be conducted in compliance with state and federal laws, including:

- State of Colorado’s NPDES;
- Anti-Degradation Policy;
- State Water Quality Standards;
- U.S. Army Corps of Engineers, Section 404 permit requirements; and
- Section 319 (Non-point Source Management Program) of the Clean Water Act (CWA).

Surface discharge of produced water that meets state standards for water quality would be allowed. Individual projects would be considered on a site-specific basis.

Management actions support the goals provided as indicators in Standard 1 of the Colorado Public Land Health Standards.

Landslide areas as identified in the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) would be open to oil and gas leasing with an NSO stipulation (38,600 acres). (See Appendix 1, WR-NSO-11.)

On natural slopes greater than or equal to 35 percent but less than 50 percent, a CSU stipulation (231,500 acres) would be applied to surface-disturbing activities associated with all land use authorizations, permits, and leases granted in these areas that are associated with oil and gas development. (See Appendix 1, WR-CSU-10.)

On natural slopes greater than or equal to 50 percent an NSO stipulation (114,200 acres) would be applied to surface-disturbing activities associated with all land use authorizations, permits, and leases associated with oil and gas development. Surface occupancy could be granted if an environmental analysis showed that the proposal would not impact the features identified or when the land-use authorization holder or lease holder and the BLM have arrived at acceptable plan for mitigation of anticipated impacts. (See Appendix 1, WR-NSO-12.)

Identified saline soils would be open to leasing with a CSU stipulation that would require operators to consider the stability and productivity of these soils in surface use plans of operations for oil and gas activities (44,300 acres). (See Appendix 1, WR-CSU-11.)

A CSU stipulation would be applied to oil and gas leases and land use authorizations to avoid the following areas:

- Mapped 100-year floodplains (22,100 acres);
- Areas within 500 feet from perennial waters, springs, water wells, and wetland/riparian areas (55,300 acres); and
- Areas 100 feet from the inner gorge of ephemeral and/or intermittent stream channels (these would be identified during site-specific analysis).

(See Appendix 1, WR-CSU-12.)

Areas within 500 feet of state 303 (d) listed impaired stream segments in the MPA would be open to oil and gas leasing with an NSO stipulation (2,500 acres). These stream segments include:

- Duck Creek tributary to Yellow Creek;
- Yellow Creek from Barcus Creek to the White River;
- Piceance Creek from Willow Creek to Hunter Creek;
- Piceance Creek from Ryan Gulch to the White River; and
- Black Sulphur Creek.

(See Appendix 1, WR-NSO-13.)

Development in designated surface and groundwater source water protection zones for public water supplies (i.e., those identified by the Source Water Protection Plans for the towns of Meeker and Rangely) including new sole source aquifers as defined in the Safe Water Drinking Act would require a plan that addresses drinking water sources. This requirement would be added as a LN to leases. (See Appendix 1, WR-LN-05.)

Areas within 1/2 mile of groundwater public water supply wells for the town of Dinosaur, Dinosaur National Monument Headquarters, the town of Massadona, the town of Meeker and the primary protection area that includes the primary aquifer for Meeker would be open to oil and gas leasing with an NSO stipulation (1,500 acres)². (See Appendix 1, WR-NSO-14.)

² These acres do not include the primary protection aquifer for Meeker since there is not any federal mineral estate associated within the Meeker public water supply area.

2.4 Vegetation

2.4.1 Goals

Plant Communities (including Remnant Vegetation Associations)

Maintain the proper ecosystem function necessary to achieve the Desired Plant Community (DPC) in areas with oil and gas activities.

Assess sites to identify weed establishment risks, analyze potential treatment of sites at high-risk of weed establishment/spread, and identify prevention practices.

Manage vegetation communities to restore, maintain, or enhance vegetation community health, composition, and diversity to benefit multiple resources and their uses (consistent with ecological site description).

Riparian Areas and Wetlands

Ensure that riparian areas and wetlands on BLM-administered lands are in or making progress toward, proper functioning condition.

Noxious and Invasive Weeds

Incorporate Integrated Pest Management practices including Early Detection Rapid Response into all phases of oil and gas activities to stop or reduce the spread of noxious and invasive plant species.

2.4.2 Objectives

Plant Communities (including Remnant Vegetation Associations)

Manage oil and gas activities to maintain, restore, and enhance upland vegetation communities, riparian areas, and wetlands to facilitate meeting or progressing toward meeting Colorado Public Land Health Standards and DPC.

Maintain, restore, and enhance vegetation communities to facilitate a healthy mix of successional stages in areas with oil and gas activities (consistent with ecological site description or identified desired plant community).

Protect the ecological integrity of unique plant communities, with particular emphasis on maintaining the genetic integrity of native species in remnant vegetation associations (RVAs and ACECs).

Riparian Areas and Wetlands

Manage oil and gas activities for maintenance, restoration, and enhancement of riparian areas and wetlands to facilitate meeting or progressing toward meeting, Colorado Public Land Health Standards through achievement of proper functioning condition.

Noxious and Invasive Weeds

Control the spread of noxious and invasive weeds found on the most current State and County Noxious Weed priority lists, associated with oil and gas activities by using appropriate management actions (eradicate, contain, suppress). Involve appropriate partners (local, county, state, federal, and public land users) to facilitate timely and successful completion of each action.

2.4.3 Management Actions

Plant Communities (including Remnant Vegetation Associations)

Proposed activities would be analyzed to determine whether the objectives for the particular plant community affected could be met if the activity were approved. If plant community objectives could not be met, the BLM could deny the request or could require specific mitigation measures for the activity to ensure that plant community objectives are met.

In areas where a pinyon-juniper component has expanded into previous fire-disclimax (mid-seral) shrublands or is invading other ecological sites or sites degraded by cheatgrass domination, the BLM would utilize vegetation removal associated with oil and gas activities and related infrastructure combined with tailored reclamation to achieve specific management objectives.

In RVAs an NSO stipulation (4,800 acres) would be applied to all land use authorizations, permits, and leases associated with oil and gas development. (Appendix 1, WR-NSO-15.)

(Note: Additional management direction related to the use of native species in RVAs can be found under Reclamation in Section 2.4.3. Additional management direction related to deciduous browse communities on Blue Mountain can be found under the Dinosaur Trail MLP in Section 2.24.)

Riparian Areas and Wetlands

Management of riparian areas and wetlands would be based on the rating system for riparian areas identified in Appendix D, Tables 2-9 through 2-11 of the 1997 White River RMP. Riparian systems have been reprioritized according to risk factors associated with oil and gas activities. The following systems would be ranked as high priority: Bitter Creek, Fawn Creek (all), Piceance Creek, Bear Creek, and Big Duck Creek. The following systems would be ranked as medium priority: West Creek, Joe Bush Gulch, Segar Gulch, East Hunter Creek, West Hunter Creek, Middle Fork Stewart, Box Elder, and Corral Gulch. The following systems would be ranked as low priority: Collins Gulch and Cascade Gulch. Any 303 (d) (CWA) listed systems could be considered high or medium priority depending on its resource value. The remaining systems would retain the priority rankings as identified in Appendix D of the 1997 White River RMP.

Authorized surface-disturbing activities and/or facilities that are found to be negatively affecting riparian or wetland habitat may be required to undertake mitigation and, if impacts are not mitigated, then relocate activities/facilities outside riparian/wetland habitat.

(Note: Additional management direction related to wetland/riparian areas can be found under Soil and Water Resources, Section 2.3.)

Noxious and Invasive Weeds

Three contiguous areas encompassing 497,900 acres would be maintained as weed-free zones. Weed management would be emphasized through cooperation with private landowners and state and county governments. The areas would be identified on the ground with signs. The following special conditions would be attached to use authorizations approved within these areas:

- All construction equipment and vehicles would be cleaned prior to entering BLM Weed-Free Zones.
- All hay, straw, unprocessed feed, and seed used in BLM Weed-Free Zones must be certified free of specified noxious weeds listed in Colorado Weed-Free Forage Certification Standards.

- All authorized users of disturbed areas would be required to inventory for noxious weeds in both the spring and fall.

When noxious weeds and/or invasive winter annuals (e.g., cheatgrass) are present, prior to seeding, they would be treated/controlled to reduce their presence to a level that would not impair revegetation efforts.

On BLM lands, noxious weeds on the Colorado Department of Agriculture’s State Weed List A would be eliminated; noxious weeds on the Colorado Department of Agriculture’s State Weed B and C Lists would be controlled; and the spread of invasive species within the permitted area of direct and indirect use (as defined in Appendix 3) would be controlled and prevented. The following COAs would be attached to land use authorizations:

- All equipment that may act as a vector for weeds will be washed before entering the WRFO. Equipment would also be washed (e.g., with a portable pressure washer) when leaving and/or moving between work-sites if the pre-disturbance weed inventory indicated the presence of undesirable invasive or noxious weeds and there is a risk of transporting these weed seeds or root propagules;
- Certified weed-free mulches, as per state guidelines, would be used;
- All seed applied on BLM public lands would comply with BLM policy regarding seed testing and certified quality;
- All authorized users of disturbed areas including ROWs would be required to inventory the entire project area for noxious weeds and invasive species in both the spring and fall through final abandonment. Results of surveys would be provided to the BLM as described in Appendix 3;
- Operators would prepare and implement weed management plans for projects consistent with the WRFO Surface Reclamation Plan (see Appendix 3); and
- Operators to the extent possible would ensure all products placed on public lands (e.g., materials from gravel pits/quarries) are free of noxious weeds, including seeds or root material, listed on Colorado Department of Agriculture’s State Weed List for A and B listed species.

Reclamation

General Reclamation Management Direction

All surface disturbing activities related to oil and gas exploration and development on BLM-administered lands authorized after the signing of the ROD for the Oil and Gas Development RMPA would be subject to reclamation standards included in the WRFO Surface Reclamation Plan. For all such exploration and development authorized prior to the signing of the ROD, the WRFO Surface Reclamation Plan would be used as guidance for Reclamation Plans submitted as per Onshore Order No. 1. Reclamation is dynamic and the WRFO Surface Reclamation Plan will be revised through time to incorporate updated reclamation practices.

For APDs and ancillary facilities authorized after the signing of the ROD for the Oil & Gas Development RMPA, the BLM would require current leaseholders to follow the reclamation requirements in the WRFO Surface Reclamation Plan (see Appendix 3). For APDs and ancillary facilities authorized prior to the signing of the ROD, the WRFO Reclamation Plan would be used as guidance for authorizing Reclamation Plans submitted as per Onshore Order No. 1.

For land use authorizations (e.g., ROWs, leases, and permits) authorized after the signing of the ROD for the Oil & Gas Development RMPA, the BLM would require current holders to follow the reclamation requirements in the WRFO Surface Reclamation Plan (see Appendix 3). For land use authorizations (e.g., ROWs, leases, and permits) authorized prior to the signing of the ROD, the WRFO Reclamation Plan would be used as guidance for approving submitted Reclamation Plans.

The BLM would require final reclamation of abandoned wells and access routes including long-term (until termination of land use authorization) maintenance (e.g., weed control, vegetation establishment) of ROWs as defined in the WRFO Surface Reclamation Plan (see Appendix 3).

In areas under an existing lease, a program would be developed in cooperation with current leaseholders to apply (where appropriate) the most current reclamation standards and practices to existing well pads, roads, and pipelines. These standards and practices would be applied in annual increments that would allow for completed interim or final reclamation of active and inactive ROW corridors and producing, plugged, and abandoned wells and access routes within 20 years. This action would be most relevant to the Douglas/Evacuation Creek, Coal Oil Basin, Indian Valley, Crooked Wash, and White River Dome areas.

The BLM would require reclamation that would result in a functioning vegetation community, established on the reclaimed site, that is capable of persisting on the site without continued intervention and would allow for successional processes progressing toward a healthy mid-seral or late-seral community. An exception could be granted for areas where a specific cover type/seral stage is needed (e.g., wildlife habitat, fire management).

Acceptable DPCs would be managed to achieve an ecological status of late-seral or healthy mid-seral for all rangeland plant communities. Interim and final reclamation for oil and gas activities would have success criteria of 80 percent similarity of desired foliar cover, bare ground, and forb and/or shrub density in relation to the identified DPC. In the absence of specified DPC data, an agreed upon reference site or Assessment, Inventory and Monitoring Protocol (AIM) data would serve as the DPC. Vegetative cover values for woodland or shrubland sites are based on the capability of those sites in an herbaceous state. The resulting plant community must contain at least five desirable plant species and no one species may exceed 70 percent relative cover in the resulting plant community to ensure that site species diversity is achieved. Desirable species include native species from the surrounding site, species listed in the range/ ecological site description, or species from the BLM approved seed mix consistent with the WRFO Surface Reclamation Plan (see Appendix 3).

A reclamation status report for each site would be submitted electronically to the WRFO annually until it is determined that reclamation of the site has met all required objectives of the particular reclamation phase. (See Appendix 3, Section 4.2 for the minimum components to be included in the report.)

Reclamation data will be submitted via the most current BLM approved data management system.

Long-term facilities would be situated on the access route side of the well pad, unless otherwise approved by the BLM.

In locations where a standard well pad foot print configuration would require large cuts and fills, the BLM would encourage an adapted footprint configuration to match the topography of the surrounding landscape to reduce reclamation needs (e.g., fewer cut/fill areas).

The BLM would require the use of native plant materials and seeds in all reclamation activities unless the use of non-native, non-invasive introduced plant species would benefit the ecological integrity or meet specified management objectives of the site. Site-specific reclamation plans would be developed based on ecological site, DPC, and ecological integrity of the surrounding community.

Sterile hybrids or cereal grasses could be used on public lands for reclamation efforts where approved by the BLM.

Special Reclamation Management Direction

Big Game Habitat

On a case-by-case basis and in addition to standard interim and final reclamation measures, special reclamation components or techniques would be prescribed to restore or provide supplemental forage species that would aid in meeting big game objectives (e.g., deciduous browse). Native species would be used as general rule, but where unavailable or considered beneficial, non-native species with established value to big game that have no demonstrated tendency to persist as a dominant forb constituent on reclaimed lands for extended timeframes (e.g., more than 10 years) or disperse beyond the treatment area could be used. (See also complementary Management Action in Section 2.7.3, Grouse.)

Special Status Animal Species

BLM Sensitive Aquatic Vertebrates, including Native Cutthroat Trout

Require specialized reclamation techniques (e.g., seeding and soil conditioning techniques, reclamation protection, application of interim reclamation standards and monitoring) that promote or accelerate the establishment of interim ground cover sufficient to reduce sediment contribution to discountable levels in aquatic habitats supporting native fisheries and BLM-sensitive species (e.g., fish and amphibians). Remaining aquatic habitats will be managed to reduce sediment contribution to levels that do not compromise proper functioning condition.

Canada Lynx

Interim and final reclamation practices would be oriented toward enhancing habitat attributes considered most important for lynx prey or denning functions at the time of project submission. These site-specific determinations will be established in coordination with CPW and FWS in preparation for ESA Section 7 consultation proceedings.

Special Status Plant Habitat

Reclamation of suitable habitat of special status plant species would include replicating the existing soil horizons and subsoil dynamics (i.e., replace soil and sub-soil to their pre disturbance order) to allow for increased potential in possible occupation of these sites by special status plant species as well as achievement of late seral vegetation conditions.

Exclusion of Livestock

Where appropriate, as determined by BLM, livestock would be excluded from oil and gas well pads and related surface disturbance, including cut and fill slopes, until interim and final reclamation vegetation is successfully established. Operators would be responsible for construction, maintenance, and removal of fencing unless otherwise specified (see Appendix 3).

Where voluntary collaboration between operators, livestock grazing permittees, and resource managers has failed, as determined by the BLM at any time during the life of the project where conditions warrant, livestock would be excluded from linear ROWs and related surface disturbance until final reclamation vegetation is successfully established. Fencing would be installed in a manner that does not impair livestock or wildlife travel through the area (pass-through areas provided). Operators would be responsible for construction, maintenance, and removal of fencing unless otherwise specified (see Appendix 3).

Use of Native Plants in RVAs, ACECs, and WSAs

Reclamation of surface disturbance resulting from authorized activities within RVAs would use only locally gathered or genetic stock from locally gathered native species. Locally collected seed or genetic stock from locally gathered seed would be used for reclamation and available in adequate quantity for reclamation needs prior to issuance of the notice to proceed. If such seed is not available in adequate quantity, then collection from the site of disturbance would be required. All seed collection, storage, or increase would be conducted in accordance with approved collection, storage, and seed increase protocols. If three growing seasons pass without adequate collection to provide the quantity necessary for reclamation needs, the impact of using non-local native species on the genetic integrity of native species would be evaluated by the BLM and mitigated through site-specific environmental analysis.

Native plant species would be used for reseeding disturbed areas within Areas of Critical Environmental Concern (ACECs). Exceptions may be considered if an environmental analysis indicates that the use of non-native species is compatible with the resources for which the ACEC was designated. Exceptions would not be considered in those ACECs which were designated for special status plant species.

Reclamation of surface disturbance resulting from authorized activities within ACECs designated for special status plant species would use only locally gathered or genetic stock from locally gathered native species. In cases where locally gathered native species are not available, the impact of using non-local native species on the genetic integrity of native species would be evaluated through site-specific environmental analysis.

Only native plant species would be used for reseeding disturbed areas within WSAs.

2.5 Fish and Wildlife - Big Game

2.5.1 Goals

Ensure that big game habitats provide components and conditions necessary to sustain big game populations at levels commensurate with multiple-use objectives and state-established population objectives.

2.5.2 Objectives

Provide the forms, distribution, and extent of vegetation cover and forage that satisfies the physiological requirements and behavioral constraints (i.e., habitat utility) of big game.

Reduce and limit to prescribed geographic and/or habitat-based thresholds the duration, expanse, intensity, and frequency of big game harassment and avoidance-induced disuse (i.e., loss of utility of habitat) across all suitable habitats.

2.5.3 Management Actions

Significant reductions in essential winter forage bases would be minimized by limiting cumulative treatment of suitable sagebrush forage types on deer winter ranges and pronghorn overall ranges. Cumulative reductions of suitable forage types would be limited to 50 percent of suitable habitat within a 1-mile radius and would not exceed 20 percent of the total type within individual game management units (GMUs). Treatment of suitable sagebrush forage types on deer severe winter range and pronghorn winter ranges would be confined, where possible, to suboptimal stands and excess cover types. Cumulative reductions of suitable forage types on deer severe winter range and pronghorn winter range would be limited to 20 percent within a 1-mile radius where involvement is unavoidable.

Big game habitat enhancement/compensation practices to help offset forage losses and effect advantageous shifts in animal distribution (i.e., outside concentrated development areas) would remain consistent with the maintenance of climax or disclimax vegetation extent (or those guidelines established in the 1997 White River RMP) and community-specific successional perturbation rates (e.g., fire-return intervals). Treatment for the restoration of disclimax shrubland communities or restoration efforts targeting communities where understories are dominated by invasive annuals would not be limited.

In wildlife movement corridors defined by CPW, modified siting of surface facilities and application of activity restrictions (i.e., up to 60 day activity deferment) would be used, where appropriate, as a management tool to enable secure big game movement between and within seasonal ranges.

All seasonal big game ranges within the WRFO (see Map 2-4) would be subject to the following timing limitations. These timing limitations would be applied through lease stipulations or as COAs that could extend up to 120 days within the following windows, unless otherwise noted from:

- December 1 through April 30 in defined big game severe winter range (673,100 acres) (see Appendix 1, WR-TL-12);
- May 15 through August 15 in defined big game summer range (420,300 acres) (see Appendix 1, WR-TL-13); and
- Defined big game winter range and winter concentration areas (604,500 acres): deferrals of up to 60 days within the period of December 1 through April 30 in stratified zones of seasonal use (refined set of seasonal use timeframes developed in coordination with CPW). (See Appendix 1, WR-TL-14.)

Exceptions, waivers, or modifications could be granted (see Appendix 1), but the criteria would be narrowly defined and timing limitations would typically be applied regardless of weather conditions (i.e., address of chronic influences).

In an effort to encourage clustered development and reduce the extent of seasonal ranges subject to cumulative adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development, exceptions to timing limitations would be offered contingent on development remaining below the following threshold allowance (based on deer seasonal range encompassed by an entity's total leaseholdings within a GMU). (An entity is the primary lessee, unit operator, or other common entity, that provides BLM the most cohesive and effective source with interest in developing the federal mineral estate and performing reclamation.) The threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, fluid mineral development activity, as measured by the area encompassed by 660-foot buffers surrounding development features (i.e., routes,

pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances.

Acute Thresholds:

- 20 percent of deer winter range;
- 15 percent of deer severe winter range;
- 15 percent of deer summer range; and
- 20 percent of deer winter concentration area.

The area of acute effects would be defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations, buffered by 660 feet on all seasonal ranges.

Collective Thresholds:

- 20 percent of deer winter range;
- 20 percent of deer severe winter range;
- 20 percent of deer summer range; and
- 20 percent of deer winter concentration area.

The area of collective effects would include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple-well pads awaiting further drilling or not meeting interim reclamation success criteria (as defined in the WRFO Reclamation Plan), linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

The area of acute effects would be exempt from big game seasonal timing limitations as long as lease development activities are managed within the threshold allowance for both collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would be subject to Timing Limitations, where practical. Adverse effects that exceed either threshold would nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

It is WRFO's intent that threshold limits be refined when necessary and through appropriate means, based on animal response or the influence of compensatory mitigation in meeting long-term population objectives, as determined through monitoring.

Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage would be assessed against the proponent's threshold calculation.

Access or other features and facilities used in common may be prorated by operator. All reclamation in a leaseholding will be subject to Appendix 3 reclamation criteria when operating within the threshold concept.

A grace period of 5 years from the time of the RMPA ROD approval would be provided to allow compliance in the event leaseholder/operator activity exceeds threshold allowances at the time of ROD approval.

In areas defined by CPW as Restricted Development Areas (e.g., North Ridge, approximately 10,700 acres), collective effects would be limited to 5 percent. Because there is no allowance for acute activity (i.e., 0 percent) in Restricted Development Areas, the manner in which these areas would be

managed in the context of the threshold strategies differs from its application elsewhere. In these cases, intensive development activities normally assigned to the “acute” effects category would generally be allowed only during those timeframes outside the period of animal occupation (i.e., similar to traditional application of timing limitations). Allowance for acute effects during the period of animal occupation could be granted. Restricted Development Areas are those geographic areas that offer inordinately high value as big game habitat (as determined by the CPW) or those that must remain relatively free of development influences to serve as experimental controls for long-term population or effects monitoring (e.g., North Ridge). (See Appendix 1, WR-TL-12.)

Protocols and criteria for lessees, cooperating agencies, or affected stakeholders would be established to implement compensatory mitigation to offset reductions in big game habitat capacity (e.g., year-round drilling). In coordination with CPW and industry, an adaptive method (based on monitoring) would be developed and implemented to quantify direct and indirect effects on big game as the basis for applying compensatory mitigation to achieve or maintain long-term population objectives.

The extent and continuity of coniferous forest, aspen, chokecherry (with special emphasis on stands within 1,300 feet of water on summer ranges), mature pinyon -juniper woodlands, and arborescent stands of Gambel oak would be maintained as much as practicable through avoidance (through aggressive use of moving surface facilities and ROW corridors up to 660 feet to avoid key vegetation types). Authorized exceptions would be subject to special reclamation or management practices to ensure that long-term community integrity is regained as soon as possible.

Federal mineral estate within the Oak Ridge (including associated BLM lands designated in the 1997 White River RMP), Jensen, and Piceance Creek (all units) State Wildlife Areas would be open to oil and gas leasing with an NSO stipulation (20,900 acres). (See Appendix 1, WR-NSO-16.)

(Note: Additional management direction related to reclamation of big game habitat can be found under Reclamation in Section 2.4.3. Additional management direction related to effective road densities and vehicular access in big game habitat can be found under Comprehensive Trails and Travel Management in Section 2.20.3.)

2.6 Fish and Wildlife - Raptors

2.6.1 Goals

Maintain the short-term utility and promote the continued long-term development and availability of suitable raptor habitats, including prey base, nest sites, and other special habitat features necessary to allow increases in regional raptor populations, where appropriate.

2.6.2 Objectives

Reduce the risk of direct mortality by removing or modifying potentially harmful features or preventing raptor access to hazards.

Minimize disruptions to ongoing raptor nest attempts that have potential to fail or reduce the success of annual breeding efforts.

Maintain the short-term utility and minimize long-term modifications in the extent and continuity of woodland/forest stands that show indications or have a documented history of nesting use as a means of maintaining the long-term development and availability of woodland raptor habitats, including

prey base, nest sites, and other special habitat features necessary to help maintain regional woodland raptor populations.

2.6.3 Management Actions

The most current raptor protection guidelines would be incorporated into power line designs in an attempt to prevent raptor electrocution (e.g., Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 [APLIC 2006]). Where perching deterrence is not an issue (e.g., sage-grouse or black-footed ferret habitats), providing adequate conductor separation would be the preferred method of protection.

Where appropriate, power line design would be required to incorporate features that enhance conductor visibility and reduce the potential for line strikes (e.g., swan diverters).

Physical barriers would be used to prevent the use of or contact with stored fluids that may pose a risk to raptors. These barriers would be installed immediately after a drilling rig has moved off-site and would remain in place through completion and until the pits are reclaimed. Methods could include netting or other alternative methods that effectively prevent use and that meet BLM approval. The use of “bird-balls” would be discouraged.

Long-term, undesirable reduction or deterioration in the extent or continuity of aspen, spruce-fir, Douglas-fir, or mature pinyon -juniper woodland communities would be avoided through facility relocation of up to 660 feet and design modifications developed on a site-specific basis.

Development proponents conducting raptor nest inventories in affected nest habitats would be required to provide survey information consistent with the most current WRFO raptor survey protocols. Consultants performing raptor nest surveys must demonstrate, to the BLM Authorized Officer, their professional expertise and experience in conducting raptor nest surveys and in producing credible reports and analysis. When possible, inventories would allow for an investigation of a full nesting sequence prior to project implementation.

Permitted land use activities within 1/4 mile of functional raptor nest sites (including woodland sites) or within 1/2 mile of the nests of special-status raptor species would be subject to relocation or design modifications to preclude, or reduce to acceptable levels, surface occupancy or use that reduces or deteriorates the extent and continuity of nest and foraging habitat.

Surface occupancy would not be allowed within 990 feet of functional nest sites of those raptors that are not considered special-status (120,700 acres) (see Appendix 1, WR-NSO-18) or within 1/2 mile of functional nest sites of golden eagle and prairie falcon. (59,900 acres) (See Appendix 1, WR-NSO-19.)

Surface-disturbing and disruptive activities would not be allowed within 1/4 mile of active nest sites of those raptors that are not considered special-status (see Appendix 1, WR-TL-15) or within 1/2 mile of active nest sites of golden eagle and prairie falcon during the period from nest territory establishment to dispersal of young from the nest (145,000 acres). (See Appendix 1, WR-TL-17.)

(Note: Additional management direction for special status raptor species can be found in Section 2.10.)

2.7 Fish and Wildlife – Grouse

2.7.1 Goals

Restore, maintain, or enhance habitat conditions and features conducive to the maintenance or expansion of native grouse population abundance and distribution, and in particular, maintain or expand the number of greater sage-grouse lek complexes (Western Association of Fish & Wildlife Agencies (WAFWA)-defined) in each identified population within the WRFO Planning Area.

2.7.2 Objectives

Restore the suitability of former sage-grouse habitat that suffers from successional advance or depauperate understory development to help offset impacts of oil and gas development.

In cooperation with industry, plan development so as to confine activity to discrete geographic areas with simple and common access requirements in order to: (1) reduce the areal extent of occupied habitat subjected to acute disturbance during the period of use; and (2) minimize the long-term influences on potential habitat that, with restoration work, could allow expansion of sage-grouse distribution and compensate for reductions in the extent of suitable habitat.

Maintain sufficient undisturbed or minimally disturbed native grouse habitats to provide for long-term species sustainability within the WRFO Planning Area.

Limit overall reductions in habitat utility of occupied grouse habitats and, particularly in the Piceance-Parachute-Roan (PPR) population area, maintain effective continuity of ridgeline habitats.

2.7.3 Management Actions

Surface occupancy and long-term conversion or adverse modification of the following sage-grouse habitat (450,700 acres) within a leaseholding would be limited to 2 percent within each of most-currently mapped Priority and General Habitats that are characterized by, or capable of redeveloping (e.g., burns) sagebrush-dominated stands:

- With ≤ 50 percent canopy and ≤ 40 inches in height; and
- On slopes ≤ 20 percent in defined winter use areas or stands showing evidence of winter use.

In coordination with CPW, these areas and habitats could be refined consistent with site-specific evaluation of seasonal use functions and updated information or science, including functionally equivalent habitat classification systems adopted by the BLM and CPW. Reclaimed habitat that does not meet minimum functional habitat properties would be assessed against the threshold acreage limitation (see below). (See Appendix 1, WR-NSO-22.)

Surface occupancy and surface-disturbing and disruptive activities within 0.6 mile of active (i.e., used by displaying males in the previous 5 years) and inactive (i.e., evidence of use within previous 10 years, but not within previous 5 years) strutting grounds (i.e., leks) would be prohibited, with narrow criteria for exception or modification (14,100 acres). If existing facilities are within 0.6 mile of such leks, alternate access routes would be devised and/or surface facilities removed to the extent practicable within 5 years of approval of the ROD. (See Appendix 1, WR-NSO-23.)

Occupation or removal of suitable sagebrush cover within 660 feet of mesic or wet meadow habitats encompassed by the most-currently mapped Priority Habitat for sage-grouse would be avoided.

Unless qualifying for an exception by working within the disturbance threshold criteria (see below), surface-disturbing and disruptive activities would be prohibited in the following areas during the seasonal use periods identified:

- December 1 through March 15 in those areas most currently defined by CPW as serving important winter use functions for sage-grouse (450,100 acres) (see Appendix 1, WR-TL-22); and
- April 1 through July 15 in suitable sage-grouse nesting/brood-rearing habitat within most-currently mapped Priority or General Habitat (450,100 acres). (See Appendix 1, WR-TL-23.)

In an effort to encourage clustered development, accommodate year-round well development, and reduce the extent of sage-grouse range subject to cumulative adverse modification and behavioral effects (e.g., avoidance) attributable to fluid mineral development, exceptions to timing limitations may be offered contingent on development effects remaining within the following threshold allowances (evaluated by the most-currently mapped Priority and General Habitats encompassed by an entity's(1) total leaseholdings within a CPW-defined sage-grouse population or sub-population area). The extent of sage-grouse habitat subject to cumulative adverse habitat and behavioral effects (i.e., reduced habitat extent/ continuity, harassment/ avoidance) attributable to oil and gas development would not exceed the following thresholds:

- 10 percent of suitable habitat within most-currently mapped Priority Habitat (or equivalent habitat classification system adopted by CPW and BLM); and
- 20 percent of suitable habitat within most-currently mapped General Habitat (or equivalent habitat classification system adopted by CPW and BLM).

An identified land base key to any given subcomplex (defined by CPW) may be subject to additional conservation measures in an effort to retain an effective source population of grouse in the subcomplex. These measures may include, but would not be limited to: well pad density limits, strict development schedules and timeframes, and facility siting that may involve moves of more than 660 feet.

The extent of adverse behavioral effects is defined by collective development activity or facility footprint buffered by 660 feet, in addition to any habitat parcels that become physically or behaviorally isolated by development features and are unavailable for effective use by sage-grouse (e.g., barriers to movement).

Development activity includes, but is not limited to:

- Pad and access construction, drilling, and completion operations;
- Trunk and gathering pipeline construction and reclamation;
- Unrestricted access tracks along ROW corridors;
- Wells receiving frequent visitation (i.e., average of more than seven vehicle trips per pad per week); and
- Well pads not fully developed or reclaimed to interim standards.

Reclaimed habitat that does not meet minimum functional habitat properties would be assessed against the threshold. Reclamation success on sage-grouse habitats would be contingent on evidence of successful establishment of desired sagebrush forms on disturbed acreage or achieving minimum functional capacity to serve sage-grouse cover and forage needs based on site capability and seasonal habitat use and allowing, where appropriate, for surrogate (e.g.,

herbaceous) forms of cover as per Appendix 1, “Structural Habitat Guidelines” from Colorado Greater Sage-grouse Conservation Plan (Colorado Greater Sage-Grouse Steering Committee 2008).

Cumulative development-related effects that exceed any of the threshold allowances would nullify the exceptions and subject all lease development to established timing limitations applied through lease stipulations or COAs that exceed 60 days (i.e., nesting/early brood functions, April 1 through July 15; winter use areas, December 1 through March 15).

For effectiveness in achieving management objectives for sage-grouse, the BLM would encourage the voluntary application of this strategy to private holdings. Acreage on fee land holdings below the occupied habitat threshold that are considered by CPW to be of comparable or higher sage-grouse value could be substituted for federally administered acreage with the approval of the WRFO Authorized Officer.

Sage-grouse thresholds would be considered separately but would also be integral with more expansive big game thresholds.

Additional conservation measures could be applied as COAs at the time of permitting of oil and gas drilling or related operations or other activities.

Threshold allowances are intended to accommodate directional, multi-well drilling technologies that can be managed to dramatically reduce long-term impacts on grouse populations and habitat. Threshold strategies and TL exceptions may not be offered in instances (e.g., exploratory, obligation wells, routine and non-emergency production, maintenance, and operation activities) where fluid mineral development activity can be reasonably scheduled to avoid interfering with important seasonal use activities of sage-grouse. (See Appendix 1, WR-TL-22 and WR-TL-23.)

In defined sage-grouse population areas identified by CPW, special management and operation refinements (e.g., integral with Wildlife Mitigation Plans) may be required to establish protocols to authorize exceptions or modifications to activity or surface use restrictions. These refinements would be developed jointly by BLM, CPW, and the leaseholder/operator, and as appropriate, other regulatory or scientific entities, within the framework of the threshold strategy.

The BLM would utilize lease notices as the vehicle for imposing management actions that mimic lease stipulations (i.e., >660-foot moves, >60-day activity deferrals) on sage-grouse habitat features that are variable through time (e.g., leks), and/or may undergo distributional shifts through time (e.g., expansion onto restored ranges). (See Appendix 1, WR-LN-08.)

The following methods would be used to minimize the frequency and extent of long-term vehicular activity (production phase) on sage-grouse ranges and to help maintain effective continuity along ridgeline habitats: (1) project siting considerations; (2) using development designs that reduce production facilities on the pad and maximize interim reclamation opportunity; and (3) employing practices that accelerate development and maintenance of vegetative cover that provides for ground movements through or across surface developments. Practices that accelerate the recovery of functional sagebrush canopies (e.g., sagebrush seeding and/or transplanting, fencing) on surface disturbance associated with oil and gas development would be required to be incorporated during interim and final (particularly pipeline) reclamation.

Unless specifically authorized exceptions are granted in coordination with CPW, local accessions of sagebrush (i.e., material collected on-site or seed propagated from “local” collections) would be used where appropriate and as specified by the BLM to accelerate the redevelopment of sagebrush where canopies have been removed or adversely modified. The extent and level of reestablishment would be designed to generally not exceed initial mature canopy densities of 10 percent and, if considered

appropriate, would be intermittently (i.e., areal extent less than 50 percent) applied along linear ROWs.

Consistent with existing land use decisions, adapted forms of forbs with recognized utility as sage-grouse forage or cover would be included in interim and final seed mixes applied to surface disturbances in suitable sage-grouse nesting/early brood-rearing and late brood habitats. Native species would be used as a general rule, but where unavailable or considered beneficial, non-native species with established value to sage-grouse that have no demonstrated tendency to persist as a dominant forb constituent on reclaimed lands for extended timeframes (e.g., more than 10 years) or disperse beyond the treatment area could be used.

Protocols and means for lessees, cooperating agencies, or affected stakeholders to implement compensatory mitigation to offset reductions in sage-grouse habitat capacity (i.e., behavioral and physical) would be established. In coordination with CPW, industry, and as appropriate, other scientific or regulatory entities, an adaptive method (based on monitoring) would be developed and implemented that would quantify direct and indirect effects on sage-grouse as the basis for establishing a compensatory mitigation guidelines to maintain viable population levels and/or achieve long-term population objectives.

Lands would be made available for sage-grouse habitat enhancement/ compensation efforts by industry and other wildlife interests to help offset behavioral or physical loss of habitat and, where appropriate, effect advantageous shifts in animal distribution (i.e., outside concentrated development areas). Consideration of public land treatment would remain consistent with the maintenance of climax or disclimax vegetation extent and community-specific successional perturbation rates (e.g., fire-return intervals). There would be no treatment limit on the restoration of disclimax shrubland communities or restoration efforts targeting communities whose understories are dominated by invasive weeds.

Employment of noise-reduction methods would be required on development facilities (e.g., drilling and completion equipment, compressors, and gas processing facilities) that have the potential to generate noises that may adversely influence sage-grouse reproductive functions (i.e., lekking and nesting). Appropriate methods could include, but would not be limited to:

- Abiding by current BMPs;
- Increasing separation of noise-generating equipment and sensitive habitat (e.g., locating compressor stations at least 2,500 feet from leks);
- Enclosure of equipment;
- Installation of hospital-grade muffling devices;
- Orientation of noise projection away from sensitive habitats; or
- Siting facilities to take advantage of natural barriers or vegetation filters.

Long-term seral or type conversions of all aspen, Douglas-fir, spruce-fir, and deciduous shrub communities as important components of dusky grouse habitats would be avoided. Where unavoidable, special COAs requiring reclamation practices that maintain site potential, restore desired plant composition, and/or accelerate development of the community's desired seral state would be applied. Seral manipulations (e.g., vegetation treatments) of aspen and conifer types would be limited to those specifically designed to restore natural successional processes or achieve riparian management objectives. Where applicable, manipulations would maintain a minimum 50 percent of an individual stand in mature to over-mature age classes.

Surface occupancy and surface-disturbing and disruptive activities within 0.4 mile of active (i.e., used by displaying males in the last 5 years) strutting grounds (i.e., leks) of Columbian sharp-tailed grouse would be prohibited (15 acres). (See Appendix 1, WR-NSO-24.)

Surface-disturbing and disruptive activities would be prohibited within 1.25 miles of active leks or mapped nesting habitat for Columbian sharp-tailed grouse from March 1 through July 30 (see Appendix 1, WR-TL-25) and in important, CPW-defined, winter range habitat from December 1 through March 15 (1,500 acres). (See Appendix 1, WR-TL-24.)

2.8 Fish and Wildlife - Migratory Birds

2.8.1 Goals

Avoid adverse impacts on migratory birds to the extent practicable and minimize detrimental alteration of their habitat consistent with the Migratory Bird Treaty Act, Executive Order 13186, and the Memorandum of Understanding between the FWS and BLM “To Promote the Conservation of Migratory Birds” (April 2010).

2.8.2 Objectives

Reduce the risk of direct mortality by removing or modifying potentially harmful features or preventing access by migratory birds to hazards.

Apply conservation measures to avoid or minimize the unintentional take of migratory birds attributable to oil and gas development and minimize adverse alterations in nesting habitat, with specific focus on BLM sensitive species, U.S. Fish and Wildlife Service (FWS) Birds of Conservation Concern, BLM Priority Migratory Birds, and the Colorado Partners in Flight high priority species for the Colorado Plateau and Southern Rocky Mountains physiographic regions.

2.8.3 Management Actions

Operators would be required to prevent migratory bird use of, or access to, reserve pits, evaporation ponds, or other oil and gas-related features that store or are expected to store fluids that may pose a risk to birds (as defined in the Migratory Bird Treaty Act) consistent with WO-IM-2013-033 or most current BLM policy. Physical barriers that prevent access to such fluids must be in place and functional within 5 days of the drilling rig moving off the location and will remain effective until such fluid storage features are removed, reclaimed, or incapable of storing fluids. The BLM’s preferred method involves the use of properly installed and maintained netting that prevents aerial and ground entry and remains free of the pit surface at all times (e.g., including during snow load sag). Unless the method is standardized and integrated with the proposed action, it would be the responsibility of the operator to notify the BLM, at least 2 weeks prior to the scheduled date for removal of the drilling rig, of the method to be used to prevent impacts on birds. All lethal and non-lethal events that involve migratory birds would be reported immediately to the AO and FWS Special Agent in Grand Junction, Colorado.

Facility and ROW siting would minimize the direct involvement (i.e., surface occupancy and vegetation clearing) of those habitat associations identified as having higher value for nesting migratory birds through the application of COAs (i.e., less than 660 foot moves) or moves negotiated during on-site inspections:

- Mature arboreal oakbrush;

- Riparian (all elevations);
- Spruce-fir (including Douglas-fir);
- Aspen;
- Mature stands of pinyon-juniper;
- Potential natural community (PNC), late seral and good condition mid-seral Wyoming and mountain big sagebrush communities; and
- Localized habitat parcels that support BLM sensitive species, BLM Priority Migratory Birds, and FWS Species of Conservation Concern (e.g., mat/Gardner saltbush association sage sparrow, loggerhead shrike; Utah juniper/black sagebrush gray vireo).

Avoid or, where impractical, minimize the disruption of migratory bird nesting activity by scheduling or prioritizing vegetation clearing, facility construction, and concentrated operational activities (e.g., drilling, completion, utility installation) to avoid involvement of better quality nesting habitats (e.g., siting on edge-of-type, avoiding better developed/more mature/more extensive and contiguous habitat parcels, consolidating with pre-existing disturbance) during the core migratory bird nesting season (generally from May 15 to July 15; applied as 60 day COA with the potential for 2-week shifts depending on elevation) (818,100 acres).

2.9 Fish and Wildlife – Fish

2.9.1 Goals

In cooperation with CPW, manage public land to provide sufficient quantity and quality of fisheries habitat and to maintain or enhance fish populations and biological diversity.

2.9.2 Objectives

Reduce cumulative oil and gas-related influences on systems that support or contribute to aquatic habitats supporting native fisheries and BLM sensitive species (e.g., fish and amphibians) to discountable levels and restore such communities adversely affected by past development.

2.9.3 Management Actions

Apply COAs to oil and gas development activity that prevents or, where avoidance is impractical, minimizes deterioration (e.g., surface disturbance/occupation, seasonal barriers to passage, contamination, sedimentation) of riparian, channel, and aquatic conditions in lotic and lentic aquatic systems that support native aquatic communities (e.g., measures that enhance vegetation expression and reestablishment, installation of protective fencing, use of impermeable reserve pit liners or fluid containment systems, facility relocation, ANS decontamination). (See Appendix 1, WR-CSU-12.)

The BLM will work cooperatively with the Colorado Water Conservation Board (CWCB) to identify private water rights owners who may be interested in voluntarily working with the CWCB to improve stream flow conditions for all native fisheries through leases, donations, or sales of their water rights. The BLM will cooperate with the CWCB and CPW to establish instream flow water rights on streams that support native and special status fisheries, noting that these fisheries are coextensive with all sport-water fishery opportunities in the WRFO.

2.10 Special Status Animal Species

2.10.1 Goals

Manage public land to maintain, restore, improve, or enhance habitats to conserve, recover, and maintain populations of federally endangered, threatened, proposed, and candidate species, and to preclude the need for federal listing of proposed and candidate species; Colorado state endangered, threatened, and special-status species; or BLM sensitive species.

Participate in achieving national goals for black-footed ferret recovery by establishing a viable population of free-ranging black footed ferrets (i.e., no fewer than 30 breeding adults) in the northwestern Colorado/northeastern Utah nonessential experimental population area.

2.10.2 Objectives

Maintain, restore, or enhance special-status species wildlife habitat, in coordination and consultation with FWS and other local, state, and federal agencies, consistent with other agency plans, policies, and agreements.

The BLM-administered lands within designated ferret management areas would be managed to enhance black-footed ferret survival and recruitment by maintaining or enhancing the capability of the sites to achieve national ferret recovery objectives.

Activities within the Wolf Creek Ferret Management Area would be conducted with the objective of maintaining at least 15,500 acres of occupied prairie dog habitat on BLM-administered lands.

2.10.3 Management Actions

Black-footed Ferret and White-tailed Prairie Dog

The placement of aboveground power lines within sight of habitat showing past or recent evidence of prairie dog occupation would be avoided. Raptor deterrents would be installed, where appropriate, on power lines within 1/4 mile of occupied and suitable (including unoccupied) prairie dog habitat.

To limit disturbance to prairie dogs during the breeding and young-rearing period, surface-disturbing and disruptive activities on prairie dog colonies would be avoided from March 1 to May 1.

Seismic activity would be avoided within active prairie dog colonies, particularly from March 1 to July 1.

Development of lease parcels that include mapped prairie dog towns could require the following conservation measures prior to and during lease development:

- Participating in the preparation of a surface use plan of operations with BLM, FWS, and CPW to integrate and coordinate long-term lease development with measures necessary to minimize adverse impacts on black-footed ferrets or their habitat.
- Abiding by special daily and seasonal activity restriction on construction, drilling, product transport, and service activities.
- Incorporating special modifications to facility siting, design, construction, and operation.
- Providing in-kind compensation for habitat loss and/or displacement (e.g., special on-site rehabilitation/revegetation measures or off-site habitat enhancement).

Within all ferret management areas (58,600 acres), surface disturbing and disruptive activities associated with land use authorizations, permits, and leases issued on BLM-administered lands would be subject to a CSU stipulation that incorporates those provisions established in A Cooperative Plan for Black-footed Ferret Reintroduction and Management, Wolf Creek and Coyote Basin Management Areas, Moffat and Rio Blanco Counties, Colorado (Wolf Creek Work Group et al. 2001). (See Appendix 1, WR-CSU-25.)

- About 6,000 acres along Snake John Reef (between the Utah border and the town of Dinosaur) would be identified as part of the WRFO's black-footed ferret management area (pending concurrence of the Wolf Creek Work Group). This area is a natural and logical extension of the Snake John Reef Management Area in Utah, which is currently managed for black-footed ferret recovery and occupied by ferrets. The Snake John Reef area would be subject to the same oil and gas development provisions as the Wolf Creek and Coyote Basin black-footed ferret management areas.
- The BLM would consider acquisition, from willing landowners, of private mineral and surface estate with high black-footed ferret habitat value within ferret management areas and would apply applicable management provisions and lease notice and lease stipulations pertinent to oil and gas development activities.

(Note: Additional management direction related to effective road densities and vehicular access in black-footed ferret habitat can be found under Comprehensive Trails and Travel Management in Section 2.20.3.)

Endangered Fish of the Upper Colorado River Basin

To minimize the risk of entrapment of endangered fishes at diversion and intake structures, the BLM could require that screens or baffles be incorporated, as identified through ESA Section 7 consultation with the FWS.

Require that any surface use activity be consistent with the restoration or maintenance of proper functioning condition on BLM-administered riverine parcels that are designated critical habitat for Colorado pikeminnow (100 year floodplain), consistent with parcel potential.

Critical or occupied habitat for federally listed fish species (e.g., 100-year floodplain of the White River below Rio Blanco Lake) would be open to oil and gas leasing with an NSO stipulation (1,100 acres). An NSO stipulation would be applied to surface-disturbing and disruptive activities associated with all land use authorizations, permits and leases issued on BLM-administered lands. Exceptions including, but not limited to the following, could be granted:

- Pipelines could not be constructed in sites identified by the CPW or FWS as important for Colorado pikeminnow reproduction and recruitment of young.
- Pipelines transporting potential contaminants would be equipped with automatic shut off valves and may be required to be double-walled where they cross the White River's 100-year floodplain or the lower mile of its larger perennial tributaries (e.g., Piceance Creek, Yellow Creek, Crooked Wash).
- Proponent would be required to prepare a spill/leak contingency plan that would be integrated with BLM's biological assessment to the FWS.
(See Appendix 1, WR-NSO-17.)

BLM Sensitive Aquatic Vertebrates, including Native Cutthroat Trout

Native cutthroat trout habitat would be open to oil and gas leasing and permitted surface use activities with a CSU stipulation (108,900 acres). (See Appendix 1, WR-CSU-13.)

The BLM-administered portions of Black Sulphur Creek would be managed as Colorado River cutthroat trout recovery waters subject to CSU provisions for native cutthroat fisheries (2,700 acres). (See Appendix 1, WR-CSU-13 and WR-NSO-13.)

Pursue acquisition or cooperative management of privately owned fisheries to compensate for cumulative impacts on aquatic habitats and/or promote recovery of BLM sensitive aquatic species. Where appropriate (e.g., where public lands are unavailable), recognize permanent stream restoration or improvements on private lands in the context of habitat banking.

Apply WR-CSU-12 (see Appendix 1) and/or COAs to oil and gas development activity that prevents or, where impractical, minimizes deterioration (surface disturbance/occupation or seasonal barriers to passage, contamination, and sedimentation) of riparian, channel, and aquatic conditions in lotic and lentic aquatic systems that support native aquatic communities (e.g., measures that enhance vegetation expression and reestablishment, installation of protective fencing, use of impermeable reserve pit liners or fluid containment systems, facility relocation).

In cooperation with current leaseholders, identify and apply restorative measures to previously authorized (or unauthorized) oil and gas development facilities or influences that are or have the potential to reduce the extent or adversely influence the physical or biological components of aquatic habitats associated with BLM sensitive aquatic species (e.g., channel modifications or obstructions; unlined pits in contributing valley alluvium; road/pipeline crossings that inhibit stream recovery; abandoned piping and material; road/pipeline runoff; culverts that inhibit fish passage; unreclaimed well pads, equipment, or infrastructure associated with non-producing wells).

(Note: Additional management direction related to reclamation of aquatic habitats supporting native fisheries and BLM sensitive species can be found under Reclamation in Section 2.4.3. Additional management direction related to water rights and instream flows can be found under Fish and Wildlife (Fish) in Section 2.9.3.)

Special Status Raptors

Surface occupancy would not be allowed within 1/2 mile of functional nests of special status raptor species (29,700 acres). (See Appendix 1, WR-NSO-19.)

Surface occupancy would also not be allowed within 330 feet of abandoned bald eagle nests (i.e., unoccupied for five consecutive years but with all or part of the nest remaining) (60 acres). (See Appendix 1, WR-NSO-20.)

Surface occupancy would not be allowed within 1/4 mile of identified bald eagle critical night roosts (as defined by the FWS) (1,000 acres). (See Appendix 1, WR-NSO-21.)

Identified bald eagle nest, roost, and perch habitat would be open to oil and gas leasing and permitted surface use activities with a CSU stipulation (930 acres). Use authorization would be contingent on the following conditions:

- Mature and regenerating cottonwood communities would be avoided;
- Special reclamation techniques would be required to accelerate recovery and for reestablishment of habitat commensurate with deterioration;

- Long-term site potential as a properly functioning riverine riparian community would be maintained or restored; and
- Short- and long-term utility as bald eagle habitat would be maintained. (See Appendix 1, WR-CSU-14.)

Timing limitation stipulations would be applied, as follows, to all surface disturbing activities associated with land use authorizations, permits, and leases issued on BLM administered lands:

- November 15 through July 31 or until fledgling and dispersal of young within 1/2 mile of identified bald eagle nests (800 acres) (See Appendix 1, WR-TL-19.);
- February 1 through August 15 or until fledgling and dispersal of young, within 1/2 mile of identified special status raptor nest sites (5,200 acres) (see Appendix 1, WR-TL-16), and within 1 mile of identified ferruginous hawk nests (66,900 acres) (see Appendix 1, WR-TL-18); and
- November 15 through March 15, within 1/2 mile of identified bald eagle critical night roosts (see Appendix 1, WR- TL-20) and within 1/4 mile of identified winter hunting perches (2,800 acres). (See Appendix 1, WR-TL-21.)

The felling of any native tree with a diameter at breast height (dbh) greater than 12 inches that is located within 100 feet of a river bank or defined bald eagle foraging area would be prohibited. Any activity that has the potential to kill perch trees or impede utilization of riverine foraging areas would also be prohibited.

Minimize the risk of line-strikes by enhancing the visibility of static lines and/or conductors with best available technology in areas of concentrated bald eagle use or movement corridors.

Canada Lynx

Oil and gas development activities on BLM-administered lands would not be allowed to contribute disproportionately to FS management thresholds applied to lynx habitat (i.e., no more than 30 percent of mapped habitat within a lynx analysis unit [LAU] in unsuitable condition and less than 15 percent of habitat within an LAU converted to unsuitable condition within a 10 year period; also, maintenance of greater than 10 percent of habitat suitable for denning).

Surface-disturbing and disruptive activities that have the potential to reduce the utility of habitat parcels suitable for lynx denning functions would not be allowed from March 15 to July 15 (3,400 acres). (See Appendix 1, WR-TL-26.)

Development and production facilities would be sited to avoid occupation of important lynx habitat features (e.g., prey-rich foraging areas, denning habitat, and movement corridors) and, to the extent practicable, minimize adverse influences on the utility of such features or habitats through the operational life of the facility.

(Note: Additional management direction related to reclamation of lynx habitat can be found under Reclamation in Section 2.4.3. Additional management direction related to oil and gas access routes, snow compaction, and the use of over-the-snow vehicles can be found under Comprehensive Trails and Travel Management in Section 2.20.3.)

2.11 Special Status Plant Species

2.11.1 Goals

Manage public land to maintain, restore, improve, or enhance habitats to sustain, conserve, and recover populations of special status plant species (federally endangered, threatened, proposed, and candidate species; BLM sensitive plant species) and designated critical habitat. This includes proactive management to preempt and preclude the need for federal listing of BLM sensitive species.

Manage all oil and gas activities authorized by the BLM in occupied and suitable habitats in order to sustain and recover special status plant species and their habitats.

Manage environmental risks, reclamation, and associated effects in a manner compatible with sustaining special status plant species and their habitats.

2.11.2 Objectives

Maintain, restore, improve, or enhance special status plant species habitat, in coordination and consultation with FWS and other local, state, and federal agencies, consistent with other agency plans, policies, and agreements, including collaborative research and monitoring of BLM special status plant species.

Maintain special status plant species communities, occupied and suitable habitats in a continuous and connected pattern on a landscape scale including consideration of short- and long-term disturbance, climate change, and population changes.

The Dudley Bluffs bladderpod (*Physaria congesta*) and Dudley Bluffs twinpod (*Physaria obcordata*) would be managed to meet species recovery goals and to limit other impacts from surface disturbance associated with oil and gas development, including fugitive dust and noxious weeds.

2.11.3 Management Actions

Prior to approving surface-disturbing or potentially impacting activities within occupied, suitable, potential or critical habitat for special status plant species a plant inventory conducted by a qualified botanist and an environmental analysis would be required for the proposed action. Based on the results of the plant survey, Section 7 consultation with FWS may be necessary, and appropriate conservation measures may be required to avoid or minimize impacts on federally listed species or critical habitat. Typically, Section 7 consultation would be required prior to surface disturbing and similar activities within occupied or critical habitat for federally listed and proposed plants.

Maintenance of existing roads and/or ROWs within occupied, suitable and/or critical habitat for federally listed, proposed, and candidate species may be subject to Section 7 consultation or conference with the FWS.

Management of populations of special status plants existing outside of ACECs would be emphasized and subject to the stipulations, COAs, and BMPs for special status plants and associated habitats. These areas include, but are not limited to, east of the Duck Creek ACEC, north of the Duck Creek ACEC on Pinto Mesa, east of the Dudley Bluffs ACEC, Calamity Ridge, and along Yellow Creek.

Areas within 330 feet of occupied habitat of federally listed and proposed plant species would be exclusion areas for new ROW authorizations.

Areas within 330-660 feet of occupied habitat or within 660 feet of suitable habitat, or within critical habitat for federally listed, proposed or candidate plant species would be avoidance areas for new ROW authorizations.

Areas within 660 feet of occupied and suitable habitat for federally listed, proposed, and candidate species, including any new habitat mapped as a result of future surveys, would be open to oil and gas leasing with an NSO stipulation (32,400 acres). (See Appendix 1, WR-NSO-25.) Areas within 330 feet of occupied habitat would have limited exceptions. Additionally, within 1,970 feet of occupied habitat other COAs (see below) would be applied to minimize indirect impacts to pollinator habitat.

Potential and critical habitat for federally listed, proposed, and candidate species would be open to oil and gas leasing with a LN. This includes any areas that are found in the future to contain currently unknown features (e.g., soil, geologic, vegetative) that would qualify as potential habitat for federally listed, proposed, or candidate species (91,400 acres). (See Appendix 1, WR-LN-07.)

Areas within 330 feet from the edge of occupied and suitable habitat for BLM sensitive plant species, including any new habitat mapped as a result of future surveys would be open to oil and gas leasing with an NSO stipulation. An NSO stipulation would be applied to surface-disturbing activities and other land use authorizations, permits, and leases associated with oil and gas development (7,300 acres). (See Appendix 1, WR-NSO-26.)

Conditions of Approval identified as appropriate through environmental analysis to mitigate the impacts to pollinator habitat for special status plant species would be applied to land use authorizations, permits, and leases that fall within the plant consideration area (e.g., within 1,970 feet of occupied habitat) of the affected plant species. Possible mitigation strategies may include, but are not limited to:

- Adjusting the location of the disturbance outside of the plant consideration area;
- Minimizing the area of disturbance;
- The use of dust abatement measures;
- Requiring construction to occur outside of the blooming season (i.e., construction could occur September through March), involving possibly delaying the project by more than 60 days;
- Using a higher percentage of forbs in the reclamation seed mix to promote pollinator habitat; and
- Non-native or invasive species monitoring and control.

Prioritize the treatment of noxious weeds in occupied, suitable, and critical habitat for special status plant species. Control methods and design criteria would utilize Integrated Pest Management (IPM) strategies for weed control as specified in the WRFO's Integrated Weed Management Plan.

Intensive control of fugitive dust within 330 feet from the edge of occupied and/or suitable special status plant habitat would be achieved using BLM approved dust suppression methods (preferably water) to be determined on a case-by-case basis. The goal of this measure would be to reduce and control the dust plumes created by traffic during construction, drilling and well completion, and maintenance stages of a project.

(Note: Additional management direction related to reclamation of suitable habitat for special status plant species can be found under Reclamation in Section 2.4.3. Additional management direction

related to travel restrictions within ACECs for threatened and endangered (T/E) plants can be found under Comprehensive Trails and Travel Management in Section 2.20.3.)

2.12 Wild Horse Management

2.12.1 Goals

Manage the wild horse herd within the Piceance-East Douglas Herd Management Area (HMA) so that a thriving ecological balance is maintained for all plant and animal species on that range.

2.12.2 Objectives

Wild horses would be managed to provide a healthy population with a diverse age structure.

Recognize and proactively respond to potential conflicts, as they occur, between the wild horse herd and other resources.

Maintain quality of habitat for wild horses in areas with oil and gas development.

2.12.3 Management Actions

Piceance-East Douglas HMA would be managed for a wild horse herd of 135 to 235 animals (as per the adjustment derived from the WRFO Wild Horse Program Analysis and Operational Plan [BLM 1999]) on 190,100 acres within the Piceance-East Douglas HMA so that a thriving ecological balance is maintained for all plant and animal species on that range.

A lease notice would be added to leases that encompass portions of a wild horse herd management area. In order to protect wild horses within this area, intensive development activities may be delayed for a specified 60-day period within the spring foaling period between March 1 and June 15.

The lessee may be required to perform special conservation measures within the wild horse herd management area including:

- Habitat improvement projects within the HMA in areas adjacent to development if such development displaces wild horses from crucial habitat.
- Disturbed watering areas would be replaced with an equal source of water, having equal utility.
- Activity/improvements would provide for unrestricted movement of wild horses between summer and winter ranges.

(See Appendix 1, WR LN 10.)

2.13 Cultural Resources

2.13.1 Goals

Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.

2.13.2 Objectives

Preserve and protect cultural and historic resources in accordance with existing laws and regulations.

Reduce imminent threats from natural or human-caused deterioration or potential conflict with oil and gas activities.

Develop cultural resource project plans for the Canyon Pintado National Historic District (NHD) and Dragon Trail/Douglas Arch area south of Rangely, Colorado.

2.13.3 Management Actions

Permits will be required for all third-party consultants conducting fieldwork on BLM-administered lands. Applicants for permits must meet the eligibility requirements at 43 CFR 7.6 and BLM Manual 8151.

The following LN will be added to all new leases: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., SHPO and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. (See Appendix 1, WR-LN-11.)

Oil and gas exploration and development activities that produce vibrations would be restricted with a CSU stipulation within 660 feet of rock art or standing architecture (13,900 acres) such as cabins, rock structures, or wickiups. (See Appendix 1, WR-CSU-15.)

Approximately 3 acres within and adjacent to the Duck Creek Wickiup Village, listed on the National Register of Historic Places, would be protected with an NSO stipulation. (See Appendix 1, WR-NSO-27.)

Federal mineral estate occurring within the Texas-Missouri-Evacuation Creek areas would be open to oil and gas leasing with a CSU stipulation. A CSU stipulation would be applied to surface-disturbing and disruptive activities associated with all land use authorizations, permits, and leases issued in these areas (19,300 acres). (See Appendix 1, WR-CSU-16.)

Protect cultural resource values in the Texas-Missouri-Evacuation Creek area by designating the area as an avoidance area for major new ROWs for pipelines, power lines, etc.

The Thornburgh/Battle of Milk Creek, National Register listed site, would be open to oil and gas leasing with an NSO stipulation (110 acres). An NSO stipulation would be applied to surface-disturbing and disruptive activities associated with all land use authorizations, permits and leases issued within the site. (See Appendix 1, WR-NSO-28.)

The Thornburgh/Battle of Milk Creek viewshed would be open to oil and gas leasing with a CSU stipulation (5,800 acres). A CSU stipulation would be applied to surface-disturbing and disruptive activities associated with all land use authorizations, permits, and leases issued in these areas (See Appendix 1, WR-CSU-17.)

The Thornburgh/Battle of Milk Creek viewshed would be an avoidance area for new ROWs (e.g., power lines, pipelines, roads, etc.) to protect cultural resources.

The Canyon Pintado NHD would be an avoidance area for new ROWs, power lines, pipelines, or roads to protect cultural resources.

Mineral material sales (e.g., sand and gravel) related to oil and gas activities would not be allowed within the Canyon Pintado NHD.

Any new surface disturbance within the Canyon Pintado NHD would be required to be monitored by an approved and qualified archaeologist for the following conditions:

- Activity occurs in the vicinity of known resources;
- Activity occurs in the alluvial bottoms along Douglas Creek and its tributaries; and
- Activity occurs in deep alluvial soils.

A cultural resource project plan (CRPP) for the Canyon Pintado NHD will be developed within five years of the ROD for the Oil and Gas Development RMPA. The Canyon Pintado NHD CRPP will be the basis for analysis, and alteration of management decisions in a future RMP revision or amendment (BLM Manual 8130.42). At a minimum, the CRPP will document:

- Measured impacts of oil and gas exploration and development on National Register of Historic Places (NRHP)-eligible sites and sites contributing to the Canyon Pintado NHD;
- Measured impacts of livestock grazing on NRHP eligible and contributing sites;
- Measured impacts of current authorized and unauthorized recreation on NRHP eligible and contributing sites; and Measured impacts of other authorized and unauthorized land uses on NRHP eligible and contributing sites.
- Based on this, the CRPP will establish a concise list of qualities and resources for management of the Canyon Pintado NHD to:
 - Be consistent with the Canyon Pintado NHD’s listing on the NRHP;
 - Identify a management boundary for the Canyon Pintado NHD based on aliquot portions that wholly contain the Canyon Pintado NHD’s National Register boundary;
 - Identify management goals and recommended uses or restrictions for federal surface estate in the Canyon Pintado NHD; and
 - Establish a site monitoring plan for sites in the Canyon Pintado NHD.

After the CRPP is completed, if the existing plan does not adequately provide long-term protection of cultural resources, the plan will be amended.

A CRPP for the Dragon Trail/Douglas Arch area south of Rangely, Colorado will be developed within six years of the ROD for the Oil and Gas Development RMPA. The CRPP will be the basis for analysis, and alteration of management decisions in a potential future RMP revision or amendment (BLM Manual 8130.42). At a minimum, the CRPP will document:

- Measured impacts of oil and gas exploration and development on National Register of Historic Places (NRHP)-eligible sites;
- Measured impacts of livestock grazing on NRHP eligible sites;
- Measured impacts of current authorized and unauthorized recreation on NRHP eligible sites; and
- Measured impacts of other authorized and unauthorized land uses.

- Based on this, the CRPP will establish a concise list of qualities and resources for management of Dragon Trail/Douglas Arch to:
 - Consider the feasibility of additional special management areas (e.g., ACECs, historic districts);
 - Identify management goals and recommended uses or restrictions for federal surface estate in potential boundary areas; and
 - Establish a site monitoring plan for sites in the area.

After the CRPP is completed, if the existing plan does not adequately provide long-term protection of cultural resources, the plan will be amended.

(Note: Additional management related to the Mellen Hill sites can be found under the Dinosaur Trail MLP, Section 2.24.)

2.14 Paleontological Resources

2.14.1 Goals

Identify and protect the integrity of the scientific value of paleontological resources from indiscriminant loss.

2.14.2 Objectives

Reduce imminent threats from natural or human-caused deterioration or potential conflict with oil and gas activities.

2.14.3 Management Actions

Monitoring by a qualified paleontologist would be required at all times during surface-disturbing activities authorized within potential fossil yield classification (PFYC) 5 and PFYC 4 areas. In PFYC 3 areas, the BLM will require spot-checking of the exposed unit, including the spoil or storage piles, at key times. These times would depend on the activity, but would typically include when bedrock is initially exposed, occasionally during active excavation, and when the maximum exposure is reached and before backfilling has begun. Monitoring and spot-checking by a qualified paleontologist or a BLM-approved representative would be required.

Permits would be required for all third-party consultants conducting work in the field, in accordance with applicable laws and regulations.

An on-the-ground survey would be required prior to approval of surface-disturbing activities to avoid resource bearing strata for PFYC 4 and PFYC 5 formations. Currently, there are no identified PFYC 4 formations within the WRFO.

The following formations are listed as PFYC 5: Morrison, Wasatch, Chinle, Glen Canyon, Mowry Shale, Parachute Creek and Douglas Creek Members of the Green River Formation, Browns Park Formation, Williams Fork Formation, Iles Formation, Mesaverde Group, and Uinta Formation.

Formations or members of formations could be added or removed from this list as additional data become available. Exceptions to the survey requirement in these areas could be granted in areas having vertical to near-vertical (i.e., unsafe) slopes, areas of soil development, and areas covered

with much vegetation, as these areas would be unlikely to produce recoverable fossils. For larger projects, an on-the-ground survey sample may be required of some likely fossiliferous PFYC 3 areas (e.g., Fort Union and Mancos Shale formations). (See Appendix 1, WR-LN-12.)

2.15 Visual Resources

2.15.1 Goals

Protect and maintain visual and aesthetic qualities in sensitive areas while allowing for changes to visual quality in less sensitive areas.

2.15.2 Objectives

Manage changes in the landscape to maintain and protect visual values as identified by visual resource management (VRM) class objectives.

2.15.3 Management Actions

Stipulations or COAs identified as appropriate through environmental analysis for the protection of visual qualities would be applied to land use authorizations, permits, and leases, to mitigate impacts on visual resources in all VRM classes. Areas of primary concern (i.e., sensitive landscapes) would include but not be limited to:

- VRM Class I and II areas;
- Canyon Pintado NHD;
- Corridors along Highways 13, 40, 64, and 139;
- National and State Scenic Byways; and
- Thornburgh/Battle of Milk Creek viewshed.

(Note: Additional management direction for visual resources within the Dinosaur Trail MLP can be found in Section 2.24.)

2.16 Forestry and Woodland Products

2.16.1 Goals

Manage oil and gas activities within forest stand communities for health, composition, and diversity (considering density, basal area, canopy cover, age class, stand health, and understory) through forest management practices and to provide late successional vegetation while providing for multiple uses.

Manage oil and gas activities in woodland communities (such as pinyon-juniper) for a healthy mix of successional stages within the range of natural variability.

Manage for retention of old growth forest and woodland stands in areas with oil and gas development.

2.16.2 Objectives

Manage to retain mature forest and woodland communities with high potential of old growth character in areas with oil and gas development.

Minimize ground disturbance in existing old growth forest and woodland stands.

2.16.3 Management Actions

In areas with oil and gas development, a full range of silviculture practices (treatments) would be utilized to thin new growth, promote old growth, maintain desired understory and maintain desired age classes (e.g., old growth) for pinyon-juniper, Douglas-fir, aspen, and ponderosa pine woodland communities.

Clearing of woodlands attributed to oil and gas activities would be limited to an annual disturbance of 260 acres or 2,600 acres per decade and primarily conducted in early or mid seral woodland areas.

Commercial and non-commercial woodlands removed as a result of oil and gas development will be appraised and purchased prior to removal.

Areas with Douglas-fir and aspen on slopes greater than 25 percent would be open to oil and gas leasing with an NSO stipulation (61,900 acres). (See Appendix 1, WR-NSO-29.)

Manage old growth and areas with high potential for old growth characteristics with a CSU stipulation. The CSU stipulation would help retain stands with old growth characteristics or high potential to develop old growth characteristics. (See Appendix 1 WR-CSU-18.)

Old growth forest and woodland stands would be avoidance areas for land use authorizations.

New pipelines in mature pinyon-juniper woodland communities and existing old growth forest and woodland stands would be required to be located within previously authorized areas of disturbance to the extent practicable.

The ROW disturbance widths in old growth forest and woodland stands, identified through site specific analysis, would be required to be 25 feet or less.

2.17 Livestock Grazing

2.17.1 Goals

Manage oil and gas activities in a manner that reduces overall effects on the livestock grazing program and maintains rangeland health.

2.17.2 Objectives

Develop and implement mitigation actions to minimize cumulative impacts on livestock grazing (including cumulative livestock forage loss and reduction in operation capabilities and production performance) where opportunities exist.

Maintain or enhance a healthy rangeland vegetative composition and species diversity, capable of supplying forage at a sustained yield to meet the demand for livestock grazing.

Identify opportunities and facilitate or implement projects to improve rangeland vegetation to sustain and enhance livestock grazing and meet Colorado Public Land Health Standards in cooperation, consultation, and coordination with grazing permittees and the interested public.

Encourage grazing permittees and affected interests to participate with the BLM to monitor and evaluate rangeland health to determine appropriate management actions in light of oil and gas development.

2.17.3 Management Actions

Administrative actions could be combined (e.g., adjustments in season of use; livestock exclusion; stocking level adjustments) and rangeland projects (e.g., fences, ponds, vegetation treatments) implemented to direct livestock use to meet resource objectives and Colorado Public Land Health Standards, in cooperation, consultation and coordination with grazing permittees and other affected interests.

Allotment management and/or permitted Animal Unit Months (AUMs) would be adjusted where oil and gas activity conflicts with grazing operations, Colorado Public Land Health Standards, and rangeland management objectives. Conflicts could include loss of forage, unsuccessful reclamation of disturbed areas, invasive species, safety hazards, improper livestock distribution, or other circumstances.

Adjustments in livestock grazing use would be implemented based on monitoring results and through consultation, coordination, and cooperation with grazing permittees, other affected interests, and state agencies.

The BLM will actively pursue opportunities and facilitate voluntary collaboration between operators and grazing permittees to identify and implement projects and actions to increase flexibility in livestock grazing management in areas temporarily impacted by oil and gas development and to enhance reclamation success.

Livestock grazing in affected allotments could be temporarily suspended or modified (for portions of or entire allotments) throughout the period of intensive oil and gas development if oil and gas activity increases to a level where the two activities are incompatible.

When oil and gas activities preclude effective implementation of a grazing plan, compensatory mitigation by oil and gas operators commensurate with the impact to the livestock operation could be recommended.

(Note: Additional management direction related to exclusion of livestock pending successful reclamation of sites can be found under Reclamation in Section 2.4.3.)

2.18 Minerals

2.18.1 Goals

Reduce potential conflicts of oil and gas activities with other resource uses while promoting efficient recovery of oil and gas resources.

Promote environmental stewardship among oil and gas operators.

2.18.2 Objectives

Make federal oil and gas resources available for leasing and development in a manner that provides reasonable protection for other resource values.

Manage oil and gas activities to prevent degradation of resources (including oil and gas resources).

Manage oil and gas activities to complement or contribute to improving trends in achieving Colorado Public Land Health Standards.

Establish partnerships with cooperating entities to develop and adapt BMPs in response to site-specific conditions and other resource objectives.

2.18.3 Management Actions

There are 1,696,000 acres of BLM oil and gas mineral estate open to oil and gas leasing and development; 83,300 acres of BLM federal oil and gas mineral estate would be closed to leasing. Areas closed to leasing include WSAs and the National Park Service’s Harpers Corner Road withdrawal.³

Zero acres of federal mineral estate would be open to leasing with standard lease terms.

The 1,696,000 acres of BLM federal oil and gas mineral estate open to oil and gas leasing are subject to lease stipulations (see Appendix 1), including NSO stipulations (405,600 acres⁴), CSU stipulations (514,400 acres), and timing limitations (1,696,000 acres)⁵.

The BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by scientific analysis. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into conditions of approval of the permit, plan of development, and/or other use authorizations.

Encourage industry to submit development plans that would direct time-referenced, managed activities intended to concentrate development, promote effective reclamation, and to reduce the cumulative adverse resource effects attributable to oil and gas activities.

The BLM would discourage the use of reserve, production, and completion/re-completion pits. Onsite burial of drill cuttings meeting COGCC 900 Series Rule would be allowed.

An NSO stipulation would be applied to oil and gas leases on existing and future Oil Shale Research, Development and Demonstration tracts in the MPA (approximately 1,100 acres). (See Appendix 1, WR-NSO-30.)

A CSU stipulation would be applied to oil and gas leases for development activities on commercial oil shale leases and for blocks greater than 640 acres within the available area for oil shale and multi-mineral leasing, as determined in the March 2013 “Approved Land Use Plan Amendments/Record of Decision (ROD) for Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the Bureau of Land Management in Colorado, Utah, and Wyoming and Final Programmatic Environmental Impact Statement” (approximately 17,500 acres), to protect oil shale resources in the

³ These are non-discretionary closures.

⁴ Total NSO acreage does not include WR-NSO-22 (Appendix 1) since the stipulation does not preclude development from taking place on any land within a lease, but rather limits the amount of disturbed lands that are rendered unsuitable for use by sage-grouse.

⁵ NSO and CSU stipulation acres reflect a hierarchy analysis which prioritized areas with overlapping NSO and CSU stipulation areas as an NSO stipulation. The CSU stipulation acres reflect areas that are only CSU stipulations; these areas contain no overlap. TL stipulations acres are not calculated using a hierarchy analysis and include all acres which would have a TL stipulation applied.

Green River Formation. There are currently no areas leased for commercial oil shale development but if existing Preference Right Lease Areas are converted to commercial oil shale leases this could increase the area up to 39,700 acres. (See Appendix 1, WR-CSU-19.)

An NSO stipulation would be applied to oil and gas leases in areas with active sodium mining (approximately 980 acres) in the MPA. Conditions of approval would be applied to permits for oil and gas drilling on existing sodium leases to protect sodium resources throughout the MPA. (See Appendix 1, WR-NSO-31.)

The area included in the approved permit area for the Deserado Coal Mine Permit Area as well as areas adjacent to and south of the approved Deserado Coal Mine Permit Area would be managed with a CSU stipulation (approximately 17,700 acres). The oil and gas lessee would be required to reach an agreement with the federal coal lessee on the placement of wells or surface facilities within the coal mine permit area. Surface occupancy may not be allowed within the mine permit area. (See Appendix 1, WR-CSU-20.)

(Note: Additional management direction related to reclamation, including placement of long-term facilities and using adapted footprint configurations to minimize cut/fill areas, can be found under Reclamation in Section 2.4.3. Additional management direction related to the disposal of produced water can be found under Soil and Water Resources in Section 2.3.3.)

2.19 Recreation

2.19.1 Goals

Until recreation resources and uses can be allocated and designated through the land use planning process as part of an RMP revision, the WRFO will continue to provide a broad spectrum and diversity of recreation opportunities to meet expected increased demand due to the continued growth of the oil and gas industry.

2.19.2 Objectives

Manage the White River Extensive Recreation Management Area (ERMA) to support, sustain and promote existing principal opportunities for dispersed, self-directed recreation while allowing for the production of oil and gas resources.

In order to continue to provide backcountry/middlecountry oriented recreational opportunities on BLM lands as oil and gas development increases, areas will be managed to preserve public access, limit resource damage, and retain the physical, social, and managerial conditions of these recreation setting classifications while still allowing for the production of oil and gas resources.

2.19.3 Management Actions

The White River ERMA will retain the qualities and conditions of the physical, social, and operational components of the existing Recreation Opportunity Spectrum (ROS) classifications within the White River ERMA as defined in the 1997 White River RMP.

Either an NSO or CSU stipulation would be applied to surface-disturbing activities associated with all land use authorizations, permits, or leases granted in these areas.

- Approximately 3,600 acres would be open to oil and gas leasing with an NSO stipulation. These two areas are:

- Anderson Gulch (2,000 acres);
- LO7 Hill (1,600 acres) (see Appendix 1, WR-NSO-32);
- Approximately 4,200 acres would be open to oil and gas leasing with a CSU stipulation on:
 - 3 Mile Gulch (4,200 acres). (See Appendix 1, WR-CSU-21.)

2.20 Comprehensive Trails and Travel Management

2.20.1 Goals

Provide access for oil and gas development consistent with public health and safety and other resource value concerns.

2.20.2 Objectives

Manage motorized travel on public lands to provide for public need and demand, protect natural resources, provide for the safety of public land users, and minimize conflicts among various users of public lands.

Provide needed and appropriate ingress, egress, and access routes to and across public lands for oil and gas activities.

Reclaim or mitigate erosion impacts on transportation corridors.

2.20.3 Management Actions

General Travel Management Direction

Motorized vehicle travel for oil and gas activities (including pre-construction survey work) would be limited year-round to authorized routes or to existing routes that are limited seasonally in the 1997 White River RMP, identifiable from the 2011 National Agriculture Imagery Program (NAIP) digital data sets (921,000 acres). Routes newly constructed for oil and gas activities would be closed except to uses defined by the Authorized Officer. Those uses would generally be limited to compliance, maintenance, drilling, and production activities.

Well access routes would generally be unavailable for public vehicular access, including BLM permittees, not expressly associated with oil and gas development, production, monitoring, and maintenance. Exceptions would be evaluated on a case-by-case basis in the context of disturbance thresholds established for each seasonal range and leaseholding. Access routes developed for well and facility access would also generally be subject to complete abandonment once its intended use is complete.

In areas of concentrated development (e.g., the geography encompassing acute/collective activity), vehicle use on BLM vehicle access networks (including existing roads, trails, and ways), where logistically practicable, would be temporarily limited to that associated directly with oil and gas development, production, and maintenance. Use by other BLM authorized land users could be considered, as determined by the Authorized Officer, consistent with big game management objectives. To be effective, this mitigation should control the use of vehicle access networks in areas of concentrated development rather than relying on controls applied to individual well access routes.

Road abandonment and use limitations would be used to limit effective road densities in the long term to an average maximum 1.5 miles per square mile in higher value big game habitat (i.e.,

defined severe winter range and summer range) and 3 miles per square mile on other big game ranges.

Access routes constructed for oil and gas activities that are considered redundant or unneeded would be obliterated and reclaimed.

In coordination with counties and authorized users, temporary route closures would be applied in areas with concentrated oil and gas development as needed to meet public health and safety or other resource concerns.

The design of utility corridors would be required to avoid the need for regular vehicular access for inspection by the ROW holder/lessee and would be conditioned by the holder/lessee to effectively preclude all subsequent vehicular travel throughout the term of the grant/lease. In the event continued access is required, the corridor would remain closed to public vehicular access and the holder/lessee would be responsible for installing and maintaining effective vehicle deterrents that would be functional beyond final abandonment of the grant/lease.

Special Travel Management Direction

Ferret Management Areas

Use of newly developed well access routes in black-footed ferret habitat would be limited to activities associated directly with oil and gas development, production, and maintenance. Access routes would be reduced to minimum standards during production and eliminated upon project completion.

Motorized vehicle use associated with oil and gas development within the Wolf Creek black-footed ferret management area (including Coyote Basin and Snake John Reef units) would be restricted to authorized roads and trails area. Effective route and trail densities of no more than 1.5 miles per square mile would remain open for public vehicular travel in these areas.

Canada Lynx Habitat

Use of newly developed well access routes in lynx habitat would be limited to that associated directly with oil and gas development, production, and maintenance activity. Access routes would be reduced to minimum standards during production and eliminated upon project completion.

The BLM would request that maximum efforts be applied to reduce the extent and effective utility of snow compaction or removal activities in lynx habitat as travel corridors for competitive carnivores. Use of over-the-snow vehicles would be prohibited for use in lynx habitat during project-related reconnaissance, on-site inspections, or surveys.

Wilderness Study Areas

Except for permitted uses, WSAs would be closed to motorized/mechanized use. If WSAs are released by Congress for management for multiple uses, motorized vehicle travel would be limited to designated roads and trails.

Wilderness Study Areas would remain closed to motorized and mechanized vehicle use until Congress either designates them as wilderness or releases them for multiple uses.

Areas of Critical Environmental Concern

Motorized vehicle travel within ACECs for T/E plants will be limited to designated roads and trails. Roads or trails in these areas not designated for use will be abandoned and reclaimed. Off road motorized vehicle travel will be prohibited in these areas.

2.21 Lands and Realty

2.21.1 Goals

Manage BLM public lands, including the siting of public and private facilities through the issuance of applicable land use authorizations, in a manner that balances the needs of oil and gas development with the management for other resource values.

2.21.2 Objectives

Respond to internal and external requests for land use authorizations (e.g., pipelines, access routes, utility lines, communication sites, leases, and permits).

Emphasize efficient use of and colocation with existing ROWs to protect resources and resource uses. Consider the establishment of new ROW corridors to meet demand for oil and gas activities.

2.21.3 Management Actions

All ROW corridors designated in the 1997 White River RMP would be carried forward in the RMPA. A section of the Colorow-Greasewood corridor that starts at the intersection of State Highway 64 (SH 64) and goes north towards Colorow Mountain would be eliminated as a designated corridor since the West-wide Energy Corridor (WWEC) amendment⁶ provided an alternate northern route for this corridor.

New designated ROW corridors could be established only when the capacities of existing ROW corridors (including energy corridors established by the 2009 Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States) have been exhausted, or when such designation would enable management objectives.

Applications for new communication sites would be considered on a case-by-case basis if: (1) it is determined that the facility would fill a need to improve public safety and information transfer and (2) no existing site would meet the applicant's needs. The site at Moosehead Mountain would not be available for additional authorizations.

Companies would be encouraged to request smaller ROW widths for pipeline installation, as well as placing pipelines under newly constructed energy-associated roads. Pipelines could be placed within a roadbed only if resource and topographic conditions dictate, and would be discouraged for county roads. Such placement must consider safety and maintenance.

⁶ The 2009 Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States is commonly referred to as the West-wide Energy Corridor amendment.

Timing limitation stipulations identified in Appendix 1 could be applied as Terms and Conditions to oil and gas-associated ROW grants.

The Rangely District Hospital R&PP lease/patent (20 acres) would be open to oil and gas leasing subject to an NSO stipulation. (See Appendix 1, WR-NSO-33.)

A lease notice will be used to inform lessees of Public Land Order 7582 (for the Rio Blanco Test Site) withdrawing 200 acres of public land from surface entry and mining and 160 acres of reserved federal mineral interest from mining. If the Department of Energy modifies the Rio Blanco Test Site withdrawal in the future, the LN will be updated to reflect the current acreage and restrictions included in the withdrawal.

Land use authorizations (e.g., ROWs, leases, and permits) will be denied in exclusion areas, with the exception of short-term land use permits involving no development and projects that are consistent with management objectives for the area.

The following areas would be classified as exclusion areas for land use authorizations:

- Wilderness Study Areas;
- South Cathedral Bluffs, Raven Ridge, Coal Draw, and Black's Gulch ACECs;
- Moosehead Mountain;
- Tier 1 lands with wilderness characteristics that will be managed to protect wilderness characteristics as a priority over other multiple uses (i.e., NSO areas); and
- Within 330 feet of occupied habitat for federally listed and proposed plants.

The following areas would be classified as avoidance areas for land use authorizations:

- All areas included in NSO or CSU stipulations (Appendix 1);
- Areas within 330-660 feet of occupied habitat or within 660 feet of suitable habitat, or within critical habitat for federally listed, proposed or candidate plant species;
- Harpers Corner Road; and
- Canyon Pintado National Historic District.

The remainder of the Resource Area would be classified as open for land use authorizations.

(Note: Additional management direction related to reclamation can be found under Reclamation in Section 2.4.3.)

2.22 Special Designations

2.22.1 Goals

Protect the integrity of unique resource values, preserve historical significance, and provide opportunity for other uses, where appropriate.

2.22.2 Objectives

Wilderness Study Areas

Manage WSAs to avoid impairment of suitability characteristics until either designated as wilderness or released by Congress for other uses.

Manage designated wilderness areas to preserve ecosystems and wilderness qualities in perpetuity.

Areas of Critical Environmental Concern

Protect areas that contain relevant and important historic, cultural, scenic, and natural values as ACECs while managing for multiple uses.

Manage ACECs in cooperation with interested agencies, landowners, and other parties to prevent degradation of the relevant and important values for which they were established.

Maintain the genetic integrity of native species in ACECs.

Maintain environmental quality to prevent undue degradation to the values that make the site or locale unique.

Maintain, restore, and enhance areas within ACECs to meet Colorado Public Land Health Standards.

2.22.3 Management Actions

Wilderness Study Areas

Six WSAs (Bull Canyon, Willow Creek, Skull Creek, Oil Spring Mountain, Windy Gulch, and Black Mountain) would be managed under BLM Manual 6330- Management of Wilderness Study Areas. Except for certain valid existing rights, activities that would impair wilderness values or the areas' suitability for preservation as wilderness would not be allowed to occur in WSAs. If WSAs are released by Congress for management for multiple uses, the areas would be managed as VRM Class II.

(Note: As discussed under Minerals in Section 2.18.3, the WSAs are closed to leasing. Additional management direction related to reclamation and the use of native species in WSAs can be found under Reclamation in Section 2.4.3. Additional management direction related to WSAs being closed to motorized/mechanized use can be found under Comprehensive Trails and Travel Management in Section 2.20.3.)

Areas of Critical Environmental Concern

The following ACECs would be open to oil and gas leasing with an NSO stipulation (see Appendix 1, WR-NSO-34):

- Dudley Bluffs (1,600 acres);
- Yanks Gulch/Upper Greasewood Creek (2,700 acres);
- Lower Greasewood Creek (200 acres);
- Raven Ridge (5,000 acres);
- South Cathedral Bluffs (1,300 acres);
- Deer Gulch (1,800 acres);

- Ryan Gulch (1,400 acres);
- Blacks Gulch (800 acres);
- Coal Draw (1,800 acres);
- Moosehead Mountain (8,900 acres);
- Duck Creek (3,400 acres); and
- White River Riparian (950 acres).

The following ACECs would be open to oil and gas leasing with a CSU stipulation (see Appendix 1, WR-CSU-22):

- Coal Oil Rim (3,200 acres);
- Oil Spring Mountain (18,300 acres); and
- East Douglas Creek (47,600 acres).

Site-specific management of ACECs would be developed in individual activity plans. Existing ACEC activity plans (i.e., Dudley Bluffs, South Cathedral Bluffs, and Raven Ridge) will be revised to be consistent with the decisions contained in the Approved RMPA. As integrated activity plans are initiated, ACECs occurring within those areas will be incorporated into that activity plan process. The integrated activity plan will then replace the need for an individual ACEC activity plan.

Harpers Corner Road (500 feet on either side of centerline) would be classified as an avoidance area for land use authorizations.

(Note: Additional management direction related to reclamation and the use of native species in ACECs can be found under Reclamation in Section 2.4.3.)

2.23 Lands with Wilderness Characteristics

2.23.1 Goals

Maintain lands with wilderness characteristics (naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive and unconfined recreation) where possible, considering manageability and the context of competing resource demands.

2.23.2 Objectives

Manage lands with wilderness characteristics in the following tiers (Map 2-9):

- Tier 1 areas will be managed to protect wilderness characteristics as a priority over other multiple uses.
- Tier 2 areas will be managed to emphasize other multiple uses while applying management restrictions to reduce impacts to wilderness characteristics.
- Tier 3 areas will be managed to emphasize other multiple uses as a priority over protecting wilderness characteristics.

2.23.3 Management Actions

Lands with wilderness characteristics inventories will be maintained for the WRFO on an ongoing basis. Inventories will be reviewed and updated prior to issuing any land use authorizations, permits, or leases for proposed actions.

For lands with wilderness characteristics the BLM will apply the following:

- Tier 1 areas would be open to leasing with an NSO stipulation (71,500 acres) (see Appendix 1, WR-NSO-35);
- Tier 2 areas would be open to leasing with a CSU stipulation (66,200 acres) (see Appendix 1, WR-CSU-23); and
- Tier 3 areas would be open to leasing without any lease stipulations designed to protect wilderness characteristics (164,000 acres).

For ROW authorizations the following will apply:

- All Tier 1 areas will be managed as ROW exclusion areas;
- All Tier 2 areas will be managed as ROW avoidance areas; and
- All Tier 3 areas will be open for ROWs and other land use authorizations.

New road construction or improving/maintaining primitive roads would not be allowed within Tier 1 areas, and would be allowed in Tier 2 and Tier 3 areas. Appropriate COAs (as described below) may be applied.

Construction of new facilities would not be allowed within Tier 1 areas; and would be allowed in Tier 2 and Tier 3 areas. Appropriate COAs (as described below) may be applied.

Consistent with existing lease rights and the management objective for each tier, COAs may be applied to leased acreage in Tier 1, 2 and 3 areas that contain wilderness characteristics. Examples of such COAs could include, but are not limited to:

- Roads will not bisect the unit;
- Visual resources will be managed similar to VRM Class II;
- Siting of facilities will be considered in facility design (topographic screening may be applied); and
- Timing restrictions on use of helicopters may be applied during big game hunting seasons.

(Note: Additional management direction related to restoring the appearance of naturalness can be found under Reclamation in Section 2.4.3.)

2.24 Dinosaur Trail Master Leasing Plan⁷

2.24.1 Goals

Reduce potential conflicts of oil and gas activities with other resource uses while promoting efficient recovery of oil and gas resources.

Promote environmental stewardship among oil and gas operators.

2.24.2 Objectives

Make federal oil and gas resources available for leasing and development in a manner that provides reasonable protection for other resource values.

Manage oil and gas activities to prevent degradation of resources (including oil and gas resources).

Manage oil and gas activities to complement or contribute to improving trends in achieving BLM's Colorado Public Land Health Standards.

Establish partnerships with cooperating entities to develop and adapt BMPs in response to site-specific conditions and other resource objectives.

2.24.3 Management Actions

Apply an MLP to 422,700 acres in the Dinosaur Trail area. All management decisions, goals, and objectives developed for the WRFO planning area would apply within the Dinosaur Trail MLP, however specific management decisions developed for the MLP would take precedence if there were conflicting guidance. A lease notice will be used to inform lessees that additional resource protection measures may be required to reduce environmental impacts within the MLP area.

(See Appendix 1, WR-LN-14.)

There are 357,800 acres of BLM oil and gas mineral estate included in the Dinosaur Trail MLP; 42,200 acres of BLM federal oil and gas mineral estate would be closed to leasing⁸. Areas closed to leasing include the Bull Canyon, Skull Creek, and Willow Creek WSAs and the National Park Service's Harpers Corner Road withdrawal.⁹

Zero acres of federal mineral estate would be open to leasing with standard lease terms.

⁷ Note: The goals and objectives for the Dinosaur Trail MLP are the same as Minerals in Sections 2.18.1 and 2.18.2, respectively. All of the resource-based management decisions developed for the WRFO Planning area would also apply within the Dinosaur Trail MLP if those resources are found to be present (see Table 2); lease stipulations and ROW avoidance/exclusion areas that are unique to the Dinosaur Trail MLP area are highlighted in this section. The Dinosaur Trail MLP was placed at the end of Chapter 2 rather than with the Minerals Section to improve understanding since management in the previous resource sections also applies within the MLP.

⁸ These acres are included in the estimates given in the Minerals Section 2.18.3.

⁹ These are non-discretionary closures.

The 315,600 acres of BLM federal oil and gas mineral estate open to leasing are subject to lease stipulations (see Appendix 1), including NSO stipulations (83,100 acres¹⁰), CSU stipulations (186,700 acres), and timing limitations (315,600)¹¹.

Leasing within the MLP would progress in phases to address resource values and concerns. Leasing would first occur in the southern portion of the MLP, where the oil and gas occurrence potential is rated medium to high. Leasing within sage-grouse habitat, areas of low oil and gas potential, or areas adjacent to Dinosaur National Monument would occur once the BLM has completed additional analysis and planning. Within sage-grouse habitat in the MLP, sage-grouse management would be emphasized and leasing would only occur after the BLM has issued the Record of Decision for the Northwest Colorado Greater Sage-Grouse RMPA (193,000 acres). In areas of the MLP that are outside of sage-grouse habitat, but are within either low oil and gas potential or adjacent to Dinosaur National Monument Headquarters leasing would only occur after the BLM has completed a RMP Revision and determined whether or not leasing is appropriate given considerations such as the potential impacts to visual resources, night skies, and soundscapes (25,300 acres).

Master Development Plans would be required for all oil and gas activities, including exploratory drilling, within the Dinosaur Trail MLP. Specific resource protection measures would be evaluated when an operator submits a Master Development Plan. Examples of resource protection measures that will be considered to reduce environmental impacts within the MLP area include:

- Planned or required unitization of federal lands to eliminate redundant infrastructure, thereby reducing habitat fragmentation;
- Phased development may be appropriate where it is important to leave areas of habitat undisturbed by ongoing construction and drilling activity while other areas are developed;
- Limitations on surface disturbance (pending acceptable interim/final reclamation) may be placed on the percentage of bare ground allowed in a developed area at any one time in order to preserve habitat in important wildlife areas or reduce erosion in areas with highly erosive soils;
- Multiple wells per pad may be required to limit the number of surface locations in scenic areas, fragile soil areas, or important wildlife habitat while still allowing the necessary number of downhole locations;
- Liquids gathering pipeline systems feeding centralized offsite production facilities to reduce year-round fluids haul traffic during the life of the field in areas of important wildlife habitat;
- New technologies to reduce/capture emissions to ensure full field development does not contribute to eventual nonattainment of National Ambient Air Quality Standards under the Clean Air Act or adversely impact Air Quality Related Values, such as visibility;
- Practices to protect scenic quality by reducing the visual contrast of development, such as (1) siting roads to follow the contours of the landscape; (2) siting well locations where they are less visible and where cuts and fills can be minimized; (3) consolidating and using low profile

¹⁰ Total NSO acreage does not include WR-NSO-22 (Appendix 1) since the stipulation does not preclude development from taking place on any land within a lease, but rather limits the amount of disturbed lands that are rendered unsuitable for use by sage-grouse.

¹¹ NSO and CSU stipulation acres reflect a hierarchy analysis which prioritized areas with overlapping NSO and CSU stipulation areas as an NSO stipulation. The CSU stipulation acres reflect areas that are only CSU stipulations; these areas contain no overlap. TL stipulations acres are not calculated using a hierarchy analysis and include all acres which would have a TL stipulation applied.

equipment; (4) screening, disguising, or placing equipment offsite; (5) painting equipment to blend with the background; and (6) burying pipelines and power lines in existing disturbed areas;

- Placing all linear disturbances (e.g., power lines, pipelines, roads) in common corridors and development of a comprehensive area wide planned transportation network to eliminate unnecessary cross-country clearing and resulting fragmentation of habitat;
- Extensive interim reclamation of roadway disturbance up to or including the road surface and reclamation of pads to the well head/production facilities to minimize long-term surface disturbance; and
- Final reclamation that fully restores the original landform and re-establishes the native plant community.

All of the resource-based management decisions developed for the WRFO Planning area would also apply within the Dinosaur Trail MLP if those resources are found to be present (see Table 2).

The following lease stipulations and ROW avoidance/exclusion areas are unique to the Dinosaur Trail MLP area and focus on the key resources identified for management:

- Federal mineral estate with surface estate identified as, adjacent to, or surrounded by VRM Class II within the Dinosaur Trail MLP would be open for oil and gas leasing with a CSU stipulation to minimize impacts to visual resources, night skies, and soundscapes (154,200 acres). (See Appendix 1, WR-CSU-26.)
- VRM Class III areas adjacent to Dinosaur National Monument headquarters would be open for oil and gas leasing with a CSU stipulation to minimize impacts to viewsheds, night skies, and soundscapes (50 acres). (See Appendix 1, WR-CSU-27.)
- Aspen, serviceberry, and chokecherry communities associated with Blue Mountain (57,600 acres) would be managed with a CSU stipulation in order to maintain the distribution, condition, and functional capacity of deciduous browse and aspen communities integral to high priority big game and dusky grouse (formerly known as blue grouse) habitats. Prior to authorizing activities in these areas, the applicant would be required to submit a plan of development to demonstrate:
 - Associations have been avoided to the extent possible;
 - Special reclamation measures or design features would promote accelerated recovery and establishment of desirable plant community components;
 - The potential or capacity of the area to support viable, self-sustaining aspen, serviceberry, and chokecherry communities has not been diminished; and
 - Involvement of community derived values are mitigated through project life commensurate with projected impacts.
 - Surface disturbance or occupation within aspen, serviceberry, and chokecherry communities may be prohibited. (See Appendix 1, WR-CSU-24.)
- Within all ferret management areas (58,600 acres), surface-disturbing and disruptive activities associated with land use authorizations, permits, and leases issued on BLM-administered lands would be subject to a CSU stipulation (see Appendix 1) that incorporates those provisions established in A Cooperative Plan for Black-footed Ferret Reintroduction

- and Management, Wolf Creek and Coyote Basin Management Areas, Moffat and Rio Blanco Counties, Colorado (Wolf Creek Work Group et al. 2001). (See Appendix 1, WR-CSU-25.)
- Approximately 360 acres within and adjacent to the Mellen Hill sites (5RB227, 5RB279, 5RB489, etc.) would be protected with an NSO stipulation. (See Appendix 1, WR-NSO-36.)
 - The following ACECs would be open to oil and gas leasing with an NSO stipulation (see Appendix 1, WR-NSO-34):
 - Raven Ridge (5,000 acres);
 - Moosehead Mountain (8,900 acres); and
 - White River Riparian (600 acres).
 - The following ACEC would be open to oil and gas leasing with a CSU stipulation (see Appendix 1, WR-CSU-22):
 - Coal Oil Rim (3,200 acres).
 - The following special designation areas are classified as exclusion areas for land use authorizations:
 - Bull Canyon, Willow Creek, and Skull Creek WSAs; and
 - Raven Ridge and Moosehead Mountain ACECs.
 - The following special designation areas are classified as avoidance areas for land use authorizations:
 - White River Riparian and Coal Oil Rim ACECs.
 - A lease notice will be used to inform lessees of regulations that restrict commercial use of Harpers Corner Road. (See Appendix 1, WR-LN-15.)
 - Harpers Corner Road (500 feet on either side of center line) would be classified as an avoidance area for land use authorizations.
 - For lands with wilderness characteristics, the BLM will apply the following:
 - Tier 1 areas would be open to leasing with an NSO stipulation and would be managed as a ROW exclusion area (see Appendix 1, WR-NSO-35):
 - 20 – Upper Coal Rim (12,100 acres);
 - 21 – Coal Ridge (8,800 acres);
 - 26 – Moosehead Mountain (7,800 acres);
 - 32 – Willow Creek South (4,700 acres);
 - 33 – Bull Canyon South (700 acres); and
 - 34 – Bull Canyon North (900 acres).
 - Tier 2 areas would be open to leasing with a CSU stipulation and be managed as a ROW avoidance area (see Appendix 1, WR-CSU-23):
 - 16 – Raven Ridge (5,800 acres);
 - 20 – Upper Coal Rim (1,600 acres);
 - 21 – Coal Ridge (200 acres);

- 22 – Coal Oil Gulch (13,000 acres);
- 25 – Lower Wolf Creek (11,600 acres);
- 27 – MF Mountain (9,100 acres);
- 32 – Willow Creek South (1,200 acres); and
- 34 – Bull Canyon North (200 acres).

Table 2. Lease Stipulations within the Dinosaur Trail MLP

Stipulation Number	Resource	Acreage	Comment
Soil and Water Resources			
NSO-11	Landslide areas	0	This resource is located outside the MLP.
NSO-12	Steep slopes $\geq 50\%$	7,200	
NSO-13	Impaired Waters in MPA	0	This resource is located outside the MLP.
NSO-14	Source Water Protection	1,500	
CSU-10	Steep slopes $\geq 35\%$ but $< 50\%$	14,500	
CSU-11	Saline Soils	20,500	
CSU-12	Flood plain, Perennial Waters, Springs, Wells, and Riparian	10,552	
Vegetation			
NSO-15	Remnant Vegetation	0	This resource is located outside the MLP.
CSU-12	Riparian/wetland habitats	130	Also under soil and water
N/A	Weed Free Zones	194,400	
Fish and Wildlife – Big Game			
NSO-16	CPW State Wildlife Areas	0	This resource is located outside the MLP.
TL-12	Big game severe winter range	89,900	
TL-12	CPW Restricted Development Areas	0	North Ridge is located outside the MLP.
TL-13	Big game summer range	76,800	
TL-14	Big game winter range, winter concentration areas	183,100	
Fish and Wildlife – Raptors			
NSO-18	Raptor nests other than special status	4,300	
TL-15	Raptor nest sites – other	6,600	

Table 2. Lease Stipulations within the Dinosaur Trail MLP

Stipulation Number	Resource	Acreage	Comment
Fish and Wildlife – Grouse			
NSO-22	Sage-grouse habitat	191,400	
NSO-23	Sage-grouse lek sites	4,700	
NSO-24	Sharp-tailed grouse leks	0	This resource is presently located outside the MLP.
TL-22	Sage-grouse winter concentration areas	191,400	
TL-23	Sage-grouse nesting/ early brood rearing habitat	191,400	
TL-24	Sharp-tailed grouse nesting habitat	0	This resource is presently located outside the MLP.
Special Status Animal Species			
NSO-17	Endangered Colorado River fish	640	
NSO-19	Special status raptor nests, golden eagle and prairie falcon nests	30,600	
NSO-20	Bald eagle nests – abandoned	0	This resource is not currently known to be present in the MLP.
NSO-21	Bald eagle critical nocturnal roosts	650	
CSU-13	Native cutthroat trout habitat	0	This resource is located outside the MLP.
CSU-14	Bald eagle nest, roost, and perch habitat	600	
CSU--25	Black-footed ferret management areas	58,600	This resource occurs only within the MLP.
TL-16	Special status raptor nests	14,000	
TL-18	Ferruginous hawk nests	76,000	
TL-19	Bald eagle nests	990	
TL-20	Bald eagle critical night roosts and winter concentration areas	650	
TL-21	Bald eagle winter hunting perches	160	
TL-26	Canada lynx denning habitat	0	This resource is located outside the MLP.
Special Status Plant Species			
NSO-25	Federally listed and candidate plant species	2,700	
NSO-26	BLM sensitive plants	1,800	

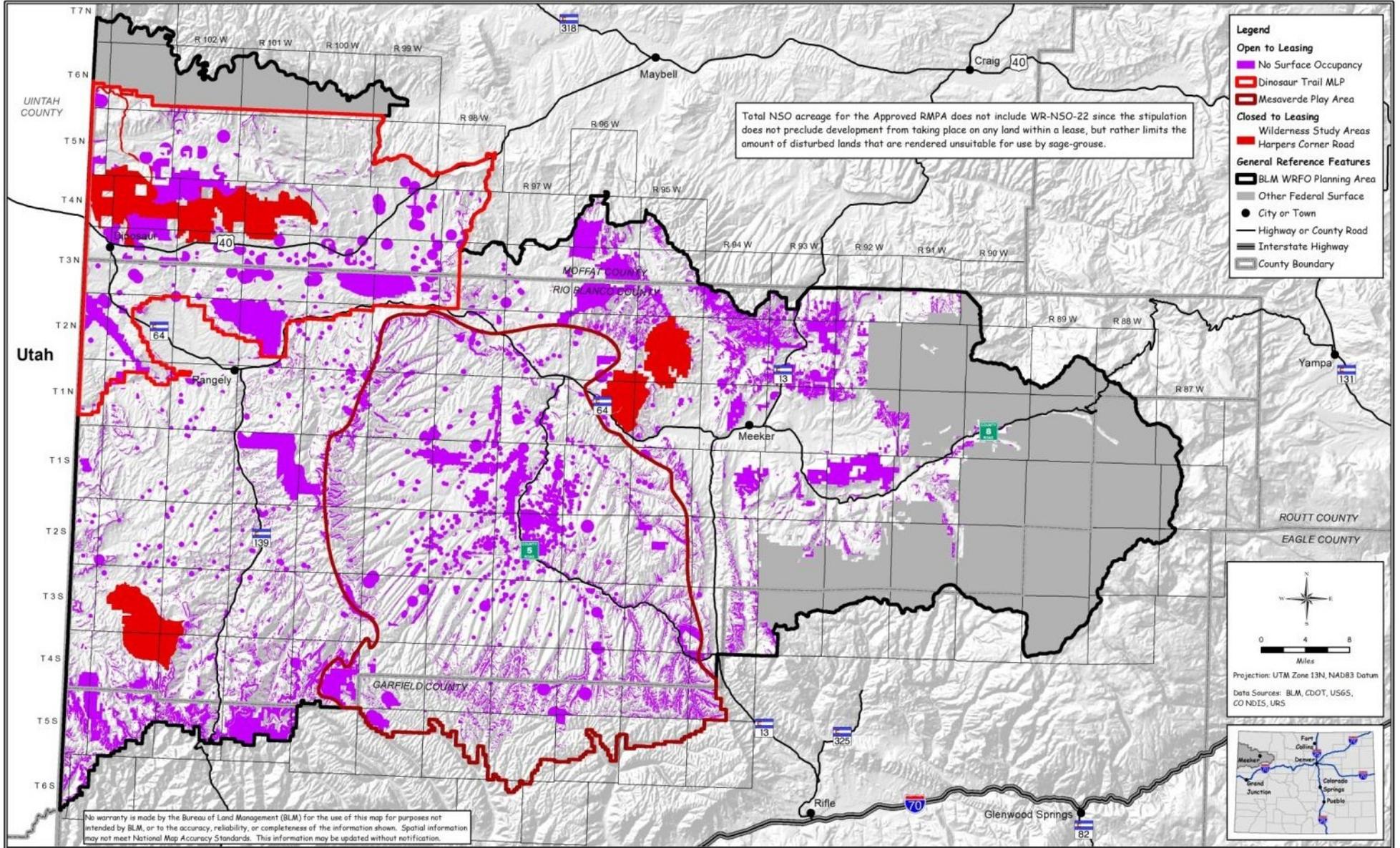
Table 2. Lease Stipulations within the Dinosaur Trail MLP

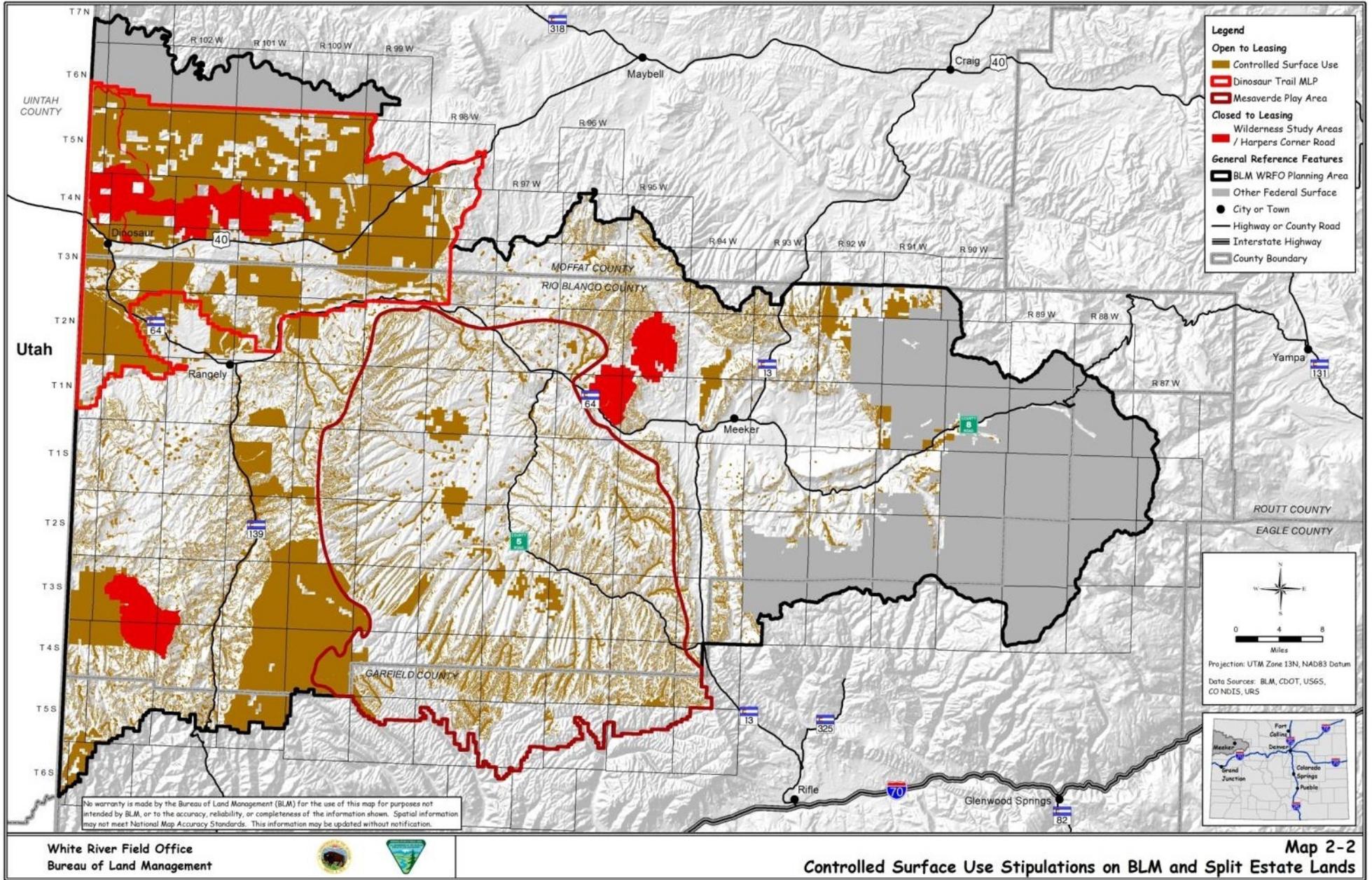
Stipulation Number	Resource	Acreage	Comment
Cultural Resources			
NSO-27	Duck Creek wickiup	0	This resource is located outside the MLP.
NSO-28	Thornburgh/Battle of Milk Creek site	0	This resource is located outside the MLP.
CSU-15	Rock art and structural features	1,100	
CSU-16	Texas-Missouri-Evacuation Creek	0	This resource is located outside the MLP.
CSU-17	Thornburgh/Battle of Milk Creek viewshed	0	This resource is located outside the MLP.
Forestry and Woodland Products			
NSO-29	Douglas-fir/aspen on slopes >25%	130	
CSU-18	Old growth	Not mapped	
Minerals			
NSO-30	Oil shale RD&D leases	0	This resource is located outside the MLP.
NSO-31	Active sodium mining areas	0	This resource is located outside the MLP.
CSU-19	Areas available for oil shale and multi-mineral leasing	0	This resource is located outside the MLP.
CSU-20	Coal areas	14,200	
Minerals: Master Leasing Plans – Dinosaur Trail			
NSO-36	Mellen Hill sites	360	This resource occurs only within the MLP.
CSU-24	Blue Mountain Vegetation	57,600	This management action applies only within the MLP.
CSU-26	VRM Class II in MLP	154,200	This management action applies only within the MLP.
CSU-27	VRM Class III in MLP	50	This management action applies only within the MLP.
Recreation			
NSO-32	Anderson Gulch and LO7 Hill recreation areas	0	This resource is located outside the MLP.
CSU-21	3 Mile Gulch recreation area	0	This resource is located outside the MLP.
Lands and Realty			
NSO-33	Rangely District Hospital R&PP	0	This resource is located outside the MLP.

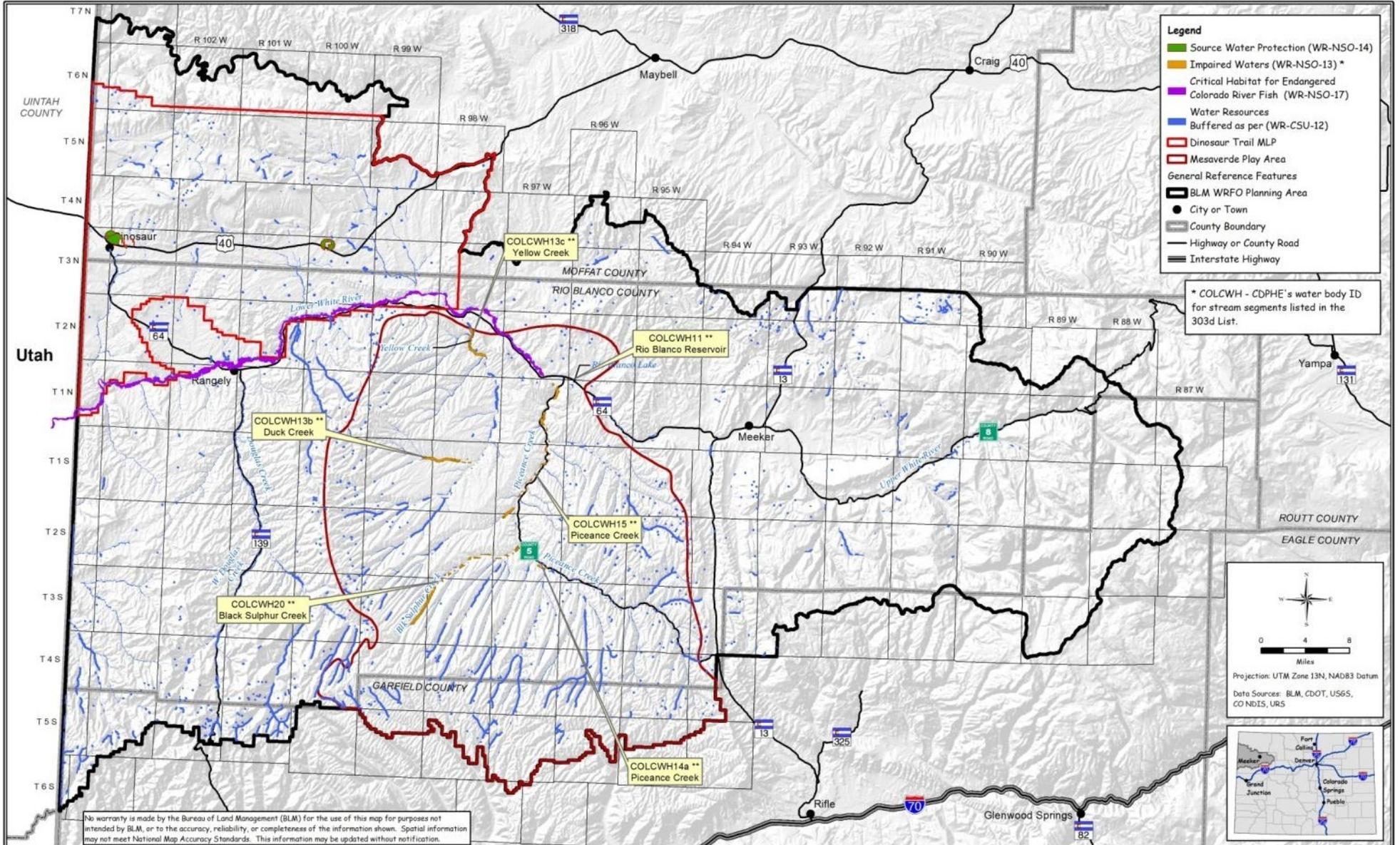
Table 2. Lease Stipulations within the Dinosaur Trail MLP

Stipulation Number	Resource	Acreage	Comment
Special Designations			
NSO-34	ACECs	14,500	
CSU-22	ACECs	3,200	
Lands with Wilderness Characteristics			
NSO-35	Tier 1 lands with wilderness characteristics	35,000	
CSU-23	Tier 2 lands with wilderness characteristics	38,800	

SOURCE: BLM GIS data, 2013.

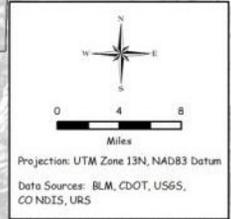




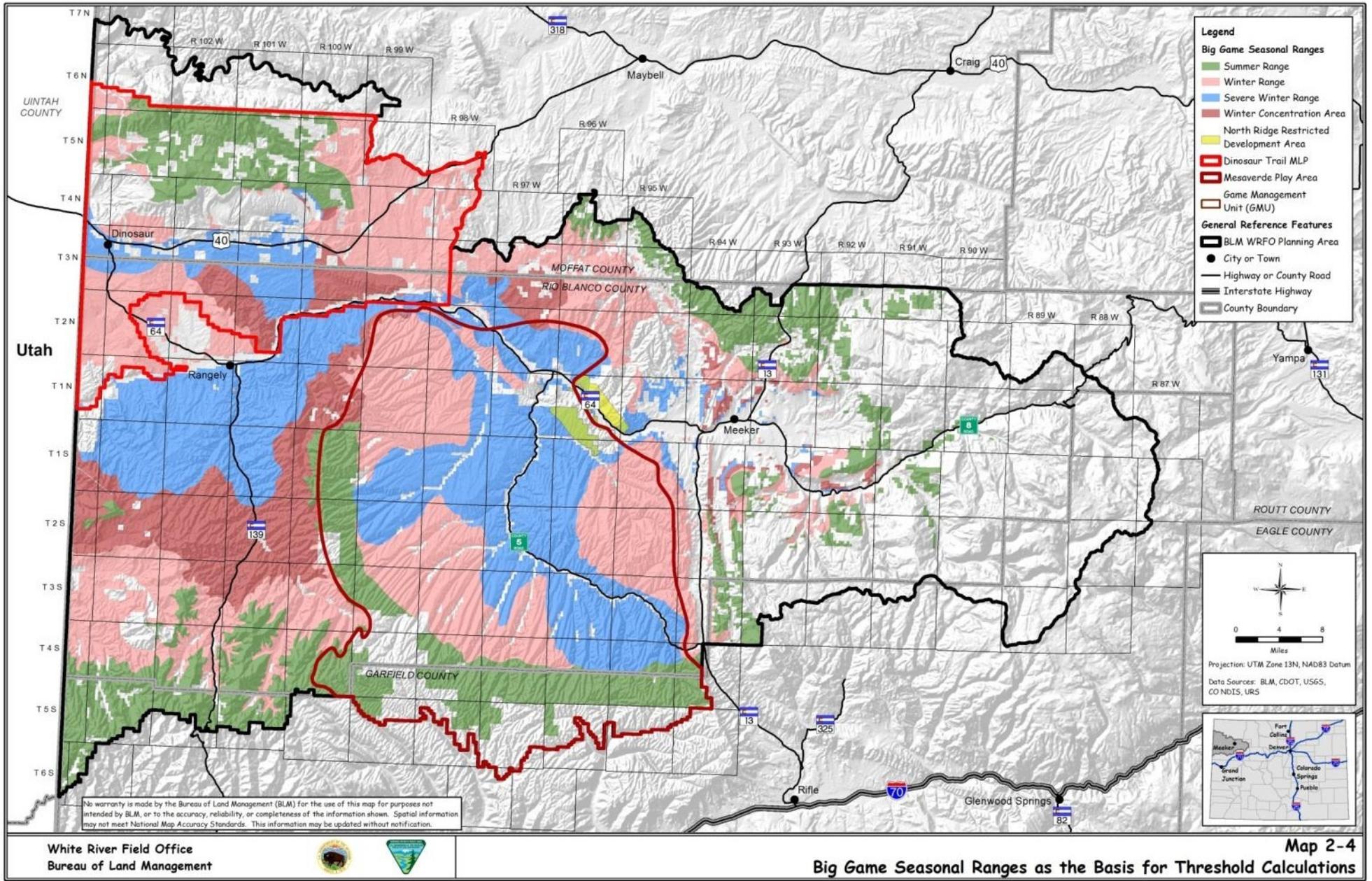


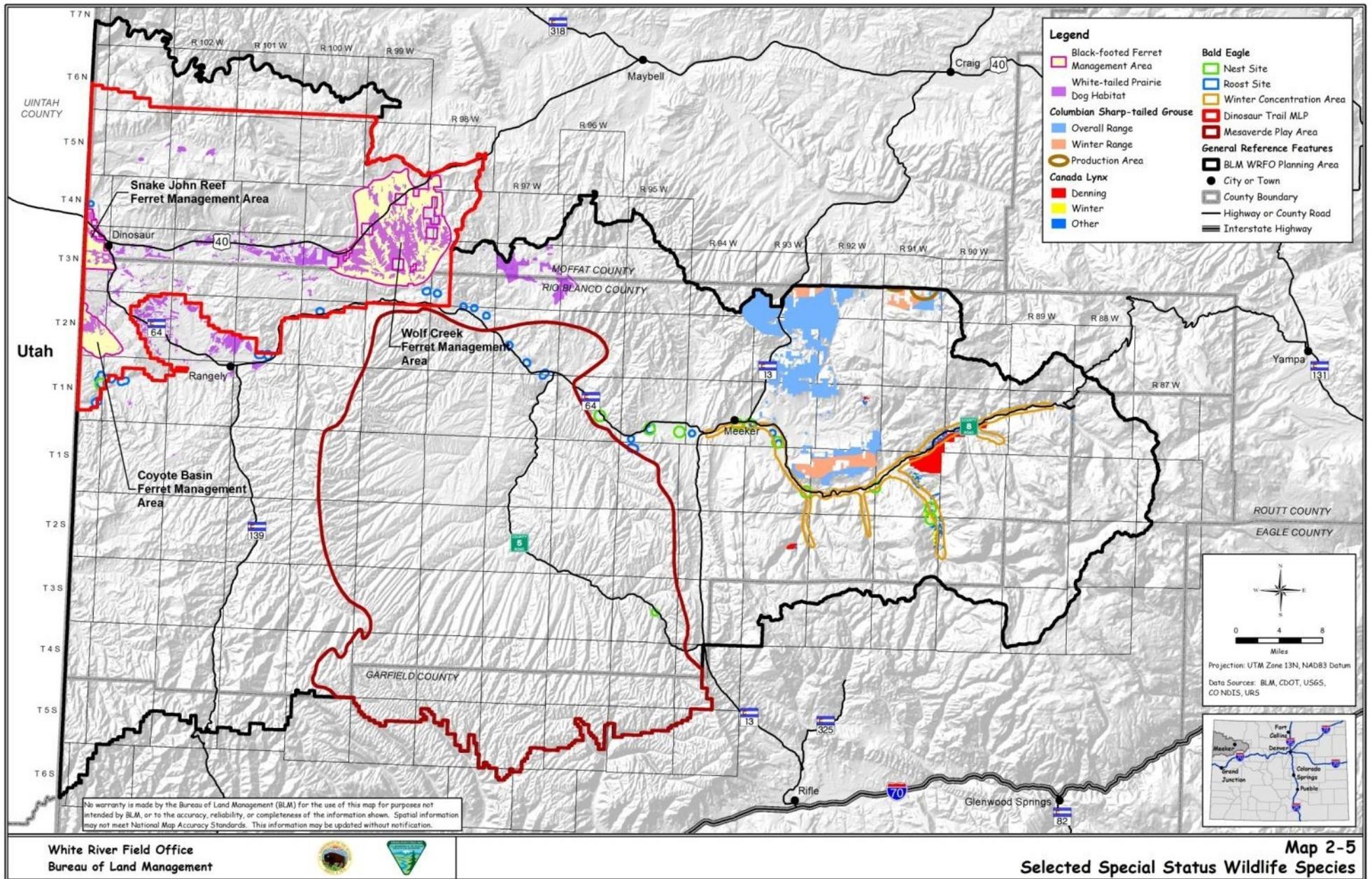
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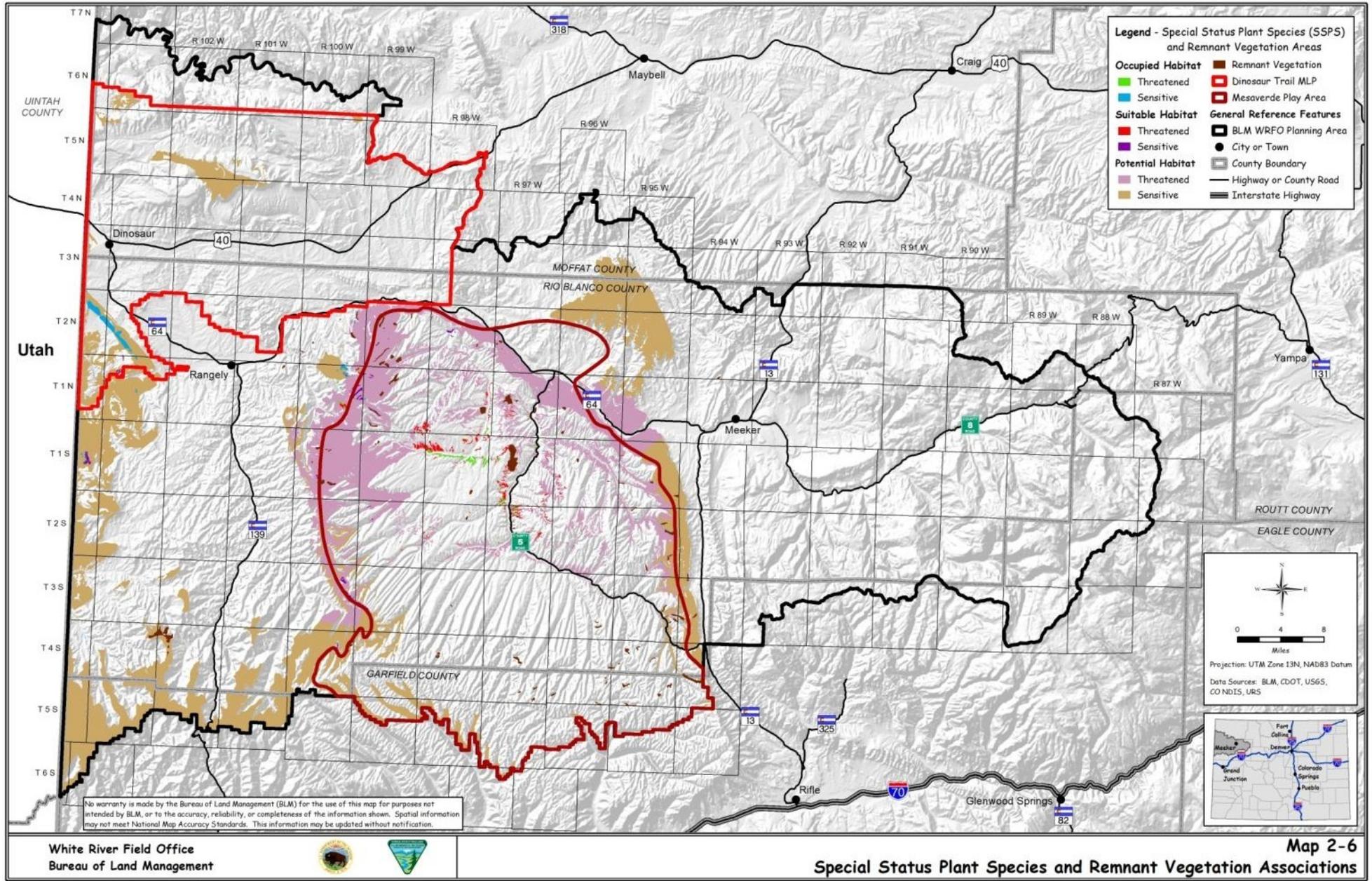
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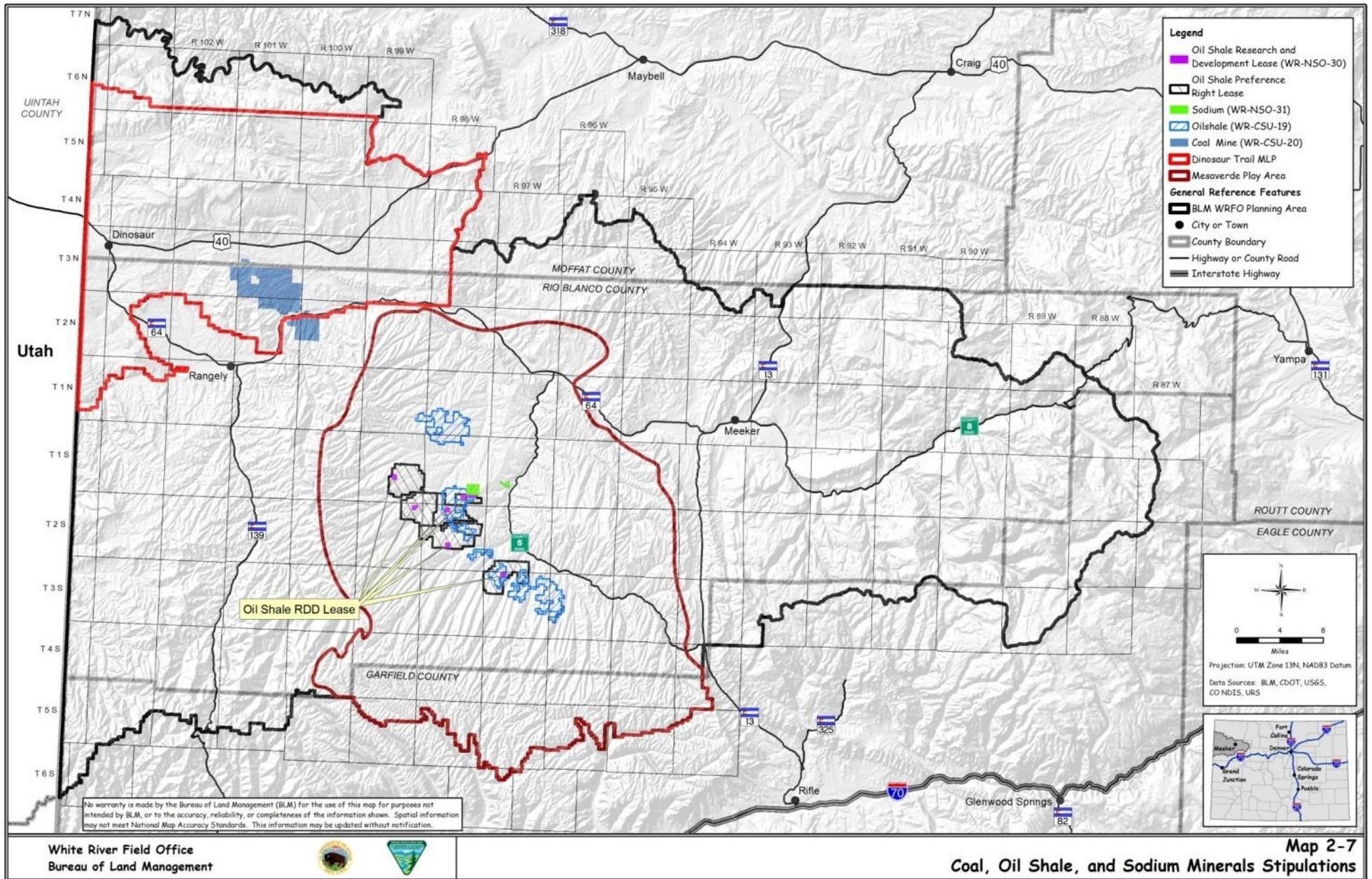


Map 2-3
Water Resource Stipulations







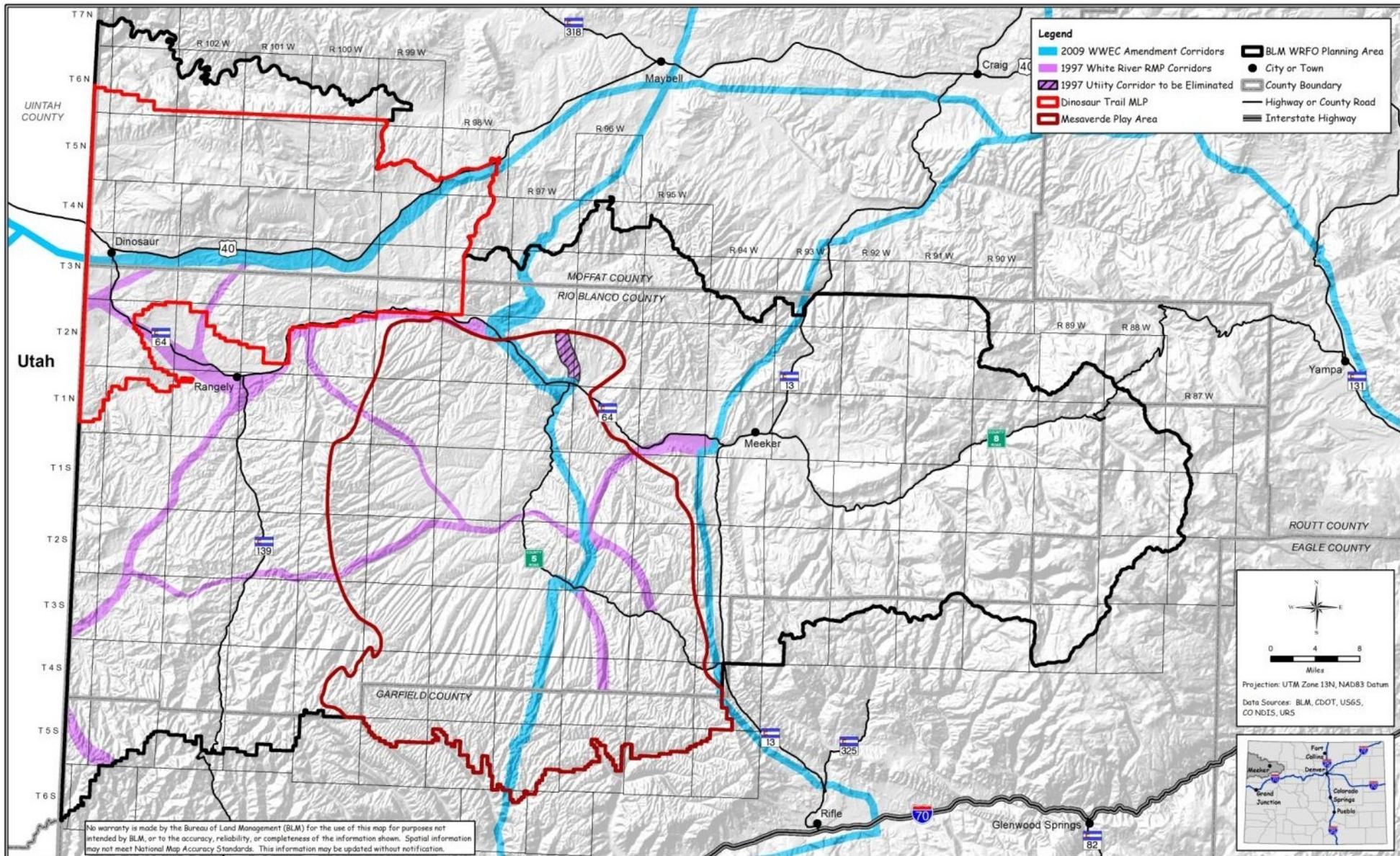


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Map 2-7
Coal, Oil Shale, and Sodium Minerals Stipulations



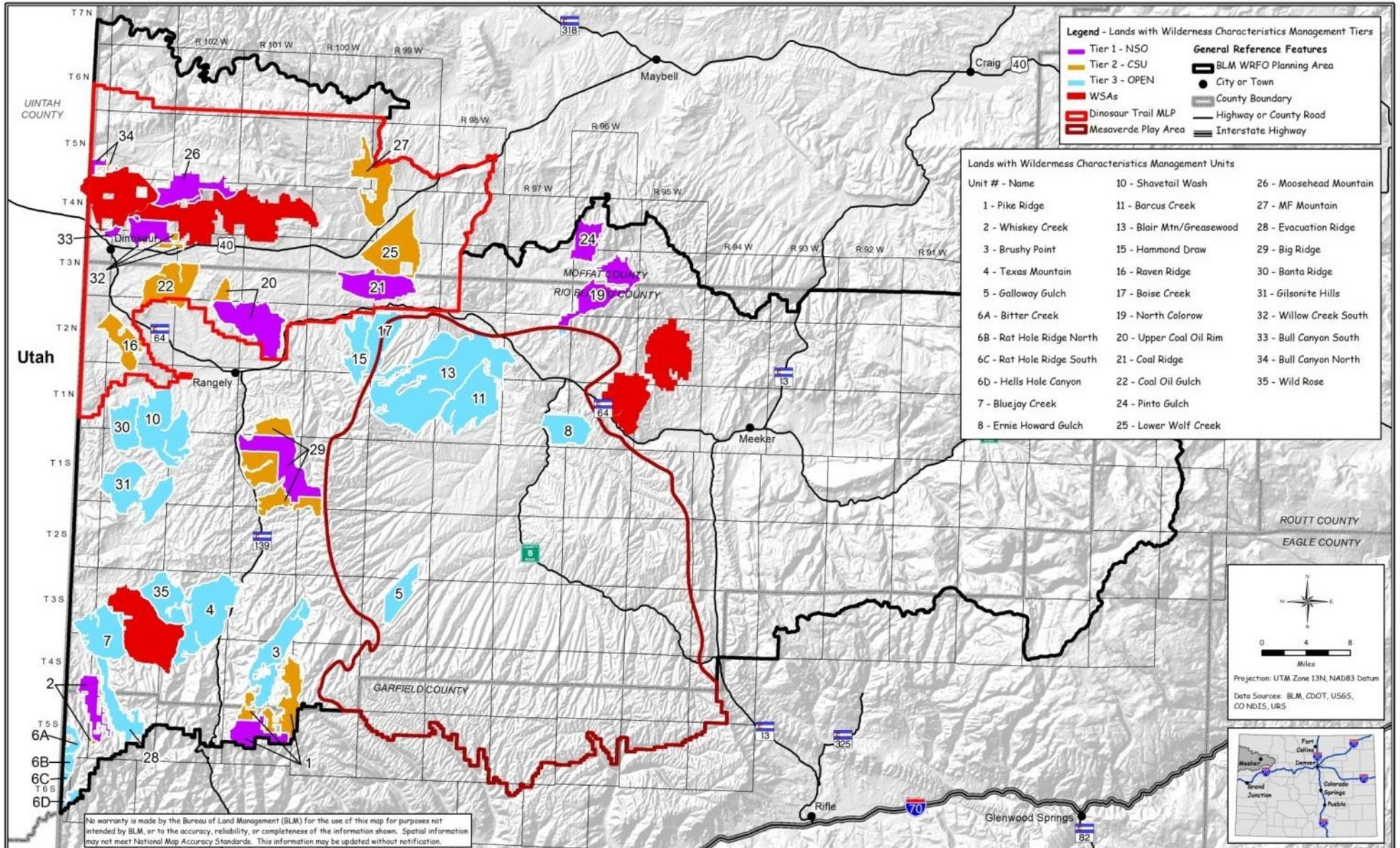
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Map 2-8
Right-of-Way Corridors

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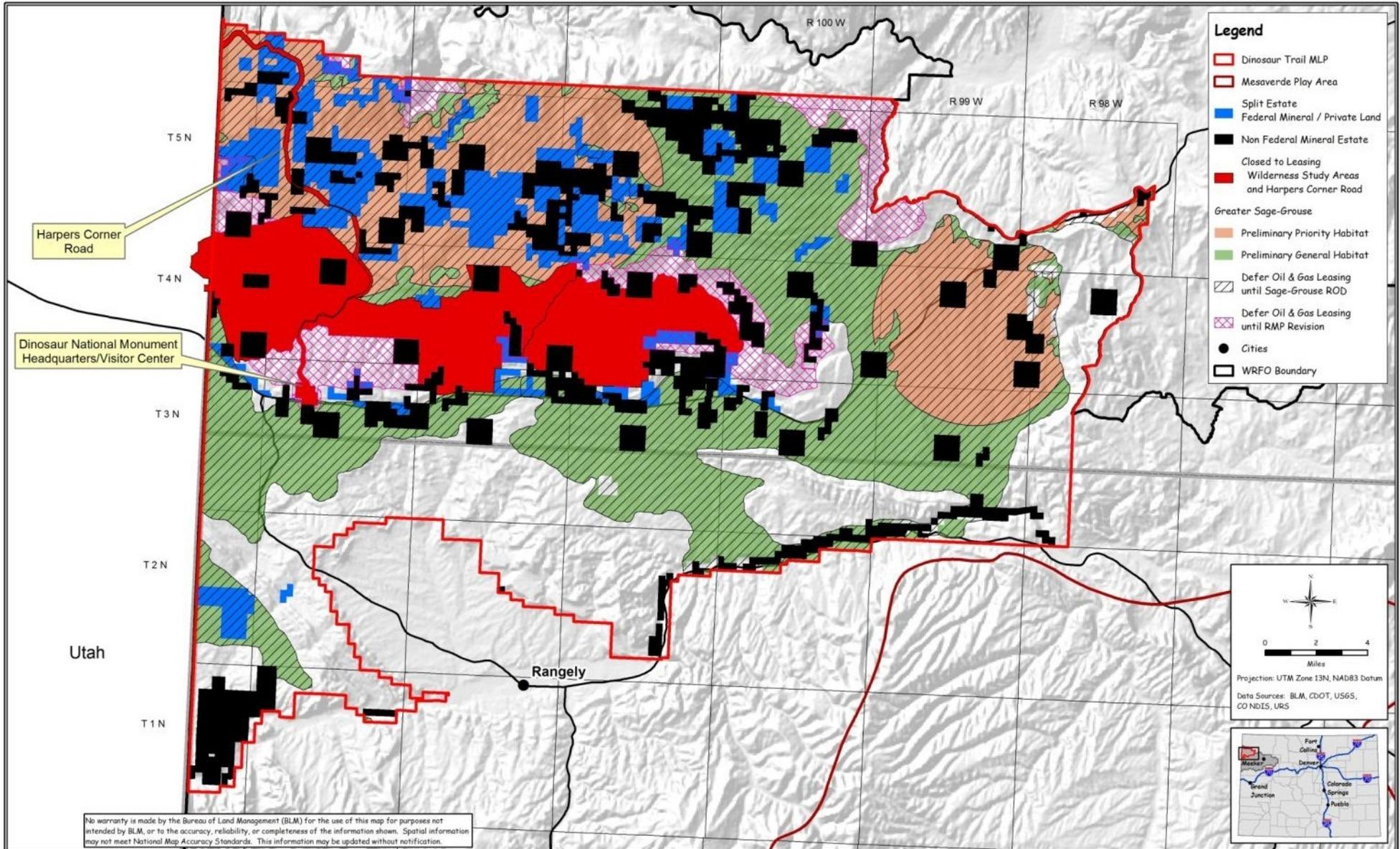
Projection: UTM Zone 13N, NAD83 Datum
Data Sources: BLM, CDOT, USGS, CO NDIS, URS



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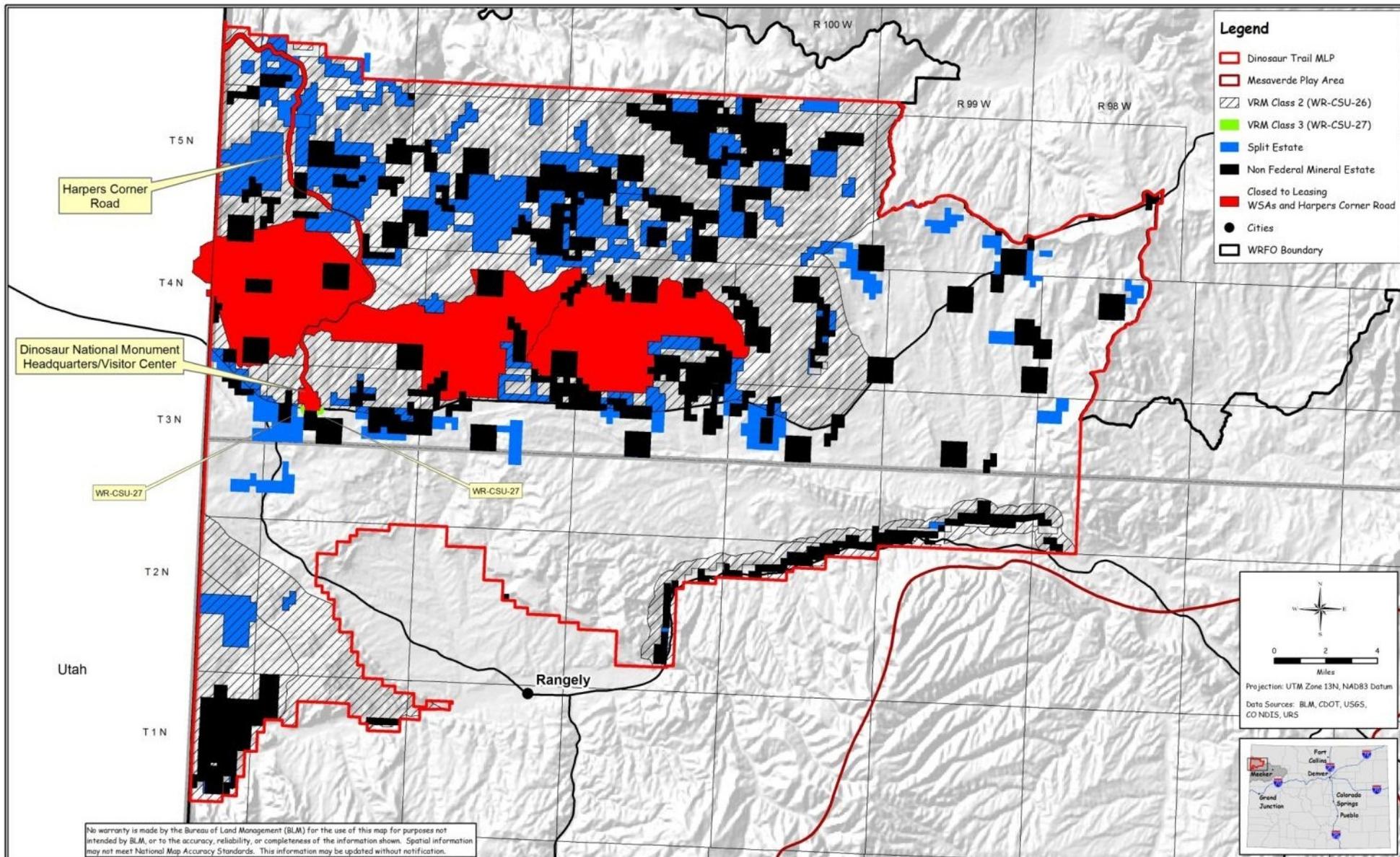


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Map 2-10
Phased Leasing in the Dinosaur Trail Master Leasing Plan Area



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Management of Visual Resources, Soundscapes, and Night Skies in the Dinosaur Trail Master Leasing Plan

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Chapter 3.0 Implementation and Monitoring

3.1 *General Plan Amendment Implementation*

Plan implementation is a continuous and active process. Decisions presented in Chapter 2 Management Decisions of this Approved RMPA are of three types: Immediate, One-Time, and Long-Term.

Immediate Decisions: These decisions go into effect upon signature of the Record of Decision and Approved RMPA. These include decisions such as the allocation of lands as available or unavailable for oil and gas leasing, phased leasing with the Dinosaur Trail MLP, management of lands with wilderness characteristics (i.e., Tier 1, 2, or 3), and use of the White River Surface Reclamation Plan. Immediate decisions require no additional analysis and provide the framework for any subsequent activities proposed in the planning area.

One-Time Decisions: These types of decisions include those that are implemented after additional site-specific analysis is completed, such as development of a cultural resource project plan (CRPP). One-time decisions usually require additional analysis and are prioritized as part of the Plan Implementation Strategy and BLM budget process. The development of an Implementation Strategy assists the field office in outlining the work needed to meet the goals and objectives of the plan amendment and set priorities for these projects in future years so that the field office can appropriately estimate budget and labor needs. The Implementation Strategy can also assist in discussions with partners and cooperators on mutual priorities and obtaining available assistance.

Priorities for implementation of “one-time” RMPA decisions will be based on several criteria, including:

- Current and projected resource needs and demands;
- National and Statewide BLM management direction and program emphasis;
- National, State, Tribal and Community Priorities; and
- Funding.

Long-Term Guidance/Life of Plan Direction: These decisions include the goals, objectives, and management actions established by the Approved RMPA applied during site-specific analyses and activity planning (e.g., review of an APD or a ROW application). All future authorizations must conform to the Approved RMPA (43 CFR 1610.5-3(a)). Further, the Field Manager is required to make operations and activities under existing permits conform to the Approved RMPA within a reasonable period of time, subject to valid existing rights (43 CFR 1610.5-3(b)).

3.2 *Program Specific Implementation*

3.2.1 **Zero to 1 Year from Signing the ROD**

All surface disturbing activities related to oil and gas exploration and development on BLM-administered lands authorized after the signing of the ROD for the Oil and Gas Development RMPA would be subject to reclamation standards included in the WRFO Surface Reclamation Plan. For all such exploration and development authorized prior to the signing of the ROD, the WRFO Surface Reclamation Plan would be used as guidance for Reclamation Plans submitted as per Onshore Order

No. 1. Reclamation is dynamic and the BLM may revise the WRFO Surface Reclamation Plan through time to incorporate updated reclamation practices.

The BLM will conduct a review of the Water Monitoring Plan within one year of signing the ROD, and every third year thereafter. This plan will be updated and refined as needed to achieve an adaptive management approach to monitoring of water resources.

The BLM will meet with the Wolf Creek Work Group within one year of signing the ROD to discuss their concurrence with managing about 6,000 acres along Snake John Reef (between the Utah border and the town of Dinosaur) as a black-footed ferret management area.

Annually, the BLM will prepare a comprehensive summary report (from actual project data and analysis) as described in the CARPP (Appendix 5). 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 the 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.

A reclamation status report for each site would be submitted electronically to the WRFO annually until it is determined that reclamation of the site has met all required objectives of the particular reclamation phase. Reclamation data will be submitted via the most current BLM approved data management system. The White River Data Management System (WRDMS) is available for industry to begin using to submit reclamation data (see Section 3.3). Industry will be required to use the WRDMS to submit the reclamation status reports beginning in spring 2016.

The BLM will evaluate the Rocky Mountain Wild ACEC nominations, submitted on January 21, 2003, and on March 9, 2007, that are located within the boundaries of the WRFO to determine whether they satisfy the relevance and importance criteria consistent with BLM's planning regulations and provide interim management for those areas found to meet the criteria.

3.2.2 Three to 6 Years from Signing the ROD

Periodically, but not less than every three years, the BLM will evaluate the available or reasonably foreseeable oil and gas development projections for the 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 Colorado Air Resources Management Modeling Study (CARMMS) modeling study (or the most recent BLM or interagency air impacts analysis). 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.

The BLM will ensure that disturbance data for all existing locations (including "legacy" sites) are included in the WRDMS within 5 years of signing the ROD. Reclamation data for existing locations would be included in the WRDMS as it becomes available.

A grace period of five years from signing the ROD would be provided to allow compliance in the event leaseholder/operator activity exceeds threshold allowances at the time of ROD approval.

If existing facilities are located within 0.6 mile of sage-grouse leks, alternate access routes would be devised and/or surface facilities removed to the extent practicable within five years of approval of the ROD.

A cultural resource project plan (CRPP) for the Canyon Pintado NHD will be developed within five years of signing the ROD.

A CRPP for the Dragon Trail/Douglas Arch area south of Rangely, Colorado will be developed within six years of signing the ROD.

3.2.3 Twenty years from Signing the ROD

In areas under an existing lease, a program would be developed in cooperation with current leaseholders, to apply (where appropriate) the most current reclamation standards and practices to existing well pads, roads, and pipelines. These standards and practices would be applied in annual increments that would allow for completed interim and/or final reclamation of active and inactive ROW corridors and producing, plugged, and abandoned wells and access routes within 20 years.

Site-specific management of ACECs would be developed in individual activity plans. Existing ACEC activity plans (i.e., Dudley Bluffs, South Cathedral Bluffs, and Raven Ridge) will be revised to be consistent with the decisions contained in the Approved RMPA. As integrated activity plans are initiated, ACECs occurring within those areas will be incorporated into that activity plan process. The integrated activity plan will then replace the need for an individual ACEC activity plan.

3.3 Plan Amendment Monitoring

Land-use plan decision monitoring is a continuous process occurring over the life of an RMP. The goal is to maintain a dynamic RMP. Monitoring data are collected, examined, and used to draw conclusions on (1) whether planned actions have been implemented in the manner prescribed by the RMP (implementation monitoring), (2) whether RMP allowable use and management action decisions and the resultant implementation actions are effective in achieving program specific objectives or desired outcomes (effectiveness monitoring), and (3) calculating the cost of delivering a service or product (efficiency monitoring by program elements). Conclusions are then used to make recommendations on whether to continue current management or determine what changes need to be made to implementation practices to better achieve RMP decisions. Indicators, methods, locations, units of measures, frequency, and action triggers can be established by national policy guidance, in RMPs, or by technical specialists in order to address specific issues.

Based on staffing and funding levels, monitoring is annually prioritized consistent with the goals and objectives of the RMP. The BLM may work in cooperation with local, State, and other Federal agencies or use data collected by other agencies and sources when appropriate and available.

White River Data Management System

The BLM will use the WRDMS to track and document disturbance and reclamation activities associated with oil and gas operations in the WRFO Planning Area. The WRDMS is an online tool that is available for the public to view at <https://my.usgs.gov/wrfo/>.

Industry will be able to submit reclamation status reports and enter data directly into the WRDMS but the BLM will retain the authority to verify data prior to determining if reclamation success criteria have been met and when calculating big game timing limitation thresholds.

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Chapter 4.0 Evaluation And Maintenance

4.1 Plan Amendment Evaluation

In accordance with the BLM’s Land Use Planning Handbook (H-1601-1), an RMP will be evaluated periodically (at a minimum every 5 years) to determine whether the land use plan decisions and the NEPA analysis are still valid and whether the plan is being implemented effectively. More specifically, the Approved RMPA will be evaluated with the 1997 White River RMP to determine if (1) the decisions remain relevant to current issues, (2) the decisions are effective in achieving or making progress toward achieving the desired outcomes specified in the plan, (3) any decisions are in need of revision, (4) any decisions need to be dropped from further consideration, and (5) any areas require new decisions.

In making these determinations, the evaluation will consider whether mitigation measures are satisfactory, whether there are significant changes in the related plans of other entities, and whether there is significant new information.

4.2 Plan Amendment Maintenance

The BLM’s land use planning regulations require that RMPs and supporting components “be maintained as necessary to reflect minor changes in data” (43 CFR 1610.5-4). The BLM’s Land Use Planning Handbook (H-1601-1) states that maintenance “must occur continuously so that the RMP and its supporting records reflect the current status of decision implementation and knowledge of resource conditions” (page 44).

Maintenance is limited to further refining, documenting, or clarifying the decisions in the Approved RMPA and will not expand the scope of resource uses or restrictions, or change the terms, conditions, and decisions of the Approved RMPA. Maintenance does not require formal public involvement or interagency coordination.

Examples of maintenance actions include:

- Correcting minor data, typographical, mapping, or data errors in the Approved RMPA;
- Applying a lease stipulation to a new area prior to the lease sale based on new inventory data (e.g., apply an NSO stipulation for raptor nests to a newly discovered nest location);
- Refining the known habitat of a special status species addressed in the plan based on new information; or
- Modifying or waiving a lease stipulation consistent with the criteria outlined in the Approved RMPA.

Maintenance may be especially necessary to update acreage figures presented throughout the Approved RMPA. Acreages were estimated using geographical information system (GIS) data, which is subject to constant refinement. Any potential discrepancies within the acreage figures or future refinements in the data may be corrected or updated in the Approved RMPA through plan maintenance.

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Chapter 5.0 Acronyms, Glossary and References

5.1 *List of Acronyms and Abbreviations*

ACEC	Areas of Critical Environmental Concern
AIM	Assessment, Inventory and Monitoring Protocol
APD	Application for Permit to Drill (an oil or gas drill)
APLIC	Avian Power Line Interaction Committee
AQCC	Air Quality Control Commission
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practice
CARMMS	Colorado Air Resources Management Modeling Study
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COA	Conditions of Approval
CPW	Colorado Parks and Wildlife
CRPP	Cultural Resource Protection Plan
CSU	Controlled Surface Use
CWA	Clean Water Act
DOI	U.S. Department of the Interior
DPC	Desired Plant Community
e.g.	For example
EIS	Environmental Impact Statement
EPCA	Energy Policy and Conservation Act
ESA	Endangered Species Act
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FLPMA	Federal Land Policy and Management Act (of 1976)
FWS	U. S. Fish and Wildlife Service
GMU	Game Management Unit
HMA	Herd Management Area
i.e.	That is
IBLA	Interior Board of Land Appeals

IPM	Integrated Pest Management
LN	Lease Notice
MLP	Master Leasing Plan
MPA	Mesaverde Play Area
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act (of 1969)
NHD	National Historic District
NHPA	National Historic Preservation Act (of 1966)
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. National Park Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy (a stipulation on an oil and gas lease)
NSPS	New Source Performance Standard
OHV	Off-highway Vehicle
PFYC	Potential Fossil Yield Classification
PNC	Potential Natural Community
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
ROW	Right-of-way
RVA	Remnant Vegetation Association
SHPO	State Historic Preservation Office
USC	United States Code
USFS	U.S. Forest Service
USGS	U.S. Geological Service
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WO	Washington Office (BLM)
WRDMS	White River Data Management System
WRFO	White River Field Office
WSA	Wilderness Study Area

5.2 Glossary

A

Acute impacts. As used in the context of the threshold management strategy, acute impacts or effects are those concentrated, intensive fluid mineral development activities attributable to vegetation clearing, pad and facility construction, pipeline installation and drilling and completion operations.

Avoid. When used in the Approved RMPA, the intention of the term “avoid” is that the preferred strategy for managing surface disturbing and disruptive activities is to keep away from or bypass sensitive resources. Activities would be relocated. Where avoidance is determined not to be feasible, intensive mitigation to prevent adverse effects to the sensitive resources would be required.

B

Best Management Practices (BMPs). Are practices that provide for state-of-the-art mitigation measures applied to oil and natural gas drilling and production to help ensure that energy development is conducted in an environmentally responsible manner. Best management practices protect wildlife, air quality, and landscapes as we work to develop vitally needed domestic energy sources. Best Management Practices are voluntary unless they have been analyzed as a mitigation measure in the environmental review for a MLP, APD, ROW or other related facility and included as a COA.

BLM Sensitive Species. Species that require special management consideration to avoid potential future listing under the Endangered Species Act (ESA) and that have been identified in accordance with procedures set forth in BLM manual 6840. (From M6840, Special Status Species Manual.)

C

Candidate Species. Plants and animals that have been studied and the U.S. Fish and Wildlife Service (FWS) has concluded that they should be proposed for addition to the Federal endangered and threatened species list. These species have formerly been referred to as category 1 candidate species. From the February 28, 1996 Federal Register, page 7597: “those species for which the Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list but issuance of the proposed rule is precluded.” Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register. (From M6840, Special Status Species Manual.)

Collective impacts. As used in the context of the threshold management strategy, collective impacts or effects are all development-related activities (including acute effects) that take place up until the time successful interim reclamation is achieved on the well pad, access road, and pipeline and vehicle visits to the pad average less than 8 per week. Collective impacts include those effects generated by all residual and incomplete well and lease development activity, including, but not limited to: access corridors, multiple-well pads awaiting further drilling or not meeting interim reclamation success criteria, linear utility corridors that support vehicle traffic after final reclamation and facilities receiving frequent visitation (i.e., greater than 7 vehicle trips per week).

Collector Roads. These Bureau roads normally provide primary access to large blocks of land, and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all the roads in the Bureau road system. User cost, safety, comfort, and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the Bureau. As a result, they have the potential for creating substantial environmental impacts and often require complex mitigation procedures. (From 9113-BLM Roads Manual.)

Conditions of Approval (COA). A site-specific and enforceable requirement included in an approved APD or Sundry Notice that may limit or amend the specific actions proposed by the operator. Conditions of Approval minimize, mitigate, or prevent impacts to resource values or other uses of public lands.

Controlled Surface Use (CSU). Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify lease rights.

Critical Habitat. An area occupied by a threatened or endangered species “on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection.”

D

Desired Plant Community (DPC). A DPC is a plant community type composed of desirable species that occupy an ecological site to meet management objectives and provide at least the minimum qualitative and quantitative criteria for the soil, water, air, plant, and animal resources.

E

Environmental Analysis. An analysis of alternative actions and their predictable short-term and long-term environmental effects, incorporating physical, biological, economic, and social considerations.

Exception. Is a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites with the leasehold. An exception is limited type of waiver.

Exclusion Areas. Land areas determined to be unavailable for corridor allocation or facility siting. Exceptions would only be considered for short-term land use permits involving no development and projects that are consistent with management objectives for the area.

I

Impacts (or Effects). Consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Inner Gorge. As used in this document, “inner gorge” refers to an ephemeral or intermittent channel system bounded by inherently unstable, near-vertical incise walls that terminate into more gentle upslope or valley topography. The outer extent of an inner gorge is determined by a significant slope break that transitions into gentler upslope topography.

L

Lands with Wilderness Characteristics. Are those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in section 2(c) of the Wilderness Act. These attributes include the area’s size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Lease Notice (LN). Areas identified as LN are open to oil and gas leasing; they provide information about a resource that is present which may limit activity or cause special operational planning to occur.

Local Roads. These Bureau roads normally serve a smaller area than collectors, and connect to collectors or public road systems. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer uses. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Low volume local roads in mountainous terrain, where operating speed is reduced by effort of terrain, may be single lane roads with turnouts. Environmental impacts are reduced as steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable. (From 9113-BLM Roads Manual.) (Note: for oil and gas development, a local road provides access to more than one well pad and provides the connection between collector roads and resource roads.)

M

Managed Development. In the context of this Resource Management Plan Amendment (RMPA), “managed development” refers to managing the spatial extent of surface disturbance by limiting the extent of impacts to sensitive wildlife habitats (e.g., the extent of sensitive big game seasonal range subjected to cumulative adverse behavioral effects, such as harassment or avoidance) at any one time. The managed development approach considered in this RMPA includes establishing thresholds for cumulative adverse behavior effects to be applied per Game Management Unit (GMU), by each mule deer seasonal range as defined by Colorado Parks and Wildlife (CPW) and the BLM (see Map 2-4), and by leaseholder. The managed development concept differs from the traditional “phased development” approach (defined in this Glossary) in that limitation of the spatial extent of surface disturbance is achieved by managing the extent of impacts to sensitive wildlife habitats rather than limiting total surface disturbance to a specific geographic area, or specific acreage regardless of habitat, condition, or terrain. Further, reclamation of a particular wildlife habitat, rather than a geographic area, is used as the criterion for removing acres of habitat from the disturbance threshold computation. The overall vision for a managed development approach would be to cluster, collocate, and consolidate surface facilities and other ground-disturbing activities.

Mesaverde Play Area. The area within the WRFO characterized by the Upper Cretaceous tight gas sand reservoirs occurring in a concentrated area involving 712,190 acres in the central portion of WRFO and geographically bound on the south by the southern border of the WRFO.

Modification. Is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

N

No Surface Occupancy (NSO). Use or occupancy of the land surface for fluid mineral exploration or development is prohibited in order to protect identified resource values. The minerals under NSO lands may potentially be developed by directionally or horizontally drilling from nearby lands that do not have the NSO limitation.

O

Occupied habitat. Intact habitat currently supporting special status plant species. Occupied habitat also includes areas that were previously mapped or confirmed as occupied habitat, but do not contain special status plant species presently.

Old-growth Forest and Woodlands. Distinguished by the age/seral stage, structure, and function of the community. Old-growth forest typically contain large-diameter trees of specific species, a wide variation in age including old trees, accumulations of large dead standing and fallen trees, decadence in the form of broken or deformed tops and boles, multi-layered canopies, canopy interspaces, and understory patchiness.

P

Phased Development. Traditionally, “phased development” refers to prescribing the sequence of drilling operations by geographic area to allow for the development of certain areas while restricting or temporarily restricting development of other areas. Subsequent development occurs as areas developed earlier are completed and reclaimed. Examples of a phased development approach include restricting drilling operations to prescribed geographical “development areas” at any one time and prohibiting shifting operations to the next development area until reclamation is complete; or limiting total surface disturbance at any one time to a specific acreage.

Plan Maintenance. The BLM regulation in 43 CFR 1610.5-4 provides that land use plans decisions and supporting components can be maintained through plan maintenance actions to reflect minor changes in data. Plan maintenance must not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the approved plan.

Plant Consideration Area. An area or zone of influence around occupied habitat for federally listed, proposed, or candidate species. The area of influence around a disturbance includes the species’ niche (e.g. potential impacts to pollinator species, seed dispersal, etc.) related to the welfare and survival of the species.

Potential habitat. Unsurveyed habitat determined by the known geologic substrate or soils on which the special status plant species are known to occupy.

R

Remnant Vegetation Association. A plant community that has become established through successional sequences without interference by man and is an expression of the relative degree in which the kinds, proportions, and amounts of the plant community may have resembled that of the original natural community. Examples include but are not limited to ponderosa pine stands and unique or ecologically intact sagebrush communities.

Resource Roads. These BLM roads are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use

restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing BLM costs, with minimal consideration for user cost, comfort, or travel time. (From 9113-BLM Roads Manual.)

Right-of-way avoidance area. An area designated in a land use plan for which use for a ROW should be avoided if at all possible but may be available for ROW location with special stipulations.

S

Special Status Plant Species. Collectively, federally listed or proposed and BLM sensitive species, which include both Federal candidate species and delisted species within 5 years of delisting. (From M6840, Special Status Species Manual.)

Suitable habitat. Surveyed and mapped habitat occurring on the geologic substrate on which the special status plant species are known to occur. This includes associated vegetation and other subtle characteristics (such as vegetation cover, light availability, aspect, surface cobble size, soil type). Most habitat mapped as suitable has been surveyed and found to contain the correct geology or soil type but is not occupied by the special status plant species.

T

Timing Limitation (TL). Prohibits surface use during a specified time period to protect identified resource values. (Seasonal Restriction).

W

Waiver. Is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

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Appendix 1

Oil and Gas Lease Stipulations And Lease Notices



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Appendix 1

Oil and Gas Lease Stipulations

1.0 Introduction

Appendix 1 contains detailed information for all of the stipulations presented as management actions in Chapter 2 (Approved RMPA), including the stipulation, area included in the stipulation, the purpose of the stipulation, and exception, modification and waiver criteria.

1.1 Description of Lease Stipulations

All surface disturbing activities are subject to standard terms and conditions (e.g., as listed in Form 3100-11). There are three types of stipulations that could be applied to land use authorizations in addition to standard terms and conditions: (1) no surface occupancy (NSO), (2) controlled surface use (CSU), and (3) timing limitations (TL). Although not a stipulation, lease notices (LN) are also provided in these tables.

- **NSO:** Use or occupancy of the land surface for fluid mineral exploration or development is prohibited in order to protect identified resource values. The minerals under NSO lands may potentially be developed by directionally or horizontally drilling from nearby lands that do not have the NSO limitation.
- **CSU:** Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify lease rights.
- **TL:** Prohibits surface use during a specified time period to protect identified resource values. (Seasonal Restriction).
- **LN:** Areas identified as having a LN are open to oil and gas leasing; they provide information about a resource that is present which may limit activity or cause special operational planning to occur.

Since the location and distribution of resources may change over time, the WRFO will review its latest inventory information prior to a lease sale and apply protective lease stipulations to new leases as provided for in the Approved RMPA. Applying an existing lease stipulation to a new area prior to a lease sale based on new inventory data (e.g., applying an NSO stipulation around a new lek) is considered plan maintenance and does not require a plan amendment or formal public involvement and interagency coordination (BLM Land Use Planning Handbook, page 44).

1.2 Exceptions, Modifications, and Waivers

Information pertaining to lease stipulations is taken from IM No. 2008-032, Exceptions, Waivers, and Modifications of Fluid Minerals Stipulations and Conditions of Approval, and Associated Rights-of-way Terms and Conditions (BLM 2008). It is important to note, the term lease “stipulation” which is used frequently in IM No. 2008-032 refers not only to lease stipulations, but can also be applied with some adaptation to Terms and Conditions and as COAs. Exceptions, modifications, and waivers provide an effective means of applying “Adaptive Management” techniques to oil and gas leases and associated permitting activities to meet changing circumstances. The criteria for approval of exceptions, modifications, and waivers should be supported by NEPA analysis, either through the land use planning process or site-specific environmental review. The definitions for exceptions, modifications, and waivers are as follows:

- **Exception:** A one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.
- **Modification:** A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.
- **Waiver:** A permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

The Approved RMPA serves as the vehicle for explaining to industry and the public the conditions under which exceptions, modifications, and waivers of lease stipulations may be granted. All circumstances for granting an exception, waiver, or modification are documented in the Approved RMPA in each stipulation.

The person requesting the exception, modifications, and waivers is encouraged to submit information that might assist the Authorized Officer in making a decision. The Authorized Officer reviews information submitted in support of the request and other pertinent information. The Authorized Officer may modify, waive, or grant an exception to a stipulation if:

- The action is consistent with federal laws.
- The action is consistent with the RMP, as amended by this Approved RMPA.
- The management objectives that led the BLM to require the lease stipulation can be met without restricting operations in the manner provided for by the stipulation given changes in the condition of the surface resources involved, or given the nature, location, timing, or design of the proposed operations.
- The action is acceptable to the Authorized Officer based on a review of the environmental consequences.

2.0 No Surface Occupancy Stipulations

2.1 Soil and Water Resources

Landslide Areas

WR-NSO-11

Stipulation: No surface occupancy or disturbance will be allowed in landslide areas, as identified in the USDA NRCS Web Soil Survey (WSS).

Area: 38,600 acres.

Purpose: To protect soils considered unstable and subject to slumping and mass movement.

Exception: The Authorized Officer may authorize surface occupancy if an environmental analysis finds the nature of the proposed action could be conditioned so as not to impair the stability of the landslide areas. An exception may also be granted if a more detailed soil survey, i.e., Order I, conducted by a qualified soil scientist, finds the soil properties associated with the proposed action are not susceptible to slumping and mass movement.

Modification: Site-specific modifications may be granted by the Authorized Officer pending determination that a portion of the soil units meet the following conditions:

- 1) Inclusions within the soil unit where slopes are less than 35 percent;
- 2) A more detailed survey identifies and delineates wet areas and sloping rock formations, and the proposed action is designed to avoid those areas;
- 3) The proposed action utilizes land treatments and soil stabilization practices that demonstrates a high probability of reducing soil loss and preventing degradation of water quality; and
- 4) The proposed action would not cause slumping or mass movement as demonstrated through engineering and design criteria.

Waiver: None.

Steep Natural Slopes

WR-NSO-12

Stipulation: No surface occupancy or disturbance will be allowed on natural slopes greater than or equal to 50 percent (as defined by digital elevation model data).

Area: 114,200 acres.

Purpose: To protect soils on natural slopes greater than or equal to 50 percent.

Exception: The Authorized Officer may authorize surface occupancy if an environmental analysis finds the nature of the proposed action could be conditioned so as not to negatively impact the stability of or productivity of the steep slopes identified.

Modification: Site-specific modification may be granted by the Authorized Officer pending determination that a portion of the proposed surface disturbance meets the following conditions:

- 1) More than 75 percent of the proposed surface disturbance and infrastructure are on stable soils that are not on natural slopes greater than or equal to 50 percent; and
- 2) The proposed action utilizes construction, reclamation, and design features that stabilize the site during occupation and restore the original contours after occupation.

Waiver: If better elevation data indicates that there are no natural slopes greater than or equal to 50 percent anywhere within the leasehold, the stipulation no longer applies.

Protection for Impaired Waters in the Mesaverde Play Area

WR-NSO-13

Stipulation: No surface occupancy or disturbance will be allowed within 500 feet of the following impaired stream segments:

- Duck Creek tributary to Yellow Creek (COLCWH13b);
- Yellow Creek from Barcus Creek to the White River (COLCWH13c);
- Piceance Creek from Willow Creek to Hunter Creek (COLCWH14a);
- Piceance Creek from Ryan Gulch to the White River (COLCWH15); and
- Black Sulphur Creek (COLCWH20).

These areas are within the Mesaverde play area.

Area: 2,500 acres.

Purpose: To allow for the improvement of water quality in these stream segments.

Exception: The Authorized Officer may authorize surface occupancy if an environmental analysis finds the nature of the proposed action could be conditioned so as not to aggravate causes of impairment or so it meets applicable Colorado Public Land Health Standards.

Modification: None.

Waiver: This NSO stipulation will be waived for individual stream segments if they are de-listed from the 303(d) list of impaired waters by Colorado Department of Public Health and Environment.

Source Water Protection for Public Water Supplies from Groundwater

WR-NSO-14

Stipulation: No surface occupancy or disturbance will be allowed within 0.5 mile of groundwater public water supply wells for the town of Dinosaur, Dinosaur National Monument Headquarters, and the town of Massadona. No surface occupancy or disturbance will be allowed within the primary protection area for the town of Meeker's groundwater public water supply well field within the alluvial aquifer of the White River.

Area: 1,500 acres.

Purpose: To protect and retain groundwater public water supplies.

Exception: The Authorized Officer may authorize surface occupancy if an environmental analysis finds the nature of the proposed action could be conditioned so as not to negatively impact the water resources identified.

Modification: None.

Waiver: None.

2.2 Vegetation

Remnant Vegetation Associations

WR-NSO-15

Stipulation: No surface occupancy or disturbance will be allowed within remnant vegetation associations (e.g., ponderosa pine stands and unique or ecologically intact sagebrush communities).

Area: 4,800 acres.

Purpose: To conserve unique plant communities and remnant vegetation associations that are not otherwise protected.

Exception: An exception may be granted by the Authorized Officer if an environmental analysis determines that the activity will not impair values associated with the maintenance or viability of the species or communities. If an exception is granted reclamation of surface disturbance resulting from authorized activities within RVAs will use only locally gathered or genetic stock from locally gathered native species. Locally collected seed or genetic stock from locally gathered seed will be used for reclamation and available in adequate quantity for reclamation needs prior to issuance of the notice to proceed. If such seed is not available in adequate quantity, then collection from the site of disturbance will be required. All seed collection, storage, or increase would be conducted in accordance with approved collection, storage, and seed increase protocols. If three growing seasons pass without adequate collection to provide the quantity necessary for reclamation needs, the impact of using non-local native species on the genetic integrity of native species would be evaluated by the BLM and mitigated through site-specific environmental analysis.

Modification: The Authorized Officer may modify (increase, decrease, or relocate) the area subject to the stipulation if new remnant vegetation sites are discovered; or it is determined that the plant community has shifted; the occupied habitat of the species or community has increased or decreased; or that the nature or conduct of the activity, as proposed or conditioned, will not impair values associated with the maintenance or viability of the species or community.

Waiver: A waiver may be granted by the Authorized Officer if the species or community is no longer designated as unique or relict or if the site has been unoccupied by the species or community for a minimum period of 15 years.

2.3 Fish and Wildlife

State Wildlife Areas

WR-NSO-16

Stipulation: No surface occupancy or disturbance will be allowed on federal mineral estate within the Oak Ridge (including associated BLM lands designated in the 1997 RMP), Jensen, and Piceance Creek (all units) State Wildlife Areas (SWA).

Area: 20,900 acres.

Purpose: To maintain the wildlife-oriented recreational and biological values for which the CPW property was established.

Exception: An exception may be granted or substituted with a timing limitation, by the Authorized Officer in coordination with CPW, if an environmental analysis determines that the action, as proposed or conditioned, would not impair the values of the SWA.

Modification: The no surface occupancy area may be modified in extent, by the Authorized Officer in coordination with CPW, if an environmental analysis finds that a portion of the area is nonessential to site utility or function, or that the proposed action could be conditioned so as not to impair the current or future values of the site. The stipulation may also be modified if the proponent, and CPW, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to the SWA.

Waiver: This stipulation may be waived if the CPW disposes of the site.

Endangered Colorado River Fish

WR-NSO-17

Stipulation: No surface occupancy or disturbance will be allowed within designated critical habitat for federally listed fish species (e.g., 100-year floodplain of the White River below Rio Blanco Lake).

Area: 1,100 acres.

Purpose: Confining surface disturbance and surface use activities to areas outside the flood-prone area would reduce the immediate risk of sediment and contaminant discharge into occupied riverine habitat and the compromise of physical and biological habitat features that are essential to the proper functioning condition of the aquatic systems that support federally listed fishes.

Exception: The Authorized Officer, in consultation with the FWS and CPW, may grant an exception to this stipulation if environmental analysis establishes that the proposed action would not adversely influence important fishery functions or compromise the integrity of constituent elements of critical habitat. Exception requests will require the submission of a proponent-prepared spill/leak contingency plan that would be analyzed integral with BLM's biological assessment to the FWS.

Specific measures that could be considered for granting exceptions include, but would not be limited to the following:

- 1) Pipelines could not be constructed in sites identified by the CPW or FWS as important for Colorado pikeminnow reproduction and recruitment of young.
- 2) Pipelines transporting potential contaminants will be equipped with automatic shut off valves and may be required to be double-walled where they cross the White River's 100-year floodplain or the lower mile of its larger perennial tributaries (e.g., Piceance Creek, Yellow Creek, Crooked Wash).

Modification: The Authorized Officer, in consultation with the FWS, may modify the provisions of the NSO if the proposed action can be sited, conducted, or conditioned to remain compatible with habitat protection and species recovery objectives.

Waiver: The Authorized Officer may grant a waiver if the BLM, in consultation with the FWS, establishes that the White River's designated critical habitat is incapable of serving the long term requirements of Colorado pikeminnow and that this aquatic system no longer warrants consideration as a recovery component for the four species of endangered Colorado River fishes.

2.4 Raptors

Raptor Nests – Other Than Special Status Raptors (Except Golden Eagle and Prairie Falcon)

WR-NSO-18

Stipulation: No surface occupancy or disturbance will be allowed within 0.19 mile (990 feet) of functional nest sites of those raptors that are not considered special-status.

Area: 120,700 acres.

Purpose: To maintain the utility of the nest site and the surrounding physical and vegetation character of the habitat for current and subsequent reproductive functions. This stipulation does not apply to golden eagle or prairie falcon.

Exception: An exception may be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest for current or subsequent nesting activity or occupancy. An exception may also be granted by the Authorized Officer consistent with policies derived from federal administration of the Migratory Bird Treaty Act.

Modification: The Authorized Officer may modify the NSO buffer distances or substitute with a timing limitation, if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of site occupation within the lease area in the long term.

Special Status Raptor, Golden Eagle, and Prairie Falcon Nests

WR-NSO-19

Stipulation: No surface occupancy or disturbance will be allowed within 0.5 mile of functional nest sites of federal endangered, threatened, proposed, and candidate raptor species; Colorado state endangered, threatened, and special-status raptor species; BLM sensitive raptor species; golden eagles, and prairie falcons.

Area: 59,900 acres.

Purpose: To maintain the integrity of the nest substrate and the character of habitat surrounding the nest site.

Exception: An exception can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of the nest site for current or subsequent nesting activity or occupancy. Section 7 consultation procedures will be instituted in those instances where an exception is being considered that involves a federally listed or proposed species. An exception to the NSO may also be granted by the Authorized Officer consistent

with policies and regulations derived from federal administration of the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.

Modification: The Authorized Officer may modify the stipulation buffer distances or substitute with a timing limitation if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. Specifically, the buffer distance applied to burrowing owl nest burrows may be reduced to 0.25 mile where appropriate. The stipulation may also be modified if the proponent, BLM, FWS, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action will not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of five years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period. Section 7 consultation procedures will be instituted in those instances where a modification is being considered that involves a federally listed or proposed species.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood that the lease area can support further nesting activity. Section 7 consultation procedures will be instituted in those instances where a waiver is being considered that involves a federally listed or proposed species.

Abandoned Bald Eagle Nests

WR-NSO-20

Stipulation: No surface occupancy or disturbance will be allowed within 330 feet of abandoned bald eagle nests (i.e., unoccupied for five consecutive years but with all or part of the nest remaining).

Area: 60 acres.

Purpose: To maintain the integrity of the nest substrate and the character of habitat surrounding the nest site.

Exception: An exception may be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of the nest for current or subsequent nesting activity or occupancy.

Modification: The Authorized Officer may modify the stipulation buffer distances or substitute with a timing limitation if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, FWS, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action will not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of five years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood that the lease area can support further nesting activity.

Bald Eagle Critical Night Roosts

WR-NSO-21

Stipulation: No surface occupancy or disturbance will be allowed within 0.25 mile of identified bald eagle critical night roosts (as defined by the FWS).

Area: 1,000 acres.

Purpose: To maintain the integrity of the roost stand and the character of habitat surrounding the roost site.

Exception: The Authorized Officer may also grant an exception if an environmental analysis indicates that the nature or conduct of the action, as proposed or conditioned, would not impair the function or utility of the site for current or subsequent roosting activities or occupancy.

Modification: The no surface occupancy or use stipulation may be modified by the Authorized Officer if an environmental analysis indicates that a portion of the area is nonessential to roost site function or utility; or that the proposed action could be conditioned to not impair the function or utility of the site for current or subsequent roosting activities or occupancy. The NSO may be modified if the site has failed to support roosting activities over a minimum five year period.

Waiver: The Authorized Officer may grant a waiver if the area has changed such that there is no reasonable likelihood of further winter roost functions taking place within the lease area.

2.5 Grouse

Sage-Grouse Habitat

WR-NSO-22

Stipulation: Surface occupancy and long-term conversion or adverse modification of the following sage-grouse habitat within a leaseholding will be limited to 2 percent in each of the most-currently mapped Priority and General Habitats:

- 1) Sites that are characterized by, or capable of redeveloping (e.g., burns) sagebrush-dominated stands with ≤ 50 percent canopy, ≤ 40 inches in height; and
- 2) Any sites that are characterized by, or capable of redeveloping sagebrush-dominated stands on slopes ≤ 20 percent in defined winter use areas or stands showing evidence of winter use.

In coordination with CPW, these areas and habitats could be refined consistent with site-specific evaluation of seasonal use functions and/or updated information or science, including functionally equivalent habitat classification systems adopted by CPW and BLM. Reclaimed habitat that does not meet minimum functional habitat properties will be assessed against the acreage limitation. Reclamation success on sage-grouse habitats would be contingent on evidence of successful establishment of desired sagebrush forms on disturbed acreage or achieving minimum functional capacity to serve sage-grouse cover and forage needs. Reclamation assessments will consider site capability and seasonal habitat use, and may allow for surrogate (e.g., herbaceous) forms of cover, where appropriate, per Appendix A, "Structural Habitat Guidelines" from Colorado Greater Sage-grouse Conservation Plan.

Area: 450,700 acres.

Purpose: To maintain the current availability of habitat suitable for occupation by greater sage-grouse.

Exception: An exception may be granted by the Authorized Officer for actions that do not cumulatively contribute to adverse modifications exceeding two percent of those habitats suitable for sage-grouse that are encompassed by a proponent's leaseholding within the relevant sage-grouse population area. An exception may be granted by the Authorized Officer if an environmental analysis determines that the action, as proposed or conditioned, would not impair the function or utility of the site for current or subsequent use by sage-grouse. An exception may also be granted if the proponent, BLM, CPW, and other appropriate regulatory entities, devise a mutually acceptable compensation or operating plan that would satisfactorily offset or reduce the anticipated loss of habitat.

Modification: The no surface occupancy or use area may be modified in extent by the Authorized Officer if an environmental analysis finds that:

- 1) A portion of the area is nonessential to site utility or function; or
- 2) That the proposed action could be conditioned so as not to impair the function or utility of the site for current or subsequent use by sage-grouse.

The stipulation may also be modified if the proponent, the BLM, CPW, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to sage-grouse habitat.

Waiver: The Authorized Officer may grant a waiver if BLM in cooperation with CPW and other appropriate regulatory entities determine that the described lands are incapable of serving the long term requirements of sage-grouse and that these ranges no longer warrant current or future consideration as components of sage-grouse habitat.

Sage-Grouse Leks

WR-NSO-23

Stipulation: No surface occupancy or disturbance will be allowed within 0.6 mile of active (i.e., used by displaying males in the last 5 years) and inactive (i.e., evidence of use within last 10 years) strutting grounds (i.e., leks), with strict and narrowly interpreted criteria for exception or modification. If existing facilities are within 0.6 mile of such leks, alternate access routes or routing will be devised and/or surface facilities removed within 5 years of approval of the ROD, to the extent practicable.

Area: 14,100 acres.

Purpose: To maintain the character and utility of sites used for communal reproductive display and to help prevent the disruption of sage-grouse reproductive activity and displacement of birds from favored reproductive display sites.

Exception: An exception may be granted by the Authorized Officer if an environmental analysis determines that the action, as proposed or conditioned, would not impair the function or utility of the site for current or subsequent reproductive display, including daytime loafing/staging activities.

Modification: The NSO or use area may be modified in extent, or substituted with a timing limitation, by the Authorized Officer if an environmental analysis finds:

- 1) That a portion of the area is nonessential to site utility or function;
- 2) That the proposed action could be conditioned so as not to impair the function or utility of the site for current or subsequent reproductive display, including daytime loafing/staging activities; or
- 3) It is determined that the site has been unoccupied for a minimum of 10 years unless the area has been identified for habitat restoration and population recovery.

The stipulation may also be modified if the proponent, BLM, CPW, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to sage-grouse breeding activities and/or habitats.

Waiver: The Authorized Officer may grant a waiver if, the BLM in cooperation with CPW, and other appropriate regulator entities, determine that the lease area is no longer capable of supporting lekking activity.

Columbian Sharp-tailed Grouse Leks

WR-NSO-24

Stipulation: Surface occupancy and surface-disturbing and disruptive activities within 0.4 mile of active (i.e., used by displaying males in the last 5 years) strutting grounds (i.e., leks) will be prohibited.

Area: 15 acres.

Purpose: To maintain the character and utility of sites used for communal reproductive display and to help prevent the disruption of Columbian sharp-tailed reproductive activity and displacement of birds from favored reproductive display sites.

Exception: An exception may be granted by the Authorized Officer if an environmental analysis determines that the action, as proposed or conditioned, would not impair the function or utility of the site for current or subsequent reproductive display, including daytime loafing/staging activities.

Modification: The no surface occupancy or use area may be modified in extent, or substituted with a timing limitation, by the Authorized Officer if an environmental analysis finds:

- 1) That a portion of the area is nonessential to site utility or function;
- 2) That the proposed action could be conditioned so as not to impair the function or utility of the site for current or subsequent reproductive display, including daytime loafing/staging activities; or
- 3) It is determined that the site has been unoccupied for a minimum of 10 years unless the area has been identified for habitat restoration and population recovery.

The stipulation may also be modified if the proponent, BLM, CPW, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to grouse breeding activities and/or habitats.

Waiver: The Authorized Officer may grant a waiver if, in coordination with the CPW, it is determined that the lease area is no longer capable of supporting lekking activity.

2.6 Special Status Plants

Federally Listed Plant Species

WR-NSO-25

Stipulation: No surface occupancy or disturbance will be allowed within 660 feet of occupied and suitable habitat for federally listed, proposed, and candidate plant species, including any new habitat mapped as a result of future surveys.

Area: 32,400 acres.

Purpose: To protect federally listed, proposed, and candidate plant species and designated critical habitat from direct and indirect impacts, including loss and degradation of habitat due to dust transport, weed invasion, chemical and produced-water spills. It also reduces impacts to important pollinators and their habitat.

Exception: The following exceptions may only be granted if they do not preclude the survival and recovery of the species, as agreed or consulted upon by the BLM and FWS, with particular emphasis on protecting populations within ACECs:

- 1) Maintenance of existing facilities.
- 2) Surface occupancy may be authorized within 330 feet of occupied habitat following an environmental analysis and ESA Section 7 consultation or conference with the FWS (for species listed under the ESA) that results in “no effect” or concurrence with a wholly beneficial effect determination. Surface occupancy may be considered for actions when the overall impacts to the species’ habitat from an action would be less than compared to other project alternatives that maintain a 330 foot buffer around occupied habitat. The proponent must convincingly demonstrate through in-depth biological analyses and collaboration with BLM and FWS that any action within 330 feet is the least damaging option when compared to other project alternatives. The FWS must concur with the proposed action in their Biological Opinion for approval of the exception to be considered by the BLM.
- 3) Surface occupancy may be authorized within 330-660 feet of occupied habitat or anywhere within suitable habitat if the proposed action results in insignificant (not reasonably measured/detected), discountable (extremely unlikely to occur), or wholly beneficial effects (no negative impacts) to occupied habitat or a similar level of impacts to suitable habitat (as defined under ESA Section 7 implementing regulations).
- 4) Surface occupancy may be authorized anywhere within suitable habitat for new construction/disturbances located adjacent to an existing disturbance if an environmental analysis of the proposed action indicates that the activity could be conditioned so as to result in a much reduced cumulative environmental impact to the species compared to other project alternatives.
- 5) Exceptions may be contingent on special design, construction, and implementation measures. Mitigation measures may include, but are not limited to:
 - a) Relocation of operations by more than 660 feet;
 - b) Delaying operations by more than 60 days so that construction occurs outside of the blooming season (i.e., construction could occur September through March);
 - c) Minimizing the area of disturbance;
 - d) Intensive control of fugitive dust;
 - e) Using signs, fencing, and other deterrents to reduce possible human disturbance;
 - f) Monitoring and control of invasive plants;
 - g) Specialized reclamation procedures (e.g., separating soil and subsoil layers with barriers to reclaim in the correct order and additional emphasis on forbs in seed mixes to promote pollinator habitat;
 - h) Long term monitoring of the species and/or habitat;
 - i) Use of a qualified, independent third-party contractor provide general oversight and assure compliance with project terms and conditions; and/or
 - j) Consideration of off-site mitigation such as conservation easements, or mitigation banking to offset impacts to occupied plant populations, adequate funding of research, or habitat protection/improvement projects.

Modification: If the site has been unoccupied by the species for a minimum period of 20 years then the habitat will be considered as suitable instead of occupied. Due to the persistence of the seed bank and variability in environmental conditions related to germination, surveys would be required over multiple years to make a determination that the area is no longer occupied. The BLM will confer with FWS in determining whether an area should be considered as suitable or occupied habitat.

Waiver: A waiver may be granted by the Authorized Officer if the species becomes extinct or if the species is downgraded in status, the NSO stipulation may be replaced with less stringent criteria.

BLM Sensitive Plant Species

WR-NSO-26

Stipulation: No surface occupancy or disturbance will be allowed within 330 feet of occupied or suitable habitat for BLM sensitive plants.

Area: 7,300 acres.

Purpose: To protect BLM sensitive plant species from direct and indirect impacts, including loss of habitat. The protection buffer reduces the risk of impacts to special status plant populations from dust transport, weed invasion, chemical and produced-water spills. It also reduces impacts to important pollinators and their habitat.

Exception: An exception may be granted by the Authorized Officer if it can be demonstrated that the activity would not cause adverse impacts or have negligible impacts to occupied and suitable habitat. An exception may be granted for maintenance of existing facilities or for new construction/disturbances located adjacent to an existing disturbance if an environmental analysis of the proposed action indicates that the activity could be conditioned so as to result in a much reduced cumulative environmental impact to the species compared to other project alternatives. If an exception is granted, special design, construction, reclamation, and implementation measures, including relocation of operations and postponing construction by more than 60 days, may be required. Specialized reclamation procedures may include:

- 1) Collection of seeds for sensitive plant species' genetic preservation, grow-out, and future reclamation attempts; and
- 2) Using a higher percentage of forbs in the reclamation seed mix to promote pollinator habitat.

Modification: The Authorized Officer may modify (increase, decrease, or relocate) the area subject to the stipulation if it is determined that the nature or conduct of the activity, as proposed or conditioned, would not impair values associated with the maintenance or recovery of the species. If the site has been unoccupied by the species for a minimum period of 20 years then the habitat will be considered as suitable instead of occupied. Due to the persistence of the seed bank and variability in environmental conditions related to germination, surveys would be required over multiple years to make a determination that the area is no longer occupied.

Waiver: If the species is removed from the Colorado BLM State Director's Sensitive Species List, a waiver may be granted by the Authorized Officer or the NSO stipulation may be replaced with less stringent criteria.

2.7 Cultural Resources

Duck Creek Wickiup Village

WR-NSO-27

Stipulation: No surface occupancy or disturbance will be allowed within and adjacent to the Duck Creek Wickiup Village.

Area: 3 acres.

Purpose: To protect a site listed on National Register of Historic Places.

Exception: None.

Modification: None.

Waiver: A waiver may be granted if the destruction of all the physical characteristics of a district, site, building, structure, object, traditional cultural property, historic landscape, or discrete group of thematically related properties, that represents American history, architecture, archaeology, engineering and culture (BLM Manual 8110.32 E) results in these locations no longer possessing integrity of location, design, setting, materials, workmanship, feeling and association to qualify them for nomination to the National Register of Historic Places described by Criteria (a) – (d) within 36 CFR 60.4.

Thornburgh/Battle of Milk Creek Site

WR-NSO-28

Stipulation: No surface occupancy or disturbance will be allowed within the Thornburgh/Battle of Milk Creek site.

Area: 110 acres.

Purpose: To preserve and protect the Thornburgh/Battle of Milk Creek site as listed on the National Register of Historic Places, maintaining the cultural values of this area.

Exception: The Field Manager may authorize surface disturbance or use within this area if an environmental analysis finds that the activity as proposed or conditioned would not adversely affect cultural values of the area after documented consultation with the Colorado State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP).

Modification: None.

Waiver: None.

2.8 Forestry and Woodlands

Douglas-fir and Aspen on Slopes

WR-NSO-29

Stipulation: No surface occupancy or disturbance will be allowed in areas with Douglas-fir and aspen on slopes greater than 25 percent.

Area: 61,900 acres.

Purpose: To preserve forest communities on slopes where forest health is difficult to maintain and would otherwise have no protection.

Exception: Operations may be permitted if the Authorized Officer determines through an environmental analysis, that the activity would not impair values associated with the protection or health of the forest communities.

Modification: The Authorized Officer may modify (increase, decrease, or relocate) the area subject to the stipulation if it is determined that the forest communities have decreased through natural causes (e.g., wildland fire, insects, blow down, etc.) or that the nature or conduct of the activity would not impair the preservation or viability of the forest community.

Waiver: None.

2.9 Minerals

Oil Shale RD&D Leases

WR-NSO-30

Stipulation: Drilling will be precluded on existing and future Oil Shale Research, Development and Demonstration (RD&D) leases in the Green River Formation.

Area: 1,100 acres.

Purpose: To provide for a prudent and planned future leasing and development program for oil shale resources.

Exception: Drilling could occur on the RD&D lease if the Authorized Officer determines and the RD&D Lessee are in agreement the proposed drilling activity will not adversely affect the RD&D operations or recovery of the oil shale resources.

Modification: None.

Waiver: The Authorized Officer may waive if this stipulation if the RD&D oil shale operations are abandoned or the RD&D lease is relinquished or terminated.

Sodium Mining

WR-NSO-31

Stipulation: Drilling will be precluded from active sodium mining areas in the Green River Formation.

Area: 980 acres.

Purpose: To facilitate the orderly and environmentally sound development of sodium resources.

Exception: Drilling could occur in active sodium mining areas if the Authorized Officer determines, and the sodium lessee/operator are in agreement, that the proposed drilling activity will not adversely affect the sodium operations or recovery of the sodium resources.

Modification: None.

Waiver: The Authorized Officer may waive this stipulation if the sodium mining operation is abandoned.

2.10 Recreation

Anderson Gulch and LO7 Hill Recreation Management Emphasis Area

WR-NSO-32

Stipulation: No surface occupancy or disturbance will be allowed in the Anderson Gulch (2,000 acres) and LO7 Hill (1,600 acres) areas.

Area: 3,600 acres.

Purpose: To maintain and/or enhance targeted recreational opportunities, experiences, and benefits with a primary market-based strategy being “Community” for a market base of Meeker and the upper White River valley of northwestern Colorado.

Exception: The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the nature or conduct of the action, as proposed or conditioned, would not directly or indirectly affect the purpose and intent of the management emphasis areas, and/or would benefit the primary market-base of Meeker and the upper White River valley in northwestern Colorado.

Modification: None.

Waiver: None.

2.11 Lands and Realty

Rangely District Hospital R&PP

WR-NSO-33

Stipulation: No surface occupancy or disturbance will be allowed within the Rangely District Hospital R&PP lease/patent area.

Area: 20 acres.

Purpose: To protect the area associated with development of the Rangely District Hospital.

Exception: The Authorized Officer may grant an exception if an environmental analysis finds that the nature or conduct of the action, as proposed or conditioned, would not directly or indirectly affect the purpose and intent of the area and would be compatible with the public use associated with the Rangely District Hospital.

Modification: None.

Waiver: None.

2.12 Special Designations

Areas of Critical Environmental Concern

WR-NSO-34

Stipulation: No surface occupancy or disturbance will be allowed within the boundaries of the following ACECs: Dudley Bluffs, Yanks Gulch/Upper Greasewood Creek, Lower Greasewood Creek, Raven Ridge, South Cathedral Bluffs, Deer Gulch, Ryan Gulch, Blacks Gulch, Coal Draw, Moosehead Mountain, White River Riparian and Duck Creek.

Area: 29,900 acres.

Purpose: These ACECs contain fossils of high scientific value; fragile soils; cultural resources; special status plants (federally listed, proposed, or candidate plant species, BLM sensitive species), important biologically diverse plant communities; riparian areas; bald eagle roosts; critical habitat for pikeminnow; and/or remnant vegetation associations.

Exception: The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the nature or conduct of the action, as proposed or conditioned, would not risk long-term or substantive compromise of the values or functions for which the ACEC was established or subsequently serves. Resource inventories, appropriate for the resource affected, may be required prior to considering any requests for exceptions. The granting of exceptions will be conditioned on the results of ESA consultation, species recovery plans, law or regulation, current BLM management policies, or resource-specific provisions expressed in related WRFO RMP stipulations.

Modification: The Authorized Officer may alter the temporal or spatial configuration of the applied NSO if an environmental analysis indicates that the action, as proposed or conditioned, may be conducted without risking long-term or substantive compromise of the values or functions for which the ACEC was established or subsequently serves.

Waiver: The Authorized Officer may waive the NSO if the ACEC no longer serves in the support of those values or functions for which the ACEC was established or subsequently served and where there is no reasonable likelihood of that utility being restored or redeveloping within reasonable timeframes.

2.13 Lands with Wilderness Characteristics

Tier 1 Areas within Lands with Wilderness Characteristics Units

WR-NSO-35

Stipulation: No surface occupancy or disturbance will be allowed in Tier 1 areas within lands with wilderness characteristics units. All acreage within land with wilderness characteristic units 24, 26, and 33 are classified as Tier 1 areas and portions of land with wilderness characteristic units 1, 2, 19, 20, 21, 29, 32, and 34 are classified as Tier 1 areas (refer to Map 2-9).

Area: 71,500 acres.

Purpose: To protect wilderness characteristics as a priority over other multiple uses.

Exception: None.

Modification: None.

Waiver: None.

2.14 NSO Stipulations Exclusive to the Dinosaur Trail MLP

Mellen Hill

WR-NSO-36

Stipulation: No surface occupancy or disturbance will be allowed within and adjacent to the Mellen Hill Sites (5RB227, 5RB279, 5RB489, etc.).

Area: 360 acres.

Purpose: To preserve and protect examples of cultural and historic resources to ensure that they are available for appropriate uses by present and future generations.

Exception: None.

Modification: None.

Waiver: A waiver may be granted if the destruction of all the physical characteristics of a district, site, building, structure, object, traditional cultural property, historic landscape, or discrete group of thematically related properties, that represents American history, architecture, archaeology, engineering and culture (BLM Manual 8110.32 E) results in these locations no longer possessing integrity of location, design, setting, materials, workmanship, feeling and association to qualify them for nomination to the National Register of Historic Places described by Criteria (a) – (d) within 36 CFR 60.4.

3.0 Controlled Surface Use Stipulations

3.1 Soil and Water Resources

Steep Natural Slopes

WR-CSU-10

Stipulation: Surface disturbing activities will be allowed on natural slopes greater than or equal to 35 percent but less than 50 percent (as defined by digital elevation model data) only after an engineered construction/reclamation plan is submitted by the operator and approved by the Authorized Officer. The following items must be addressed in the plan:

- 1) How soil productivity will be restored; and
- 2) How surface runoff will be treated to avoid accelerated erosion such as riling, gullyng, piping, and mass wasting.

Area: 231,500 acres.

Purpose: To protect soils on natural slopes greater than or equal to 35 percent but less than 50 percent.

Exception: An exception may be granted by the Authorized Officer if an environmental analysis of the proposed action identifies that the scale or nature of the operation would not result in any long term decrease in site productivity or increased erosion. An exception may also be granted by the Authorized Officer if a more detailed survey determines that the proposed action will not disturb soils on slopes greater than or equal to 35 percent.

Modification: None.

Waiver: None.

Saline Soils

WR-CSU-11

Stipulation: Surface disturbing activities will be allowed in areas with saline soils (i.e., greater than 8 mmhos/cm), as identified in USDA NRCS Web Soil Survey, only after a reclamation plan is submitted by the operator and approved by the Authorized Officer. Operators must consider the stability and productivity of these soils in the reclamation plan and specifically address:

- 1) How soil productivity will be restored; and
- 2) How reclamation success will be evaluated.

Area: 44,300 acres.

Purpose: To protect the productivity of saline soils and to reduce salt and selenium loading of surface waters.

Exception: An exception may be granted by the Authorized Officer if an environmental analysis of the proposed action identifies that the scale of the operation would not result in any long term decrease in site productivity or increased erosion. An exception may also be granted if a more detailed soil survey, i.e., Order I, conducted by a qualified soil scientist, finds the soil properties associated with the proposed action are not saline.

Modification: None.

Waiver: None.

Water Resources

WR-CSU-12

Stipulation: Surface disturbance and occupation will be avoided in the following areas:

- 1) Mapped 100-year floodplains;
- 2) Areas within 500 feet from perennial waters, springs, water wells, and wetland/riparian areas; and
- 3) Areas within 100 feet from the inner gorge of ephemeral or intermittent stream channels.
(See Approved RMPA Glossary for definition of inner gorge.)

Area: The areas within mapped floodplain boundaries comprise 22,100 acres. Areas within 500 feet of perennial waters, springs, water wells, and wetland/riparian areas comprise 55,300 acres. Wetlands and the inner gorge of stream channels will be identified during site-specific analysis.

Purpose: To maintain the vegetative, hydrologic, and geomorphic functionality of stream channels, water quality characteristics, spring function, water well integrity, proper wetland/riparian function, aquatic health, aquatic and wetland habitat, macroinvertebrate communities, downstream fisheries and natural sediment and salt processes.

Exception: An exception may be granted by the Authorized Officer to the avoidance of these areas if an environmental analysis determines that the proposed activity would not or if the activity could be conditioned so as to not degrade the resources identified (see the modification criteria below). The Authorized Officer may authorize surface disturbance and occupation in identified areas when avoidance would result in the degradation of off-site resources to an extent that contravenes the BLM management direction or objectives, provided that adverse effects to water resources are satisfactorily resolved by design considerations, engineering, reclamation, and best management practices.

Modification: The stipulation may be modified by the Authorized Officer pending an environmental analysis of site specific information by BLM staff that finds the sites proposed for surface disturbance or occupancy after construction, during operation, and after final abandonment would:

- 1) Pass the 10-year peak flow event without erosion;
- 2) Pass the 25-year peak flow without failed infrastructure;
- 3) Pass the 50-year peak flow event without failure (when surface occupancy is planned for greater than 50 years);
- 4) Not impede a 100-year peak flow event causing upstream flooding beyond floodplain boundaries;
- 5) Not negatively impact springs or water wells, and
- 6) Beyond temporary, short-term timeframes would:
 - a) Not degrade water quality;
 - b) Not compromise, degrade, or forestall attainment of proper wetland/riparian conditions or channel functions; and
 - c) Maintain aquatic health and habitat.

The proposed activity must further not represent a vector for the transmission of aquatic pathogens or invasive/nuisance aquatic organisms, and must include provisions to restore wetland/riparian/floodplain vegetation and stream channel features temporarily impacted by the proposed activity. Modifications may also include the use of timing limitations designed to limit impacts to aquatic, riparian or channel resources (e.g., restrictions on activities during high or low flow conditions or during times that are critical for fish reproduction).

Waiver: None.

3.2 Fish and Wildlife

Native Cutthroat Trout Habitat

WR-CSU-13

Stipulation: Prior to authorizing surface disturbance of native cutthroat trout habitat (including occupied stream reaches, those slated for recovery, or within watersheds contributing to occupied habitats), the proponent/applicant will be required to submit a plan of development that will demonstrate that the proposed action will not:

- 1) Increase stream gradient;
- 2) Result in a net increase in sediment contribution;
- 3) Decrease stream channel sinuosity;
- 4) Increase the channel width to depth ratio;
- 5) Increase water temperature;
- 6) Decrease vegetation derived stream shading; or
- 7) Degrade existing water quality parameters, including specific conductance, turbidity, organic/inorganic contaminant levels, and dissolved oxygen in identified reaches or contributing perennial or intermittent tributaries.

If approvals are granted and development results in these standards being exceeded, additional measures will be required to correct the deficiencies. The proponent may be required to monitor stream/channel responses throughout the life of the project.

Area: 108,900 acres.

Purpose: Protection of aquatic habitats occupied by or suited for recovery of native cutthroat trout.

Exception: The Authorized Officer may authorize surface disturbance in these areas if an environmental analysis indicates that the project would have no adverse influence on identified stream characteristics.

Modification: Short term transgressions of the stream characteristics listed above may be allowed if the Authorized Officer determines, through environmental analysis, that short term deviations will have no adverse consequences on affected channel reaches beyond the construction phase of the project. In the event the management status of native cutthroat trout warrants downgrading, this stipulation may be replaced by less stringent criteria. The provisions of the stipulation may also be modified if the proponent, BLM, CPW, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to channel function and aquatic habitat conditions as they pertain to the support of native trout populations.

Waiver: A waiver may be granted if habitat conditions are determined to be permanently incapable of supporting populations of native cutthroat trout.

Bald Eagle Nest, Roost, and Perch Habitat

WR-CSU-14

Stipulation: Prior to authorizing surface disturbance within bald eagle nest, roost, and perch habitat, and pending coordination with the FWS consistent with provisions of the Bald and Golden Eagle Protection Act, including its implementing regulations, the Authorized Officer may require the proponent/applicant to submit a plan of development that will demonstrate that:

- 1) Involvement of cottonwood stands or cottonwood regeneration areas have been avoided to the extent practicable;
- 2) Special reclamation measures or design features are incorporated that will accelerate recovery and/or reestablishment of affected cottonwood communities;
- 3) The pre-development potential of affected floodplains to develop or support riverine cottonwood communities has not been diminished; and
- 4) The current/future utility of such cottonwood substrate for bald eagle use will not be impaired.

Area: 930 acres.

Purpose: For maintaining the long term suitability, utility and development opportunities for specialized riverine habitat features involving bald eagle nest, roost, and perch substrate on federal lands.

Exception: The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the long term suitability or utility of habitat features or diminish opportunities for natural floodplain functions. Surface disturbance and occupation may also be authorized in the event that established impacts to habitat values would be compensated or offset to the satisfaction of the BLM in consultation with FWS and CPW.

Modification: Integral with exception and stipulation.

Waiver: None.

3.3 Cultural Resources

Rock Art and Standing Architecture

WR-CSU-15

Stipulation: Oil and gas exploration and development activities that produce vibrations will be restricted within 660 feet of rock art or standing architecture such as cabins, rock structures, and wickiups. Vibration sources, which could include but are not limited to, road and well pad construction, drilling, and operation of compressor stations, will be restricted unless it could be shown that environmental attenuation will prevent the vibrations from reaching the rock art or standing architecture. Particular attention will be placed on low frequency, long wavelength vibrations at or below the range of human hearing.

Area: 13,900 acres.

Purpose: To preserve and protect examples of cultural and historic resources to ensure that they are available for appropriate uses by present and future generations.

Exception: If avoidance standards could not be met, mitigation as determined through consultation with the Colorado SHPO, ACHP and Native American tribes could be required before development would be allowed to proceed. Appropriate mitigation would be determined by site type and proximity to proposed activity, and could include but is not limited to:

- 1) Studies monitoring the vibrations in relation to the given site, during the length of the activity causing them;
- 2) Level II archival documentation; or
- 3) Offsite mitigation.

Modification: None.

Waiver: None.

Texas-Missouri-Evacuation Creek

WR-CSU-16

Stipulation: In the event archaeological or historical resources are located during the inventory process, the proposed action will be relocated to avoid and protect the cultural values. The extent of relocation will be dependent upon the nature and extent of the proposal and the type of cultural resources involved. Relocation may involve moving surface disturbing activities a distance greater than 660 feet to adequately avoid the resource of concern. Proposed actions that would result in the production of supersonic, sonic, or low frequency subsonic vibrations shall be located a distance far enough from rock art or architectural features to allow full attenuation of the vibrations.

Area: 19,300 acres.

Purpose: To preserve and protect examples of cultural and historic resources to ensure that they are available for appropriate uses by present and future generations. The Texas-Missouri-Evacuation Creek cultural resource concentration area contains a high potential for the occurrence of cultural resources.

Exception: The Authorized Officer may grant an exception to this stipulation, if through an environmental analysis and consultation with the Colorado SHPO, ACHP, and Indian Tribes it is determined that other acceptable mitigation can be developed to protect or preserve sites and data.

Modification: None.

Waiver: None.

Thornburgh/Battle of Milk Creek Viewshed

WR-CSU-17

Stipulation: Surface occupancy or use within the Thornburgh/Battle of Milk Creek viewshed is subject to the following constraints:

- 1) The Authorized Officer may impose mitigation measures on a site specific basis designed to avoid, or reduced to acceptable levels, the short and long term visual and auditory adverse effects on the area. Mitigation measures may include, but are not limited to:
 - a) Relocation of surface activities more than 660 feet;
 - b) Limiting access to existing roads and trails;
 - c) Limiting surface disturbance to certain seasons of the year;
 - d) Modifications of project design for permanent above ground facilities with height restrictions and use of visual resource management painting methods, including camouflage; and
 - e) Modifications of project design for temporary and permanent developments to adhere to sound restrictions.

Area: 5,800 acres.

Purpose: To preserve and protect the landscape surrounding the Thornburgh/Battle of Milk Creek site as listed on the National Register of Historic Places, maintaining the cultural values of this area.

Exception: The Field Manager may authorize surface disturbance or use within this area if an environmental analysis finds that the activity as proposed or conditioned would not adversely affect cultural values of the area.

Modification: None.

Waiver: None.

3.4 Forestry and Woodland Products

Old Growth

WR-CSU-18

Stipulation: Surface disturbance and occupation will be avoided in old growth and areas with high potential for old growth characteristics.

Area: Not mapped.

Purpose: To preserve old growth forests and woodlands communities that are not otherwise protected.

Exception: Operations may be authorized if the Authorized Officer determines that the activity would not impair values associated with the maintenance or viability of the forest and woodland communities.

Modification: The Authorized Officer may modify (increase, decrease, or relocate) the area subject to the stipulation if it is determined that the forest and woodland communities have decreased through natural causes (e.g., wildland fire, insects, blow down, etc.); or that the nature or conduct of the activity, as proposed or conditioned, would not impair values associated with the maintenance or viability of the forest and woodland community.

Waiver: None.

3.5 Minerals

Oil Shale

WR-CSU-19

Stipulation: Oil and gas wells within commercial oil shale leases or within tracts greater than 640 acres within the area available for oil shale and multi-mineral leasing may be relocated more than 660 feet such that drilling will not interfere with the mining and recovery of oil shale deposits or the extraction of shale oil by in situ methods or that the interest of the United States will best be served thereby. Areas available for oil shale and multi-mineral leasing were determined in the March 2013 “Approved Land Use Plan Amendments/Record of Decision (ROD) for Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the Bureau of Land Management in Colorado, Utah, and Wyoming and Final Programmatic Environmental Impact Statement”.

Area: Approximately 17,500 acres. No areas are currently leased for commercial oil shale development; if existing Preference Right Lease Areas are converted to commercial oil shale leases this could increase the area up to 39,700 acres.

Purpose: To provide for a prudent and planned future leasing and development program for oil shale resources.

Exception: The drilling location will be permitted only in the event that it is established to the satisfaction of the Authorized Officer that such drilling will not interfere with the mining and recovery of oil shale deposits or the extraction of shale oil by in situ methods or that the interest of the United States would best be served thereby.

Modification: None.

Waiver: None.

Coal

WR-CSU-2

Stipulation: Surface occupation may not be allowed within the Deserado Coal Mine Permit Area as well as the area adjacent to and south of the approved Deserado Coal Mine Permit Area. The oil and gas lessee must reach agreement with the federal coal lessee on the placement of wells or surface facilities within the coal lease and adjacent coal mine permit area.

Area: 17,700 acres.

Purpose: To protect the existing rights of the federal coal lessee and protection of coal resources for future recovery.

Exception: The Authorized Officer may grant an exception to this stipulation if the coal lessee and the oil and gas lessee have reached an agreement as to the location of well(s) and surface facilities.

Modification: None.

Waiver: The Authorized Officer may waive this stipulation if the coal mining operation is abandoned.

3.6 Recreation

Three Mile Gulch Recreation Management Emphasis Area

WR-CSU-21

Stipulation: The Authorized Officer may impose land use measures and limitations designed to avoid, or reduce to acceptable levels, the short term and long term adverse effects on maintaining the physical, social, and managerial conditions associated with backcountry/middlecountry recreation setting classifications for the Three Mile Gulch area. Examples of measures and limitations include:

- 1) Relocation of surface activities more than 660 feet;
- 2) Deferring activities longer than 60 days;
- 3) Limiting access to designated roads and trails;
- 4) Limiting surface disturbance to certain seasons and times of day to minimize conflicts during periods of high recreation use; and
- 5) Mitigation designed to reduce both the visual and auditory presence of oil and gas development activities.

Area: 4,200 acres.

Purpose: To maintain and/or enhance targeted recreational opportunities, experiences, and benefits with a primary market-based strategy being “Community” for a market base of Meeker and the Upper White River Valley of northwestern Colorado.

Exception: The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the nature or conduct of the action, as proposed or conditioned, would not directly or indirectly affect the purpose and intent of the management emphasis area, and/or would benefit the primary market-base of Meeker and the upper White River valley in northwestern Colorado.

Modification: None.

Waiver: None.

3.7 Special Designations

Areas of Critical Environmental Concern

WR-CSU-22

Stipulation: Surface occupancy or disturbance will not be allowed within mapped locations of important biologically diverse plant communities, (e.g., small aspen clones, riparian areas, and/or spruce-fir communities) within the Coal Oil Rim, Oil Spring Mountain, and East Douglas Creek ACECs. Prior to authorizing surface disturbance in watersheds contributing to native cutthroat trout habitat within the East Douglas ACEC, the proponent will be required to submit a plan of development that demonstrates the proposed action will not adversely influence important characteristics of native cutthroat trout habitat.

Area: 69,100 acres.

Purpose: Portions of these ACECs are known to contain, or have potential to contain, important biologically diverse plant communities, (e.g., small aspen clones, riparian areas, and/or spruce-fir communities) and/or native cutthroat trout habitat.

Exception: The Authorized Officer may grant an exception to this stipulation if an environmental analysis indicates that the nature or conduct of the action, as proposed or conditioned, would not risk or compromise the values or functions for which the ACEC was established or subsequently serves. Resource inventories, appropriate for the resource affected, may be required prior to considering any requests for exceptions. The granting of exceptions would be conditioned on current BLM management policies, resource objectives, or resource-specific provisions expressed in related WRFO RMP stipulations.

Modification: The Authorized Officer may alter the temporal or spatial configuration of the applied CSU if an environmental analysis indicates that the action, as proposed or conditioned, may be conducted without risking long-term or substantive compromise of the values or functions for which the ACEC was established or subsequently serves.

Waiver: The Authorized Officer may waive the CSU if the ACEC no longer serves in the support of those values or functions for which the ACEC was established or subsequently served and where there is no reasonable likelihood of that utility being restored or redeveloping within reasonable timeframes.

3.8 Lands with Wilderness Characteristics

Tier 2 Areas within Lands with Wilderness Characteristics Units

WR-CSU-23

Stipulation: Surface disturbing and disruptive activities will be subject to the following operating constraints within Tier 2 areas within lands with wilderness characteristics units:

- 1) Linear features (e.g., roads, pipelines, or power lines) will not be permitted to bisect a unit or create an extensive intrusion into the unit (e.g., long or multiple “cherry-stemmed” roads); and
- 2) New development will be located on existing disturbances (e.g., well pads) or adjacent to existing roads or trails.

All acreage within land with wilderness characteristic units 16, 22, 25, and 27 are classified as Tier 2 areas and portions of land with wilderness characteristic units 1, 2, 19, 20, 21, 29, 32, and 34 are classified as Tier 2 areas (see Map 2-9).

Area: 66,200 acres.

Purpose: To emphasize other multiple uses while applying management restrictions to reduce impacts to wilderness characteristics.

Exception: The Authorized Officer may grant an exception if an environmental analysis of the proposed action indicates that the nature or conduct of the activity could be conditioned so as to emphasize other multiple uses while applying management restrictions to reduce impacts to wilderness characteristics. Exceptions should not result in substantial changes to the acreage included within the unit. Linear disturbances (e.g., access routes, pipelines, power lines) that bisect a unit or create an extensive intrusion into the unit (e.g., long or multiple “cherry-stemmed” roads) would not be permitted. The majority of the area should continue to remain to appear to have been affected primarily by the forces of nature, and any work of human beings should be substantially unnoticeable (as described in BLM Manual 6310). If an exception is granted, special design, construction, and implementation measures may be required. Mitigation measures may include, but are not limited to:

- 1) Relocation of operations by more than 660 feet;
- 2) Delaying operations by more than 60 days and/or limiting activity to certain times of day to minimize impacts to opportunities for primitive and unconfined recreation;
- 3) Use of topographic and vegetative screening;
- 4) Limiting access to existing roads and trails;
- 5) Modifications to project design for permanent above ground facilities with height restrictions and use of visual resource management painting methods, including camouflage;
- 6) Modifications of project design for temporary and permanent developments to adhere to sound restrictions; and
- 7) Restoring the appearance of naturalness by requiring the establishment of native grasses, forbs, shrubs or trees and the addition of rocks, felled trees or other locally sourced materials.

Modification: The Authorized Officer may modify the area subject to the stipulation if the land with wilderness characteristic unit boundary has been modified due to development of existing leases (i.e., those that pre-date the Oil and Gas Development RMPA) within the unit (e.g., a road was constructed that resulted in a portion of the unit being removed from the larger unit).

Waiver: The Authorized Officer may waive this stipulation if development of existing leases within the land with wilderness characteristic unit resulted in the unit no longer meeting the criteria for lands with wilderness characteristics (BLM Manual 6310), including the minimum size criteria.

3.9 CSU Stipulations Exclusive to the Dinosaur Trail MLP

Aspen, Serviceberry, and Chokecherry Communities

WR-CSU-24

Stipulation: Surface disturbance or occupation within aspen, serviceberry, and chokecherry communities in the Dinosaur Trail MLP area may be prohibited. Prior to authorizing activities in this area, the proponent/applicant will be required to submit a plan of development that will demonstrate:

- 1) Involvement of aspen, serviceberry, and chokecherry associations have been avoided to the extent possible;
- 2) Special reclamation measures or design features will promote accelerated recovery or establishment of desirable plant community components;
- 3) The potential or capacity of the area to support viable, self-sustaining aspen, serviceberry, and chokecherry communities has not been diminished; and
- 4) Involvement of community derived values are mitigated through project life commensurate with projected impacts.

Area: 57,600 acres.

Purpose: To maintain the distribution, condition, and functional capacity of deciduous browse and aspen communities integral to high priority big game and dusky grouse habitats.

Exceptions: The Field Manager may authorize actions within this area if an environmental analysis indicates that the proposed action would not involve or adversely affect the desirable attributes of the deciduous browse/aspen communities, or their wildlife related functions. Surface disturbance and occupation may also be authorized if established impacts to community derived habitat values would be compensated or offset to the satisfaction of the Field Manager.

Modification: Integral with exception and stipulation.

Waiver: None.

Black-footed Ferret Management Area

WR-CSU-25

Stipulation: Surface occupancy or use within ferret management areas (e.g., Wolf Creek, Coyote Basin, and Snake John Reef) is subject to the following special operating constraints:

- 1) Prior to authorizing activities in this area, the Authorized Officer will confer or consult with the FWS as required by Section 7 of the Endangered Species Act. Depending on the scope of the proposed action, a plan of development may be required that demonstrates how the proposed activities will be conducted or conditioned to avoid the direct or indirect loss of black-footed ferrets or to avoid affecting the capability of the site to achieve reestablishment and recovery objectives.
- 2) The Authorized Officer may impose land use measures and limitations derived from a site specific ferret reintroduction and management plan (see below). The measures and limitations will be designed to avoid, or reduce to acceptable levels, the short and long term adverse effects on ferret survival, behavior, reproductive activities, and/or the area's capacity to sustain ferret population objectives. Examples of measures and limitations include:

- a) Relocation of surface activities more than 660 feet;
 - b) Deferring activities longer than 60 days;
 - c) Limiting access to designated roads and trails;
 - d) Modifications to project design to discourage raptor perching and prohibit the disruption of certain or all prairie dog burrow systems;
 - e) Limiting surface disturbance to certain seasons and times of day; and
 - f) Requiring efforts to offset losses of, or expand suitable prairie dog habitats to compensate for, unavoidable habitat loss or adverse habitat modification.
- 3) The following provisions are derived from “A Cooperative Plan for Black-footed Ferret Reintroduction and Management, Wolf Creek and Coyote Basin Management Areas”:
- a) A “Plan of Operations” will be developed for large or multi-year mineral development programs that occur on federal estate within Black-footed Ferret Management Areas.
 - b) Mineral development and utility installation activities will be designed to avoid adverse influence on prairie dog habitat. In the event adverse impacts to prairie dog habitat are unavoidable, activities will be designed to influence the smallest area practicable and/or those areas with the lowest prairie dog densities. When proposed developments cannot be designed or implemented to avoid substantive adverse impacts to the black-footed ferret or their habitat, the project proponents and appropriate agency(ies) will cooperatively develop a mitigation plan. The default objective for compensation is equal and in-kind replacement of the disturbed or destroyed prairie dog habitat via a cooperatively arranged expansion or enhancement of other prairie dog colonies in the Management Area.
 - c) Ferret occupation at the site of a proposed commercial activity may require special mitigation measures (e.g., delay of activities, capture and relocation of ferrets, habitat mitigation, modification to the design of activities or facilities, singularly or in combination). The course of events chosen will be determined cooperatively by the operator, CPW, and FWS at the time of an identified conflict. Reliable evidence of a ferret occupying a proposed project vicinity during the reproductive period may warrant imposing measures as COAs in an effort to reduce the risk of compromising ferret reproductive efforts. Such measures may include relocating the proposed facility, modifying the conduct of an activity, or imposing a timing limitation (May 1 to July 15) on suitable habitats within 0.5 mile of the documented evidence.
 - d) On-site habitat reclamation will be required upon cessation of temporary (less than two years) surface disturbances as necessary.
 - e) As a general rule, acre-for-acre mitigation will be required for habitat lost due to permanent (equal to or greater than two years) surface disturbances. Examples of mitigation forms are listed below:
 - i. Vegetation Treatment. Burning, mechanical, and/or chemical treatments applied to areas with excessive or otherwise incompatible vegetation adjacent to existing towns and likely to be colonized by prairie dogs following land treatment.
 - ii. Relocation of Prairie Dogs. Prairie dogs translocated from the site of surface disturbance to an area with vacant burrow systems.
 - iii. Create New Burrow Systems. The construction of artificial burrows in potential habitat which is lacking burrows and relocating affected prairie dogs to the artificial burrows.
 - iv. Habitat Banking. To avoid the inconvenience and inefficiency of implementing a large number of small mitigation projects over time, operators will have the option of implementing larger mitigation projects that could be used as a credit against future habitat modifications.

Area: 58,600 acres.

Purpose: This is a controlled surface use area for promoting the reestablishment and development of a self-sustaining black-footed ferret population.

Exception: The Authorized Officer, in conference with FWS, may authorize surface disturbance or use within these areas if an environmental analysis finds that the activity as proposed or conditioned, would not adversely influence ferret recovery, or conflict with the ferret reintroduction and management plan.

Modification: The Authorized Officer, in conference with FWS, may modify the terms of the CSU if the proposed action is shown to be compatible with ferret recovery goals and/or the ferret reintroduction and management plan.

Waiver: The Authorized Officer, in conference with FWS, may grant a waiver if extirpation of wild, free roaming ferret populations culminates in the discontinuance of the species recovery program, or local reintroduction efforts are otherwise abandoned.

Visual Resources, Night Skies, and Soundscapes within VRM Class II Areas **WR-CSU-26**

Stipulation: Prior to initiating construction operations, a site-specific Visual Resources Management and Noise Reduction Plan (Plan) must be submitted to the BLM by the operator as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate).

The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards:

- 1) In order to retain the existing character of the landscape, all energy development and related activities will be located, designed, constructed, operated, and reclaimed using environmental Best Management Practices so that the development meets VRM Class II objectives within 1 year from initiation of construction. VRM Class II objectives do not apply to workover operations, reclamation operations, or geophysical exploration operations conducted by the lessee taking less than one year to complete. Development, production, and drilling operations lasting more than one year at a location will be designed so that they are integrated into the surrounding landscape and minimize visual contrast to meet VRM Class II standards. This may include the use of practices such as full interim reclamation of roads and pads, vegetative and topographic screening, vegetation preservation, proper siting, minimizing hill cuts, utilization of low profile tanks, the effective use of digital camouflage painting of above ground facilities, using existing disturbance where practical, disguising facilities as ranching structures, and other Best Management Practices to avoid or minimize visual impacts.
- 2) Minimize noise using the best available technology such as installation of multi-cylinder pumps, hospital-grade sound reducing mufflers, and placement of exhaust systems to direct noise away from sensitive receptors (e.g., residences, the DNM Visitor's Center/Headquarters, overlooks along Harpers Corner Road, established campgrounds, and sensitive wildlife habitat). The goal for the minimum level of acceptable change will be a 10 db(A) or less increase from ambient background levels. However, at no time should operations exceed Colorado Oil and Gas Conservation Commission 800 Series Rules regarding maximum permissible noise levels at residential/agricultural/rural zones (which currently limit noise levels to between 50 and 55 db(A) at 350 feet from the source).

- 3) The lighting component of the Plan should specify the following:
- a) Number of lights and lumen output of each (minimum number of lights and the lowest luminosity consistent with safe and secure operation of the facility);
 - b) Alternatives to lighting (retro-reflective or luminescent markers in lieu of permanent lighting where feasible);
 - c) Fixture design (lights of the proper design, shielded to eliminate uplight, placed and directed to eliminate light spill and trespass to offsite locations);
 - d) Lamp color temperature (lights of the proper color to minimize night-sky impacts);
 - e) Standard operating procedures (minimization of unnecessary lighting use through alternatives to permanent lighting, such as restricting lighting usage to certain time periods);
 - f) Any activities that may be restricted to avoid night-sky impacts; and
 - g) A process for promptly addressing and mitigating complaints about potential lighting impacts.

In areas north of Highway 40, the Plan must also be coordinated with the National Park Service, with particular emphasis on views seen from key observation points within Dinosaur National Monument (DNM), along the Harpers Corner Road, and at the Visitor's Center/Headquarters.

Area: 154,200 acres. (Note: This stipulation applies to all federal mineral estate with surface estate identified as, adjacent to, or surrounded by VRM Class II within the MLP.)

Purpose: To manage lands in a manner to protect view sheds, night skies, and soundscapes within the Dinosaur Trail MLP, with emphasis on those areas in the proximity of Dinosaur National Monument (including the Visitor's Center/Headquarters and Harpers Corner Road).

Exception: The BLM Authorized Officer may grant an exception if it is determined that the action as proposed in the Surface Use Plan of Operation or Master Development Plan would not result in a failure to meet the performance standards above; or, a BLM evaluation, in consultation with the National Park Service, determines that the area is not visible, cannot be heard, and night skies would not be affected as observed from key observation points on the National Monument, including along Harpers Corner Road and near the Visitor Center.

Modification: The stipulation and performance standards identified above may be modified based on negative or positive monitoring results from similar actions on similar sites or increased national, state, or field office performance standards.

Waiver: The BLM Authorized Officer, in consultation with the National Park Service, determines that operations (visual, noise, light) on the entire lease area would not be detectable from Dinosaur National Monument.

Light and Soundscape VRM Class III areas around DNM Headquarters

WR-CSU-27

Stipulation: Minimize noise and light pollution within VRM Class III areas adjacent to Dinosaur National Monument (DNM) headquarters using the best available technology such as installation of multi-cylinder pumps, hospital-grade sound reducing mufflers, and placement of exhaust systems to direct noise away from DNM. Additionally, there will be a requirement to reduce light pollution by using methods such as limiting height of light poles, timing of lighting operations (meaning limiting lighting to times of darkness associated with drilling and work over or maintenance operations), limiting wattage intensity, and constructing light shields. However, this requirement is not applicable if it affects human health and safety. Movement of operations to mitigate sound and light impacts will be required to be at least 660 feet from the DNM headquarters.

Area: 50 acres.

Purpose: To protect night skies and soundscapes in the proximity of Dinosaur National Monument headquarters area that falls within VRM Class III areas. (Note: this area is not included in CSU-37.)

Exception: An exception may be granted if a determination is made that natural barriers or view sheds will meet these mitigation objectives or if human health and safety were adversely affected.

Modification: None.

Waiver: None.

4.0 Timing Limitation Stipulations

4.1 *Big Game*

Big Game Severe Winter Range

WR-TL-12

Stipulation: All defined big game severe winter ranges within the WRFO (see Map 2-7) will be subject to a timing limitation from December 1 through April 30 which will be applied through lease stipulations or as COAs that could extend up to 120 days. Timing limitations will typically be applied regardless of weather conditions (i.e., address of chronic influences).

Area: 673,100 acres; 10,700 acres CPW Restricted Development Areas.

Purpose: Timing limitations are intended to reduce the intensity, frequency, and extent of disturbances imposed on animals occupying important seasonal habitats during periods when animals are physiologically or energetically challenged. The behavioral response of animals exposed to these disturbances generally elevates energetic demands (e.g., avoidance movements, elevated metabolism) or reduces foraging efficiency (e.g., disuse of available resources, reduced foraging efficiency) which suppresses animal fitness or reproductive performance. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby reduce the extent of seasonal ranges subject to cumulative and chronic adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development.

Exception: The Authorized Officer may grant an exception for clustered development remaining within the acute and collective thresholds described below (evaluated by total leaseholdings within a GMU). In short, the threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, the extent of fluid mineral development activity, as measured by the area encompassed by 200-meter buffers surrounding development features (i.e., routes, pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances. For leaseholders that do not choose to participate in clustered development strategies within threshold allowances, exceptions could be granted if:

- 1) An environmental analysis indicates that the proposed action can be conditioned so as not to interfere cumulatively with habitat function or utility, or compromise animal condition within the project vicinity;
- 2) The proponent, BLM, and CPW negotiate mitigation that would satisfactorily offset anticipated impacts to big game seasonal range function or utility; or
- 3) For actions intended to enhance the long term utility or availability of suitable habitat. This latter set of exceptions is intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of big game to behavioral disturbance.

Acute Thresholds: The area of acute effects are defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations buffered by 660 feet on all seasonal ranges.

- 20 percent of deer winter range.
- 15 percent of deer severe winter range.
- 15 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 0 percent of defined Restricted Development Areas.

Collective Thresholds: The area of collective effects include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple well pads awaiting further drilling or not meeting interim reclamation success criteria, linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

- 20 percent of deer winter range.
- 20 percent of deer severe winter range.
- 20 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 5 percent of defined Restricted Development Areas.

The area of acute effects will be exempt from big game seasonal timing limitations as long as lease development activities are managed to not exceed the threshold allowances for collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would, where practicable, be subject to timing limitations. Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage may be assessed against the proponent's threshold allowances. Access or other features and facilities used in common may be prorated by operator.

Adverse effects that exceed either the acute or collective threshold will nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

Because there is no allowance for acute activity (i.e., 0 percent) in Restricted Development Areas, the manner in which these areas would be managed in the context of the threshold strategies differs from its application elsewhere. In these cases, intensive development activities normally assigned to the "acute" effects category would generally be allowed only during those timeframes outside the period of animal occupation (i.e., similar to traditional application of timing limitations). The accumulation of collective activity would remain subject to a threshold allowance of 5 percent.

Modification: The Authorized Officer may modify the size and time frames of this stipulation if:

- 1) CPW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation;
- 2) The proposed action could be conditioned so as not to interfere with habitat function or utility, or compromise animal condition;
- 3) The proponent, BLM, and CPW agree to mitigation that satisfactorily offsets anticipated impacts to big game fitness, productivity, or habitat condition; or
- 4) For actions intended to enhance the long term utility or availability of suitable habitat.

Waiver: The Authorized Officer may grant a waiver if CPW determines that the lease area is no longer utilized for, or capable of serving as, seasonal habitat for big game.

Big Game Summer Range

WR-TL-13

Stipulation: All defined big game summer range areas within the WRFO (see Map 2-7) will be subject to a timing limitation from May 15 through August 15 which will be applied through lease stipulations or as COAs that could extend up to 90 days.

Area: 420,300 acres.

Purpose: Timing limitations are intended to reduce the intensity, frequency, and extent of disturbances imposed on animals occupying important seasonal habitats during periods when animals are physiologically or energetically challenged. The behavioral response of animals exposed to these disturbances generally elevates energetic demands (e.g., avoidance movements, elevated metabolism) or reduces foraging efficiency (e.g., disuse of available resources, reduced foraging efficiency) which suppresses animal fitness or reproductive performance. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby reduce the extent of seasonal ranges subject to cumulative and chronic adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development.

Exception: The Authorized Officer may grant an exception for clustered development remaining within the acute and collective thresholds described below (evaluated by total leaseholdings within a GMU). In short, the threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, the extent of fluid mineral development activity, as measured by the area encompassed by 200-meter buffers surrounding development features (i.e., routes, pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances. For leaseholders that do not choose to participate in clustered development strategies within threshold allowances, exceptions could be granted if:

- 1) An environmental analysis indicates that the proposed action can be conditioned so as not to interfere cumulatively with habitat function or utility, or compromise animal condition within the project vicinity;
- 2) The proponent, BLM, and CPW negotiate mitigation that would satisfactorily offset anticipated impacts to big game seasonal range function or utility; or
- 3) For actions intended to enhance the long term utility or availability of suitable habitat. This latter set of exceptions is intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of big game to behavioral disturbance.

Acute Thresholds: The area of acute effects are defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations buffered by 660 feet on all seasonal ranges.

- 20 percent of deer winter range.
- 15 percent of deer severe winter range.
- 15 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 0 percent of defined Restricted Development Areas.

Collective Thresholds: The area of collective effects include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple well pads awaiting further drilling or not meeting interim reclamation success criteria, linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

- 20 percent of deer winter range.
- 20 percent of deer severe winter range.
- 20 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 5 percent of defined Restricted Development Areas.

The area of acute effects will be exempt from big game seasonal timing limitations as long as lease development activities are managed to not exceed the threshold allowances for collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would, where practicable, be subject to timing limitations. Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage may be assessed against the proponent's threshold allowances. Access or other features and facilities used in common may be prorated by operator. Adverse effects that exceed either the acute or collective threshold will nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

Because there is no allowance for acute activity (i.e., 0 percent) in Restricted Development Areas, the manner in which these areas would be managed in the context of the threshold strategies differs from its application elsewhere. In these cases, intensive development activities normally assigned to the "acute" effects category would generally be allowed only during those timeframes outside the period of animal occupation (i.e., similar to traditional application of timing limitations). The accumulation of collective activity would remain subject to a threshold allowance of 5 percent.

Modification: The Authorized Officer may modify the size and time frames of this stipulation if:

- 1) CPW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation;
- 2) The proposed action could be conditioned so as not to interfere with habitat function or utility, or compromise animal condition;
- 3) The proponent, BLM, and CPW agree to mitigation that satisfactorily offsets anticipated impacts to big game fitness, productivity, or habitat condition; or
- 4) For actions intended to enhance the long term utility or availability of suitable habitat.

Waiver: The Authorized Officer may grant a waiver if CPW determines that the lease area is no longer utilized for, or capable of serving as, seasonal habitat for big game.

Big Game Winter Range and Winter Concentration Areas

WR-TL-14

Stipulation: All defined big game winter range and winter concentration areas(see Map 2-7) will be subject to deferrals of up to 60 days within the period of December 1 through April 30 in stratified zones of seasonal use (refined set of seasonal use timeframes developed in coordination with CPW). Timing limitations will typically be applied regardless of weather conditions (i.e., address of chronic influences).

Area: 604,500 acres.

Purpose: Timing limitations are intended to reduce the intensity, frequency, and extent of disturbances imposed on animals occupying important seasonal habitats during periods when animals are physiologically or energetically challenged. The behavioral response of animals exposed to these disturbances generally elevates energetic demands (e.g., avoidance movements, elevated metabolism) or reduces foraging efficiency (e.g., disuse of available resources, reduced foraging efficiency) which suppresses animal fitness or reproductive performance. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby reduce the extent of seasonal ranges subject to cumulative and chronic adverse behavioral effects (i.e., harassment, avoidance) attributable to oil and gas development.

Exception: The Authorized Officer may grant an exception for clustered development remaining within the acute and collective thresholds described below (evaluated by total leaseholdings within a GMU). In short, the threshold allowances are a predetermined percentage of each seasonal range within a leaseholding (i.e., listed below). To qualify for timing limitation exceptions, the extent of fluid mineral development activity, as measured by the area encompassed by 660 foot buffers surrounding development features (i.e., routes, pipelines, pads) within a leaseholding, must not exceed the acreage represented by those threshold allowances. For leaseholders that do not choose to participate in clustered development strategies within threshold allowances, exceptions could be granted if:

- 1) An environmental analysis indicates that the proposed action can be conditioned so as not to interfere cumulatively with habitat function or utility, or compromise animal condition within the project vicinity;
- 2) The proponent, BLM, and CPW negotiate mitigation that would satisfactorily offset anticipated impacts to big game seasonal range function or utility; or
- 3) For actions intended to enhance the long term utility or availability of suitable habitat. This latter set of exceptions is intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of big game to behavioral disturbance.

Acute Thresholds: The area of acute effects are defined by the physical footprint of those concentrated, intensive activities associated with, for example, pad and pipeline construction and well drilling and completion operations buffered by 660 feet on all seasonal ranges.

- 20 percent of deer winter range.
- 15 percent of deer severe winter range.
- 15 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 0 percent of defined Restricted Development Areas.

Collective Thresholds: The area of collective effects include the area of acute effects in addition to all residual and incomplete lease development activities buffered as above, including but not limited to: access corridors, multiple well pads awaiting further drilling or not meeting interim reclamation success criteria, linear ROWs that support vehicle traffic after final reclamation, and facilities receiving frequent visitation (i.e., an average greater than seven vehicle trips per pad per week).

- 20 percent of deer winter range.
- 20 percent of deer severe winter range.
- 20 percent of deer summer range.
- 20 percent of deer winter concentration area.
- 5 percent of defined Restricted Development Areas.

The area of acute effects will be exempt from big game seasonal timing limitations as long as lease development activities are managed to not exceed the threshold allowances for collective and acute effects. Minor work involving lower intensity activity (e.g., installation of production facilities, reclamation) within the area of remaining collective effects would, where practicable, be subject to timing limitations. Construction activity that is unrelated to the exercise of lease rights would continue to be subject to timing limitations as established above. Development activities that may affect adjoining leaseholders' acreage may be assessed against the proponent's threshold allowances. Access or other features and facilities used in common may be prorated by operator.

Adverse effects that exceed either the acute or collective threshold will nullify the timing limitation exemptions and subject all leaseholding development to timing limitations as established above.

Modification: The Authorized Officer may modify the size and time frames of this stipulation if:

- 1) CPW monitoring information indicates that current animal use patterns are inconsistent with dates established for animal occupation;
- 2) The proposed action could be conditioned so as not to interfere with habitat function or utility, or compromise animal condition;
- 3) The proponent, BLM, and CPW agree to mitigation that satisfactorily offsets anticipated impacts to big game fitness, productivity, or habitat condition; or
- 4) For actions intended to enhance the long term utility or availability of suitable habitat.

Waiver: The Authorized Officer may grant a waiver if CPW determines that the lease area is no longer utilized for, or capable of serving as, seasonal habitat for big game.

4.2 Raptors

Raptor Nests (not considered Special Status Species)

WR-TL-15

Stipulation: Surface-disturbing and disruptive activities will not be allowed within 0.25 mile of active nest sites of those raptors that are not considered special-status during the period from nest territory establishment to dispersal of young from nest (within a period from February 1 through August 31).

Area: 59,900 acres.

Purpose: To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

Exception: An exception to the TL can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of nest for current or subsequent nesting activity or occupancy. The Authorized Officer may also grant an exception if the nest is unattended or remains unoccupied by May 15 of the project year. An exception may be granted to these dates by the Authorized Officer, consistent with policies derived from federal administration of the Migratory Bird Treaty Act.

Modification: The Authorized Officer may modify the TL dates or buffer distances if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of site occupation within the lease area in the long term.

Special Status Raptor Nests (Except Bald Eagles and Ferruginous Hawks)

WR-TL-16

Stipulation: Surface disturbing and disruptive activities will not be allowed within 0.5 mile of identified nests of federal endangered, threatened, proposed, and candidate raptor species; Colorado state endangered, threatened, and special-status raptor species; or BLM sensitive raptor species (except bald eagles and ferruginous hawks) from February 1 through August 15 or until fledging and dispersal of young.

Area: 5,200 acres.

Purpose: To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

Exception: An exception can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest site for current or subsequent nesting activity or occupancy. The Authorized Officer may grant an exception if a nest is unattended or remains unoccupied by May 15 of the project year. An exception may also be granted to this timing limitation by the Authorized Officer consistent with policies derived from federal administration of the Migratory Bird Treaty Act. Section 7 consultation procedures will be instituted in those instances where an exception is being considered that involves a federally listed or proposed species.

Modification: The Authorized Officer may modify the stipulation dates or buffer distances if an environmental analysis indicates that a portion of the area is nonessential to the utility or function of the feature, or that the proposed action could be conditioned so as not to impair the utility of the site for current or subsequent nest activities or occupation. Specifically, the buffer distance applied to

burrowing owl nest burrows may be reduced to 0.25 mile where appropriate. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected agencies or interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of five years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period. Section 7 consultation procedures will be instituted in those instances where a modification is being considered that involves a federally listed or proposed species.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of further nesting activity within the lease area. Section 7 consultation procedures will be instituted in those instances where a waiver is being considered that involves a federally listed or proposed species.

Golden Eagle and Prairie Falcon Nests

WR-TL-17

Stipulation: Surface-disturbing and disruptive activities will not be allowed within 0.5 mile of active nest sites of golden eagle and prairie falcon during the period from nest territory establishment to dispersal of young from nest (within a period from February 1 through August 31).

Area: 85,100 acres.

Purpose: To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

Exception: An exception to the TL can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of nest for current or subsequent nesting activity or occupancy. The Authorized Officer may also grant an exception if the nest is unattended or remains unoccupied by May 15 of the project year. An exception may be granted to these dates by the Authorized Officer, consistent with policies derived from federal administration of the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act.

Modification: The Authorized Officer may modify the TL dates or buffer distances if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to interfere with adult attendance and visitation of the nest site, jeopardize survival of the eggs or nestlings, or otherwise impair the utility of the nest site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of site occupation within the lease area in the long term.

Ferruginous Hawk Nests

WR-TL-18

Stipulation: Surface disturbing and disruptive activities will not be allowed within one mile of identified nests of ferruginous hawks from February 1 through August 15 or until fledging and dispersal of young.

Area: 66,900 acres.

Purpose: To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest.

Exception: An exception can be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest site for current or subsequent nesting activity or occupancy. The Authorized Officer may grant an exception if a nest is unattended or remains unoccupied by May 15 of the project year. An exception may also be granted to this timing limitation by the Authorized Officer consistent with policies derived from federal administration of the Migratory Bird Treaty Act. Section 7 consultation procedures will be instituted in those instances where an exception is being considered that involves a federally listed or proposed species.

Modification: The Authorized Officer may modify the stipulation dates or buffer distances if an environmental analysis indicates that a portion of the area is nonessential to the utility or function of the feature, or that the proposed action could be conditioned so as not to impair the utility of the site for current or subsequent nest activities or occupation. The stipulation may also be modified if the proponent, BLM, and where necessary, other affected agencies or interests, negotiate compensation that satisfactorily offsets anticipated impacts to raptor breeding activities and/or habitats. Modifications could also occur if sufficient information is provided that supports the contention that the action would not contribute to the suppression of breeding population densities or the population's production or recruitment regime from a regional perspective. A modification may be granted if the nest has remained unoccupied for a minimum of five years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10-year period.

Section 7 consultation procedures will be instituted in those instances where a modification is being considered that involves a federally listed or proposed species.

Waiver: The Authorized Officer may grant a waiver if conditions have changed such that there is no reasonable likelihood of further nesting activity within the lease area. Section 7 consultation procedures will be instituted in those instances where a waiver is being considered that involves a federally listed or proposed species.

Bald Eagle Nests

WR-TL-19

Stipulation: Surface disturbing and disruptive activities will not be allowed within 0.5 mile of identified nests of bald eagles from November 15 through July 31 or until fledging and dispersal of young.

Area: 800 acres.

Purpose: To prevent disruptions of nesting raptors that may result in absences of adults sufficient to cause direct or indirect mortality of the eggs or young or the premature departure of young from the nest, injury to birds, or prompt abandonment of the nest site.

Exception: An exception may be granted to these dates by the Authorized Officer, if authorization is obtained from the FWS (through applicable provisions of the Endangered Species Act, Eagle Protection Act, or Migratory Bird Treaty Act) to disturb, harass, harm, wound, or kill in the context of active nesting attempts. An exception can also be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of nest for current or subsequent nesting activity or occupancy. The Authorized Officer may also grant an exception if the nest is unattended or remains unoccupied by May 15 of the project year.

Modification: The Authorized Officer may modify the size of the stipulation area if an environmental analysis indicates that a portion of the area is nonessential to nest utility or function, or that the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation. If the species status is downgraded, or if the species is delisted, the size of the TL area may be reduced.

Waiver: A waiver may be granted if the nest has remained unoccupied for a minimum of 5 years or conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10 year period.

Bald Eagle Critical Night Roosts

WR-TL-20

Stipulation: Surface disturbing and disruptive activities will not be allowed within 0.5 mile of identified bald eagle critical night roosts from November 15 through March 15.

Area: 2,800 acres.

Purpose: To prevent disruptions to bald eagles that may result in eagle injury, reduced productivity, or abandonment of the site.

Exception: An exception may be granted to these dates by the Authorized Officer, if authorization is obtained from the FWS (through applicable provisions of the Eagle Protection Act or Migratory Bird Treaty Act) to disturb, harass, harm, wound, or kill in the context of ongoing roosting activities and/or short or long term adverse modification of suitable roost site characteristics. An exception can also be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of the site for current or subsequent roosting activities or occupancy. An exception may also be granted if forms of compensation are satisfactorily negotiated which fully offset losses associated with project implementation.

Modification: The Authorized Officer may modify the size of the stipulation area or timeframes if an environmental analysis indicates that a portion of the area is nonessential to roost site function and utility, or that the proposed action could be conditioned so as not to impair the utility of the roost site for current or subsequent roosting activities or occupancy.

Waiver: A waiver may be granted if the species becomes extinct, the site has failed to support roosting activities over a minimum 5 year period, or if the site conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10 year period.

Bald Eagle Winter Hunting Perches

WR-TL-21

Stipulation: Surface disturbing and disruptive activities will not be allowed within 0.25 mile of identified bald eagle winter hunting perches from November 15 through March 15.

Area: 0 acres.

Purpose: To prevent disruptions to bald eagles that may elevate energetic demands or displace birds from favored foraging areas.

Exception: An exception may be granted to these dates by the Authorized Officer, if authorization is obtained from the FWS (through applicable provisions of the Eagle Protection Act or Migratory Bird Treaty Act) to harass, harm, wound, or kill in the context of ongoing perching activities and/or short or long term adverse modification of suitable winter hunting perch characteristics. An exception can also be granted if an environmental analysis of the proposed action indicates that nature or conduct of the activity could be conditioned so as not to impair the utility of the site for current or subsequent perching activities or occupancy. An exception may also be granted if forms of compensation are satisfactorily negotiated which fully offset losses associated with project implementation.

Modification: The Authorized Officer may modify the size of the stipulation area or timeframes if an environmental analysis indicates that a portion of the area is nonessential to perch site function and utility, or that the proposed action could be conditioned so as not to impair the utility of the perch site for current or subsequent perching activities or occupancy.

Waiver: A waiver may be granted if the species becomes extinct, the site has failed to support perching activities over a minimum 5 year period, or if the site conditions have changed such that there is no reasonable likelihood of site occupation over a minimum 10 year period.

4.3 Grouse

Sage-Grouse Important Winter Use Areas

WR-TL-22

Stipulation: Surface disturbing and disruptive activities will be prohibited from December 1 through March 15 in those areas most currently defined by CPW as serving important winter use functions for sage-grouse. This stipulation is intended to apply to construction, drilling, fracing, and completion activities, but may apply, where practicable, to routine or non-emergency operation, maintenance, and production activities that can be scheduled and conducted to reduce or prevent disruption of winter use distribution and behaviors of sage-grouse.

Area: 450,100 acres.

Purpose: To reduce disruption of important winter-use functions with the overall objective of expanding the distribution and promoting recovery of greater sage-grouse populations in the WRFO. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby confine and limit the extent of suitable habitat adversely influenced at any given time.

Exception: The Authorized Officer may grant an exception under the following circumstances:

- 1) An environmental analysis and consultation with CPW indicates that the proposed action could be conditioned so as not to contribute to elevated energetic demands on birds or displace birds from favored forage and cover areas;
- 2) The proponent, BLM, and CPW negotiate compensation that would satisfactorily offset the anticipated losses of winter habitat;
- 3) For actions designed to enhance the long term utility or availability of suitable winter habitat; or
- 4) Clustering of development so that the extent of sage-grouse habitat subject to cumulative adverse habitat and behavioral effects (defined below) attributable to oil and gas development within a lease/unit holding in a defined sage-grouse population/subpopulation area would not exceed any of the following thresholds:
 - a) 10 percent of suitable habitat within most-currently mapped Priority Habitat (or equivalent habitat classification system adopted by CPW and BLM); and
 - b) 20 percent of suitable habitat within most-currently mapped General Habitat.

The first three exceptions are intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of sage-grouse to behavioral disturbance. Threshold strategies and TL exceptions may not be offered in instances (e.g., exploratory, obligation wells, routine and non-emergency production, maintenance, and operation activities) where fluid mineral development activity can be reasonably scheduled to avoid interfering with important seasonal use activities of sage-grouse. The extent of adverse behavioral effects is defined by collective development activity buffered by 660 feet, in addition to any habitat parcels that become physically or behaviorally isolated by development features and are unavailable for effective use by sage-grouse (e.g., impediments to movement and use). Development activity includes, but is not limited to: construction, drilling, and completion operations; trunk and gathering pipeline construction and reclamation; access routes; wells receiving frequent visitation (i.e., average of more than seven vehicle trips per pad per week); and well pads not fully developed or reclaimed to established WRFO reclamation standards (interim or final, as appropriate).

Reclaimed habitat that does not meet minimum functional habitat properties would be assessed against the threshold. Reclamation success on sage-grouse habitats would be contingent on evidence of successful establishment of desired sagebrush forms on disturbed acreage or achieving minimum functional capacity to serve sage-grouse cover and forage needs. Reclamation assessments would consider site capability and seasonal habitat use, and may allow for surrogate (e.g., herbaceous) forms of cover, where appropriate, per Appendix A, "Structural Habitat Guidelines" from Colorado Greater Sage-grouse Conservation Plan. (Note: Sage-grouse thresholds will be considered separately but will also be integral with more expansive big game thresholds.)

Modification: The Authorized Officer may modify the size or dates of the timing limitation area if site-specific information and ensuing environmental analysis indicates that the proposed action could be conditioned or conducted so as not to contribute cumulatively to adverse effects on the condition or distribution of wintering birds, winter use behaviors, or sustained fidelity to and occupation of birds within the area influenced by development activity. A modification may also be granted if the proponent, BLM, CPW, and other appropriate regulatory entities, devise a mutually acceptable compensation or operating plan that would satisfactorily offset or reduce the anticipated loss of winter use habitat or activities. The BLM would encourage the voluntary application of this strategy to private holdings. Acreage on fee land holdings below the occupied habitat threshold that are considered by CPW to be of comparable or higher sage-grouse value could be substituted for federally administered acreage with the approval of the WRFO Authorized Officer.

Waiver: The Authorized Officer may grant a waiver if BLM in cooperation with the CPW and other appropriate regulatory entities determine that the described lands are incapable of serving the long term requirements of sage-grouse winter habitat and that these ranges no longer warrant current or future consideration as components of sage-grouse habitat.

Sage-Grouse Nesting Habitat

WR-TL-23

Stipulation: Surface disturbing and disruptive activities will be prohibited from April 1 through July 15 in suitable sage-grouse nesting/brood-rearing habitat within most-currently mapped Priority and General Habitat (or equivalent habitat classification system adopted by CPW and BLM). This stipulation is intended to apply to construction, drilling, fracing, and completion activities, but may apply, where practicable, to routine or non-emergency operation, maintenance, and production activities that can be scheduled and conducted to reduce or prevent disruption of sage-grouse reproductive activities.

Area: 450,100 acres.

Purpose: To prevent disruptions of nesting and early-brooding sage-grouse that may result in absences of the brooding hen sufficient to cause direct or indirect mortality of the eggs or young. The overall objective is to expand the distribution of and promote the recovery of greater sage-grouse populations in the WRFO. This stipulation includes an exception criterion that is intended to promote the clustering of development activity and thereby confine and limit the extent of suitable habitat adversely influenced at any given time.

Exception: The Authorized Officer may grant an exception under the following circumstances:

- 1) An environmental analysis and consultation with CPW indicates that the proposed action could be conditioned so as not to contribute to cumulative effects on nest attendance, egg/chick survival, or nesting success;
- 2) The proponent, BLM, and CPW negotiate compensation that would satisfactorily offset the anticipated losses of nesting habitat or nesting/brooding activity;
- 3) For actions designed to enhance the long term utility or availability of suitable nesting habitat; or
- 4) Clustering of development so that the extent of sage-grouse habitat subject to cumulative adverse habitat and behavioral effects (defined below) attributable to oil and gas development in a lease-holding would not exceed any of the following thresholds:
 - a) 10 percent of suitable habitat within most-currently mapped Priority Habitat (or equivalent habitat classification system adopted by CPW and BLM); and
 - b) 20 percent of suitable habitat within most-currently mapped General Habitat.

The first three exceptions are intended to be considered in the context of a project's contribution to cumulative effects through project life and not granted as a means of circumventing clustered development strategies that are meant to reduce spatial and temporal exposure of sage-grouse to behavioral disturbance. Threshold strategies and TL exceptions may not be offered in instances (e.g., exploratory, obligation wells, routine and non-emergency production, maintenance, and operation activities) where fluid mineral development activity can be reasonably scheduled to avoid interfering with important seasonal use activities of sage-grouse. The extent of adverse behavioral effects is defined by collective development activity buffered by 660 feet, in addition to any habitat parcels that become physically or behaviorally isolated by development features and are unavailable for effective use by sage-grouse (e.g., impediments to movement and use). Development activity includes, but is not limited to: construction, drilling, and completion operations; trunk and gathering pipeline construction and reclamation; access routes; wells receiving frequent visitation (i.e., average of more

than seven vehicle trips per pad per week); and well pads not fully developed or reclaimed to established WRFO reclamation standards (interim or final, as appropriate).

Reclaimed habitat that does not meet minimum functional habitat properties will be assessed against the threshold. Reclamation success on sage-grouse habitats would be contingent on evidence of successful establishment of desired sagebrush forms on disturbed acreage or achieving minimum functional capacity to serve sage-grouse cover and forage needs. Reclamation assessments would consider site capability and seasonal habitat use, and may allow for surrogate (e.g., herbaceous) forms of cover, where appropriate, per Appendix A, “Structural Habitat Guidelines” from Colorado Greater Sage-grouse Conservation Plan.

(Note: Sage-grouse thresholds will be considered separately but will also be integral with more expansive big game thresholds.)

Modification: The Authorized Officer may modify the size or dates of the timing limitation area if site-specific information and ensuing environmental analysis indicates that the proposed action could be conditioned or conducted so as not to contribute cumulatively to adverse effects on nest attendance, egg/chick survival, nesting success, or sustained fidelity to, and occupation of birds within, the area influenced by development activity. Nesting timeframes may be adjusted if appropriate monitoring data supports the primary objective of allowing 90 percent of initial nesting attempts, on average, to progress through hatch. A modification may also be granted if the proponent, BLM, CPW, and other appropriate regulatory entities, devise a mutually acceptable compensation or operating plan that would satisfactorily offset or reduce the anticipated loss of nesting habitat or activities. The BLM would encourage the voluntary application of this strategy to private holdings. Acreage on fee land holdings below the occupied habitat threshold that are considered by CPW to be of comparable or higher sage-grouse value could be substituted for federally administered acreage with the approval of the WRFO Authorized Officer.

Waiver: The Authorized Officer may grant a waiver if BLM in cooperation with the CPW and other appropriate regulatory entities determine that the described lands are incapable of serving the long term requirements of sage-grouse nesting habitat and that these ranges no longer warrant current or future consideration as components of sage-grouse habitat.

Columbian Sharp-tailed Grouse Important Winter Use Areas

WR-TL-24

Stipulation: Surface-disturbing and disruptive activities will be prohibited within important, CPW-defined, winter range habitat from December 1 through March 15.

Area: 8,600 acres.

Purpose: To prevent imposing deleterious nutritional or energetic demands on wintering Columbian sharp-tailed grouse or prompting displacement of Columbian sharp-tailed grouse from important winter use areas.

Exception: The Authorized Officer may grant an exception if an environmental analysis and coordination with CPW indicate that the proposed action could be conditioned so as not to adversely affect the short and long-term utility or suitability of winter range habitat or the birds’ winter distribution and survival. An exception could also be granted if the proponent, BLM, and CPW negotiate compensation that would satisfactorily offset the anticipated loss of winter use habitat or winter use functions. Actions designed to enhance the long-term utility or availability of winter use habitat may be excepted.

Modification: The Authorized Officer may modify the size of the timing limitation area if an environmental analysis indicates that the proposed action could be conditioned so as not to adversely affect the short and long term utility or suitability of winter range habitat or the birds' winter distribution and survival.

Waiver: This stipulation may be waived if CPW determines that the described lands are incapable of serving the long-term requirements of Columbian sharp-tailed grouse winter use habitat and that these ranges no longer warrant consideration as components of Columbian sharp-tailed grouse winter habitat.

Columbian Sharp-tailed Grouse Nesting Habitat

WR-TL-25

Stipulation: Surface-disturbing and disruptive activities will be prohibited within 1.25 miles of active leks or mapped nesting habitat for Columbian sharp-tailed grouse from March 1 through July 30.

Area: 1,500 acres.

Purpose: To prevent disruptions of nesting and early-brooding Columbian sharp-tailed grouse that may result in absences of the brooding hen sufficient to cause direct or indirect mortality of the eggs or young.

Exception: The Authorized Officer may grant an exception if an environmental analysis and coordination with CPW indicate that the proposed action could be conditioned so as not to affect breeding behavior, nest attendance, egg/chick survival, or nesting success. An exception could also be granted if the proponent, BLM, and CPW negotiate compensation that would satisfactorily offset the anticipated loss of nesting habitat or nesting activities. Actions designed to enhance the long term utility or availability of suitable nest habitat may be excepted.

Modification: The Authorized Officer may modify the size of the timing limitation area if an environmental analysis indicates that the proposed action could be conditioned so as not to affect nest attendance, egg/chick survival, or nesting success. With the primary objective of allowing for 90 percent of initial nesting attempts to progress through hatch, timeframes may also be adjusted in nesting habitat as supported by appropriate monitoring data.

Waiver: This stipulation may be waived if CPW determines that the described lands are incapable of serving the long term requirements of sharp-tailed nesting habitat and that these ranges no longer warrant consideration as components of Columbian sharp-tailed grouse nesting habitat.

4.4 Canada Lynx

Canada Lynx

WR-TL-26

Stipulation: Surface-disturbing and disruptive activities that have the potential to reduce the utility of habitat parcels suitable for Canada lynx denning functions will not be allowed from March 15 to July 15.

Area: 3,400 acres.

Purpose: To maintain the utility of lynx denning habitat consistent with the most current Canada Lynx Conservation Assessment and Strategy guidelines.

Exception: The Authorized Officer, in consultation with FWS, may grant an exception to this stipulation if an environmental analysis indicates that the proposed or conditioned activities would not affect the long-term suitability or utility of lynx denning habitat within lynx analysis units (LAUs).

Modification: The Authorized Officer, in consultation with FWS, may modify the size of the stipulation area or time frames if an environmental analysis indicates that a portion of the area is nonessential to the function and utility of lynx denning habitat, or that the proposed action could be conditioned so as not to impair the utility of denning habitat for lynx use and occupancy.

Waiver: The Authorized Officer, in consultation with the FWS, may grant a waiver to this stipulation if site conditions have changed sufficient to preclude lynx occupation of the LAU.

5.0 Lease Notices

5.1 Air Resources

Air Resources

WR-LN-04

Lease Notice: 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).

Area: Statewide - Colorado

5.2 Soil and Water Resources

Designated Surface and Groundwater Source Water Protection Zones

WR-LN-05

Lease Notice: Development in designated surface and groundwater source water protection zones for public water supplies will require a plan that addresses drinking water sources. Mitigation measures that will be considered for inclusion in drinking water plans include, but are not limited to, the following: notification to the public water supply operator of the proposed development; use of closed loop drilling; pit lining requirements if pits are used; an emergency response program; and collection of baseline and long-term water quality data.

Area: Designated surface and groundwater source water protection zones for public water supplies within the White River Field Office

5.3 Special Status Species

Endangered Species Act Section 7 Consultation

WR-LN-06

Lease Notice: The lease may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The 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. 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 Endangered Species Act, as amended,

16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

Area: White River Field Office

Potential Habitat Federally Listed Plants

WR-LN-07

Lease Notice: The lease contains potential and/or critical habitat for federally listed, proposed, and candidate plant species. Special status plant species inventories must be conducted by a qualified botanist prior to approving any surface disturbing activities in potential habitat. Surface occupancy is generally not permitted in areas within 660 feet of occupied and suitable habitat for federally listed, proposed, and candidate plant species, including any new habitat mapped as a result of future surveys. Conditions of approval identified through an environmental analysis as appropriate to mitigate impacts to federally listed, proposed, and candidate species and associated habitat will be applied to land use authorizations, permits, and leases that fall within the plant consideration area (e.g., 1,970 feet of the affected plant species) or critical habitat. Possible mitigation strategies may include, but are not limited to:

- 1) Restricting development within 330 feet of occupied habitat;
- 2) Adjusting the location of the disturbance to be at least 660 feet from the edge of occupied or suitable habitat and ideally outside of the plant consideration area;
- 3) Minimizing the area of disturbance;
- 4) The use of dust abatement measures;
- 5) Using signs, fencing, and other deterrents to reduce possible human disturbance;
- 6) Requiring construction to occur outside of the blooming season (i.e., construction could occur September through March), involving possibly delaying the project by more than 60 days;
- 7) Requiring specialized reclamation procedures (e.g., separating soil and subsoil layers with barriers to reclaim in the correct order and additional emphasis on forbs in seed mixes to promote pollinator habitat);
- 8) Long term monitoring of the species and/or habitat;
- 9) Using a qualified, independent third-party contractor to provide general oversight and assure compliance with project terms and conditions;
- 10) Non-native or invasive species monitoring and control. These measures may also be applied to projects near suitable habitat that may hold special value or to provide protection to suitable habitat that may allow for species' expansion; and/or
- 11) Consideration of off-site mitigation such as conservation easements or mitigation banking to offset impacts to occupied plant populations, adequate funding of research, or habitat protection/improvement projects.

Area: 91,400 acres.

Sage-Grouse Habitat Features

WR-LN-08

Lease Notice: The BLM may impose management actions that mimic lease stipulations (i.e., > 660-foot moves, >60-day deferrals) on sage-grouse habitat features that are variable through time (e.g., leks), and/or may undergo distributional shifts through time (e.g., expansion onto restored ranges).

Area: Suitable sage-grouse habitat within the White River Field Office

Prairie Dog Towns

WR-LN-09

Lease Notice: Lands within this lease parcel involve prairie dog ecosystems that constitute potential habitat for wild or reintroduced populations of the federally endangered black-footed ferret. Conservation and recovery efforts for the black-footed ferret are authorized by the Endangered Species Act of 1973 (as amended). The successful lessee may be required to perform special conservation measures prior to and during lease development. These measures may include one or more of the following:

- 1) Participating in the preparation of a surface use plan of operations with BLM, FWS, and CPW, which will be expected to integrate and coordinate long term lease development with measures necessary to minimize adverse impacts to black-footed ferrets or their habitat;
- 2) Abiding by special daily and seasonal activity restrictions on construction, drilling, product transport, and service activities;
- 3) Incorporating special modifications to facility siting, design, construction, and operation; and/or
- 4) Providing in-kind compensation for habitat loss and/or displacement (e.g., special on-site rehabilitation/revegetation measures or off-site habitat enhancement).

Area: Mapped Prairie Dog Towns

5.4 Wild Horse Herd Management Area

Wild Horse Habitat

WR-LN-10

Lease Notice: This lease parcel encompasses a portion of a wild horse herd management area (HMA). In order to protect wild horses within this area, intensive development activities may be delayed for a specified 60-day period within the spring foaling period between March 1 and June 15.

The lessee may be required to perform special conservation measures within the wild horse management area including:

- 1) Habitat improvement projects within the HMA in areas adjacent to development if such development displaces wild horses from crucial habitat;
- 2) Disturbed watering areas will be replaced with an equal source of water, having equal utility; and/or
- 3) Activity/improvements will provide for unrestricted movement of wild horses between summer and winter ranges.

Area: Herd Management Area

5.5 Cultural Resources

Cultural Resources

WR-LN-11

Lease Notice: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such

properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Area: White River Field Office

5.6 Paleontological Resources

Paleontological Values

WR-LN-12

Lease Notice: An on-the-ground survey will be required prior to approval of any surface disturbing activities to avoid resource bearing strata for PFYC Class 4 and 5 formations. Mitigation may be required upon the discovery of any vertebrate fossil or other scientifically-important paleontological resource. Mitigation of scientifically important paleontological resources may include avoidance, monitoring, collection, excavation, or sampling. Mitigation of discovered scientifically important paleontological resources might require the relocation of the disturbance over 330 feet. This and any subsequent mitigation work shall be conducted by a BLM-permitted paleontologist. The lessee shall bear all costs for inventory and mitigation (WO IM-2009-011). Exceptions to the survey requirement in these areas could be granted in areas having vertical to near vertical (i.e., unsafe) slopes, areas of soil development, and areas covered with much vegetation, as these areas will be unlikely to produce recoverable fossils. For larger projects, an on-the-ground survey sample may be required of some likely fossiliferous PFYC Class 3 areas.

Area: Currently, there are no identified PFYC Class 4 formations within the WRFO. The following formations are listed as PFYC Class 5: Morrison, Wasatch, Chinle, Glen Canyon, Mowry Shale, Parachute Creek and Douglas Creek Members of the Green River Formation, Browns Park Formation, Williams Fork Formation, Iles Formation, Mesaverde Group, and Uinta Formation. Formations or members of formations could be added or removed from this list as additional data become available.

5.7 Lands and Realty

Rio Blanco Test Site

WR-LN-13

Lease Notice: Public Land Order No. 7582, Withdrawal of Public Land and Reserved Federal Mineral Interest for the Rio Blanco Project Site; Colorado; in Federal Register Volume 68, Issue 181, published on September 18, 2003 (68 FR 54739). This order withdraws 200 acres of public land from surface entry and mining and 160 acres of reserved Federal mineral interest from mining for the Department of Energy (DOE) for a 50-year period to protect the public from subsurface contamination at the Rio Blanco Project Site. The land remains open to mineral leasing subject to approval by the DOE. To maintain protectiveness of the original detonation site and the immediate surrounding area and to protect human health and the environment from the contamination left in place, caution and consultation is required. For pre-existing interests, DOE recommends consultation prior to any construction or intrusion in the withdrawal area. Further, new leases or interests will require written permission from DOE, in the withdrawn area of sections 10, 11, 14, and 15, Township 3 South, Range 98 West of the 6th Principal Meridian and will require written permission from DOE to construct permanent structures on the surface withdrawal area.

Any wells within two miles of the Rio Blanco Project Site will be subject to oversight measures established by the Colorado Oil and Gas Conservation Commission. Any such wells will also be reviewed by the Department of Energy for possible inclusion into DOE's regular monitoring program.

5.8 Lease Notices Exclusive to the Dinosaur Trail MLP

Dinosaur Trail Master Leasing Plan

WR-LN-14

Lease Notice: The lessee is hereby notified that special design and construction measures may be required in order to minimize the impacts of drilling and producing operations within the Dinosaur Trail Master Leasing Plan area. This parcel is located within the Dinosaur Trail MLP. Additional analysis and mitigation may be required to address impacts to important resources and special areas including Areas of Critical Environmental Concern, Wilderness Study Areas, and Dinosaur National Monument. Specific resource protection measures will be evaluated when an operator submits a plan of development or site-specific proposal.

Harpers Corner Road

WR-LN-15

Lease Notice: Federal regulations prohibit the use of commercial vehicles on National Park Service roads, which may have implications for leases located near Harpers Corner Road. The Harpers Corner Road has never been engineered and is only a double layer of chip seal. If the National Park Service issued commercial permits for use of the road, those permits will reflect considerably lower weight loads than regular state roads.

§36 CFR 5.6 Commercial vehicles.

- (a) The term "Commercial vehicle" as used in this section shall include, but not be limited to trucks, station wagons, pickups, passenger cars or other vehicles when used in transporting movable property for a fee or profit, either as a direct charge to another person, or otherwise, or used as an incident to providing services to another person, or used in connection with any business.
- (b) The use of government roads within park areas by commercial vehicles, when such use is in no way connected with the operation of the park area, is prohibited, except that in emergencies the Superintendent may grant permission to use park roads.
- (c) The Superintendent shall issue permits for commercial vehicles used on park area roads when such use is necessary for access to private lands situated within or adjacent to the park area, to which access is otherwise not available.

Area: Harpers Corner Road

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Appendix 2

Best Management Practices and Conditions of Approval



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Appendix 2

Best Management Practices and/or Conditions of Approval

1.0 Introduction

Best management practices (BMPs) are land and resource management techniques designed to maximize beneficial results and minimize negative impacts of management actions. Best management practices are applied as Conditions of Approval (COA) or may be selected by an applicant and incorporated into their request for authorization approvals. The Bureau of Land Management (BLM) describes BMPs as “state-of-the-art mitigation measures applied to oil and natural gas drilling and production to help ensure that energy development is conducted in an environmentally responsible manner.” The objective of BMPs is to protect wildlife, air quality, landscapes and other natural resources as domestic energy sources are developed. Numerous oil and gas operators have developed and used BMPs. Best management practices are not "one size fits all." The actual practices and mitigation measures best for a particular site are evaluated through the National Environmental Policy Act (NEPA) process and vary to accommodate unique, site-specific conditions and local resource conditions. Selection and implementation of any BMPs will be evaluated against the Colorado Public Land Health Standards (BLM, 1997b) to ensure progress toward public land health attainment. Best management practices include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. Best management practices can be applied before, during, and after pollution-producing or surface-disturbing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 Code of Federal Regulation 130.2(m), U.S. Environmental Protection Agency [EPA] Water Quality Standards Regulation) or to prevent unnecessary or undue degradation of resources.

Best Management Practices are identified as part of the NEPA process, with interdisciplinary involvement. Because the control of nonpoint sources of pollution and prevention of damage to other resources is an ongoing process, continual refinement of BMP design is necessary. This process can be described in five steps, which are:

- 1) Selection of design of a specific BMP;
- 2) Application of BMP;
- 3) Monitoring;
- 4) Evaluation; and
- 5) Feedback.

Data gathered through monitoring is evaluated and used to identify changes needed in BMP design, application, or in the monitoring program. For oil and gas operations, sundry notices will be used to convey BLM’s written approval for changes to operations and/or BMP’s.

Best Management Practices described in this attachment are a compilation of existing policies and guidelines and commonly employed practices designed to assist in achieving the objectives for maintaining or minimizing water quality degradation from nonpoint sources; preventing the loss of

soil productivity; providing guidelines for aesthetic conditions within watersheds; and mitigating impacts to a particular resource (e.g., soil, vegetation, or wildlife habitat) from surface-disturbing activities. Best management practices are selected and implemented as necessary, based on site-specific conditions, to meet a variety of resource objectives for specific management actions. The oil and gas industry and the BLM are constantly developing and improving BMPs. Adjustments to BMPs are made as necessary to ensure that RMPA goals and objectives are being met as well as to conform to changes in oil and gas development strategies, the BLM regulations, policy, and direction, or new scientific information. Therefore, this document does not provide an exhaustive list of BMPs, additional BMPs or modifications may be identified to minimize the potential for negative impacts when evaluating site-specific management actions through an interdisciplinary process.

In addition, implementation and effectiveness of BMPs need to be monitored to determine whether the practices are achieving resource objectives and accomplishing desired goals. Adjustments will be made as necessary.

Each of the following BMPs are a part of the coordinated development of the White River Field Office (WRFO) Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (RMPA/EIS) for Oil and Gas Development, and may be updated as new information becomes available to ensure objectives are met and to conform with changes in the BLM regulations, policy, direction, or new scientific information. Applicants may suggest alternative procedures that could accomplish the same or improved results. These guidelines will apply, where appropriate, to all use authorizations, including BLM-initiated projects. Any BMP listed may be used in any program wherever it may be effective. Other sources for information on BMPs is the publication *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (commonly referred to as *The Gold Book*) which was developed to assist operators on the requirements for obtaining permit approval and conducting environmentally responsible oil and gas operations on Federal lands.

Planning criteria were established to provide focus for data collection efforts, achieve compliance with legal mandates, and facilitate decision making. General and specific criteria that pertain to the RMPA/EIS are described in Chapter 1 of the Draft RMPA/EIS.

2.0 Physical Resources

2.1 Air Resources

The operator/holder will limit unnecessary emissions from point or nonpoint pollution sources and prevent air quality deterioration from necessary pollution sources in accordance with all applicable Federal, State, and local air quality laws and regulations.

The operator/holder will limit air pollutant emissions in accordance with management actions established in Chapter 2 and Appendix 5, Table 1 in the ROD and Approved RMPA.

Dust abatement is required for all access routes and pipeline ROWs (treated with water and/or a BLM-approved chemical dust suppressant) during construction and drilling activities so that there is not a visible dust plume behind vehicles. All vehicles will abide by company or public speed restrictions during all activities. If water is used as a dust suppressant, there should be no traces of oil or solvents in the water and it should be properly permitted for this use by the State of Colorado. Chemicals and/or treated produced water used as dust suppressants will require prior written approval by the Authorized Officer. Only water needed for abating dust will be applied; dust abatement will not be used as a water disposal option under any circumstances.

In the Mesaverde Play Area, proper road design, construction, and surfacing on resource roads (see BLM Manual 9113-Roads) would be required to achieve at least 80 percent reduction from uncontrolled fugitive dust emissions (using a combination of chemical suppression, watering, or other control measures). Resource roads in planning units other than the Mesaverde Play Area would be required to achieve at least 50 percent fugitive dust control effectiveness.

2.2 Soil Resources

Disturbance across unstable or fragile soils would be allowed only after all other options have been exhausted, and the WRFO Authorized Officer has approved an engineered construction and reclamation plan for the proposed location.

Oil and gas activities in areas exhibiting accelerated soil erosion or degraded soil conditions would be allowed only after all other options have been exhausted, and the WRFO Authorized Officer has approved an engineered construction and reclamation plan for the proposed location.

Erosion features (e.g., rilling, gulying, piping, or mass wasting) that are the result of the Proposed Action and are located either on or adjacent to the surface disturbance will be addressed immediately after observation by contacting the Natural Resource Specialist/Realty Specialist and by submitting a plan to assure successful soil stabilization with BMPs to address erosion problems

Soil storage areas will be clearly marked to restrict vehicle and equipment use. Metal fence posts, construction fencing, construction barriers or other physical barriers will be placed at regular intervals between the working surfaces and soil storage areas when necessary.

No slopes planned for revegetation will be steeper than a 3(horizontal):1(vertical) slope before topsoil is placed. After spreading topsoil and seeding, the operator/holder will spread stored woody debris, hydromulch the location, or crimp in straw to stabilize the soil surface in seeded areas.

If salt is observed on the surface of soils during reclamation activities the Natural Resource Specialist/Realty Specialist will be notified and a plan will be developed with approval of the AO to improve reclamation on the site.

Construct sediment barriers when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Employ straining or filtration mechanisms as needed for the removal of sediment from runoff.

2.3 Water Resources

Any stormwater management BMPs that would result in additional surface disturbance beyond what is shown in the diagrams for the project must be submitted via Sundry Notice and approved by the AO before installation.

Surface casing will be set to a depth below all potential sources of usable or potable drinking water. All surface casing will be cemented from total depth back to surface. In the event surface casing cannot be set to this depth, the subsequent casing string will be cemented from its total depth to at least 100 feet above the surface casing shoe. In the event surface casing cementing does not reach the surface, that casing will be remedially cemented by squeeze or top cementing as approved by the AO.

Operators would construct reserve pits with 2 feet of freeboard in cut areas or in compacted and stabilized fill. Reserve pits would not be located in areas in which groundwater is less than 50 feet from the surface. A closed system would be required if water shows in the conductor hole.

To ensure the timely review of the water quality data, the operator is required to have a BLM approved firm contracted to conduct water samples and to send a copy of water quality test results to the BLM WRFO at the same time that they are sent to the operator.

Pursuant to Onshore Order No. 7, a permanent disposal method for produced water must be approved by the BLM and in operation, 90-days after well completion. The reserve pit may not be used for produced water disposal after these 90-days except with prior written permission of the BLM AO.

Prior to starting drilling operations, the operator will submit a Sundry Notice describing the point(s) of diversion for industrial water rights used for freshwater supply and the backflow preventer or other method used to protect water quality at the diversion site.

3.0 Biological Resources

3.1 Vegetation Communities

General

All disturbed areas will be promptly seeded (at the first appropriate seeding window) with an approved or a recommended seed mix. The elevation and vegetation community for this location are: *<insert appropriate vegetation community and elevation>*. The site will be seeded in accordance with the WRFO Surface Reclamation Plan (see Appendix 3 in the ROD and Approved RMPA). If an alternate date of seeding is requested, contact the designated Natural Resource Specialist/Realty Specialist prior to seeding for approval. Seed mixture rates are Pure Live Seed (PLS) pounds per acre. Drill seeding is the preferred method of application and drill seeding depth will be no greater than ½ inch. If drill seeding cannot be accomplished, seed should be broadcast at double the rate used for drill seeding, and harrowed or raked into the soil.

Use seed that is certified and free of noxious weeds. All seed tags will be submitted via Sundry Notice (SN)/*<letter for Realty>* to the designated Natural Resource Specialist/Realty Specialist within 14 calendar days from the time the seeding activities have ended. The notification will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor). In addition, the notification will include the well or well pad number or right of way case file number associated with the seeding activity, if applicable, the name of the contractor that performed the work, his or her phone number, the method used to apply the seed (e.g., broadcast, hydro-seeded, drilled), whether the seeding activity represents interim or final reclamation, the total acres seeded, an attached map that clearly identifies all disturbed areas that were seeded, and the date the seed was applied.

The operator/holder will be required to meet with the WRFO reclamation staff in March or April of each calendar year and present a comprehensive work plan. The purpose of the plan is to provide information pertaining to reclamation activities that are expected to occur during the current growing season. Operators/holders will also provide a map that shows all reclamation sites where some form of reclamation activity is expected to occur during the current growing season.

A Reclamation Status Report will be submitted to the WRFO annually according to the WRFO Surface Reclamation Plan (see Appendix 3 in the ROD and Approved RMPA) for all actions that require disturbance of surface soils on BLM administered lands.

Consult the BLM Integrated Vegetation Management Handbook H-1740-2 to reach BLM objectives of maintaining and restoring native plant community diversity, resiliency, and productivity (BLM 2008). This handbook addresses renewable resource management and provides BMPs that can be used for energy development related projects.

Noxious and Invasive Weeds

All weed management proposals will be developed within an Integrated Pest Management format that is consistent with the current WRFO Integrated Weed Management Plan.

Herbicide Application

Application of herbicides will comply with the WRFO Integrated Weed Management Plan.

Pesticide Use Proposals (PUPs) will be submitted to and approved by the BLM before applying herbicides on BLM lands. The PUP will include target weed species, the herbicides to be used, application rates and timeframes, estimated acres to be treated, as well as maps depicting the areas to be treated and known locations of weeds.

Application of herbicides must be under field supervision of an EPA-certified pesticide applicator. Herbicides must be registered by the EPA and application proposals must be approved by the BLM.

Use of off-highway vehicles (OHVs) for access to weed treatment areas along the pipeline/power line ROW will be considered on a case-by-case basis, provided that access is limited and will not create visible tracks, and will require prior written approval from the AO.

3.2 Fish and Wildlife Resources

Surface disturbance and vegetation clearing associated with project construction should generally be located to avoid vegetative types in most limited supply, those less conducive to successful reclamation, or those representing greater site-specific value for wildlife, as determined during the NEPA process. Examples of these vegetative types are juniper stands in a predominant sagebrush type, sagebrush in a predominant woodland type, mature tree stands rather than younger growth, and woodlands with well-developed understory rather than with barren understory.

Vehicular access by the public on important wildlife habitats and/or during sensitive functional use periods (e.g., big game severe winter range, critical summer use areas, raptor nesting areas, sage grouse reproductive habitats) would be subject to restrictions as directed by the Area Manager. Use of restricted road segments by authorized personnel (e.g., BLM personnel, law enforcement, permitted land users) may be allowed for administrative and operational purposes. Methods used to restrict vehicular access may include:

- Installing lockable gates, barricades or other forms of deterrents;
- Signing, or reclaiming and abandoning roads or trails no longer necessary for management; and/or
- Other methods prescribed by the Field Manager.

Woodland treatments will be designed and located where possible to replicate natural patterns of forest succession and distribution. Efforts will be made to minimize community fragmentation, including structural and age class components. In general, no point within a cleared opening will be more than 200 yards from equal or greater intervals of cover.

Power lines will be constructed in accordance with most current avian protection standards, for example, those designs presented in "Suggested Practices for Avian Protection on Power Lines, The State of the Art in 2006", Avian Power Line Interaction Committee, Edison Electric Institute and California Energy Commission (2006) (www.aplic.org). The holder will assume the burden and expense of proving that pole designs deviating from those shown in the above publication provide effective electrocution and line-strike protection for birds. Such proof will be provided by a subject-

matter expert approved by the AO. The BLM reserves the right to require modifications or additions to all power line structures placed on this ROW, should they be necessary to ensure the safety of large birds. Such modifications and/or additions will be made by the holder without liability or expense to the United States.

Encourage oil and gas operators to develop Avian Protection Plans that are similar to those voluntary partnerships formed between the utility industry and FWS to identify and implement practices that reduce the risk of bird mortality and the operators' liability under the Migratory Bird Treaty Act.

A raptor nest survey will be required in habitats potentially influenced by the Proposed Action, including suitable woodland habitat within [990] feet of project-related disturbance, and suitable cliff/rock outcrops within [1,320] feet of project-related disturbance. Surveys must be consistent with the most current WRFO raptor survey protocol (available upon request) and survey results must be analyzed by the WRFO prior to project initiation. Depending on specific project circumstances and nest status, nest sites documented through these surveys would be subject to siting constraints and timing limitations.

In areas under an existing lease, a program would be developed in cooperation with current leaseholders, to apply (where appropriate) the most current reclamation standards and practices to existing well pads, roads, and pipelines. These standards and practices would be applied in annual increments that would allow for completed interim or final reclamation of active and inactive ROW corridors and producing, plugged, and abandoned wells and access routes within 20 years. This action would be most relevant to the Douglas/Evacuation Creek, Coal Oil Basin, Indian Valley, Crooked Wash, and White River Dome areas.

Avoid subjecting sage-grouse priority and, where appropriate, general habitat to development-related noise that exceeds ambient predisturbance levels by 10 dBA or more (based on default background levels of 20-22 dBA). In those instances where avoidance is not possible, minimize the noise levels and/or area affected by noise to the extent practicable, particularly from vehicle traffic, during the lekking and nesting seasons (March 1- May 15). These noise levels should not be exceeded at the margin of active leks and, where reoccupation is being promoted, inactive leks. Noise measurement protocols should be based on guidelines presented in Patricelli et al. (2012).

Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.

Restrict the construction of tall facilities, distribution powerlines, and fences to the minimum number and amount needed.

Design or site permanent structures to minimize impacts to sage-grouse, with emphasis on locating and operating facilities that create movement (e.g., pump jacks) or attract frequent human use and vehicular traffic (e.g., fluid storage tanks), in a manner to minimize disturbance of sage-grouse or interference with habitat use.

As a means of reducing the risk of physical disruption and sediment-related effects on fish reproduction and spawning habitat (e.g., smothering of eggs, fungal exposure), timing limitations will be applied, as appropriate, to authorizations that involve channel feature disturbances or sediment release to occupied habitats during species-specific incubation timeframes recommended by CPW, as follows:

Appendix 2 – Best Management Practices and Conditions of Approval

Species	Avoidance period
Bluehead sucker	May 1 – July 31
Roundtail chub	May 1 – July 31
Flannelmouth sucker	March 15 – July 1
Mountain sucker	May 15 – July 31
Colorado River cutthroat trout	June 1 – September 1
Rainbow/brook/brown trout, mountain whitefish	Applicable to White River upstream of Rio Blanco Lake. Timeframes negotiated in coordination with CPW.

To reduce the risk of inadvertent introduction and contamination of area streams with invasive aquatic plants and animals and aquatic pathogens/parasites, any equipment to be used in contact with waters that contribute to or directly involve occupied aquatic habitats must comply with the most current disinfection practices endorsed by CPW. The most current practices provided by CPW at this time follow:

Heavy equipment (e.g., excavation, construction, and water transport equipment), hand tools, boots, water suction hoses, water tanks or other equipment that was previously used in a river, stream, lake, pond, or wetland must be cleaned and disinfected prior to the equipment being moved to and contacting other water bodies. The disinfection practice should follow these guidelines:

- Remove all mud and debris from equipment (e.g., tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with a 1:15 solution of disinfecting solution comprised of the following:
 - Dialkyl dimethyl ammonium chloride (5-10% by weight);
 - Alkyl dimethyl benzyl ammonium chloride (5-10% by weight);
 - Nonyl phenol ethoxylate (5-10% by weight);
 - Sodium sesquicarbonate (1-5%);
 - Ethyl alcohol (1-5%);
 - Tetrasodium ethylene diaminetetraacetate, 1-5%; and
 - Water.
- The equipment must be kept moist with this solution for at least 10 minutes. Manage and dispose of the rinsate as a solid waste in accordance with local, county, state, or federal regulations;

Or

- Remove all mud and debris from equipment and spray/soak equipment with water greater than 140 degrees F for at least 10 minutes.

3.3 Special Status Species – Plants

Prior to approving surface-disturbing or potentially impacting activities within known (occupied), suitable, or potential habitat for federal listed, proposed, candidate species, and BLM sensitive species a plant inventory conducted by a qualified botanist and an environmental analysis would be required for the Proposed Action. Based on the results of the plant survey, Section 7 consultation with FWS may be necessary, and appropriate conservation measures may be required to avoid or minimize impacts on federally listed species.

Field botanical surveys for special status plants should be completed within a distance specified by BLM around the project disturbance area. In some cases the topographic setting or land ownership patterns may impede covering the full recommended survey area. Field botanical surveys should be conducted at a time when the plant species of concern can be detected and accurately identified. In some cases multi-year surveys are necessary. For example, in dry years some ephemeral annuals may not germinate and produce plants, but they are still present at the site in the seed bank. Surveys should also include areas where direct or indirect effects may impact hydrology. Surveys should be floristic and provide complete GIS data and all data collected should correspond with the Colorado Natural Heritage Program field data forms. Negative survey data should also be reported. Botanical surveys are considered valid for three years (i.e., growing seasons).

Maintenance of existing and planned roads and/or rights-of-way within occupied and/or suitable habitat for federally listed, proposed, and candidate species would be limited to the existing disturbance; maintenance would be performed in accordance with specifications provided by the BLM during site specific environmental analysis. Maintenance of county roads as a result of oil and gas development within these same specified plant habitats will be performed in communication and coordination with the respective county's road and bridge department and the BLM.

Non-native or invasive species monitoring and control will follow the most current WRFO Integrated Weed Management Plan (IWMP) which has BMPs related to monitoring and controlling weeds near special status plant species habitat.

Intensive control of fugitive dust within 330 feet from edge of occupied, suitable, and/or potential special status plant species (federally listed species, proposed species and candidate species) habitat would be achieved using the BLM approved dust suppression methods (preferably water) to be determined on a case by case basis. The goal of this measure would be to reduce and control the dust plumes created during construction, drilling and well completion, and maintenance stages of a project.

Prevent plumes of dust and particulate matter from impacting plants of concern. While new roads should not be built within 660 feet of the plants of concern, preexisting roads with an expected increase in traffic should be graveled in these areas. The operator is encouraged to apply water for dust abatement to such areas during the flowering period. If possible, dust abatement applications should be comprised of water only, with minimal use of chemical dust suppressants.

Where avoidance is not feasible and development is allowed within 660 feet of plant populations, impacts to the plants of concern can be reduced by placing temporary fencing or other barriers around the footprint of the project so that vehicles don't go any further than needed and the sensitive habitat is avoided as much as possible. To avoid working in rare plant habitat and drawing attention to the plants, the edge of disturbance should be fenced, not the nearby plant population. Communication of the importance of rare plant habitat protection with those working on the project is vital to the success of fencing or barriers.

Ex-situ techniques such as transplanting are not recommended. However, an operator could support research to investigate the long-term feasibility of transplanting. If transplanting efforts are undertaken to the following efforts are minimally needed to develop new population:

- Consider the genetic effects of moving the species around on the landscape (genetic research may be needed);
- Research and identify the best germination and transplanting techniques;
- Ensure enough individuals are established to ensure long-term success; and
- Include long-term monitoring (at least 20 years).

Construction should take place down slope of plants of concern where feasible. Down slope ground disturbing activities should be conducted in such a way as to avoid as much as is reasonably possible undercutting and sloughing of the slopes where rare plant habitat occurs. If well pads and roads must be sited upslope, buffers of 660 feet minimum between surface disturbances and plants of concern should be incorporated.

Perform frequent and timely inspections of development sites and plants of concern occurrences to ensure that BMPs are being followed, and to identify areas of potential conflict. Inspections of plant occurrences should be performed by a botanist or other qualified personnel.

The operator will appoint a qualified, Independent Third-Party Contractor (Contractor) to provide general project oversight, assure compliance with the terms and conditions of the approval, and perform monitoring. The Contractor will be present during all surface disturbing operations that occur until reclamation is completed. Prior to the initiation of construction, pre-work meetings will be held between the BLM, the operator, and the Contractor to discuss required procedures associated with the conditions of approval.

All vegetation within a specified proximity of ROW corridors will be brush-hogged and left in place. The maximum allowable roadside disturbance in ACECs is brush hogging the ROW.

Any authorized use of padding machines to lay pipe within a ROW corridor that is within proximity of special status plant habitat, will include the use of necessary apparatus to prevent the generation of fugitive dust and methods to prevent topsoils from percolating through large diameter spoils (see Appendix 3 Section 6.2 in the ROD and Approved RMPA).

Any contractor or agent hauling earthen material, in association with a project near special status plant species, will cover all of their loads.

4.0 Wild Horse Management

Should the Proposed Action occur simultaneously with a wild horse gather, all project-related traffic, including helicopters, would need to be coordinated with the BLM and the gather contractor.

To minimize incidents where young foals become separated from their mares, helicopters should avoid flights over wild horses observed in the area. Drilling and receiving crews are required to slow down or stop when wild horses are encountered, allowing bands to move away at a pace slow enough so that foals can keep pace and are not separated.

A “horseproof” cattle guard will be installed and maintained at the following locations: [describe location or give legal description]. To reduce the potential for injuries to wild horses, sucker rod or

rebar should be tack welded (centered between the equally spaced rails) to each cross member for the entire length and width of the cattle guard. “Horseproof” cattle guards will be painted a dark color to help with snow melt.

In wild horse use areas, open trenches for burial of gathering pipelines should be inspected daily to reduce the potential for horses to become trapped should they fall into a trench. If a horse has fallen into the trench the BLM Range Staff will be notified immediately.

No motorized or surface-disturbing activities would be permitted within a 2,000-foot radius around water sources in the Piceance-East Douglas Herd Management Area.

5.0 Wildland Fire Ecology and Management

When working on lands administered by the BLM WRFO, notify Craig Interagency Dispatch (970-826-5037) in the event of any fire.

- 6) The reporting party will inform the dispatch center of fire location, size, status, smoke color, aspect, fuel type, and provide their contact information.
- 7) The reporting party, or a representative thereof, should remain nearby, in a safe location, in order to make contact with incoming fire resources to expedite actions taken towards an appropriate management response.
- 8) The applicant and contractors will not engage in any fire suppression activities outside the approved project area. Accidental ignitions caused by activities such as welding, cutting, grinding, will be suppressed by the applicant only if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If chemical fire extinguishers are used the applicant must notify incoming fire resources on extinguisher type and the location of use.
- 9) Natural ignitions caused by lightning will be managed by Federal fire personnel. If a natural ignition occurs within the approved project area, the fire may be initially contained by the applicant only if employee safety is not endangered. The use of heavy equipment for fire suppression is prohibited, unless authorized by the Field Manager.

6.0 Heritage Resources

6.1 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 Authorized Officer. 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 the BLM determines a treatment approach, and the treatment is completed. Unless previously determined in treatment plans or agreements, the 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 Authorized Officer (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), 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.

Any new surface disturbance within the Canyon Pintado NHD would be required to be monitored by an approved and qualified archaeologist under the following conditions:

- Activity occurs in the vicinity of known resources.
- Activity occurs in the alluvial bottoms along Douglas Creek and its tributaries.
- Activity occurs in deep alluvial soils.

The operator/holder applicant assumes responsibility for the integrity of site [insert number] for the duration of the life or operation of [insert project/well pad name/number]. This includes, but is not be limited to, having an approved archaeological consultant conduct yearly monitoring of site [insert number] as well as any stabilization or data recovery necessitated by site degradation, whether resulting from construction and operation of [insert project/well pad name/number], vandalism, erosion, or any other cause.

6.2 Paleontological Resources

Any excavations into the underlying native sedimentary rock must be monitored by a permitted paleontologist. The monitoring paleontologist must be present before the start of excavations that may impact bedrock.

The operator/holder/applicant is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for disturbing or collecting vertebrate fossils, collecting large amounts of petrified wood (over 25 lbs./day, up to 250 lbs./year), or collecting fossils for commercial purposes on public lands.

If any paleontological resources are discovered as a result of operations under this authorization, the operator/holder or any of his agents must stop work immediately at that site, immediately contact the BLM Paleontology Coordinator, and make every effort to protect the site from further impacts, including looting, erosion, or other human or natural damage. Work may not resume at that location until approved by the AO. The BLM or designated paleontologist will evaluate the discovery and take action to protect or remove the resource within 10 working days. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (a) following the Paleontology Coordinators instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (b) following the Paleontology Coordinators instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

6.3 Visual Resources

All above ground facilities will be painted to blend in with the surrounding environment. The chosen paint color will be selected from the BLM Standard Environmental Color Chart in consultation with the BLM Visual Resource Specialist.

In areas of high visual sensitivity, the use of digital camouflage painting of above ground facilities, in consultation with the BLM Visual Resource Specialist, may be required.

In consultation with the BLM Visual Resource Specialist, the site design (including above ground facilities) will be integrated with the surrounding landscape in such a way that minimizes visual contrast. This may include the use of vegetative and topographic screening, vegetation preservation, proper siting, minimize hill cuts, minimize the number of facility structures, utilization of low profile tanks, and using existing disturbance where practical.

Other best management practice design features that may be applied to reduce contrast, mitigate impacts to visual resources values, and/or meet visual resource management objectives include but are not limited to:

- Avoiding siting linear features in the centers of valley bottoms and on ridge tops;
- Bury underground utilities along roads;
- Use round road cut slopes;
- Use of non-reflective materials, coatings, paint, or surface treatments to reduce contrast with surrounding landscapes;
- Use of full cutoff luminaries;
- Use amber instead of bluish-white lighting;
- Use vehicle mounted lights for nighttime maintenance activities instead of permanent lighting structures;
- Do not allow applying paints or permanent discoloring agents to rocks or vegetation for survey markers;
- Dust, sediment, and wind erosion control;
- Feather the edges of vegetation clearings;
- Design vegetation openings to mimic natural openings;
- Re-vegetate using salvaged or transplanted vegetation;
- Salvage and replace rocks, brush, and woody debris, sculpt or re-shape bedrock landforms;
- Remove or bury gravel or other surfaces; and
- Use fabric covered fences to conceal storage yards.

7.0 Resources Uses

7.1 Forest Products

All trees removed in the process of construction will be purchased from the BLM. Trees should first be used in reclamation efforts and then any excess material made available for firewood or other uses.

- 1) Woody materials required for reclamation will be removed in whole with limbs intact and will be stockpiled along the margins of the authorized use area separate from the topsoil piles. Once the disturbance has been recontoured and reseeded, stockpiled woody material will be scattered across the reclaimed area where the material originated. Redistribution of woody debris will not exceed 20 percent ground cover. Limbed material will be scattered across reclaimed areas in a

manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. Woody material will be distributed in such a way to avoid large concentrations of heavy fuels and to effectively deter vehicle use.

- 2) Trees that must be removed for construction and are not required for reclamation will be cut down to a stump height of 6 inches or less prior to other heavy equipment operation. These trees will be cut in four foot lengths (down to 4 inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal for company use or removal by the public.

7.2 Livestock Grazing Management

The operator must coordinate with the livestock grazing permittee (enter name) authorized to graze livestock within the project area a minimum of 72 hours prior to construction activities associated with this permit. Livestock grazing permittee contact information may be found at www.blm.gov/ras/ or by contacting the WRFO Range staff (970-878-3800). The operator will provide the grazing permittee the location, nature, and extent of the anticipated activity being completed.

Any range improvement projects such as fences, water developments, cattleguards, gates, or other livestock handling/distribution facilities that are damaged or destroyed either directly or indirectly as a result of implementation of the Proposed Action will be promptly (at least prior to the livestock grazing permittee's need to utilize the range improvement) be repaired or replaced by the operator to restore it to at least its pre-disturbance functionality. If the operator damages any range improvement project(s) the operator will notify the Authorized Officer through sundry notice (Form 3160-5) and identify the actions taken to repair the feature(s).

All range improvements (e.g., stock water tanks, pipelines, corrals) would be avoided by 500 feet unless no other alternative is available and impacts can be mitigated as per the BLM AO.

Coordinate with livestock operators and/or the BLM Range staff to identify and develop mutually beneficial livestock management project proposals to include for analysis with development proposals. Some examples are vegetation treatment projects, water developments, maintenance of range projects, etc., to benefit reclamation success while improving livestock management.

When industrial use dominates an allotment to the point of making it unsuitable for livestock grazing, the BLM would consider granting special non-use so that livestock could be removed without penalty for a specified amount of time.

Where development is intense, operators would identify an employee to coordinate with grazing permittees on these issues.

Pipeline projects would be conducted to allow natural movement of livestock through the project area. Operator provided plans would identify appropriate methods (e.g., gaps in trenching) to accomplish this the project would be completed while livestock are not/will not be in the project area.

Facilities that could be hazardous to livestock would be fenced to keep livestock out and the fences maintained in functioning condition.

Compensation would be provided by operators for cattle lost to oil and gas activities (e.g., deaths from pits and animals struck on roads). This would be addressed in the same manner as a road maintenance agreement, with operators making payment based on their level of activity, not on the

proximity to the dead animal except in cases where the specific operator causing the loss of cattle can be identified and an agreement reached between that operator and the owner of the livestock.

7.3 Minerals

7.3.1 Geophysical

In general, the BLM requires an examination of resource values and development of appropriate surface protection and reclamation measures. The BLM uses Manual 3150 (Onshore Oil and Gas Geophysical Exploration Surface Management Requirements) and Manual 3150-1 (Onshore Oil and Gas Geophysical Exploration Surface Management Requirements [Public]) to provide the guidelines for all Geophysical actions being conducted on federally administered surface. The BLM will solicit involvement from public land users (e.g., grazing permittees) to develop site-specific protection measures and reclamation specifications. Compliance monitoring should occur during and after seismic exploration activities when or if necessary. Compliance inspections during the operation would ensure that requirements and guidelines are being followed. Compliance inspections upon completion of work would ensure that the lines are clean and drill holes are plugged properly.

Plugging of drill shot holes will conform to the Colorado Reclamation Standards Abandoned Drill Holes Act. Drill hole cuttings will be placed back in the hole.

7.3.2 Oil and Gas

General

In conformance with Onshore Oil and Gas Order (Onshore Order) No. 1, operators would at a minimum prepare and submit individual comprehensive drill site design plans for BLM approval however, comprehensive plans of development for areas and regions would aid in overall planning and implementation of thresholds. These plans would show the drill location layout over the existing topography, dimension of the location, volumes and cross-sections of cut and fill, location and dimensions of reserve pits, existing drainage patterns, and access routes, egress and ingress. Plans would be submitted and approved prior to initiation of construction.

Activities occurring during preliminary investigations may include remote sensing; mapping of rock outcrops and seeps (either of which result in little or no surface disturbance); and seismic, gravity, and magnetic surveys.

The BLM WRFO requires notification to the BLM AO’s field representative concerning well development. Notification will be 24 hours prior to start for the following activities.

Activity	Method	AO’s Field Representative
Construction ⁽¹⁾	Sundry Notice and either Email or Phone	NRS
Reclamation ⁽²⁾		NRS
Drilling Rig Moves on Location	Email and/or Phone	NRS and PET
Well Spud ⁽³⁾	Sundry Notice	PET only
Drilling Rig Leaves Location	Email and/or Phone	NRS and PET

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Activity	Method	AO's Field Representative
Completion Rig Moves on Location	Email and/or Phone	NRS and PET
Completion Rig Leaves Location	Email and/or Phone	NRS and PET
Work-Over Rig Moves on Location	Email and/or Phone	NRS
Work-Over Rig Leaves Location	Email and/or Phone	NRS

NOTES: NRS = Natural Resource Specialist, PET=Petroleum Engineering Technician

⁽¹⁾ Construction-related activities may include, but are not limited to, pad and road construction, pad expansion, clearing pipeline corridors, trenching, recontouring. The Sundry Notice will include the well pad name, location, and date of construction.

⁽²⁾ Reclamation activities may include, but are not limited to, seed bed preparation that requires disturbance of surface soils, seeding, or constructing exclosures (e.g., fences) to exclude livestock from reclaimed areas.

⁽³⁾ Breaking ground for drilling surface casing.

If applicable, the operator will plan all activities and operations in a manner so as to avoid infringing on any timing limitations, without the need to apply for exceptions to the specified timing limitations.

Drilling, well completion, and workover lights would be shrouded and directed onto the drilling platform and/or well pad, to the extent allowed by safety requirements, so that lights/glare are not directed away from the well pad.

Permanent and temporary lighting fixtures on oil and gas facilities should be shrouded and directed to illuminate only the location needed for work or safety. Care should be taken to not distract driving on roads adjacent to facilities, unnecessarily disrupt wildlife with lighting or contribute to light pollution that is not in keeping with rural and natural environments.

Post-Construction GIS Data Submission:

In order to track reclamation of actions related to the development of Federal mineral resources, the operator will provide the designated (Natural Resource Specialist [NRS] or Realty Specialist) with geospatial data in a format compatible with the WRFOs geographic information system (GIS) (i.e., point or polygon features). These data will be used to accurately locate and identify all geographic as-built (i.e., constructed and design implemented) features, recontouring, and seeding associated with this project and must be included in the Application for Permit to Drill (APD) or Sundry Notice (SN) as appropriate.

- These data will be submitted within 60 days of construction completion. If the operator is unable to submit the required information within the specified time period, the operator will notify the designated [NRS or Realty Specialist] via email or phone, and provide justification supporting an extension of the required data submission time period.
- GIS polygon features may include, but are not limited to:
 - Full well pad footprints (including all stormwater and design features);
 - Constructed access routes/widths, existing roads that were upgraded/widths, temporary use areas; and
 - Pipeline corridors.
- Acceptable data formats are: (1) corrected global positioning system (GPS) files with sub-meter accuracy or better; (2) ESRI shapefiles or geodatabases; or (3) AutoCAD .dwg or .dxf files. If possible, both (2) and (3) should be submitted for each as-built feature. Geospatial data must be submitted in UTM Zone 13N, NAD 83, in units of meters. Data may be submitted as: (1) an email attachment or (2) on a standard compact disk (CD) in

compressed (WinZip only) or uncompressed format. All data will include metadata, for each submitted layer, that conforms to the Content Standards for Digital Geospatial Metadata from the Federal Geographic Data Committee standards. Questions will be directed to the WRFO BLM GIS staff at (970) 878-3800. If the operator is unable to send the data electronically, the operator will submit the data on compact disk(s) to the designated [NRS or Realty Specialist].

- Internal and external review of the reporting process and the adequacy of the associated information to meet established goals will be conducted on an on-going basis. New information or changes in the reporting process will be incorporated into the request, as appropriate. Subsequent permit application processing may be dependent upon successful execution of this request, as stated above.

Reserve Pits, and Pits other Than Reserve Pits, and Drilling Muds

The BLMs preferred method for the handling of drilling fluids is those methods that result in limited impacts to human health and the environment. These would include the use of close-looped and semi-closed loop drilling systems. The use of closed and semi-closed loop systems aids in reuse and recycling of drilling fluids reducing the impacts to the environment. However, in situations where the use of pits is necessary the following BMPs and COAs will further aid in the limiting of impacts to human health and the environment.

- Reserve pits used for drilling will be fenced on three sides prior to drilling activity and closed off on the fourth side after drilling is finished unless drilling is delayed, in this case the operator would implement measures to prevent wildlife and livestock from entering the reserve pit area until the drill rig is in place or until the fence on the fourth side of the pit has been constructed in accordance with the BLM standards to reduce risk for wildlife and livestock mortality.
- All wire fence corners will be braced with an H-type brace (See BLM Manual H-1741-1-Fencing for recommended construction standards).
- Within the wild horse range, the reserve pit fence will be 48 inches high.
- In sheep allotments, the fence will have 48 inches of woven wire and cattle allotments will have four strands of barbed wire.
- Requests to use alternate fence materials must be preapproved by the Authorized Officer.
- Fences will be located at least four feet from the edge of the pit slope.

It is the operator's responsibility to design and construct a liner system to contain fluids in the pits that contain liquids without compromising the integrity of the liners. Liners must be installed over smooth fill subgrade that is free of pockets, loose rocks, or other materials that could damage the liner. The pit should be padded with material if necessary to reduce potential damage to the liner by sharp rock edges. Sand, sifted soil or bentonite are suggested.

Since all pits may receive fluids from completion and fracing activities (see Appendix 6 of the ROD and Approved RMPA) and soluble materials left in pits may migrate into the shallow groundwater, all pits (including cuttings pits) will be lined with 24 mil reinforced liner and closed as per Onshore Orders Nos. 1 and 7, The Gold Book, COGCC, and the CDPHE requirements. Liners will be of a high-density polyethylene, polypropylene, poly vinyl chloride, hypalon, or other synthetic material that is impervious, weather resistant, and resistant to deterioration when in contact with hydrocarbons, aqueous acids, alkali, fungi, or other substances in the produced water. The synthetic liners will also be resistant to deterioration by ultraviolet light, punctures and tearing, and will be designed for the life of the pit. Pit liner disposal will be in accordance with all existing federal, state, and local laws. If

the COGCC requires the removal of the pit liner, the method of removal and location of disposal for pit liners and pit solids must be submitted to the AO and approved before beginning the pit closure. If pit liners are to be left in place, the fluids from the pit must be removed and/or evaporated before closing. The pit liner should be cut or folded at the mudline and the pit should be buried with at least 3 feet from final grade before interim reclamation efforts are started.

The reserve pit will be allowed to dry through natural evaporation for up to six months after the drill rig has left the location. If a pit has not dried by the end of this period, all remaining fluids and/or mud must be removed and disposed of in an approved manner. Operators will construct, operate, and close reserve pits in accordance with federal, state, and local laws. Only dispose of RCRA exempted wastes within reserve pits. The concentration of hazardous materials within the reserve pit at the time of pit backfilling must not exceed the standards set forth in COGCC 900 Rules RCRA.

The operator is required to obtain authorization from the COGCC for pit fluid treatment by means other than natural evaporation. The operator will submit a Sundry Notice for approval by the Authorized Officer before conducting any reserve pit evaporation by means other than natural evaporation. The Sundry Notice would provide a detailed description of the drying method.

Slope, grade, and other construction control stakes (e.g., exterior boundary centerline) would be placed, as necessary, to ensure construction in accordance with the surface use plan. The cut and fill slopes and spoil storage areas would be marked with a stake and/or lath at a minimum of 50-foot intervals. The tops of the stakes or laths would be painted or flagged in a distinctive color. All boundary stakes and/or laths would be maintained in place until final construction cleanup is completed. If stakes are disturbed, they would be replaced before proceeding with construction.

Pits will not be constructed on known intermittent or perennial springs, seeps, or other near surface water features. If groundwater is encountered during pit construction activity, pit construction will cease and the location will be reclaimed. An alternate location or an alternate plan (e.g., disposing of pit contents offsite or use of a closed loop and/or semi-closed loop system) must be submitted via Sundry Notice and approved by the AO before resuming operations. Pits will be constructed, monitored, and operated to provide for a minimum of two feet of freeboard at all times and maintain fluids in pits at the lowest practicable level, subject to the type of operation in process.

All produced liquids will be contained in a pit or tank, including the dehydrator vent/condensate line effluent. All production pits must have a livestock-proof fence. All pits must be bermed and designed to contain fluids so that leaking or breaching problems are minimized and reclamation potential is maximized. At least 50 percent of the pit capacity will be in cut material.

Operators will identify either in the APD or through a Sundry Notice, describing how the oil based drilling muds will be used, stored, and disposed of. Any on location disposal sites for the oil contaminated drill cuttings would be lined with a 24-mil or stronger impervious liner compatible with oils and separate from other drill cuttings. A liner meeting this specification also would be placed under any temporary storage area for the oil contaminated cuttings.

Should an event occur, all oil from the surface of reserve pit will be removed within 24 hours.

All drilling fluids where the contents of the pit will be left in place will meet the concentration levels identified within COGCC's table 910-1 which recommends that operators use the latest version of EPA SW 846 analytical methods. The cost of the testing and disposal would be borne by the potentially responsible party.

Production Facilities

All storage tank batteries, including drain sumps and sludge holdings at compressor facilities, installed on location and designed to contain any oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, would be surrounded by a secondary means of containment for the entire contents of the largest single tank in use plus 1 foot of freeboard for precipitation or 110 percent of the capacity of the largest vessel. The appropriate containment and/or diversionary structures or equipment, including walls and floor, to prevent discharged fluid from reaching ground, surface, or navigable waters, would be impervious to any oil, glycol, produced water, or other fluid for 72 hours and would be constructed so that any discharge from a primary containment system (e.g., tank or pipe) would not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

Treaters, dehydrators, and other production facilities installed on location that have the potential to leak or spill oil, glycol, produced water, or other fluid that may constitute a hazard to public health or safety, would be placed on or within an appropriate containment and/or diversionary structure to prevent spilled or leaking fluid from reaching ground, surface, or navigable waters. The appropriate containment and/or diversionary structure would be sufficiently impervious to oil, glycol, produced water, or other fluid and would be installed so that any spill or leakage would not drain, infiltrate, or otherwise escape to ground, surface, or navigable waters before cleanup is completed.

All aboveground permanent structures (permanent means onsite for longer than 90 days) not subject to safety requirements would be painted by the operator to blend with the natural color of the landscape. New production facilities would be painted a noncontrasting color that is harmonious with the surrounding landscape as specified and approved by the BLM on a case-specific basis.

Well Plugging Standards

A. Open Hole: Cement plug will be placed to extend at least from 50 feet below the bottom (except as limited by total depth (TD) or plugged back total depth (PBSD) to 50 feet above the top of (1) any zones encountered during drilling that contain fluid with a potential to migrate; (2) lost circulation zones; and (3) any potential valuable minerals, including noncommercial hydrocarbons, coal, and oil shale. Extremely thick sections may be secured by placing 100-foot plugs across the top and bottom of the formation. Lost circulation zones may require alternate methods. In the absence of productive zones or minerals that otherwise require placement of cement plugs, long sections of open hole will be plugged at least every 3,000 feet. Such plugs will be placed across in-gauge sections of the hole.

B. Cased Hole: Cement plug will be placed opposite all open perforations and extend a minimum of 50 feet below (except as limited by TD or PBSD) to 50 feet above the perforated interval. In lieu of the cement plug, a bridge plug is acceptable, provided: (1) the plug is set as close as practical above the open perforations; (2) the perforations are isolated from any open hole below; and (3) the plug is capped-if cap is placed through tubing, a minimum of 50 feet of fill-up is required; if placed by bailer, a minimum of 35 feet of fill-up is needed. If production casing is cut and recovered, a cement plug will be placed to extend at least 50 feet above and below the stub. An additional cement plug will be placed to extend a minimum of 50 feet above and below the shoe of the surface casing (or intermediate string, as appropriate). The exposed hole resulting from the casing removal must be secured as required above.

C. Annular Space: No annular space that extends to the surface will be left open to the drilled hole below. If this condition exists, a minimum of the top 50 feet of annulus will be plugged with cement.

D. Testing: The first plug below the surface plug will generally be tested by either tagging the plug with the working pipe string or pressuring to a minimum pump (surface) pressure of 1,000 psig with no more than a 10 percent drop during a 15-minute period (cased hole only). If the integrity of any other plug is questioned, it must be tested in the same manner. Also, any cement plug that is the only isolating medium for a fresh water interval or a zone containing a valuable mineral deposit should be tested by tagging with the drill string. Tagging the first plug below the surface plug will not be necessary where water flows or valuable mineral deposits have not been encountered.

E. Surface Plug: A cement plug of at least 50 feet will be placed in the smallest casing that extends to the surface. The top of this plug will be placed as near the eventual casing cut-off point as possible.

F. Mud: Each interval between the plugs will be filled with mud of sufficient density to exert hydrostatic pressure exceeding the greatest formation pressure encountered while drilling such interval. In the absence of other information at the time plugging is approved, a minimum mud weight of nine pounds per gallon will be specified.

G. Surface Cap: All casing will be cut off at the base of the cellar or three feet below final restored ground level (whichever is deeper). The casing will be filled from the cement plug to the surface with suitable material (e.g., cement, sand, gravel). The well bore must then be covered with a metal plate at least 1/4-inch thick, welded in place, or a four-inch pipe, extending four feet above the recontoured ground surface and embedded in cement as specified by the authorized officer. The well location and identity will be permanently inscribed on the pipe or plate.

Surface Disturbance

Surface-disturbing activities may be moved to avoid visually sensitive areas or design and reclamation mitigation measures may be required, as appropriate, to protect scenic and natural landscape values and to reduce the visual effects. Design measures may include transplanting trees and shrubs, mulching and fertilizing disturbed areas, removing surfacing material, using low-profile permanent facilities, and painting to minimize visual contrasts.

Transplanting of shrubs and the planting of native forbs or shrubs may be required during reclamation activities to increase the success of achieving final reclamation goals

Prior to approving surface-disturbing or potentially impacting activities within known or potential habitat for a listed, proposed or candidate plant species, a plant inventory conducted by a qualified botanist and an environmental analysis would be required for the Proposed Action. Based on the results of the plant survey, informal consultation with the FWS may be conducted during preparation of the environmental analysis. Formal consultation with the FWS would occur if the environmental analysis indicates a finding of possible impact to a listed species and the Proposed Action cannot be moved to avoid the impact.

All disturbed areas will be contoured to the original contours or at least to blend with the natural topography. Blending is defined as reducing form, line, shape and color contrast with the disturbing activity. In visually sensitive areas, all disturbed areas will be contoured to match the original topography. Matching is defined as reproducing the original topography and eliminating form, line, shape and color caused by the disturbance as much as possible. See Appendix 3 (WRFO Surface Reclamation Plan) in the ROD and Approved RMPA.

All construction activity will cease when soils or road surfaces become saturated to a depth of three inches unless there are safety concerns or activities are otherwise approved by the AO.

Topsoil, those soils corresponding with the O, A, and sometimes B horizons that contain the greatest amount of organic matter, biological activity and nutrients, and that are the most favorable for establishment of seeded species and plant growth will be removed to a depth of 6-8 inches or as determined from submitted pre-disturbance site condition information identified in the Surface Reclamation Plan (see Appendix 3 Section 2.2 at No. 1 in the ROD and Approved RMPA) in areas of surface disturbance. To protect topsoil for future use during reclamation, topsoil piles will be covered, seeded, labeled, and stored unmixed with other soils.

Immediately after the road and pad construction is completed and before drilling begins, seed and apply a temporary protective surface treatment on all soils on disturbed areas not required for operation or production equipment during drilling and completion activities. Areas not required for operations include all cut/fill slopes on access routes and pads as well as stockpiled soils and drainage ditches along roads. Slopes dominated by rock of 4 inches and greater are not required to be seeded or treated. Surface treatments can vary depending on the local site conditions and changes in erosion control technology, but mulch, matting, netting, and/or tackifiers should be used after seeding the soil surface and soil amendments may be used with BLM approval.

All areas where the topsoil has been removed and soils have become compacted will be ripped to a depth of 18 inches below the finished grade or to bedrock, or as appropriate for the site. Another suitable method of decompaction may be used before topsoil is re-spread with approval of the BLM AO. Areas where the topsoil has not been removed, but has been compacted, must be de-compacted by disking or other methods to prepare the soils for reclamation.

New roads and pipelines should be located in existing pipeline or road corridors whenever possible.

Topsoil will be stored, stabilized and labeled as described in the WRFO Surface Reclamation Plan (see Appendix 3 in the ROD and Approved RMPA).

Road Design and Maintenance

All road and well pad construction will adhere to The Gold Book standards (DOI and USDA 2007) and to BLM Manuals 9112-Bridges and Major Culverts and 9113-Roads (BLM 1984, 2011), relating to culvert and road design and construction requirements.

Road designs must be the minimum requirements in terms of width and design to meet the intended use while providing for safety, maintenance and limiting adverse environmental impacts. Minimum standards for oil and gas resource roads are defined in section 2.23 Geometric Standards in the BLM Manual 9113-Roads.

An all-weather surface is required from [first location] to [second location] that will not rut when the road base is saturated. All-weather surfacing may include the use of road base and/or gravel and be maintained at a depth that will protect the integrity of the travel surface; location of surfacing materials should be stated in the proposed action or the surface use plan. Specifications for road surfacing are subject to BLM approval and should be maintained as long as regular access is needed to the site. Gravel and surfacing should be removed and used somewhere else to the greatest extent possible during final reclamation.

Roads that use natural materials should not be traveled when the road surface is saturated such that ruts greater than three inches form consistently on the road surface. If travel is required during wet conditions, an all-weather surface should be implemented. Spot graveling in localized areas of poor soils or accumulated water should be employed as necessary on natural surface roads to allow travel

without compromising the integrity of the road. Sources of materials for spot graveling should be specified in the surface use plan or the proposed action.

An engineered road design should be submitted for BLM approval that illustrates road design features from [first location] to [second location], due to the complicated drainage features and/or difficult terrain in this road section. The engineered design should include plan view diagrams by mile marker with a topographic base layer and all relevant design features such as culverts, water-bars, run-out ditches etc., clearly illustrated. In addition to the plan view drawings, specifications such as road surfacing materials and thickness, profiles of road cross-sections, any peak flow analysis that was used for sizing drainage features, and any other relevant design specifications or analysis that would be needed for evaluating the integrity of the proposed engineered design. Engineered designs must be approved and certified by a professional engineer licensed in the State of Colorado and approved by the BLM before construction begins.

General access to the following locations will be restricted by means of a lockable gate (may require fence wings) placed along the proposed access at a point as close as possible to the intersection of the proposed and established access: [List locations]. The operator is responsible for constructing and maintaining these structures through the life of the project and removing them upon abandonment. The selected control point is subject to the approval of the AO with the objectives of effectively deterring all unauthorized vehicle use not associated with natural gas development and production (including other BLM permitted users, but excepting CPW District Wildlife Managers and BLM Rangers, [others]) and preventing bypass of the gate. These gates would be installed [selected timeframe] with signage, and are to remain closed and locked throughout the year, though they may remain open temporarily during well development or maintenance activities that require high traffic volumes.

Base road design criteria and standards on road management objectives such as The Gold Book, BLM Manuals, traffic requirements of the proposed activity and the overall transportation plan, economic analysis, safety requirements, resource objectives, and minimizing damage to the environment.

Locate drainage crossings where channels are, stable, well-defined, unobstructed and straight. Design the road approach and crossings perpendicular to the prominent flow channels whenever possible. Design crossings to minimize their influence on surface runoff, wetland/riparian function. Install rip-rap as necessary to reduce erosion and protect the integrity of the crossings.

Drainage crossings will be designed to maintain the natural stream channel to the greatest extent feasible and support the normal stream sediment transport processes through the crossing. Crossings in fish habitat will allow unimpeded fish passage and consider fish habitat in the design.

Locate roads on stable positions (e.g., ridges, natural benches, and flatter transitional slopes near ridges and valley bottoms) to minimize heights of cutbanks. Avoid high, steeply sloping cutbanks in highly fractured bedrock. Implement extra mitigation measures when crossing areas of unstable or fragile soils.

When roads are located in low-lying areas, ensure that the road surface is constructed above the adjacent ground surface and the road base does not impede groundwater flow under the road base.

Construct roads surfaces for drainage by using outslopes, crowns, grade changes, drain dips, waterbars, and/or insloping to ditches as appropriate. Outsloping roads is recommended for local spurs or minor collector roads where low-volume traffic, long intervals between maintenance are expected, gradients do not exceed 10 percent, and lower traffic speeds are anticipated. Insloping can

be considered on roads with greater than 10 percent gradient and where the underlying soil formation is not subject to erosion or failure. Drainage ditches and cross-drains should be employed with insloping and crowned roads at regular intervals so that runoff does not accumulate and cause erosion (See BLM Manual 9113-Roads). Cross-drains may include installation of 18 –inch diameter or greater culverts and/or waterbars depending on the terrain.

Crown and ditching is recommended for arterial and collector roads where traffic volume, speed, intensity and user comfort are considerations. Gradients may range from two to 15 percent as long as adequate drainage away from the road surface and ditchlines is maintained.

Locate and design drainage dips immediately upgrade of stream crossings, providing buffers and sediment basins, to prevent sediment from entering surface water features.

Do not locate drainage dips where water might accumulate or where there is an outside berm that prevents drainage from the roadway.

Provide vegetative or artificial stabilization of cut and fill slopes in the design process.

Avoid sidecasting during road maintenance, where it will adversely affect water quality or weakens stabilized slopes.

Provide for erosion-resistant surface drainage prior to fall rain or snow.

Identify potential water problems caused by off-site disturbance and add necessary drainage facilities.

Identify ditchline and outlet erosion caused by excessive flows and add necessary drainage facilities and armoring.

Add additional full-rounds, half-rounds, and energy dissipators as needed for drainage ditches.

Correct special drainage problems (e.g., high water table, seeps) that affect stability of subgrade by using perforated drains, geotextiles, or drainage bays.

Eliminate undesirable berms that retard normal surface runoff.

Roadside brushing should be done in a way that prevents disturbance to root systems (i.e., avoid using excavators for brushing).

Current locations and specifications of pre-disturbance roads should be identified in the surface use plan or proposed action. Final reclamation should restore the pre-disturbance road condition in a way that is maintainable, sustainable and minimizes adverse environmental impacts, unless specified by the BLM Authorized Officer.

Culverts and Drainage Features

Culverts and waterbars should be installed according to the BLM Manual 9113-Roads standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.

Keep road inlet and outlet ditches, catch basins, and culverts free of obstructions, particularly before and during spring run-off. Routine machine-cleaning of ditches should be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.

Locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Install culverts with adequate armoring of inlet and outlet. Operator/holder is responsible for maintaining the integrity of road beds as well as erosion control and drainage features.

Proper sized aggregate and rip rap should be used during culvert construction. Place rip rap at culvert entrance to streamline water flow and reduce erosion; provide aggregate for energy dissipations at culvert or drainage dip outlets.

Install cross drains for inside drainage ditches on roads according to the following: Percent Grade; Spacing (feet); 1-6; 300; 7-9; 200; 10-14; 150; 15-20; 90; 21-40; 50; Over 41; 25.

Place permanent stream-crossing structures on fishery streams before heavy equipment moves beyond the crossing area. Where this is not feasible, install temporary crossings to minimize stream disturbance.

Use 12 inches as the minimum recommended cover over a culvert, or one-half the diameter of the culvert, whichever is greater.

Compact fill in lifts during culvert installation with water or other soil material in such a way that the loads anticipated will not deteriorate the road base or fill above and around the culvert. Armor fill as described above to protect compacted fill.

Monitor culvert installations to ensure adequate armoring of inlet and outlet and no erosion of design. Patrol areas susceptible to road or watershed damage during periods of high runoff.

Bridges and Major Culverts

Bridges and major culverts should be designed and constructed according to the standards provided in BLM Manual 9112-Bridges and Major Culverts. The design, review, and evaluation of these crossings must be accomplished under the direct supervision of a registered professional engineer.

Road Maintenance and Abandonment

Locate and maintain roads to prevent their influence on riparian areas and surface waters. When stream crossing is necessary, design the approach and crossing perpendicular to the channel. Locate the crossing where the channel is well-defined, unobstructed and straight.

Perform maintenance to conserve existing surface material; retain the original crowned or outsloped, self-draining cross-section; and prevent or remove rutted berms (except those designed for slope protection) and other irregularities that retard normal surface runoff. Avoid casting loose ditch or surface material past the shoulder where it can cause stream sedimentation or weaken slump-prone areas. Avoid undercutting backslopes.

Promptly remove slide material when it is obstructing road surface and ditchline drainage. Save all soil or material useable for reclamation and stockpile for future reclamation needs. Use remaining slide material for needed road improvement or place in a stable waste area. Avoid sidecasting of slide material where it can damage, overload, saturate embankments, or flow into downslope drainage courses.

When obliterating a road no longer needed, gravel or surfacing should be removed and reused to the maximum extent possible. Culverts and other drainage features should be removed, original contours should be reestablished, the road should be ripped or pitted to remove compaction and increase infiltration. On roads, topsoil will be spread where successful revegetation is likely (e.g., along

appropriate cut and fill slopes or at the top edge of the borrow ditches) and where it will not be disturbed during regular road maintenance activities.

Maintain roads in special management areas according to special management area guidance. Generally, retain roads within existing disturbed areas and side cast material away from the special management area.

7.3.3 Sodium Resources

Conditions of approval would be applied to permits for oil and gas drilling in areas available for sodium and multi-mineral leasing and/or on existing sodium leases to protect sodium resources throughout the Green River Formation as follows:

- Utilize flooded reverse circulation drilling techniques from surface to 100 feet into the Wasatch Formation to minimize fluid loss to the formation;
- Cement the surface casing with high temperature cement (e.g., Class ‘G’ cement plus 35 percent silica flour) through the saline interval;
- Add a fluorescent dye fluid, other than Rhodamin WT, to drilling fluids used from surface to 100 feet into the Wasatch Formation;
- Take a drilling fluid sample every 100 feet during drilling from surface to 100 feet below the dissolution surface and analyze for pH and conductivity;
- Document any fluid losses during drilling, from the surface, to 100 feet into the Wasatch Formation; and.
- Make available a tracer log survey of the upper most frac to demonstrate in-zone penetration and total vertical height growth achieved.

7.4 Recreation

During big game hunting season (generally mid-August through November) it is recommended that helicopter flights be limited to a critical, as needed basis only and no flights be conducted on the first two days of each big game hunting season. In <insert year>, the hunting seasons for deer, elk, pronghorn, and bear in Game Management Unit (GMU) #, are as follows: <insert dates of applicable seasons.> For information about the dates of seasons for other years, please refer to the Colorado Parks and Wildlife Big Game Hunting Brochure or contact the BLMs Outdoor Recreation Planner.

7.5 Lands and Realty

7.5.1 Rights-of-Way

Use areas adjoining or adjacent to previously disturbed areas for rights-of-way and utility corridors whenever possible rather than traverse undisturbed vegetation communities.

All activities will comply with all applicable local, State, and Federal laws, statutes, regulations, standards, and implementation plans. This includes acquiring all required Federal, State, and/or local permits, implementing all applicable mitigation measures required by each permit, and effectively coordinating with existing rights-of-way (ROW) holders.

Stabilize disturbed areas within road rights-of-way and utility corridors by implementing vegetation practices designed to hold soil in place and minimize erosion as described in the WRFO Surface Reclamation Plan (see Appendix 3 in the ROD and Approved RMPA).

At least 90 days prior to termination of the right-of-way, the holder will contact the Authorized Officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan will include, but is not limited to, removal of facilities, drainage structures, and surface material (e.g., gravel or concrete), as well as final recontouring, spreading of topsoil, and seeding. The Authorized Officer must approve the plan in writing prior to the holder's commencement of any termination activities.

Any proposal involving additional surface disturbance outside of the authorized ROW requires an application to the BLM for analysis and authorization. New stipulations for construction would be applied to projects subject to the regulations and policies existing at the time of authorization.

The holder will conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the ROW.

The holder of the ROW grant will not convey, assign, or otherwise transfer, in whole or in part, without prior written approval by the AO.

The holder of the ROW grant will notify the Authorized Officer of any changes in the holder's status, such as changes in legal mailing address, financial condition, business or corporate status, and alien ownership.

For the purpose of determining joint maintenance responsibilities on shared access, the holder will make road use plans known to all other authorized users of the common access road. Upon request, the AO will be provided with copies of any maintenance agreement entered into.

Retention and maintenance of a permanent travel lane is not authorized in the following corridor segments: [list by milepost or legal]. On these segments, the [operator/holder] will be responsible for installing physical controls to effectively deter unauthorized vehicle use along the rights-of-way, continuous maintenance of the controls (through project life), and, at a minimum, [interval] monitoring to assess the controls' efficacy. Monitoring reports and documentation of maintenance activity will be sent to the [Natural Resource Specialist/Realty Specialist] by September 30 of each year.

During pipeline construction, the width of the disturbed area will be kept to a minimum. Only the amount of soil and vegetation necessary for construction of the pipeline will be disturbed and removed. Topsoil material must be segregated and not mixed or covered with subsurface material.

Under no circumstances will topsoil, soil material below or adjacent to the trench spoils, or subsoil excavated from the trench down to the effective rooting depth (refer to WRFO Surface Reclamation Plan, Appendix 3 in Approved RMPA) be used as padding in the trench, to fill sacks for trench breakers, or for any other use as construction material.

The holder will notify the authorized officer at least 60 days prior to non-emergency activities that would cause surface disturbance in the right-of-way. A "Notice to Proceed" will be required prior to any non-emergency activities that would cause surface disturbance on the right-of-way. Any request for a "Notice to Proceed" must be made to the authorized officer, who will review the Proposed Action for consistency with resource management concerns such as wildlife, big game winter range,

paleontology, special status species, and cultural resource protection. The authorized officer may require the completion of special status species surveys or other resource surveys. Additional measures may be required to protect special status species or other resources.

8.0 Socioeconomic Resources

8.1 Health and Safety

Waste Management

All operators/holders will comply with all Federal, State and/or local laws, rules, and regulations, including but not limited to Onshore Orders and Notices to Lessees, addressing the emission of and/or the handling, use, transport, and release of any substance that poses a risk of harm to human health or the environment based on applicable laws, rules and/or regulations. Appendix 6 in the ROD and Approved RMPA provides the overall hazardous material management plan, which provides additional guidance and identifies the types of hazardous or potentially hazardous materials that are common within exploration and development of oil and gas.

As a reasonable and prudent operator/holder acting in good faith, the operator/holder will report all emissions or releases that may pose a risk of harm to human health or the environment, regardless of a substance's status as exempt or nonexempt based on applicable laws, rules and/or regulations, and regardless of fault, to the BLM WRFO (970) 878-3800.

As a reasonable and prudent operator/holder, acting in good faith, the operator/holder will provide for the immediate clean-up and testing of air, water (surface and/or ground), and soils contaminated by the emission or release of any substance that may pose a risk of harm to human health or the environment, and will provide for cleanup, based on applicable laws, rules, and regulations, regardless of that substance's status as exempt or non-exempt. Where the operator/holder fails, refuses, or neglects to provide for the immediate clean-up and testing of air, water (surface and/or ground), and soils contaminated by the emission or release of any quantity of a substance that poses a risk of harm to human health or the environment, the BLM WRFO may take measures to clean-up and test air, water (surface and/or ground), and soils at the operator's/holder's expense plus additional fees based upon current standards as per 43 CFR 3163.1 (a)(4). Such action will not relieve the operator/holder of any liability or responsibility.

Where required by law or regulation to develop a plan for the prevention of releases or the recovery of a release of any substance that poses a risk of harm to human health or the environment, provide a current copy of said plan to the BLM WRFO.

With the acceptance of this authorization, the commencement of operations under this authorization, or within thirty calendar days from the issuance of this authorization, whichever occurs first, operator/holder, and through the operator/holder, its agents, employees, subcontractors, successors and assigns, stipulate and agree to indemnify, defend and hold harmless the United States Government, its agencies, and employees from all liability associated with the emission or release of substances that pose a risk of harm to human health or the environment.

Construction sites and all facilities will be maintained in a sanitary condition at all times; all waste must be stored in approved containers with appropriate controls and protections until it is collected by an approved waste disposal contractor and hauled off-site to an approved disposal facility. Waste materials will be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

Appendix 2 – Best Management Practices and Conditions of Approval

When drilling to set the surface casing, drilling fluid will be composed only of fresh water, bentonite, and/or a benign lost circulation material that does not pose a risk of harm to human health or the environment (e.g., cedar bark, shredded cane stalks, mineral fiber and hair, mica flakes, ground and sized limestone or marble, wood, nut hulls, corncobs, or cotton hulls).

Through all phases of oil and gas exploration, development, and production, the operator/holder will employ, maintain, and periodically update to the best available technology(s) aimed at reducing:

- Emissions;
- Fresh water use; and
- Utilization, production, and release of any substance that poses a risk of harm to human health or the environment based on applicable regulations.

Portable pressure washing stations would be constructed and maintained within secondary containment with the ability to collect and dispose of hazardous materials at an approved disposal site.

Noise Management

Where sensitive receptors are identified the operators will utilize noise reduction mufflers, earthen berms, walls, sheds, distance or topographical features, consolidation of facilities, and limiting sound generating equipment to comply with identified noise standards to reduce impacts to sensitive receptors.

Appendix 3

White River Field Office Surface Reclamation Plan



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Appendix 3

White River Field Office

Surface Reclamation Plan

1.0 Introduction

1.1 Background

The 2007 revised Onshore Oil and Gas Order Number 1 (Onshore Order No. 1) requires oil and gas operators to incorporate a reclamation plan into its Application for Permit to Drill, which the Bureau of Land Management (BLM) utilizes to determine the overall effects of the proposal. These plans describe the operator’s reclamation practices and procedures, which it will implement to ensure that effective reclamation of disturbed lands occurs. The purpose of this document is three fold. First, it provides the minimum information and operation standards that the White River Field Office (WRFO) expects within reclamation plans, with the level of detail necessary to assess the technical adequacy and land use plan conformance of those plans. Secondly, the document establishes specific criteria the WRFO will implement which will determine if reclamation is successful. And finally the document identifies a number of techniques and methodologies that can be incorporated into a site specific reclamation plan which the WRFO has seen successfully used by operators in the past to achieve successful reclamation. The WRFO contains a diversity of site characteristics (i.e., elevation, topography, precipitation, and soil type) present across the 2.6 million acres within the field office requiring a standards-based approach to reclamation rather than a one-size fits-all procedure-based approach. The following standards are specific to the WRFO and are intended to complement current reclamation guidance found in the “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development” (The Gold Book) and other BLM policy and guidance.

All surface disturbing activities approved on BLM lands administered by the WRFO will be subject to reclamation standards described in this document. It is important to note that reclamation success criteria expressed in this document are considered standards that, through the Authorized Officer (AO), are subject to adaptation depending on site-specific reclamation challenges (i.e., physical or biological constraints beyond the operator’s control). WRFO will consider authorizing well-designed reclamation experiments and trials outside established strategies that may serve as the basis for enhancing reclamation efficacy or efficiency consistent with the BLM’s reclamation objectives.

Standards-based reclamation focuses on using the desired end condition as the ultimate determinant of reclamation success. Reclamation procedures are designed to provide soil stabilization while expediting the return of a functional and desirable plant community. Reclamation plans submitted are to be location specific and when approved strictly adhered to unless a written exception is granted by the AO. There are numerous other sources of guidance (e.g., Best Management Practices) to aid operators in achieving reclamation success. Industry is encouraged to propose analogous innovative approaches to help meet or exceed the BLM reclamation standards.

Additional reclamation planning, requirements, implementation methods, and monitoring guidance can be found in the following references or on the WRFO’s webpage:

- Revised Onshore Order No. 1 (Effective March 7, 2007)
- Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (The Gold Book)
- Bureau of Land Management – Colorado Public Land Health Standards
- The BLM Core Terrestrial Indicators and Methods Technical Note 440 and Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start. Methods discussed in BLM Technical Reference 1730-1 may also be used after BLM pre-approval.
- Natural Resource Conservation Service (NRCS) Range Site Descriptions
- Once available from the NRCS, the WRFO will transition from using range sites to the updated Ecological Site Descriptions.

1.2 Authority

The BLM is required by law to ensure that authorized actions are carried out in a manner that does not result in “permanent impairment of the productivity of the land or the quality of the environment” (Federal Land Policy and Management Act [FLPMA], 1976). In order to promote a consistent and science-based approach to reclamation, this document identifies minimum information and operational requirements and performance-based criteria that are expected to satisfy WRFO’s responsibilities under FLPMA and Colorado’s Public Land Health Standards.

The Mineral Leasing Act of 1920 (30 U.S.C. § 181-287), amended by the Federal Onshore Oil and Gas Leasing Reform Act of 1987, PL 100-203, among other things, authorizes the Secretary of Interior to regulate all surface-disturbing activities associated with any lease and to impose mitigation and reclamation measures in order to “conserve surface resources.”

Bureau of Land Management regulations established in 43 CFR §3160 (i.e., Onshore Oil and Gas Order No. 1) require that a reclamation plan be submitted with the Surface Use Plan in the Application for Permit to Drill (APD). The Onshore Order No. 1, Section XII. B., in referencing Section III.D.4.j., requires that plans for surface reclamation must be designed to return the disturbed area(s) to productive use and meet the objectives of the land and resource management plan.

2.0 Site-Specific Reclamation Plans

2.1 Introduction

As described in Onshore Order No. 1 (Revised 2007), project specific reclamation plans are required for any surface disturbing activity related to oil and gas activities. All reclamation plans must be consistent with current standards and RMP goals and objectives for all land management designations throughout the Field Office. Project placement and planning should be designed to optimize reclamation success and prevent impacts to the surrounding area. Exceptions may be warranted for wells on existing multi-well pads with approved reclamation plans. The Code of Federal Regulations (CFR), at 43 CFR 2800 describes requirements for surface use plans and associated reclamation plans for rights-of-way (ROW). Reclamation plans must be designed to return the disturbed area to a condition that meets the objectives of the 1997 White River ROD/RMP, as amended. Reclamation plans will address surface reclamation and/or stabilization of all disturbed areas for both the interim reclamation of all areas not needed for production and Final reclamation of locations (after plugging) or linear facilities (upon completion of construction). Such plans must include the reclamation timelines, configuration of the reshaped topography, drainage systems, segregation of spoil materials (stockpiles), surface disturbance, backfill requirements, practices necessary to reclaim all disturbed areas, including any access roads and pipelines, storage, and redistribution of topsoil, soil treatments, seeding or other steps to stabilize soils and reestablish vegetation, and weed control. The reclamation plan should be updated and re-submitted for approval if any changes occur that may influence reclamation. The Reclamation Plan is part of the Surface Use Plan (SUP). An APD may have additional site specific Conditions of Approval (COAs) attached by the BLM.

2.2 Plan Components

Project specific reclamation plans submitted to the WRFO must be sufficient to accurately characterize surface and site conditions prior to disturbance. Plan components should include at a minimum:

- 1) Documentation of surface and site conditions prior to disturbance:
 - a) Photos of area to be disturbed, taken from permanent photo points. At least one photo should be taken from a repeatable point at a reasonable/appropriate distance to provide an overview of the site to be developed. Photo points should be repeatable, located where they are less likely to be disturbed, and provide an overview of the site (e.g., from the center of the pad toward the ends and/or from the corners of the pad inward toward the center or inward/outward to/from the four cardinal directions). Additional photo points to capture entire area of disturbance may be included.
 - b) Pre-disturbance terrain and contour.
 - c) Soil type, texture, erosion potential, average topsoil depth and characteristics (i.e., physical and chemical properties), and average depth to bedrock by soil type.
 - d) If topsoil is expected to be stored for more than six months, BLM suggests that its physical and chemical characteristics should be measured to determine pre-disturbance baseline values and to identify potential changes during storage. The topsoil should be retested during Phase II interim reclamation using the same baseline methods to determine if there is a need for soil amendments. Suggested parameters for testing include pH, organic carbon, fertility (nitrogen, phosphorus, and potassium), aeration porosity, water-holding or available water capacity, bulk density, hydraulic

conductivity, and electrical conductivity. An adequate number of samples should be taken to ensure that changes in soil attributes can be detected.

- e) Pre-disturbance ground cover, including surface rock and vegetation composition (by species). Data must be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. Approved methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start or at the Jornada Experimental Range website (<http://jornada.nmsu.edu/education/training-materials>), which provides informational videos on methods such as line-point and canopy gap. They have developed a simple, statistically rigorous one-transect line-point intercept method that measures all six indicators. Other data collection methods such as those described in BLM Technical Reference 1730-1 may be submitted as part of the reclamation plan for approval by the BLM.
 - f) Pre-disturbance survey identifying and quantifying noxious and/or invasive weeds within the area of direct and indirect use (project disturbance and a 330 foot buffer), including all access roads, pipelines, or other associated surface disturbance.
 - g) The NRCS range site(s) or associated reference site(s) (identified and mapped). Reference sites can be used when the operator and the BLM agree that the site does not reflect the range site. The reference site must be approved by the BLM. The operator must provide statistically valid quantitative reference site measurements of vegetation cover, vegetation composition, woody plant density, and percent bare ground. Pre-disturbance vegetation data must be gathered using quantitative methods as explained above in 2.2e.
- 2) Construction practices and Phase I interim reclamation drainage design (including a plan view figure or diagram):
- a) Pipeline construction practices that define the progression, method of installation such as using a plow, trencher, or excavator and a description of soil management practices during construction including storage of topsoil, subsoil, and methods for bedding the pipeline.

Note: Topsoil will only be used as a seed bed for reclamation. Under no circumstances will topsoil be used as a pipe bedding material, to fill sacks for trench breakers, use as a construction material, or for any use other than reclamation/seeding, unless approved.
 - b) Drainage systems including any stormwater measures, diversion ditches, catchment ditches, infiltration ponds, culverts, low-water crossings, or waterbars.
 - c) Planned disturbance including locations of stockpiles, stormwater measures, production facilities pads, or other needed infrastructure.
 - d) Identify and describe management of waste materials (e.g., cuttings management/ disposal, contaminated soils).
- 3) Weed management:
- a) Weed management plans to address treatment from pre-disturbance, the life of the project, and through final abandonment including a summary of methods used to monitor, treat, and report the presence of noxious or undesirable invasive weeds within the project area and surrounding area (i.e., within 330 feet of areas of direct use). Ensure that weed treatments are developed and conducted in an effective manner compatible with approved seed mixes.

- b) Plans for washing all vehicles and equipment to prevent the spread of weeds. Plans must address weed free zones identified in the 1997 White River ROD/RMP, as amended. Weed free zones are areas designated for intensive weed management through cooperation with private land owners, and state and county governments. Maps of designated weed free zones are in the 1997 White River ROD/RMP.
- 4) Monitoring methods:
 - a) The location of permanent photo points, which should show all aspects of planned surface disturbance and the adjacent undisturbed landscape.
 - b) Reclamation monitoring plans must address all aspects of success criteria and include proposed methods, sampling design, inspection frequency, and reporting schedules. The operator will consult with the project lead (NRS/Realty Specialist) when developing the monitoring plan. Vegetation monitoring, completed by qualified personnel, should occur within the growing season and begin the second year after reclamation efforts are initiated and every third year after that until final abandonment. The BLM may require more frequent monitoring of reclamation if necessary. Vegetation monitoring reports should be submitted to the BLM with the reclamation status report by January 1st. Vegetation monitoring must also be completed and reported in conjunction with the final abandonment notice.
- 5) Interim reclamation (Phase I & II):
 - a) Soil stabilization methods and stormwater management practices.
 - b) Topographic diagram showing interim reclamation footprint including the extent of recontouring (Phase II only), any areas put into final contours, and the means employed to maximize the extent of disturbance available for effective reclamation (e.g., placement of production facilities).
 - c) Topsoil management and stabilization practices.
 - d) Surface preparation before and after seeding, including but not limited to: depth of ripping, soil pocking, disking, mulching, incorporation of woody material, etc.
 - e) Seeding methods and seed mix.
 - f) Methods for managing livestock and wild horse influences.
- 6) Final reclamation:
 - a) Diagram showing proposed final recontouring.
 - b) Proposed seeding methods and seed mixes (updated to match current approved mixes)
 - c) Proposed/desired phased reclamation (e.g., of access road) to facilitate maintenance and monitoring.
 - d) Methods for managing livestock and wild horse influences.
- 7) Long-term maintenance plans for roads, pipelines, power lines, and facilities:
 - a) Weed control.
 - b) Erosion control.
 - c) Stormwater BMP maintenance.
 - d) Control of unauthorized use or travel.
 - e) Inspection and reporting schedule.

2.3 Additional Instances Requiring Site-Specific Reclamation Plan Submission

- As an attachment to Sundry Notice and Report on Well (Form 3160-5) if the APD was formerly approved without a reclamation plan.
- As a separate Sundry Notice submitted at the same time as the Subsequent Report of Well Abandonment (43 CFR 3162.4).
- Prior to requesting to abandon a right-of-way.
- Prior to any actions associated with the project that may influence reclamation.

The operator/holder can propose to amend the reclamation plan at any time via Sundry Notice.

3.0 Timeframes, Success Criteria, and Requirements

Reclamation success is determined by specific standards (that vary by phase) associated with a self-sustaining Desirable Plant Community (DPC) as defined by the range site or an associated reference site. In Phase I interim reclamation, physical measures may be combined with vegetation-based techniques to successfully stabilize, protect, and preserve soils. Phase II interim reclamation and Final reclamation for oil and gas activities would be considered successful once attaining the criteria described at 3.1.2.3 and 3.2, respectively. It is the responsibility of the operator to make repeated attempts (e.g., seeding, weed control) until successful reclamation has been achieved and accepted by the BLM. A timeline for reclamation activities is provided in Table 1.

3.1 Interim Reclamation

There are two distinct phases of interim reclamation recognized by the WRFO to manage surface disturbance associated with energy development. Phase I interim reclamation generally begins within 24 hours from the time when surface disturbing activities have ended. Surface disturbing activities include, but are not limited to, road construction and well pad construction. Phase II generally begins when drilling on the pad has ended and the wells are ready for completion and/or production. Rights-of-way (e.g., pipelines and power lines) do not necessarily have an interim reclamation phase, but proceed immediately to Final reclamation upon completion of construction. Pipeline and power line construction should be scheduled so that seed bed preparation and seeding occurs in optimal timeframes for reclamation success.

3.1.1 Phase I Interim Reclamation

Phase I interim reclamation is designed to stabilize and protect soil resources from erosion and to properly store topsoil during periods of active well development such that it remains viable and available for redistribution during later stages of reclamation. Soil stabilization measures should include vegetation-based techniques, but may rely primarily on physical measures such as erosion fabric.

3.1.1.1 Timeframe (Phase I)

Phase I interim reclamation will be implemented immediately (i.e., within 24 hours) after surface disturbing activities have ended. Application of seed should generally be avoided between April 1 and August 30, but the BLM will consider exceptions on a case-by-case basis.

3.1.1.2 Success Criteria (Phase I)

The primary objective of Phase I interim reclamation is to stabilize and protect soil resources from wind and water erosion. The BLM acknowledges that Phase I interim reclamation techniques may rely predominantly on physical measures such as erosion fabric. In those circumstances where vegetation establishment is used to stabilize soils, the primary determinant for evaluating reclamation success will be desirable ground cover rather than seeded vegetation composition. At a minimum, the following standards must be met in order for Phase I interim reclamation to be deemed successful:

- 1) All disturbed areas including stockpiled soils and the surrounding area are kept free of noxious and undesirable invasive weeds, construction debris, and trash.
- 2) Soil piles and all areas of surface disturbance not required for operations are protected (e.g., mulch, matting, netting, tackifiers, established re-vegetation).

- 3) There is no evidence of excessive erosion such as slope or soil instability, subsidence, or slumping at the site or in areas adjacent to the site (as compared to the range site).
- 4) Stored topsoil to be used in a later phase of reclamation is identified (e.g., signs or fencing), protected, and appropriately placed to minimize disturbance in/until later stages of reclamation.

3.1.1.3 Requirements (Phase I)

The following requirements apply to Phase I interim reclamation and are designed to help meet the success criteria for this phase of reclamation.

- 1) The project lead (NRS/Realty Specialist) will be notified via email or by phone at least 24 hours (follow-up with a Sundry Notice) prior to beginning any BLM approved construction or reclamation-related activities, regardless of size, that result in disturbance of surface soils.
- 2) Prior to beginning reclamation activities, a pre-reclamation onsite meeting must be scheduled with the project lead (NRS/Realty Specialist). Reclamation activities may include, but are not limited to recontouring, seed bed preparation, seeding, or construction of livestock exclosures.
- 3) All equipment that may act as a vector for weeds will be cleaned before entering the WRFO. Equipment will also be cleaned (e.g., with a portable pressure washer) when leaving and/or moving between work-sites if the pre-disturbance weed inventory indicated the presence of undesirable invasive or noxious weeds and there is a risk of transporting these weed seeds or propagules.
- 4) Trees or shrubs that must be removed for construction or ROW preparation will be cut down or masticated to a stump height of six inches or less prior to other heavy equipment operation. Trees removed for construction that are not needed for reclamation purposes will be cut in four foot lengths (down to four inches diameter) and placed in manageable stacks immediately adjacent to a public road to facilitate removal by the public. Woody materials required for reclamation will be stockpiled and stored separately from stockpiled topsoil and may be positioned along the margins of the authorized use area. Smaller limbs and trees may be chipped and stockpiled if needed for reclamation, and with approval from the AO, incorporated into the top 6-10 inches of topsoil. Boles, limbs, and other large woody material should be retained for redistribution not to exceed 20-30 percent total ground cover.
- 5) During site construction all topsoil will be stripped from the location, handled separately from subsoil materials, and stored for reuse during Phase II interim reclamation and/or Final reclamation.
 - a) Topsoil will only be used as a seed bed for reclamation. Under no circumstances will topsoil be used as a pipe bedding material, to fill sacks for trench breakers, use as a construction material, or for any use other than reclamation/seeding unless approved. Fines and organics will not be shaken out of the effective rooting zone soils for pipeline bedding.
- 6) Balance cut and fill to the maximum extent possible in order to minimize excess spoils piles and facilitate Phase II interim reclamation.

- 7) Topsoil must be salvaged during road construction and respread to the greatest degree practical on cut slopes, fill slopes, and borrow ditches prior to seeding. Road shape will be built using the borrow ditch subsoil. Topsoil may be stabilized with mulch as needed.
- 8) Properly store topsoil to protect it from erosion and compaction, assure that it remains readably identifiable (i.e., signed), viable, and available for redistribution during later stages of reclamation. Topsoil piles that will be stored for more than one month will be seeded with an approved BLM seed mix, stabilized with certified weed free erosion fabric or mulch, and may require fencing. When topsoil will be stored for more than one year and other resource values can be accommodated, topsoil will be stored in piles with a depth of two feet or less.
- 9) Vegetative and structural soil stabilization practices will be required on cut and fill slopes off the working surfaces and in areas near water features, e.g., streams (including ephemeral drainages, ponds, and wetlands), or in other situations where wind or water erosion may otherwise accelerate movement of sediments.
- 10) All disturbed surfaces, including cut and fill slopes and drainage ditches along roads, will be seeded with a BLM approved seed mix. On roads, topsoil will be spread where successful revegetation is likely (e.g., along appropriate cut and fill slopes or at the top edge of the borrow ditches) and where it will not be disturbed during regular road maintenance activities.
- 11) Livestock should generally be excluded from reclaimed areas until successful reclamation is achieved. These decisions will be made by the BLM on a case-by-case basis. Fences, cattleguards, and gates (all built to the BLM specifications per BLM manual H-1741-1) will be installed, maintained, and removed by the operator upon approval by the AO. In specific and predetermined instances, livestock exclosures may be retained for extended periods to meet other resource objectives.
- 12) To track Phase I and Phase II interim and Final reclamation, the operator will submit Geographic Information System (GIS) data to the designated [*NRS/Realty Specialist*] for any post construction (i.e., “as-built”) polygon feature that is associated with the project. GIS data will be submitted within 30 days from when construction has completed for all geographic features associated with the project. The operator will submit updated GIS data to the WRFO for approved location or orientation changes within 14 calendar days of the change. GIS data will include constructed access roads, existing roads that were upgraded, pipeline corridors, temporary work areas, well pad footprints, and ancillary facilities. Geospatial (GIS/GPS/Remote Sensing) data submitted to WRFO shall be in a format compatible with the WRFO’s Geospatial Data Submission Standards. This information can be found on the WRFO website or in the glossary.
- 13) The operator will be required to meet with the WRFO reclamation staff in March or April of each calendar year and present a comprehensive work plan. The purpose of the plan is to provide information pertaining to reclamation activities that are expected to occur during the coming year. Operators will also provide a map that shows all sites where some form of reclamation activity is expected to occur during the coming year.
- 14) A Reclamation Status Report (see Section 4.0) including weed survey results for each site will be submitted electronically to the WRFO annually (due January 1st) until it is determined that reclamation of the site has met all required objectives of Phase I interim reclamation.

3.1.2 Phase II Interim Reclamation

Phase II interim reclamation will involve recontouring the site to maximize the extent of disturbance available for reclamation, leaving the minimum area necessary for routine production and maintenance activities or as necessary to accommodate BLM authorized development plans. Desired native or seeded vegetation will be established and self-sustaining on as much of the disturbance as practicable to minimize soil erosion, inhibit noxious and undesirable invasive weed establishment, minimize visual resource impacts, allow for the advance of successional processes, and provide specific wildlife habitat components over the productive life of the well pad or facility.

The WRFO uses early-seral successional stages of the NRCS Range Site Descriptions; Ecological Site Descriptions (ESDs), where available; Assessment, Inventory and Monitoring (AIM) data; or agreed upon reference site data to compare to reclamation cover and composition values to determine if reclamation success has been achieved for Phase II and Final reclamation. The WRFO has developed an eco-site database using the Assessment, Inventory, and Monitoring (AIM) protocol (BLM TN 440). The AIM protocol gathers much of the same data used to characterize sites when developing ESDs. Assessment, Inventory and Monitoring data will generally be used to provide cover and composition data to use as DPC reference data until ESDs are developed. Success criteria for desired foliar cover, bare ground, and forb and/or shrub density in relation to the identified DPC will be determined on a site by site basis according to these data.

3.1.2.1 Timeframe (Phase II)

Revised Onshore Order No. 1 requires that earthwork for interim reclamation is to be completed within six months of well completion. WRFO prefers to have recontouring work either deferred or expedited so that seed can be applied to a fresh seedbed during the optimal seeding times (i.e., September through March), or as otherwise approved by the BLM. Topsoil redistribution and seedbed preparation should be accomplished immediately before seeding.

Phase II interim reclamation will be initiated when one of the following applies:

- The last well on a pad has been drilled and has undergone completion.
- There are no drilling activities expected on the pad for the next six months.
- There has been no activity on the pad within the last six months, regardless of whether or not there are outstanding approved APDs.

Deadlines for reclamation are subject to extension upon the approval of the AO based on weather, timing limitations, or other constraints on a case-by-case basis.

3.1.2.2 Success Criteria (Phase II)

Successful reclamation must conserve the potential of the site to produce vegetation on a sustainable basis and must meet the Colorado Public Land Health Standards. At a minimum, with BLM consideration to site conditions (i.e., elevation, slope, aspect), the following standards must be met in order for Phase II interim reclamation to be deemed successful:

- 1) All disturbed areas including stockpiled soils are kept free of noxious and undesirable invasive weeds, construction debris, and trash.
- 2) There is no evidence of excessive erosion such as slope or soil instability, subsidence, or slumping at the site or in areas adjacent to the site (as compared to the range site description).

- 3) Self-sustaining desirable vegetative groundcover consistent with the site DPC (as defined by the range site, WRFO AIM protocol site data (BLM TN 440), or an associated approved reference site) is adequately established as described below on disturbed surfaces to stabilize soils through the life of the project. As ESDs are developed those cover values may replace range site, AIM data, or reference site values.
 - a) Vegetation with eighty percent similarity of desired foliar cover, bare ground, and shrub and/or forb density in relation to the identified DPC. In the absence of specified DPC data, an agreed upon reference site or AIM data would serve as the DPC. Vegetative cover values for woodland or shrubland sites are based on the capability of those sites in an herbaceous state.
 - b) The resulting plant community must have composition of at least five desirable plant species, and no one species may exceed 70 percent relative cover to ensure that site species diversity is achieved. Desirable species include native species from the surrounding site, species listed in the range/ecological site description, or species from the BLM approved seed mix.
 - c) If non-prescribed or unauthorized plant species (e.g., yellow sweetclover, *Melilotus officinalis*) appear in the reclamation site the BLM may require their removal.
- 4) Adequate desirable vegetative groundcover is established on disturbed surfaces to stabilize soils through the operational life of the project.
 - a) The vegetation community established on the reclaimed site is capable of persisting without continued intervention (excluding routine weed management) and will allow plant community successional processes to progress toward advanced community states.
 - b) Bare ground does not exceed the AIM data, range site description or if not described, bare ground will not exceed that of a representative undisturbed DPC meeting the Colorado Public Land Health Standards.
- 5) Reclamation success in areas affected by cheatgrass and/or other invasive annual species will be qualified based on the condition of the project site (i.e., the relative vegetative cover) prior to disturbance.
 - a) If the project site contains less than 25 percent relative cover of undesirable species, interim reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 5 percent.
 - b) If the project site contains 25 percent to 50 percent relative cover of undesirable species, interim reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 10 percent.
 - c) If the project site contains more than 50 percent relative cover of undesirable species, interim reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed the level defined by site-specific criteria established in the reclamation plan developed for that site.

3.1.2.3 Requirements (Phase II)

In addition to the procedures listed above for Phase I interim reclamation, the following requirements apply to Phase II interim reclamation.

- 1) Recontour to maximize the extent of disturbance available for reclamation and restore all natural drainages to the extent possible. Soils must be returned to their respective positions in the predisturbance soil profile. Recontoured surfaces must be stable and have adequate surface roughness to reduce surface run-off.
 - a) For well pads, place rock into cut first where it can be buried below the surface. The surface cover and size distribution of exposed rock must not exceed pre-disturbance site conditions documented in the project specific reclamation plan (except when rock is used as an approved erosion control feature).
 - b) After placement of subsoil, decompaction (ripping) or other preparation of subsoils must occur prior to spreading topsoil over the ground surface. Generally, all topsoil should be redistributed across all surfaces subject to Phase II interim reclamation. Topsoil will not be spread when the ground or topsoil is frozen or too wet to adequately support construction equipment. Soil is deemed “too wet” if equipment creates ruts greater than three inches.
 - c) All topsoil that has been stockpiled for an extended period of time (six months or greater) should be retested using the same procedure described in Section 2.2 Item 1d to determine topsoil viability before it is re-spread. Analytical results should be compared to data obtained for soil characteristics prior to disturbance. If the comparison indicates problems with soil productivity, topsoil may be treated with amendments approved by the AO to meet the physical, chemical, and biological properties necessary for successful reclamation.
- 2) After topsoil has been redistributed, all disturbed areas will be seeded using a BLM approved seed mix. Seeding should occur between the beginning of September and the end of March (depending on elevation) or as otherwise approved by the BLM (See Table 5).
- 3) Once the disturbance has been recontoured and the seedbed has been prepared and seeded, stockpiled woody material shall be scattered across the reclaimed area where the material originated. Chipped material should be scattered across reclaimed areas in a manner that avoids the development of a mulch layer that suppresses growth or reproduction of desirable vegetation. With approval from the AO, chipped woody material could be incorporated into the top 6-10 inches of topsoil. Redistribution of large woody debris will not exceed 20-30 percent ground cover and excess material must be removed from the site. Large woody material should be distributed in a manner that helps deter vehicle use and promote a heterogeneous landscape. Materials would be distributed in such a way to avoid concentrations of heavy fuels that constitute a fire hazard or suppress adequate vegetation growth.
- 4) Disturbed and reclaimed areas will be managed to control dust and must be kept free of State of Colorado A and B listed noxious weeds.
- 5) Ensure that weed treatments are conducted in an effective manner compatible with approved seed mixes. To reduce the need for repeated bare ground herbicide treatments around facilities, alternative methods such as gravel, weed barrier fabric, or low-growing, disturbance-tolerant herbaceous vegetation may be used as authorized for a specific site by the BLM.

- 6) Cover, composition, and diversity data should be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. Approved methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start. In order to consistently measure success, forb and shrub density must be measured along the same transects as cover and composition using a 2 meter wide belt transect (Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems – Volume 1: Quick Start). The BLM can provide direction and data collection sheets. Other data gathering methods must provide statistically rigorous quantitative monitoring data that conforms to the BLM’s Assessment Inventory and Monitoring (AIM) strategy. Other data collection methods can be found in BLM Technical Reference 1730-1 and may be used if pre-approved by the BLM.
- 7) To track interim reclamation, the operator will submit Sundry Notice(s) supported by Geographic Information System (GIS) data (via the current data management system) for delineating all recontouring and seed application areas. GIS data will be submitted within 14 calendar days from the time when seed has been applied. Also refer to Section 3.1.1.3 item 13 for additional clarification on interim reclamation.
- 8) A Reclamation Status Report, including weed survey results for each reclamation site will be submitted electronically to the WRFO annually and a vegetation monitoring report every third year (both due January 1st) until reclamation at that site is deemed successful (see Chapter 4).

3.2 Final Reclamation

Final reclamation will be applied once pipelines and power lines are installed, wells are plugged and abandoned, or after the operational life of the facilities has ended. Desired vegetation will be established on the entire reclaimed disturbance to minimize soil erosion, inhibit noxious and undesirable invasive weed establishment, allow for the advance of successional processes, and provide specified wildlife and/or special status plant habitat components. Operators may be required to update their reclamation plan to incorporate current reclamation practices at the time of abandonment or reauthorization.

3.2.1 Timeframe (Final)

Final reclamation on pipelines will be initiated immediately after installation and seeding should occur during recommended periods. Revised Onshore Order No. 1 requires that earthwork for Final reclamation is completed within six months of well plugging. WRFO prefers to have final recontouring work either deferred or expedited so that seed can be applied to a fresh seedbed during the optimal seeding times (i.e., September through March), or as otherwise approved by the BLM. Topsoil redistribution and seedbed preparation should be accomplished immediately before seeding.

Final reclamation will be initiated when one of the following conditions exist:

- The operator encounters a “dry hole” and no further exploration or production is planned at the location.
- The final well on a pad has been plugged and abandoned.
- Facilities or infrastructure are no longer used in operations.
- The facilities that an access road serves have ceased operations and the road will be obliterated.

3.2.2 Success Criteria (Final)

At a minimum, the following standards must be met in order for Final reclamation to be deemed successful:

- 1) All reclaimed areas are kept free of noxious and undesirable invasive weeds, construction debris and trash.
- 2) There is no evidence of excessive erosion such as slope or soil instability, subsidence, or slumping at the site or in areas adjacent to the site (as compared to the range site description).
- 3) Stormwater management structures and drainage features (e.g., culverts and ditches) installed by the operator have been removed and reclaimed except where specified/approved by BLM to be left in place.
- 4) The site has been recontoured to its pre-disturbance contour or a contour that blends with the surrounding landform. See Appendix B (Best Management Practices and Conditions of Approval) of the RMPA/EIS.
- 5) The surface cover and size distribution of exposed rock must not exceed pre-disturbance site conditions documented in the project specific reclamation plan (except when rock is used as an approved erosion control feature).
- 6) Roads built for and no longer supporting oil and gas development have been recontoured, obliterated, revegetated, and are no longer distinguishable as a means of vehicle travel (i.e., no ruts or two-tracks).
- 7) All signs, fences, gates, and cattleguards associated with livestock enclosures have been removed from the site, unless in specific predetermined instances the AO directs that livestock enclosures be retained for extended periods to meet other resource objectives.
- 8) Self-sustaining desirable vegetative groundcover consistent with the site DPC (as defined by the range site, WRFO AIM protocol site data (BLM TN 440), or an associated approved reference site) is adequately established as described below on disturbed surfaces to stabilize soils. As ESDs are developed those cover values may replace range site, AIM data, or reference site values.
- 9) Final reclamation is considered successful when the entire reclamation site (including obliterated roads) has attained the following criteria:
 - a) Vegetation with eighty percent similarity of desired foliar cover, bare ground, and shrub and/or forb density in relation to the identified DPC. In the absence of specified DPC data, an agreed upon reference site or AIM data would serve as the DPC. Vegetative cover values for woodland or shrubland sites are based on the capability of those sites in an herbaceous state.
 - b) The resulting plant community must have composition of at least five desirable plant species, and no one species may exceed 70 percent relative cover to ensure that site species diversity is achieved. Desirable species include native species from the surrounding site, species listed in the range/ecological site description, or species from the BLM approved seed mix.
 - c) If non-prescribed or unauthorized plant species (e.g. Yellow sweetclover, *Melilotus officinalis*) appear in the reclamation site the BLM may require their removal.

- 10) The vegetation community established on the reclaimed site stabilizes soils, is capable of persisting without continued intervention (excluding routine weed management), and will allow plant community successional processes to progress toward advanced community states.
- 11) Bare ground does not exceed that of the AIM data, range site, or if not described, bare ground does not exceed that of a representative undisturbed DPC meeting the Colorado Public Land Health Standards.
- 12) Reclamation success in areas affected by cheatgrass and/or other invasive annuals will be qualified based on the condition of the project site (i.e., the relative vegetative cover) prior to disturbance.
 - a) If the project site contains less than 25 percent relative cover of undesirable species, Final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 5 percent.
 - b) If the project site contains 25 percent to 50 percent relative cover of undesirable species, Final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed 10 percent.
 - c) If the project site contains more than 50 percent relative cover of undesirable species, Final reclamation will be considered acceptable when the relative cover of undesirable species on the project site does not exceed the level defined by site-specific criteria established in the reclamation plan developed for that site.

3.2.3 Reclamation Requirements (Final)

In addition to all applicable Phase I and Phase II interim reclamation requirements listed above, the following additional requirements apply to Final reclamation.

- 1) Sampling of soils directly beneath facilities may be required, depending on the type of facility, to assure compliance with State of Colorado Total Petroleum Hydrocarbons (TPH) and Salinity quality standards prior to being incorporated into the reclaimed surface. If sampled, laboratory analytical results, resulting actions taken by the operator, and GPS coordinates of tested locations must be submitted via Sundry Notice to the AO prior to submitting a Request for Final Abandonment.
- 2) Roads that existed prior to development have been returned to their original state unless otherwise directed by the AO. Roads left at the end of Final reclamation should be designed at an appropriate standard, no higher than necessary to accommodate their intended function.
- 3) Unless authorized, there will be no vehicle access, including OHVs, on linear rights-of-way (e.g., pipelines and power lines). Physical barriers (e.g., fences, rocks, etc.) may be necessary to prevent travel on reclaimed surfaces. Woody materials would be distributed in such a way to avoid large concentrations of heavy fuels.
- 4) Where needed, signs and/or deterrents to limit public use of reclaimed surfaces should be installed. These items and livestock control measures must also be removed upon approval of Final Abandonment by the WRFO BLM.

- 5) Cover, composition, and diversity data should be gathered using quantitative methods to measure the six Core Terrestrial Indicators and Methods in BLM Technical Note 440. Approved methods are found in Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume I and II: Quick Start. In order to consistently measure success, forb and shrub density must be measured along the same transects as cover and composition using a 2 meter wide belt transect (Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems – Volume 1: Quick Start). The BLM can provide direction and data collection sheets. Other data gathering methods must provide statistically rigorous quantitative monitoring data that conforms to the BLM's Assessment Inventory and Monitoring (AIM) strategy. Other data collection methods can be found in BLM Technical Reference 1730-1 and may be used if pre-approved by the BLM. Monitoring of pipeline reclamation will occur at appropriate spatial intervals (approved by BLM) to determine if success criteria have been met and identify problem sites that require follow-up actions.
- 6) To track final reclamation, the operator will submit Sundry Notice(s) supported by Geographic Information System (GIS) data (via the current data management system) delineating all recontouring and seed application areas. GIS data will be submitted within 14 calendar days from the time when seed has been applied.
- 7) The BLM WRFO AO will be informed when Final reclamation has been successfully completed (based on results of vegetation monitoring data) and the site is ready for final inspection. Vegetation monitoring must also be completed and reported in conjunction with the Final Abandonment Notice.

Table 1. Timeline for Reclamation Activities

Phase	Actions
Predisturbance	1) A Reclamation Plan is submitted as part of the Surface Use Plan (SUP) with an Application for Permit to Drill (APD, Form 3160-3), Sundry Notice (Form 3160-5), or as part of a Right-of-Way Application, or when there is a change in action (see Section 2.0). <i>Prior to beginning construction; monitoring methods, site specific surveys, and pre-disturbance evaluations are completed as described in site specific reclamation plan.</i>
	2) The BLM reviews or prepares an environmental assessment to analyze potential impacts of the proposed action. Identified impacts are mitigated with BLM Conditions of Approval (COAs). The approved Reclamation Plan and applied COAs specify procedures and techniques to be used at each stage of reclamation.
Phase I Interim Reclamation	3) Phase I interim reclamation is implemented immediately (within 24 hours) after surface disturbing activities (e.g., construction of access road and pad) have ended. The goal of Phase I interim reclamation is to stabilize, protect and preserve soils during construction and drilling (see Section 3.1.1.1). Rights-of-way (e.g., pipelines, power lines) proceed immediately to Final reclamation of the surface (see Section 3.2.1).
	4) Phase I interim reclamation (see Section 3.1.1.3) typically involves the following activities: <ul style="list-style-type: none"> • Install approved BMPs and stabilization measures for slopes and stockpiled soils; and • Begin/continue weed control measures.
Phase II Interim Reclamation	5) Earthwork for Phase II recontouring must begin within six months (weather permitting) of drill rig leaving the location, (see Section 3.1.2.1). The goal of Phase II interim reclamation is to recontour and reclaim the maximum extent of the disturbance possible while leaving the minimum area necessary for routine production and maintenance activities. Phase II interim reclamation helps to establish desirable vegetation to minimize soil erosion, inhibit weed establishment, allow for the advancement of successional processes, and provide specific wildlife habitat components over the productive life of the well pad or facility (see Section 3.1.2). Submit Sundry Notice and GIS data (see Section 3.1.2.3 No. 7).
	6) Maintenance activities such as weed control and stormwater control described in the approved Reclamation Plan continues throughout Phase II (see Section 3.1.2.3).
	7) The completion of earthwork for Phase II should coincide with optimal seeding times (i.e. September through March), or as otherwise approved by the BLM. After recontouring is complete, stored topsoil is re-spread, and if approved, soil amendments are added. Following topsoil placement, seed is applied, stabilization measures are installed, and woody debris is spread on reclaimed areas. Following seeding, fencing (if not already in place) is installed. Phase II interim reclamation remains in place through the life of the well or facility (see Section 3.1.2.3).
Final Reclamation	8) Earthwork for Final reclamation must be completed within six months of well plugging (see Section 3.2.1). The goal of Final reclamation is to return the site as close as possible to its original contour and its predisturbed condition with desirable, self-sustaining vegetation to minimize soil erosion, inhibit weed establishment, allow for the advancement of successional processes, and provide specific wildlife habitat components (see Section 3.2).
	9) Disturbed areas (e.g., pads, roads, linear facilities, facility sites) must be reclaimed to a satisfactorily revegetated, safe, and stable condition. Earthwork and soil preparation should be timed to be completed immediately prior to optimal seeding times (i.e., September through March), or as otherwise approved by the BLM (see Section 3.2.1). Submit Sundry Notice and GIS data (see Section 3.2.3 No. 6).
	10) When Final reclamation efforts are successful the operator submits a Final Abandonment Notice (FAN) to the BLM (see Section 3.2.3). Final abandonment will not be approved until the surface reclamation work has been completed and seeded vegetation has established to the satisfaction of the BLM (see Section 3.2.2).

4.0 Reclamation Status Reports

Reclamation status reports will be submitted annually in order to monitor progress at all reclaimed sites across the WRFO. Reclamation vegetation monitoring, completed by qualified personnel, should occur within the growing season and begin the second year after reclamation efforts are initiated and every third year after that until final abandonment. The BLM may require more frequent monitoring of reclamation if necessary. Vegetation monitoring reports should be submitted to the BLM with the reclamation status report via the current data management system. Vegetation monitoring must also be completed and reported in conjunction with the Final Abandonment Notice. An internal and external review of the WRFO reclamation status report and the processes used to acquire necessary information will be conducted and incorporated periodically.

4.1 Timeframe for Reclamation Status Report Submission

A reclamation status report for each site will be submitted electronically to the WRFO annually (due January 1st) until it is determined that reclamation of the site has met all required objectives of that particular reclamation phase. Every third year, a vegetation monitoring report should accompany the status report.

The reclamation status report will be submitted electronically via the most current data management system. Contact your WRFO project lead (NRS/Realty Specialist) with any questions. Any changes to the project status or related information can also be provided through the most current data management system.

4.2 Status Report Components

The reclamation status report will include (at a minimum) the following components to sufficiently and accurately characterize progress and status of reclamation to be included in a BLM database:

- The original National Environmental Policy Act (NEPA) document number and, if applicable, realty case file number or the well number and American Petroleum Institute (API) number.
- “As-built” GIS data of the project feature(s) (e.g., well pad, pipeline, travel or power-line corridor, ancillary facilities, etc.).
- The date of the inspection.
- Legal description and UTM coordinates for each discrete point feature associated with the report.
- A reclamation diagram will be included in the report and submitted for each project feature. The reclamation diagram will clearly show the area(s) where reclamation activities have occurred and will also include each point, polygon, or polyline feature that is associated with the report.
- Site Description (e.g., Range Site, ESD, or Reference Site as applicable).
- Reclamation status (e.g., “Phase I interim,” “Phase II interim,” or “Final”).
- Re-contouring status, including areas returned to final contours.
- Date(s) seeded, total area seeded (in acres), seed mixture applied, and seeding method (e.g., broadcast, drilled, hydro-mulched, etc.), if applicable.

- Contact information for the person responsible for developing the report.
- Additional notes pertaining to the overall condition of the site including identification of sites in need of additional reclamation actions with an outline of the actions to be taken.
- Weed management plans, surveys, and treatment actions including Pesticide Application Reports (PAR).
- Permanent photo points identified and noted on the reclamation diagram. Photos will be taken at each photo point, and the date the photo was taken will be noted on each photo. (Refer to BLM Technical Reference 1730-1 for specific guidance regarding establishing photo points.)
- Reclamation vegetation monitoring reports should accompany the (above) status report to include in the BLM database. It must include (at a minimum) the following components to sufficiently and accurately characterize progress of the vegetative community establishment:
 - Vegetative attributes for seeded surfaces. Refer to BLM Core Terrestrial Indicators and Methods Technical Note 440, preferably, or Technical Reference 1730-1 for guidance regarding quantitatively assessing vegetative species composition and cover. The size of each reclaimed area must be specified as well as the number of transects and points hit along the intercept. Indicators to measure and quantify:
 - Bare ground including rock fragment, woody debris, biotic soils (if applicable), and litter estimates
 - Plant cover
 - Vegetation composition
 - Relative cover of all plant species found in the line-point intercept monitoring
 - Plant species of management concern
 - Species richness over entire reclaimed area
 - Nonnative invasive plant species
 - Vegetation height
 - Proportion of soil surface in large intercanopy gaps

If any portion of the report is not complete or accurate the operator may be required to re-sample and re-submit it.

5.0 Seed Mixes

Bureau of Land Management approved seed mixes are designed to promote long term establishment of native species, minimize erosion, compete with noxious and undesirable invasive weeds, and provide the foundation for further successional development of vegetation (particularly shrubs and trees) derived from adjacent native communities as habitat for wildlife. Seed mixes are developed according to plant community types and wildlife needs.

If the use of non-native species is desired, justification and documentation of the need is required for the BLM to consider its approved use. Examples of this situation could be sites with soils that demonstrate repeated resistance to seedling establishment despite amendment or areas at high risk of reclamation failure due to noxious or invasive weeds. Seed mixes including annual cereal grasses or sterile hybrid crops will generally not be approved for use in the WRFO resource area. The BLM may consider exceptions to this policy if research or well-founded empirical information indicates that benefits of a nurse crop outweigh competitive interactions on desired perennial vegetation. All seed placed on BLM and split-estate lands will comply with United States Department of Agriculture (USDA) state noxious weed seed requirements. Any seed lot with test results showing presence of State of Colorado A or B list species will be rejected in its entirety and a new tested lot will be used for reclamation.

5.1 Seed Mix Selection, Application Methods, and Rates

Most range sites within the WRFO have been assigned a seed mix (Table 2). These seed mixes have been designed by considering soil types, ranges sites, and the composition of native species likely to occur in the potential native plant community. Some of the range sites or soil units within the WRFO have not been assigned a seed mix. For sites with specialized characteristics (e.g., riparian floodplains, shale barrens, community variations within the ecological site) or those difficult to reclaim (e.g., rocky, shallow soils or steep slopes) specific seed mixes will be approved by the BLM on a case-by-case basis.

Drill seeding is the preferred method of seed application, however special circumstances may warrant another seeding method. If slopes are too steep or otherwise unsuitable for drilling, seed will be broadcast at double the rate specified. Broadcast seed should be covered by harrowing or raking to ensure germination and establishment. Hydromulching after seed application will generally be recommended on steeper slopes.

Where appropriate, the AO may require (or consider proposals to employ) seeding and seedbed preparation techniques that favor germination and seedling establishment of forb and shrub seeds in conjunction with, or as a supplement to, conventional drill-seeding applications. These techniques are intended to avoid problems associated with applying or mixing seeds that differ from grass seed in size or density.

Seed mixes in Table 3 were designed to average 50 seeds per square foot with the assumption that there would not be a substantial viable seed bank remaining in topsoil piles that had been stored for greater than six months. At the discretion of the BLM, it may be appropriate to reduce the seeding rates (i.e., adjusted to 20-30 seeds per square foot) in circumstances where a substantial viable seed bank persists in the topsoil (e.g., pipelines in which the topsoil is removed and replaced in the same growing season).

The composition of Phase I interim reclamation seed mixes may be different from those used during Phase II interim reclamation and Final reclamation since the BLM would not generally require the use of forb or shrub seed during Phase I interim reclamation. If non-prescribed or unauthorized plants appear in the reclamation site, the BLM may require their removal.

Table 2. Seed Mixes Tied to Range Sites within the WRFO

Seed Mix	Range Sites
1	Alkali Flat, Alkaline Slopes, Clayey Foothills, Clayey Slopes
2	Deep Loam, Loamy Slopes, Loamy, Loamy 10-14 inch precipitation, Loamy Bottom, Loamy Breaks, Loamy Slopes, Rolling Loam
3	Desert Clay, Foothills Juniper, Mountain Pinyon, Pinyon Juniper Woodlands, Sandy Juniper, Stoney Foothills, Soil Unit 206mcs
4	Sandhills, Sandy Foothills
5 or 10 ⁽¹⁾	Foothill Swale, Swale Meadow
6	Aspen, Brushy Loam, Deep Clay Loam, Douglas-Fir Woodland, Lodgepole Pine Woodland, Mountain Loam, Mountain Meadow, Mountain Shallow Loam, Mountain Swale, Spruce-Fir Woodland
7	Dry Exposure, Dry Mountain Loam, Stoney Loam
8 or 9 ⁽¹⁾	Clayey Loam, Clayey Saltdesert, Desert Shallow Clay, Loamy Cold Desert, Loamy Saltdesert, Salt Meadow, Saltdesert Breaks, Saltdesert Overflow, Sandy, Sandy Saltdesert, Semidesert Clay Loam, Semidesert Gravelly Loam, Semidesert Loam, Semidesert Sandy Loam, Semidesert Shallow Loam, Silty Saltdesert, Upland Shallow Loam, Upland Stony Loam, and Soil Units 196mcs and 204mcs

NOTE:

⁽¹⁾Two seed mixes are presented as options available only at the discretion of the BLM in areas that are known to be especially harsh sites to reclaim. The second seed mix listed is a mix of native and introduced species.

**Table 3. Standard Seed Mixes
(50 seeds per square foot application rate)**

Seed Mix	Cultivar	Common Name	Scientific Name	Application Rate (lbs PLS/acre)	
1	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	4.5	
	Critana	Thickspike Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	3.5	
	Toe Jam Creek	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	3	
		Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5	
		Sulphur Flower Buckwheat	<i>Eriogonum umbellatum</i>	1.5	
		Winterfat	<i>Krascheninnikovia lanata</i>	1	
	Alternates:⁽¹⁾				
	Sodar	Streambank Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i>	3.5	
		Annual Sunflower	<i>Helianthus annuus</i>	3	
	Mat Saltbush	<i>Atriplex corrugata</i>	2		
2	Arriba	Western Wheatgrass	<i>Pascopyrum smithii</i>	4	
	Rimrock	Indian Ricegrass	<i>Achnatherum hymenoides</i>	3.5	
	Whitmar	Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i> ssp. <i>inermis</i>	4	
	Lodorm	Green Needlegrass	<i>Nassella viridula</i>	2.5	
	Timp	Northern Sweetvetch	<i>Hedysarum boreale</i>	3	
		Sulphur Flower Buckwheat	<i>Eriogonum umbellatum</i>	1.5	
	Alternates:⁽¹⁾				
		Needle and Thread	<i>Hesperostipa comata</i> ssp. <i>comata</i>	3	
	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5		
3	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	4	
	Whitmar	Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i> ssp. <i>inermis</i>	3.5	
	Rimrock	Indian Ricegrass	<i>Achnatherum hymenoides</i>	3	
		Needle and Thread Grass	<i>Hesperostipa comata</i> ssp. <i>comata</i>	2.5	
	Maple Grove	Lewis Flax	<i>Linum lewisii</i>	1	
		Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5	
	Alternates:⁽¹⁾				
	Critana	Thickspike Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	3	
		Sulphur Flower Buckwheat	<i>Eriogonum umbellatum</i>	1.5	

**Table 3 continued. Standard Seed Mixes
(50 seeds per square foot application rate)**

Seed Mix	Cultivar	Common Name	Scientific Name	Application Rate (lbs PLS/acre)	
4	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	3.5	
	Critana	Thickspike Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	2.5	
	Rimrock	Indian Ricegrass	<i>Achnatherum hymenoides</i>	3	
		Needle and Thread Grass	<i>Hesperostipa comata</i> ssp. <i>comata</i>	2.5	
		Northern Sweetvetch	<i>Hedysarum boreale</i>	3	
		Sulphur Flower Buckwheat	<i>Eriogonum umbellatum</i>	1	
	Alternates:⁽¹⁾				
	Toe Jam Creek	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	2	
	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5		
5	Magnar	Basin Wildrye	<i>Leymus cinereus</i>	3.5	
	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	3.5	
	San Luis	Slender Wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	3	
	Critana	Thickspike Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	3	
	Timp	Northern Sweetvetch	<i>Hedysarum boreale</i>	4.5	
	Maple Grove	Lewis Flax	<i>Linum lewisii</i>	1	
	Alternates:⁽¹⁾				
	Sodar	Streambank Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i>	3	
	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5		
6	UP Plateau	Sandberg bluegrass	<i>Poa secunda</i> ssp. <i>sandbergii</i>	0.5	
	San Luis	Slender Wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	2	
	Sherman	Big Bluegrass	<i>Poa secunda</i> ssp. <i>ampla</i>	1	
	Bromar	Mountain Brome	<i>Bromus marginatus</i>	2	
	Maple Grove	Lewis Flax	<i>Linum lewisii</i>	1	
	Bandera	Rocky Mountain Penstemon	<i>Penstemon strictus</i>	0.5	
	Alternates:⁽¹⁾				
	Canbar	Canby Bluegrass	<i>Poa secunda</i> ssp. <i>canbyi</i>	0.5	
	Arrowleaf Balsamroot	<i>Balsamorhiza sagittata</i>	3		

**Table 3 continued. Standard Seed Mixes
(50 seeds per square foot application rate)**

Seed Mix	Cultivar	Common Name	Scientific Name	Application Rate (lbs PLS/acre)	
7		Letterman needlegrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	3	
	San Luis	Slender Wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	2	
	Whitmar	Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i> ssp. <i>inermis</i>	4	
	Sodar	Streambank Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i>	3	
		Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5	
		Sulfur Flower Buckwheat	<i>Eriogonum umbellatum</i>	1	
	Alternates:⁽¹⁾				
	UP Plateau	Sandberg Bluegrass	<i>Poa secunda</i> ssp. <i>sandbergii</i>	0.5	
		Northern Sweetvetch	<i>Hedysarum boreale</i>	3	
8	Viva Florets	Galleta Grass	<i>Pleuraphis jamesii</i>	3	
	Rimrock	Indian Ricegrass	<i>Achnatherum hymenoides</i>	3	
	Toe Jam Creek	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	2.5	
	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	4	
		Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.25	
		Annual Sunflower	<i>Helianthus annuus</i>	2.5	
		Mat Saltbush	<i>Atriplex corrugata</i>	2	
	Alternates:⁽¹⁾				
		UP Plateau	Sandberg Bluegrass	<i>Poa secunda</i> ssp. <i>sandbergii</i>	0.5
			Fernleaf Biscuitroot	<i>Lomatium dissectum</i>	3
		Shadscale	<i>Atriplex confertifolia</i>	2	
Seed Mix 9 and 10 may only be used after BLM interdisciplinary team analysis and approval					
9	Rosana	Western Wheatgrass	<i>Pascopyrum smithii</i>	5	
	Bozoisky-Select	Russian Wildrye	<i>Psathyrostachys juncea</i>	3	
	Hycrest	Crested Wheatgrass	<i>Agropyron cristatum</i>	3	
		Annual Sunflower	<i>Helianthus annuus</i>	5	
	Alternates:⁽¹⁾				
		P27	Siberian Wheatgrass	<i>Agropyron fragile</i>	3.5
			Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	1

**Table 3 continued. Standard Seed Mixes
(50 seeds per square foot application rate)**

Seed Mix	Variety	Common Name	Scientific Name	Application Rate (lbs PLS/acre)	
10	Magnar	Basin Wildrye	<i>Leymus cinereus</i>	3.5	
	Rosanna	Western Wheatgrass	<i>Pascopyrum smithii</i>	4	
	Luna	Pubescent Wheatgrass	<i>Elytrigia intermedia</i>	4	
	Paiute	Orchardgrass	<i>Dactylis glomerata</i>	1	
	Ladak	Alfalfa	<i>Medicago sativa</i>	1.5	
	Wytana	Fourwing Saltbush	<i>Atriplex canescens</i>	2	
	Alternates:⁽¹⁾				
		Hycrest	Crested Wheatgrass	<i>Agropyron cristatum</i>	1.5
			Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5

NOTE:

⁽¹⁾As seeds for other native species become commercially available the BLM will consider the use of site adapted (i.e., varieties compatible with local conditions) native species that are listed as a component of the potential native plant community.

Table 4 is a list of some BLM approved alternate forb species acceptable for use in the seed mixes in Table 3. For site specific recommendations or application rates, contact the project lead (NRS or Realty Specialist).

Table 4. Alternate Forb Species

Variety	Common Name	Scientific Name
	American Vetch	<i>Vivia americana</i>
	Arrowleaf Balsamroot	<i>Balsamorhiza sagittata</i>
	Fernleaf Biscuitroot	<i>Lomatium dissectum</i>
	Hoary Tansyaster	<i>Machaeranthera canescens</i>
	Hood’s Phlox	<i>Phlox hoodii</i>
	Mule’s Ears	<i>Wyethia amplexicaulis</i>
	Munro Globemallow	<i>Sphaeralcea munroana</i>
	Narrowleaf Indian Paintbrush	<i>Castilleja linariaefolia</i>
	Rayless tansyaster	<i>Machaeranthera grindelioides</i>
	Rocky Mountain Beeplant	<i>Cleome serrulata</i>
	Scarlet Gilia	<i>Ipomopsis aggregata</i>
	Showy Goldeneye	<i>Heliomeris multiflora</i>
	Silverleaf Lupine	<i>Lupinus argenteus</i>
Occidentalis	Western Yarrow	<i>Achillea millefolium</i>
	White Evening Primrose	<i>Oenothera pallida</i>
	Wyeth Buckwheat	<i>Eriogonum heracleoides</i>

5.2 Acceptable Seeding Dates

Seeding should occur between September 1 and March 31, depending on elevation and vegetation community, or as otherwise approved by the BLM. General guidelines for dominant vegetation communities within the White River Field Office resource area are provided in the table below.

Table 5. Acceptable Seeding Dates Based on Vegetation Community

Vegetation Community	Seeding Dates
Desert Shrub	September 1 - February 29
Low Elevation Sagebrush (below 5,500 ft.)	September 1 - February 29
Mid-elevation Sagebrush (5,500 - 7,200 ft.)	September 1 - March 15
High Elevation Sagebrush (above 7,200 ft.)	September 1 - March 31
Low Elevation Pinyon-Juniper (below 5,500 ft.)	September 1 - February 29
Mid-elevation Pinyon-Juniper (5,500 - 7,200 ft.)	September 1 - March 15
High Elevation Pinyon-Juniper (above 7,200 ft.)	September 1 - March 31
Mixed Mountain Shrub	September 1 - March 31
Aspen Forest	September 1 - March 31
Douglas-Fir Forest	September 1 - March 31

6.0 Modifications of Standard Reclamation Success Criteria and Seed Mixes

The BLM may request special reclamation procedures or seed mixes to be augmented with special components to meet specific and pre-defined resource objectives.

6.1 Greater Sage-Grouse Habitat

Within the overall range of greater sage-grouse, the following conditions may be imposed:

- Reclamation success criteria on sage-grouse habitats would generally be contingent, where prescribed, on evidence of successful establishment of desired forbs and sagebrush. Reclaimed acreage would be expected to progress without further intervention to a state that meets sage-grouse cover and forage needs based on site capability and seasonal habitat use as per Appendix A, “Structural Habitat Guidelines” from the *Colorado Greater Sage-grouse Conservation Plan*.
- Consistent with existing land use decisions, adapted forms of forbs with recognized utility as sage-grouse forage or cover would be included in Phase II interim and Final reclamation seed mixes applied to surface disturbances in suitable sage-grouse nesting, early brood rearing, and late brood habitats. Native forms would be used as a general rule, but where unavailable or considered beneficial and consistent with existing land use decisions, non-native species with established value to sage-grouse that have no demonstrated tendency to persist as a dominant forb constituent on reclaimed lands for extended timeframes (e.g., 10 years) or disperse beyond the treatment area could be used where approved by the BLM.
- When prescribed as a reclamation seed mix component, local accessions of sagebrush (i.e., material collected on site or seed propagated from “local” collections) would be used where appropriate and as specified by the BLM to accelerate the redevelopment of sagebrush where canopies have been removed or adversely modified.

6.2 Habitat for Special Status Plant Species

Reclamation of special status plant species’ habitats may require additional conditions to prevent topsoil from mixing into or percolating through large diameter spoils. Examples may include but are not limited to: topsoil and subsoil separation by protective covering and/or fencing during excavation, spoil crushing and/or compacting prior to topsoil and subsoil replacement, adhesion fabrics or mulch on steep slopes, and restrictions on topsoil storage timeframes.

6.3 Areas of Critical Environmental Concern (ACEC) and Remnant Vegetation Associations (RVA)

Within RVAs and identified ACECs (i.e., those established for special status plant species) the following additional conditions apply:

- In order to maintain genetic integrity, native seed must be collected prior to construction operations or disturbance. Native seed will be collected utilizing established standards put forth and provided by the Association of Official Seed Certifying Agencies (www.AOSCA.org).
- If native seed production is insufficient to allow collection of an adequate quantity of seed after three consecutive growing seasons, then the operator may request authorization to use an alternate seed mix that resembles the desired native plant community as closely as possible. Any alternate seed mix must be approved, in writing, by the AO after appropriate environmental analysis is conducted.

7.0 Supplemental Information

7.1 Acronyms

ACEC	Areas of Critical Environmental Concern
AIM	Assessment, Inventory, and Monitoring Protocol
AO	Authorized Officer
APD	Application for Permit to Drill
API	American Petroleum Institute
BLM	Bureau of Land Management
BMP	Best Management Practice
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
COA	Condition of Approval
DPC	Desired Plant Community
ESD	Ecological Site Descriptions
FAN	Final Abandonment Notice
FLPMA	Federal Land Policy and Management Act of 1976
GIS	Geographic Information System
GPS	Global Positioning System
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service (USDA Federal Agency)
OHV	Off-highway vehicle
PAR	Pesticide Application Reports
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision

Appendix 3 – Surface Reclamation Plan

ROW	Rights of Way
RS	Remote Sensing
RVA	Remnant Vegetation Association
SUP	Surface Use Plan
TN	Technical Note
TPH	Total Petroleum Hydrocarbons
USDA	United States Department of Agriculture
UTM	Universal Transverse Mercator
WRFO	White River Field Office

7.2 Contact Information

Phone: (970) 878-3800

All inquiries should be sent to the WRFO:

Attn: [name of project lead]
Bureau of Land Management
White River Field Office
220 East Market Street
Meeker, CO 81641

7.3 References

Bureau of Land Management (BLM). 1998a. Measuring and Monitoring Plant Populations.

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MacKinnon, W.C., J.W. Karl, G.R. Toevs, J.J. Taylor, M. Karl, C.S. Spurrier, and J.E. Herrick. 2011. BLM Core Terrestrial Indicators and Methods. Technical Note 440. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.

U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS). 1976. Davis R.M. National Range Handbook. July 1976.

7.4 Glossary

Best Management Practice (BMP): BMPs are state-of-the-art mitigation measures designed to provide for safe and efficient operations while minimizing undesirable impacts to the environment.

Desirable species/desirable vegetative groundcover: Include those plant species defined by the range site, from the BLM approved seed mix, or other desired species found in the surrounding areas (approved by the BLM).

Desired Plant Community (DPC): DPCs are plant community types composed of desirable species that occupy an ecological site to meet management objectives and provide at least the minimum qualitative and quantitative criteria for the soil, water, air, plant, and animal resources.

Drilling: A drill rig is present and in the act of drilling for placement of surface casing and/or production casing.

Ecological Reference Area: A landscape unit in which ecological processes are functioning within a normal range of variability and the plant community has adequate resistance to and resiliency from most disturbances. These areas do not need to be pristine, historically unused lands (e.g., climax plant communities or relict areas) (Pellant et al. 2000). Ecological reference areas are lands that best represent the potential of a specific ecological site in both physical function and

biological health. In many instances potential ecological reference areas are identified in Ecological Site Descriptions and are referred to as “type locations.”

Ecological Site: A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation.

Ecological Site Description: Describes physiographic features, climate features, influencing water features, representative soil features, and plant communities (including information about state and transition of plant communities) for the ecological site. Information common for plant communities can include community narratives, annual production, species composition, growth curves, cover and structure, and photos. This system describes what is possible for a particular reclamation site and also allows for the updating of the site descriptions as new information becomes available.

Effective Rooting Zone: Effective rooting zone is the depth where plants obtain most of their water and nutrients. Approximately 80 percent of a given plant’s root system is found within this zone. The depth of the effective rooting zone varies by plant species, soil type, and local depths to bedrock.

Final Reclamation: Reclamation of an area (not planned for further disturbance) including recontouring, stabilization of soils, and establishment of vegetation representative of the DPC in a healthy early seral state that will allow progression toward the climax community.

Growing Season: Growing season is the portion of the year when temperatures and moisture permit plant growth. The growing season for the WRFO is defined as the period between the last frost of spring and the first frost of autumn, which varies with elevation. In the WRFO this period generally begins in April and may continue into September depending on elevation.

Interim Reclamation (Phase I/II): Reclamation of an area (likely to be redisturbed in the future) including partial recontouring, soil stabilization, and revegetation. This includes sites where final recontouring will be needed at the end of the project and sites where periodic disturbance may occur due to on-going operation and maintenance activities. Phase I interim reclamation generally begins within 24 hours from the time when surface disturbing activities have ended.

On-Site Evaluation: A preplanning meeting to evaluate the site of proposed disturbance, usually attended by the operator, surface owner, the BLM, and interested parties.

Rangeland Ecological Site/Range Site: A distinctive kind of land with specific physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species (see *National Range Handbook, Soil Conservation Service, USDA, 1976*).

Reclamation: The result of activities implemented to provide: surface and subsurface stability and a functioning plant community of desirable perennial vegetative cover that is capable of persisting and is compatible with or complements BLM established land management objectives. Vegetation will be representative of the range site or Desired Plant Community and allow for successional processes that allow progression toward the climax vegetative community expected for that range site.

Reclamation Plan: A plan submitted by the operator as outlined in the Revised Onshore Order No. 1, effective March 7, 2007. The Plan is a dynamic document that defines and explains the extent

and timing of actions taken to contribute to the eventual restoration of the disturbed site to its natural undisturbed potential.

Restoration: Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term.

Revegetation: Establishing or re-establishing desirable plants in areas where desirable plants are absent or of inadequate density, by natural revegetation, by seeding, or transplanting (artificial revegetation).

Soil Productivity: Soil productivity is defined as the capacity of a soil for producing a specified plant or sequence of plants under a specified system of management. For reclamation, soil productivity is the effectiveness of the seed bed to propagate the reclamation seed mix.

Surface Disturbing Activities: An action that alters the vegetation, surface/near surface soil resources, and/or surface geologic features, beyond natural site conditions, and on a scale that affects other Public Land values. Examples of surface disturbing activities may include: operation of heavy equipment to construct well pads, roads, pits and reservoirs, installation of pipelines and power lines, or vegetation treatments (e.g., prescribed fire, etc.). Surface disturbing activities may be either authorized or prohibited. *Wyoming Information Bulletin 2007-029, Guidance for Use of Standardized Surface Use Definitions.*

Surrounding Area: The variable area of influence (generally within 330 feet) associated with a disturbance that, if infested by noxious or undesirable invasive weeds, could serve as a seed source to infest or re-infest the disturbed area.

Topsoil: For the purpose of this document topsoil is considered the surface soil, usually corresponding with the O and A, and sometimes B horizons that contain the greatest amount of organic matter, biological activity, and nutrients. Depths vary by location. Topsoil is distinguished from subsoil as the most favorable material for establishment of seeded species and plant growth. It is used to top-dress areas of previous disturbance.

WRFO Geospatial Data Submission Standards: Geospatial (GIS/GPS/Remote Sensing) data submitted to the designated [*NRS/Realty Specialist*] and shall be in a format compatible with the WRFO's Geographic Information System (GIS). Acceptable data formats are: (1) ESRI shapefiles or geodatabases and (2) AutoCAD .dwg or .dxf files. Option 1 is highly preferred, but in the case of engineering drawings, both Options 1 and 2 are required. AutoCAD submission must include, or be constructed with, spatial referencing (defined below) similar to standard GIS data for direct incorporation into WRFO data models. Data must be submitted in UTM Zone 13N, NAD83 in units of meters. Data may be submitted as: (a) an email attachment; or (b) on a standard compact disk (CD) in uncompressed (preferred) or compressed (WinZip only) format. All submitted data shall include metadata that includes collection methods (e.g., type of GPS), accuracy, field notes, etc., and conforms to the Content Standards for Digital Geospatial Metadata from the Federal Geographic Data Committee standards. Alternatives to the stated submittal requirements may be approved on a case-by case basis. Questions should be directed to WRFO BLM GIS staff at 970-878-3800.

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Appendix 4

Water Resources Monitoring Plan



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Appendix 4

Water Resources Monitoring Plan

1.0 Introduction

In 2005, the Bureau of Land Management (BLM) funded the United States Geological Survey (USGS) to create a regional framework for Water Resources Monitoring Related to Energy Exploration and Development (Regional Framework). The Regional Framework (McMahon et al. 2007) is a universal water resource monitoring methodology that can be applied to any BLM field office facing energy development. The Regional Framework was funded as part of the BLM's Assessment, Inventory, and Monitoring (AIM) Strategy (Toevs et al. 2011). As an example of its use, the Regional Framework approach was applied to the Piceance Creek and Yellow Creek watersheds in White River Field Office (WRFO), in the Mesaverde Play Area (MPA). Baseline data collection recommended in the Regional Framework for the MPA began in 2007. Information from this data collection effort has been included in the water resource sections in Chapter 3 and considered in Chapter 4 of the Proposed Resource Management Plan Amendment and Final Environmental Impact Statement (RMPA/EIS) for Oil and Gas Development.

The purpose of this Water Resource Monitoring Plan (Water Monitoring Plan) is to document current condition and identify future water resources data collection, management and information gathering strategies for implementing the decisions in the RMPA/EIS. In addition, this Water Monitoring Plan describes baseline data collected, reports completed and outlines the authority, policy, and methods WRFO uses to manage oil and gas activities that have the potential to impact water resources. This Water Monitoring Plan is built on the Regional Framework and past research efforts in the MPA; outlines baseline data collected for ground and surface water in the MPA; is informed by USGS reports funded by the BLM; includes current monitoring efforts; describes standard operating procedures and policies; and describes partnerships and coordination with local government, State of Colorado, other federal agencies, and the oil and gas industry to monitor water resources in the MPA. Proposed future monitoring efforts are presented in Section 4 Water Monitoring Plan Implementation, to be accomplished as funding and time allow.

The first step to implementing the Regional Framework for the MPA was to assess existing information. The BLM funded data gap studies and a data repository to collect and analyze existing water resource information (<http://rmgsc.cr.usgs.gov/cwqdr/Piceance/>). The Piceance Basin, due to interest in oil shale since the 1930s, has a tremendous amount of baseline data, scientific research papers, USGS reports, monitoring wells and other information directly pertinent to the MPA. There are well over 200 active and inactive monitoring wells in the MPA and an extensive network of historic USGS streamflow sites. These past studies and reports (available from http://library.mines.edu/Tell_Ertl) were used to the greatest extent possible to shape the goals and scope of monitoring efforts and inform this Water Monitoring Plan.

The National Environmental Policy Act (NEPA) mandates a systematic, interdisciplinary approach to ensure an integrated use of natural and social sciences in planning and decision making and the Federal Land Policy and Management Act of 1976 gives the BLM the authority to conduct investigations, studies, and experiments, on its own initiative or in cooperation with others involving the management, protection, development, acquisition, and conveyance of the public lands. This monitoring plan and the Regional Framework are in keeping with this authority.

2.0 Water Resource Management Plan Components

Plan components are the specific implementation decisions and assumptions necessary to achieve effective monitoring for the RMPA/EIS. Methods for implementing plan components are provided in *Section 4.0 Water Monitoring Plan Implementation* of this document and components are built on the conceptual models presented in *Section 3.0 Application of the Regional Framework to the MPA*.

- 1) The BLM will conduct a review of the Water Monitoring Plan within one year of signing the Record of Decision (ROD), and every third year thereafter. This plan will be updated and refined as needed to achieve an adaptive management approach to water resource monitoring.
- 2) This Water Monitoring Plan may be modified with a maintenance action as necessary to comply with law, regulation, and policy and to address new information and changing circumstances.
- 3) The BLM will promote the implementation of reasonable mitigation, control measures, monitoring, and design features through appropriate mechanisms, including lease stipulations and conditions of approval, notices to lessees, and permit terms and conditions as provided for by law and consistent with lease rights and obligations.
- 4) The BLM will ensure that water resources management strategies, Best Management Practices (BMPs) and stormwater control measures (both operator committed and BLM required mitigation) are enforceable by including specific Conditions of Approval (COAs) in permits to protect water resources based on environmental review (see Appendix B – Best Management Practices and Conditions of Approval).
- 5) The BLM recognizes that long-term surface water streamflow, climate, water quality, and biological monitoring are essential to define climate conditions, measure long-term trends, and to evaluate the effectiveness of oil and gas management strategies. The BLM will continue to maintain and support groundwater, streamflow, and climate sites with the USGS and at BLM maintained sites as funding and personnel allow.
- 6) The BLM will work collaboratively with state, local, and federal agencies responsible for water resource management. This strategy will include participation in local stakeholder groups like the White River Water Quality Group, the Source Water Protection Committees for Rangely and Meeker, the Piceance Basin Steering Committee and other groups in a position to augment and partner in efforts to monitor water quality and quantity in the White River Field Office.
- 7) The BLM will facilitate cooperative efforts with the oil and gas industry, state, local, and federal agencies to establish, fund, operate, and design specific water resource studies as they relate to furthering the overall water resource monitoring goals described.

3.0 Application of the Regional Framework to the MPA

A seven-step process to develop conceptual models was implemented for the MPA and is the basis of the Regional Framework and is adopted for this Water Monitoring Plan:

- 1) Specify monitoring goals and objectives.
- 2) Characterize anthropogenic stressors.
- 3) Develop questions and conceptual models.
- 4) Suggest indicators.
- 5) Estimate the sensitivity of indicators.
- 6) Describe thresholds of change and receptors.
- 7) Identify clear connections between the monitoring program and management.

The Regional Framework identified specific goals needed to add water quality parameters to USGS streamflow measurement sites for the White River, Piceance Creek and Yellow Creek; and BLM began funding this effort in 2007. The RMPA/EIS and the Regional Framework addressed the first five steps in the framework by defining goals and management objectives for water resource management and also by identifying aspects of the proposed action that may impact water quality (anthropogenic stressors). However, the Regional Framework did not define conceptual models for monitoring; therefore, this Water Monitoring Plan begins on the third step of the Regional Framework, which is to develop conceptual models for monitoring water resources. It is useful to separate ground and surface waters; therefore two conceptual models are presented.

The overall goals the Regional Framework were to develop robust and cost-effective baseline monitoring for water resources. This has been accomplished for the MPA for surface waters and groundwater by achieving the following monitoring goals and objectives:

- 8) Evaluate existing water-resources data for uniformity.
 - a) This goal was accomplished by baseline assessment reports for groundwater (<http://pubs.usgs.gov/sir/2012/5198/>) and surface water quality (<http://pubs.usgs.gov/sir/2013/5015/>). The groundwater report included sampling results from private domestic wells. Parameters sampled for both surface water and groundwater are listed in these reports.
- 9) Develop a web-accessible common data repository that provides energy operators, researchers, consultants, agencies, and interested stakeholders equal access to the latest information.
 - a) This goal was accomplished by the Piceance Basin Stake holder Group and data repository (<http://rmgsc.cr.usgs.gov/cwqdr/Piceance/>).
- 10) Perform and publish a baseline assessment of available water-resources data.
 - a) Baseline assessment reports for groundwater and surface water quality (<http://pubs.usgs.gov/sir/2013/5015/> and <http://pubs.usgs.gov/sir/2012/5198/>).

- 11) Use this information to inform regional monitoring strategies to more economically fill data gaps by reducing duplication of effort while still meeting regulatory requirements.
- a) The BLM funded water quality data collection at seven USGS streamflow measurement sites, established three conductivity probes on the White River, two on Piceance Creek and one on Yellow Creek since 2007.
 - b) The BLM has supported additional water quality sampling in the White River, Piceance Creek and Yellow Creek. Water quality sampling measured the following parameters:
 - i) Physical: pH, temperature, specific conductance, dissolved oxygen (DO), DO saturation, turbidity, salinity, and hardness.
 - ii) Nutrients: Inorganic nitrogen (nitrate plus nitrite), total phosphorus, orthophosphate, ammonia, and Kjeldahl nitrogen.
 - iii) Metals: Aluminum, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc.
 - iv) Other: alkalinity, bicarbonate, boron, calcium, carbonate, chemical oxygen demand, chloride, hydroxide, magnesium, sodium, potassium, sulfate, total organic carbon, total dissolved solids (TDS), total suspended solids (TSS), BTEX (e.g., benzene, toluene, ethylbenzene, and xylenes).
 - v) Isotopic Analysis – The groundwater sampling program used multiple approaches to isotopic analysis to look at ages and source of water (McMahon 2013).
 - vi) Real-time: Conductivity probes were installed on three sites in the White River, two sites on Piceance Creek and one on Yellow Creek.
 - vii) BTEX was measured for five years at three sites on the White River, two on Piceance Creek and one on Yellow Creek. There was not enough record to apply the trend analysis in (Table 1). BTEX are some of the volatile organic compounds (VOCs) found in petroleum derivatives such as gasoline or diesel fuel, but there are also natural sources for BTEX from hydrocarbon sources that may show up in groundwater. Natural sources of BTEX are discussed in more depth with the Groundwater Conceptual Model.
 - c) Six new streamflow measurement sites were established in the MPA and are maintained by the BLM to measure stream discharge, conductivity, air and water temperature, and conduct water quality and macroinvertebrate sampling. Two precipitation measurement sites and one weather station were established and maintained by the BLM for this area.
 - d) Two USGS technical reports of the results of BLM funded water resource monitoring were generated:
 - i) Chemistry and age of groundwater in bedrock aquifers of the Piceance and Yellow Creek watersheds, Rio Blanco County, Colorado, 2010–12 (available at <http://pubs.er.usgs.gov/publication/70048381>).

- ii) Characterization of Surface-Water Hydrology and Surface-Water Quality of Piceance Creek in the Alkali Flat Area, Rio Blanco County, Colorado, March 2012 (Thomas in Review).

3.1 Surface Water Conceptual Model

The previous section described the monitoring goals and objectives for the surface water. Ideally, the level of monitoring would continue for surface waters at the current level by maintaining the USGS and the BLM stream monitoring sites and this monitoring would be the basis for the Surface Water Conceptual Model.

The second step in the Regional Framework is to characterize anthropogenic stressors. This step was completed with the impact analysis in the RMPA/EIS. The direct water quality impacts, the RMPA/EIS impact analysis identified the potential for increased runoff and soil erosion from surface disturbance associated with oil and gas development. Eroded soil carried via surface runoff may increase turbidity, salinity, and suspended sediment loads in surface waters. These changes can impact aquatic life, water supply and irrigation, and recreation which are identified beneficial uses for streams.

The impact analysis also identified that freshwater use by oil and gas development may decrease surface flows in streams and increase the proportion of baseflow from groundwater thereby increasing salinity concentrations in surface waters. Another impact to surface waters may occur from unintentional spills and leaks. A conceptual model of the regional salinity and sediment transport in creeks and rivers in the WRFO could potentially be developed using existing data from studies done by the USGS and other agencies during the past 30 years, data collected by the USGS for the Regional Framework since 2007, and from records maintained by the BLM and other agencies.

Step three and four in the Regional Framework are to develop questions, conceptual models and suggest indicators. The logic for a conceptual model for surface water would be with increased surface disturbance, increased freshwater use, and the potential of spills from oil and gas development in the MPA, it is anticipated the stressors would result in upward long term trends or short-term spikes, in dissolved solids, suspended sediment, BTEX, and trace elements such as selenium.

Long-term significantly relevant trends for water quality parameters in surface waters were analyzed in the Thomas et al. (2013) report. This report indicated increasing dissolved solids loads from upstream to downstream on the White River (Table 1). The total dissolved solids load from the White River Basin was represented by the most downstream site (White River below Boise Creek, near Rangely), where the load in water year 2000 was 245,000 tons. Loads from Piceance Creek at White River for water year 2000 were about 26,600 tons, which was about 11 percent of the total load from the White River Basin. The dissolved solids load was disproportionate to Piceance and Yellow Creek's contribution to stream discharge in the White River, which was 4.1 percent of the streamflow measured in water year 2000 (USGS 2013).

Table 1. Water Quality Trend Analysis of Selected USGS Gaging Stations in the WRFO

Site Number	Site Name	Period of Record, Trend Direction ⁽¹⁾⁽²⁾	Parameter ⁽³⁾ (Units)
White River			
09304200	White River above Coal Creek	1992-2002, down 1990-2009, no trend 1990-2002, down 1990-2002, down 1991-2001, down 1990-2001, no trend	Sodium (mg/L) Chloride (mg/L) Sulfate (mg/L) Dissolved Solids (mg/L) Total Rec. Iron (µg/L) Suspended Sediment (mg/L)
09304800	White River below Meeker	1990-2009, no trend 1990-2009, no trend 1990-2009, down 1990-2009, down 1990-2009, no trend 1991-2002, no trend 1991-2009, down	Sodium (mg/L) Potassium (mg/L) Chloride (mg/L) Sulfate (mg/L) Dissolved Solids (mg/L) Total Rec. Iron (µg/L) Selenium (µ/L)
09306290	White River below Boise Creek, near Rangely	1998-2009, down 1999-2009, down 1990-2009, down 1990-2009, down 1998-2009, down 1991-2001, no trend 1990-2009, down 1990-2009, down	Sodium (mg/L) Potassium (mg/L) Chloride (mg/L) Sulfate (mg/L) Dissolved Solids (mg/L) Total Rec. Iron (µg/L) Selenium (µg/L) Suspended Sediment (mg/L)
09306305	White River below Taylor Draw Reservoir, above Rangely	1996-2002, down	Suspended Sediment (mg/L)
Piceance Creek			
09306200	Piceance Creek below Ryan Gulch, near Rio Blanco	1997-2009, up* 1990-2009, no trend 2003-2009, up* 1990-2009, down 2003-2009, up* 1990-2009, no trend 1999-2009, down 1990-2009, down	Sodium (mg/L)* Potassium (mg/L) Chloride (mg/L)* Sulfate (mg/L) Dissolved Solids (mg/L)* Dissolved Iron (µg/L) Selenium (µg/L) Suspended Sediment (mg/L)

Table 1. Water Quality Trend Analysis of Selected USGS Gaging Stations in the WRFO

Site Number	Site Name	Period of Record, Trend Direction ⁽¹⁾⁽²⁾	Parameter ⁽³⁾ (Units)
09306222	Piceance Creek at White River	1990-2009, no trend 1990-2009, no trend 1990-2009, down 2004-2009, up* 1990-2009, down 2001-2009, up* 1999-2009, down 2003-2009, up*	Sodium (mg/L) Potassium (mg/L) Chloride (mg/L) Sulfate (mg/L)* Dissolved Solids (mg/L) Dissolved Iron (µg/L) Selenium (µg/L) Suspended Sediment (mg/L)*
Yellow Creek			
09306242	Corral Gulch near Rangely	1990-2008, down 1990-2008, no trend 2002-2008, up* 1990-2008, down 1993-2008, down	Sodium (mg/L) Potassium (mg/L) Chloride (mg/L)* Sulfate (mg/L) Dissolved Solids (mg/L)
09306255	Yellow Creek near White River	1990-2009, no trend 1990-2009, no trend 1999-2009, up* 1990-2009, down 1991-2009, up*	Sodium (mg/L) Potassium (mg/L) Chloride (mg/L)* Sulfate (mg/L) Dissolved Iron (µg/L)*

NOTES: Adapted from Thomas et al. 2013

⁽¹⁾ Only selected parameters with potential oil and gas impacts and considered in this summary.

⁽²⁾ Results that failed the test for enough data were not included and only the latest time frame available was included

⁽³⁾ Parameters are for “Filtered” unless otherwise noted.

* Parameters with an upward trend during the most recent time period

Both Yellow Creek and Piceance Creek have high dissolved solid loads due to groundwater upwelling. The Thomas et al. (2013) report indicated Piceance Creek is showing an upward trend in dissolved solids (Table 1). Between the White River above Coal Creek and the White River below Meeker more than 60,000 tons of dissolved solids load are generated through an outcrop of Mancos shale before the confluence with Piceance Creek. This is confirmed by past studies on water quality including Boyle et al. (1984), which also noted spikes in specific conductivity and dissolved solids downstream of Mancos shale outcrops (e.g., the Meeker Dome and loads from Piceance and Yellow Creek).

One possible question to be answered by the conceptual model would be with the potential for leaks or spills due to failure of well integrity, drilling practices or from surface sources such as pits, or tanks, would specific parameters that could be indicators such as sodium, chloride, iron, sulfate, BTEX and dissolved solids be indicated by upward trends and/or spikes in future monitoring data.

Step five in the Regional Framework is to estimate the sensitivity of indicators. Generally, the characterization and data-gap analysis study (Thomas et al. 2013) indicated that there was either no trend or a net, downward trend in most water quality parameters measured over the period of

1990-2009, including the parameters selected as indicators. During the years of 1990 to 2009 the region experienced increasing oil and gas development. There were a few upward trends presented in the data gap analysis study that could indicate potential oil and gas or other anthropomorphic impacts and are indicated with an asterisk in (Table 1). The data-gap analysis study reported exceedances in recommended standards for domestic water supplies for chloride in Piceance Creek and sulfate in the upstream area of the White River basin associated with Mancos shale, but no other exceedances of water quality standards. The surface water baseline assessment report did not show upward trends in the parameters identified as indicators for the surface water conceptual model.

Step six in the Regional Framework’s list of items needed for a conceptual model is to determine thresholds; these thresholds are identified in the RMPA/EIS as significance criteria:

- Exceeding Colorado Department of Health and the Environment (CDPHE) water-quality standards as result of BLM permitted activities.
- Impacts to administered water rights due to freshwater withdrawals to support BLM permitted activities.
- Violating or exceeding BLM Public Land Health Standards specifically for erosion.

Yellow Creek was listed for iron on the 303(d) impaired waters listed in 2012 and was likely in part due to the upward trend in dissolved iron shown in the trend summary table (Table 1). These are the kinds of trends that can lead to an exceedance of a water quality standard. The cause of the upward trend has not been identified by CDPHE and is uncertain from existing data. The RMPA/EIS impact analysis evaluated water quality conditions in detail and there are currently portions of Piceance Creek and Yellow Creek that are listed as impaired for aquatic life standards and specific parameters such as iron by CDPHE.

Determining a cause for impairment is difficult and impairments may result or include natural sources and as such exceeding numeric standards may not require a specific management response. Qualitative thresholds such as Public Land Health Standards may be easier to identify and attribute to a specific cause. For example, rills forming on a reclaimed slope near a drilling pad can be clearly attributed to the surface disturbance and are an indicator of a failure of Public Land Health Standards. Whereas, an increasing trend in suspended sediments might be attributable to natural occurring events or other anthropomorphic causes and may not require a specific management response, but instead require further study to identify causes.

Additional stressors from oil and gas development that may contribute to exceeding the thresholds described above are:

- Increased soils erosion due to increased hillslope and surface-erosion rates. Erosion may increase sediment loading and an increase in associated water-quality constituents (salinity, nutrients, and metals) in receiving streams.
- Loss of vegetation, compaction of soils, and concentrating drainage may increase surface-water runoff volume and frequency.
- The storage, transport, use, and production of fluids and the use of industrial chemicals for drilling, stimulation, and hydraulic fracturing of wells, increases the risk of spills or leaks.

Historically, the stressors that affect salt loading between groundwater and surface water sources in the MPA have been relatively static. With the increased surface disturbances from the expansion of the current gas play in the study area, noticeable impacts to sediment yields and subsequent salt loading to streams on a regional basis is likely (McMahon et al. 2007).

Currently, Piceance Creek at the White River shows an upward trend in suspended sediment concentrations and it is possible this upward trend is due in part to surface disturbance from energy development. Due to the complexities of sediment transport dynamics and the increased sedimentation of these systems, the Regional Framework looked at a modeling approach that would augment the suspended sediment measurements in surface waters (McMahon et al. 2007) recommended intensive spatial and temporal sampling may be needed to separate sediment yield resulting from energy development from sediment yield resulting from natural variables and other land uses. Some of these approaches, as well as step seven, identify connections between monitoring and management and BLM policy are discussed in Section 4.0 Water Management Plan Implementation along with proposed monitoring efforts.

3.2 Groundwater Conceptual Model

For the purposes of the groundwater conceptual model, the Piceance Creek Basin refers to the portion of the structural basin bounded by the MPA (Piceance Creek and Yellow Creek). The first step in the Regional Framework is to develop monitoring goals and objectives, these goals and objectives were changed from the 2007 document to establish dedicated groundwater monitoring wells instead of collecting regional water levels.

The 2007 Regional Framework recommended that the most effective groundwater indicators would be water-level and stream discharge measurements due to freshwater use by oil and gas development. However, it became clear as oil and gas development has progressed in the Piceance Creek Basin that groundwater is not now nor is it likely to be the primary source of freshwater for oil and gas development in this area. This is because of the widespread reuse and recycling of both fresh and produced water and operators successfully obtaining surface water rights. Surface sources for freshwater supply are more likely to be used as compared to groundwater sources, due to the available surface water rights in the Basin. Groundwater development as a freshwater source for oil and gas development has been limited because of the difficulty in providing augmentation water to offset impacts to senior water rights on streams and springs. Therefore, the assumption that regional groundwater levels would change or stream discharge would be noticeably impacted by groundwater withdrawals is not realistic. However, the RMPA/EIS indicates that water quality impacts resulting from surface water withdrawals may lead to reductions in streamflow. Current sources of freshwater include in-priority withdrawals from Piceance Creek and its tributaries, water withdrawals from the White River, and water purchased from Rangely or Meeker. Applications for Permit to Drill (APDs) must specify all water sources and the validity of water rights used for these purposes is evaluated by the BLM before approval of APDs.

If groundwater becomes a primary source for freshwater in the future, operators will be required to provide augmentation water to offset their depletions to surface streams and springs. In addition, freshwater supply wells will also require land use authorization from the BLM if such wells are located on BLM lands. If oil and gas operators divert groundwater that depletes surface streams, they could injure senior water rights holders. The use of groundwater as a source of freshwater could also injure senior water rights held by the BLM on springs. Operators would likely require augmentation water to offset their depletions to surface streams and springs. The Colorado Division of Water Resources (CDWR) has monitored regional water levels since 1991. Trends in regional

water levels appear to be linked to climatic conditions and not groundwater use. Regional changes in water levels would be considered in permitting any new groundwater withdrawals and any resulting impacts would be evaluated in an environmental review before approving new groundwater wells.

Based on a better understanding of oil and gas development in MPA, monitoring objectives and goals were redirected to sampling groundwater quality from existing and improved monitoring wells instead of duplicating the CDWR's efforts at measuring regional groundwater levels.

The following items were selected as potential stressors in a revised groundwater monitoring approach completed in 2008 by the WRFO:

- Lost circulation zones during natural gas drilling have the potential to introduce contaminants to shallow aquifers.
- Injection wells and water storage or treatment ponds have the potential to contaminate shallow aquifers or surface water through fault driven pathways. This may occur through exceeding fracture pressures of formations and by pit liners failing.
- Poor cementing of gas wells and failures in well bore integrity, drilling techniques, and or well bore design may introduce pathways for contamination of shallow aquifers from high salinity zones and/or producing formations. Well bore failure can also lead to alteration of local and regional ground-water flow systems.

The WRFO groundwater monitoring well network can help to identify changes in groundwater flow paths or introduced contaminants from these stressors. The following tasks have been accomplished to achieve the monitoring goals and objectives for groundwater:

- GIS products developed within the USGS Energy Resource Program's Central Energy Team were utilized to better understand the groundwater hydrology of the basin. Historical studies for the area were also reviewed.
- A partnership with USGS and Shell Exploration and Production was formed to inventory and do geophysical logging of 40 existing groundwater monitoring wells in order to identify wells for use in the monitoring network and to determine methods for low-flow sampling.
- The BLM funded the recompletion of two wells and drilled one new monitoring well on the TH75-13 pad near Black Sulphur Creek. This allows the A-Groove, B-Groove and the Uinta formation to be sampled from one pad site.
- Groundwater sampling of 14 wells in the MPA for parameters of concern including gaseous samples and extensive isotopic analysis. Sampling is planned for fiscal year 2013 and 2014, but future years are uncertain.
- A site specific study of ground and surface water interaction on Piceance Creek below Alkali Flats was conducted by USGS and funded by the BLM.
- WRFO also completed an inventory of springs on BLM administered lands within the MPA. This four year effort was completed in the summer of 2012. The next step is to compile this information and identify specific springs for future monitoring.
- Developed a stakeholder group and water quality database; participants include Rio Blanco, Garfield, and Delta Counties; Colorado River Conservation District, USGS,

Encana Corporation, Williams as well as other oil and gas operators. A groundwater assessment for the Piceance Basin was published (Thomas et al. 2013).

Preliminary results from the groundwater monitoring wells found three BTEX compounds (benzene, toluene, and ethylbenzene) in water from six of the monitoring wells. None of the concentrations exceeded drinking-water standards. The groundwater monitoring indicated a widespread occurrence of trace quantities of these BTEX compounds in the bedrock aquifers, specifically benzene and toluene (McMahon et al. 2013). The source of these BTEX compounds needs further study, but preliminary indications point to the BTEX compounds being liberated from the oil shales in the Mahogany zone. Little detection of these BTEX compounds were found in groundwater wells and the concentrates were low when they were detected.

4.0 Water Management Plan Implementation

Although many of the goals of the Regional Framework have been achieved, this effort would be meaningless without continued support of ground and surface water monitoring during future oil and gas development. Funding is looking to be one of the most challenging aspects of continuing the current level of monitoring. The BLM has invested well over one million dollars and much time to building the current monitoring network. The Water Monitoring Plan must continue to build on this robust framework and serve as a model for identifying and collecting information necessary for the regional assessment of oil and gas development to be successful. The BLM will continue to apply resources as they are available to maintain and expand the water monitoring program in the Piceance Basin. The BLM faces a substantial challenge in developing and implementing monitoring programs that are effective and efficient across multiple scales, and capable of satisfying multiple institutional and legal requirements associated with environmental compliance and land-use planning.

The overall goal for the implementation of the Water Resources Monitoring Plan is to develop a practical approach to integrated water-resources monitoring related to energy development that capitalizes on existing monitoring programs and readily available data and information. The BLM and the appropriate state regulatory agency will investigate. If water resource impacts result, then existing monitoring data will be used to identify a specific cause. If existing monitoring data are insufficient, then additional data collection may be required.

4.1 Implications of Approaching or Exceeding Thresholds

The BLM is committed to protecting the integrity of surface waters within its management authority and accomplishes this goal by the administration of oil and gas development according to the Onshore Oil and Gas Orders (Onshore Orders). The scope of any future monitoring will be influenced and implemented with management decisions and processes specified in the Onshore Orders and other BLM policies. Implementation will also include identifying future monitoring and study efforts and must be built on partnerships and collaborations with oil and gas operators and local governments.

Indicators of the potential impact of oil and gas development stressors on surface waters from the MPA are detectable changes in water quality in Piceance Creek, Yellow Creek, or the White River. Monitoring for water quality in perennial streams should be implemented for real-time and long-term temporal scales to evaluate the impact of stressors identified in the RMPA/EIS. Real-time data collected every 15 minutes such as conductivity, water temperature, and streamflow can be evaluated for anomalies that may indicate the potential for persistent or episodic spills and leaks. For example, if there is a loss of saline produced water from a pipeline or on the surface,

conductivity levels may spike as the plume moves through surface waters. A more long-term change in conductivity due to surface disturbance or persistent leaks or spills may require trend analysis and complex statistics over time to detect, but still benefits from the frequency of measurement.

Long-term changes in water quality should be evaluated based on statistically rigorous trend analysis. Part of the BLM funded baseline data collection effort included trend analysis on the White River, Piceance Creek, and Yellow Creek. The Characterization and Data-Gap Analysis of Surface Water Quality in the Piceance Study Area (Thomas et al. 2013) looked at changes in historical water quality trends and included sites relevant to the MPA. This trend analysis should be repeated after development gains momentum and the long-term data needed to support this type of trend analysis can be collected. If surface water quality data is not collected in the future or if there are data gaps due to lack of funding, trend analysis may not be possible.

Subsurface activities related to energy development may affect rates of salt dissolution in ground water and ground-water/surface-water interactions that contribute salinity to area streams. Additionally, surface disruption resulting from drilling of wells, and construction of pipelines and roads for both gas and oil-shale development may increase sediment yields, resulting in increases in salt and sediment loading to area streams and rivers. The receptors of the effects of these stressors would likely be Piceance Creek, Yellow Creek, and subsequently the White River.

The BLM will investigate, alert and assist CDPHE or Colorado Oil and Gas Conservation Commission (COGCC) to take the lead in appropriate measures for stopping and remediating leaks or spills. On public lands and for federal minerals, the BLM will participate in the planning for the cleanup process in order to be sure water resources are properly protected. The BLM will also keep track of CDPHE changes in water quality classification, standards, or listing of impaired waters and provide monitoring information when appropriate. If long-term upward trends are detected in groundwater or surface waters, specific studies to determine causality and identify design features, mitigation, policy changes or BMPs that would reduce the upward trends of parameter of concern may be implemented.

The connection between monitoring, thresholds and management decisions for both the groundwater and surface water conceptual models would come when real-time monitoring indicates a potential leak or spill, there is a significant change in water yield, or a long-term upward trend in water quality parameters is identified that can be attributed to oil and gas development.

4.2 BLM Water Resources Land Management Policies

The BLM administers federal mineral resources which include oil and gas operations according to the Onshore Oil and Gas Orders. Onshore Oil and Gas Orders implement and supplement the oil and gas regulations found under 43 CFR 3160. Onshore Order No. 1 (Approval of Operations) covers requirements for APDs for all proposed oil and gas and service wells, certain subsequent well operation and abandonment. Included in APDs are the requirements for drilling and a surface use plan for operations. These plans provide information on reclamation, the protection of groundwater resources and other details that allow the BLM to assess the specific impacts associated with the drilling activity. Based on an environmental review, the BLM may apply COAs to the approved APDs that require measures to mitigate specific impacts identified during the review process. These COAs typically include casing or drilling requirements to protect freshwater aquifers, secondary containment measures to reduce impacts from spills or leaks, additional drainage features for roads and pads to reduce overland flow impacts, BMPs to provide more stability to roads and pads, and reclamation requirements among others (refer to Appendix B).

4.2.1 Freshwater Use and Water Rights

Oil and gas operators are required to provide accurate information for the location and type of water supply used during development including the source, amount of diversions, timing of diversions, access route, and transportation method for freshwater used in their Surface Use Plan of Operations. Proposed water use amounts and sources are evaluated for potential injury to water rights and to water-dependent values during site specific environmental review before a project and its associated water use is approved. The BLM will continue to maintain and protect beneficial water uses on public lands through this review process. In addition, the Colorado BLM has also developed a programmatic consultation with the U.S. Fish and Wildlife Service with regard to water depletions that could jeopardize the recovery of endangered Colorado River fish species. The consultation requires reporting of water use amounts and locations by operators, and also requires mitigation to address potential impacts to the endangered fish. Long-term monitoring at USGS and BLM streamflow measurement sites are used to monitor the success of these policies to protect water-dependent values on public lands.

In anticipation of future freshwater use from oil and gas development as well as oil shale, the BLM has recommended instream flow rights for lower Piceance Creek and lower Yellow Creeks to the Colorado Water Conservation Board (CWCB). The Colorado Water Conservation Board is the only entity authorized under Colorado law to hold instream flow water rights, and that law directs the CWCB to consider instream flow recommendations from federal agencies. If the proposed instream flow water rights are appropriated, they would be junior to existing water rights. However, instream flow water rights can help protect flows by preventing diversions by new, junior water rights during times of the year when the instream flow water right isn't satisfied. Parties who seek to change senior water rights must also insure that when the proposed change is implemented, flows through the protected stream reach aren't reduced beyond what was experienced prior to the proposed change.

Water use amounts and sources are evaluated for potential injury to water rights during site specific environmental review before project approvals.

4.2.2 Floodplains and Wetlands

Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Executive Order 11990 requires federal agencies to take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The BLM first attempts to avoid locating infrastructure in floodplains or wetlands during planning. When areas cannot be avoided the BLM may apply COAs to minimize impacts, allow for mitigation of impacts, and restore the natural conditions after occupancy.

Operators show in their APD that U.S. Army Corp of Engineers (USACE) Section 404 requirements have been addressed. There are various strategies that can be employed to identify waters of the US and it is up to operators to determine the strategy needed to meet Section 404 requirements; strategies typically include the use of nationwide permits. For more permanent features and nonlinear features such as drilling pads, and for projects that are likely to exceed minimums for minor discharges based on fill estimates for nationwide permits, individual permits may be required. Nationwide permits typically have Regional Conditions specific to Colorado (USACE 2012). The type of permit needed is under the discretion of the USACE, but the BLM assures compliance before approvals are granted.

4.2.3 Water Sampling on BLM Administered Lands

Sampling requirements to comply with COGCC and CDPHE regulations is a source of monitoring data for BLM administered lands. The COGCC recently issued rule 609 which will require groundwater sampling within 0.5 mile of any well. The BLM has helped establish and is an active member in the stakeholders group to provide resources to make water quality sampling data available in public repositories. Public repositories such as this could be useful for oil and gas operators to help them comply with COGCC requirements. The COGCC requires sampling of injection formations, produced water, and other information that can be beneficial for monitoring efforts. This data is often submitted to the BLM as part of COAs, and becomes public record. Data collected for one purpose does not always benefit another purpose, but often with some forethought can be designed for both. For example parameters of interest for determining if a specific formation is acceptable for water disposal may not be the same parameters of interest for groundwater monitoring efforts, but if a few parameters are added during the review it might be used for both purposes.

4.2.4 Public Availability and Reporting of Monitoring Data

The Piceance Basin Data Repository was built to house data collected in the Piceance Structural Basin. This area includes most of the WRFO and extends through the I-70 corridor and down as far south as Delta, Colorado. Data from the repository is being migrated to the (<http://www.coloradowaterdata.org/>).

The BLM collected water quality samples have also been published on the Colorado Data Share Network. The Steering Committee for the Piceance group is looking to team with COGCC to either include data from its database on this site or to develop some type of link between the databases that can assist in making sampling data available. Four peer-reviewed technical reports have been generated by the USGS with support from the BLM:

- Overview of Groundwater Quality in the Piceance Basin, Western Colorado, 1946–2009. By J.C. Thomas and P.B. McMahon (<http://pubs.usgs.gov/sir/2012/5198/>).
- Characterization and Data-Gap Analysis of Surface-Water Quality in the Piceance Study Area, Western Colorado, 1959–2009. By Judith C. Thomas, Jennifer L. Moore, Keelin R. Schaffrath, Jean A. Dupree, Cory A. Williams, and Kenneth J. Leib. (<http://pubs.usgs.gov/sir/2013/5015/>).
- Chemistry and age of groundwater in bedrock aquifers of the Piceance and Yellow Creek watersheds, Rio Blanco County, Colorado, 2010-2012: U.S. Geological Survey Scientific Investigations Report. By J.C. Thomas and P.B. McMahon (<http://pubs.er.usgs.gov/publication/70048381>).
- Characterization of Surface-Water Hydrology and Surface-Water Quality of Piceance Creek in the Alkali Flat Area, Rio Blanco County, Colorado, March 2012. By Judith C. Thomas

4.3 Future Monitoring Projects

Monitoring should be flexible and help identify specific areas for concentrated study. This section contains projects that would add to the overall monitoring goals, information collected to date, and could be implemented based on funding and/or personal in future years.

4.3.1 Aquatic Life

Algae, fish and invertebrate assemblages are the most direct and effective measure of the ecological integrity of streams, living systems have evolved under specific environmental conditions (Karr and Chu 1999). These living systems can respond in somewhat predictable ways to human disturbances such as large-scale landscape changes related to energy development.

In 2012, CDPHE listed or provisionally listed four stream segments in the MPA for aquatic life as impaired. This decision was based on policy statement 10-1, which developed aquatic life use attainment standards for rivers and streams in Colorado. Policy statement 10-1 identified bioassessment and biological thresholds to be used for assessing a streams ability to meet aquatic life criteria. A Multi-Metric Index (MMI) was developed for Colorado to be used as a tool to assess macroinvertebrate communities. Aquatic benthic macroinvertebrates are animals without backbones that live on submerged rocks, logs, sediment, debris and aquatic plants during some period of their life. Reference streams identified in Colorado and the decision for impairment was based on biological community metrics that reflect a significant departure from a reference or expected conditions as indicated by the MMI measured.

The BLM financially supports the National Aquatic Monitoring Center located at Utah State University (the Bug Lab). The WRFO facilitated coordination with the Bug Lab and CDPHE to assure consistency with the CDPHE protocol. The BLM streamflow sites were sampled in 2012 and will continue to be sampled as BLM staff resources allow. Three of the BLM streamflow sites are located in listed stream segments (Yellow Creek, Piceance Creek, and Black Sulphur Creek). Coordination with CDPHE and EPA on future additional monitoring and evaluation of these impaired waters is needed and additional sampling sites may be added in the future as the need arises.

4.3.2 Surface Disturbance, Erosion and Sedimentation Modeling

As part of the RMPA/EIS, the BLM is implementing a data collection and database management project designed to accurately track surface disturbance and reclamation associated with oil and gas (See Appendix D). This project employs extensive ground truthing, remote sensing, and new requirements for electronic reporting on behalf of operators. This data is the type of detailed information that can be effectively utilized by erosion models such as Water Erosion Prediction Project (WEPP) model or the KINematic Runoff and EROSSion model, (KINEROS) on a hillslope or subwatershed level. Model output can then be combined in a tool such as the Automated Geospatial Watershed Assessment (AGWA) tool for hydrological analysis. This approach can be paired with continued suspended sediment measurement at USGS streamflow sites to evaluate and monitor overall sedimentation rates.

This tool could be used at the Master Development Plan level to identify targeted BMPs for specific locations to be attached as COAs based on predicted erosion rates. This tool could also be used to assess the success of BMPs used and adapt new BMPs that may be more effective. Base layers for soils, vegetation data from Assessment, Inventory and Monitoring (AIM) protocol, information from the reclamation and disturbance database, slopes and other geospatial information can be used to improve hydrologic model performance and predict erosion.

4.3.3 Natural Spring Monitoring

Groundwater springs are an important element in monitoring and essential for identifying potential impacts from energy development. A spring inventory begun in 2008 in the MPA measured field water quality and flow information for over 500 springs in the Piceance area. This inventory can be used to identify springs in a statistically rigorous way for more intense sampling. More detailed monitoring could include the installation of permanent flow monitoring sites and more intensive sampling that would include potential stressors such as BTEX as recommended by Thomas et al. (2013) along with isotopic analysis. Isotopic analysis can be informative about sources and transit times and recharge areas for groundwater.

4.3.4 Expansion of the Groundwater Monitoring Network

The groundwater monitoring study recognized the limitations of fourteen wells to characterize groundwater chemistry in a 900 square mile study area (McMahon et al. 2013). Although great care was taken to inventory the available monitoring wells and select ones that may be representative of the aquifers and take into account spatial variability and trends identified in previous research, adding additional groundwater monitoring wells would likely greatly enhance the scope and clarity of sampling results. Also, due to funding limitations, a subset of sampling parameters and a subset of wells to be sampled has been used. Additional wells were recommended by McMahon et al. (2013) to improve the ability to define spatial variability and variability measured in chemical and isotopic composition of the water quality samples.

One of the key findings of this report was the need for pre-drilling groundwater sampling data in areas where development is proposed but not yet started. Groundwater sampling should be continued near pad sites as wells are drilled and completed to provide continued monitoring as activities. It is likely that if monitoring and sampling of the existing monitoring network one of the current monitoring wells could serve this purpose. However, establishing additional monitoring wells would likely improve the odds for having baseline data from a groundwater well nearby and down-gradient from future drilling activities. Maintaining a bi-annual or annual sampling of all 14 wells would also help in improving the odds of having a monitoring well with baseline information in the right place to assess impacts.

4.4 Partnerships and Collaboration

The level of energy development described in the RMPA/EIS requires targeted partnerships for developing data, dedicated data collection, expertise and monitoring infrastructure to understand regional surface and groundwater hydrology. Examples of these types of partnerships are:

- Shell Oil Groundwater Monitoring Collaboration. This began with Shell, the BLM and the USGS to inventory and conduct geophysical logging of existing monitoring wells and a Memorandum of Understanding (MOU) to transfer unused Shell monitoring wells to BLM. Information from this project has allowed the BLM to assemble a high quality monitoring well network at minimal cost and Shell to learn more about the regional hydrology than what might have occurred otherwise.
- Chevron and the Weber Sand Unit. Surface water sampling of Stinking Water Creek near Rangely to measure selenium and total dissolve solids from a historical oil and gas development in Mancos shale. A Water Monitoring Plan with a water quality sampling effort was developed for this project cooperatively with Chevron and funded by Chevron with in-kind support from the BLM.

- Piceance Basin Stakeholder Group. The BLM, Rio Blanco County, Garfield County, Delta County, USGS and other government agencies and with industry have created a regional water monitoring stakeholder group that has published a regional surface and groundwater study, built a web-accessible common data repository to assemble data collected from industry, local, State, federal, and other sources (<http://www.usgs.gov/newsroom/article.asp?ID=3563>).

Collaborative processes and partnerships are essential to building long-term monitoring programs in uncertain funding environments. These types of partnerships allow entities to pool resources by contributing funds, data, authority, materials, and expertise to understanding regional hydrology and pool resources. Surface water quality data, streamflow and groundwater information include water data collected at BLM sponsored USGS streamflow sites, natural spring inventories, water quality samples, streamflow and water quality data from the BLM along with water chemistry for major streams, groundwater wells, and aquatic studies collected by energy companies. This collaboration will benefit everyone as it will make the monitoring of direct and indirect impacts from energy development comprehensive and more economical.

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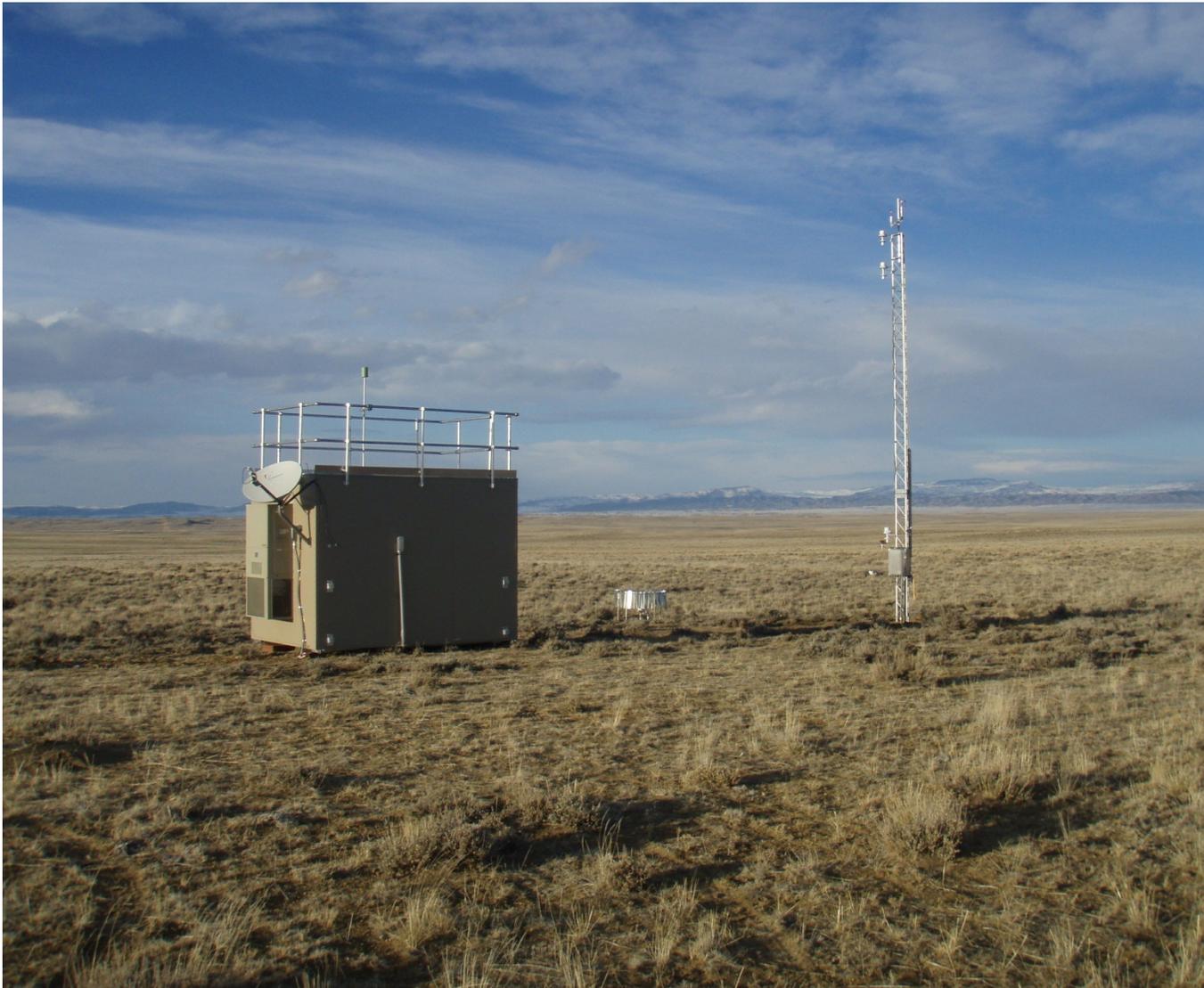
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Appendix 5

Comprehensive Air Resource Protection Protocol (CARPP)





COLORADO BUREAU OF LAND MANAGEMENT

COMPREHENSIVE AIR RESOURCE PROTECTION PROTOCOL (CARPP)

February 2014

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CARPP Change History

Section	Revision	Date
3.4.1	Amended paragraph to reflect final approved LN language.	2/11/2014

Appendix 5

Comprehensive Air Resources Protection Protocol

1.0 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.

1.1 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.

1.2 BLM Responsibilities under FLPMA 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 rights¹.

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

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.

2.0 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.

2.1 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.

3.0 Actions to Analyze & Protect Air Quality

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.

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.

3.1 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.

3.1.1 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.

3.1.2 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 3.4 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.

3.1.3 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 3.4 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.

3.1.4 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 of our annual report required under Section 5 of this protocol.

3.2 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.

3.3 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.

3.3.1 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 3.4 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.

3.3.2 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.

3.3.3 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). The 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.

3.3.4 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.

3.3.5 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.

3.4 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; and
- Issues identified during project scoping.

3.4.1 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).

3.5 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 6, Emissions Reduction Strategies and Best Management Practices (BMPs), provides some emission reduction technologies and strategies as an example. The list in Table 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.

3.5.1 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.

3.5.2 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 3.3.3 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 6), 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.

3.6 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.

4.0 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:

4.1 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.

4.2 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.

4.3 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 3 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.

4.4 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.

4.4.1 Quality Assurance/Quality Control

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.

4.4.2 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 1.3 above.

4.4.3 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.

4.4.4 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.

4.5 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) 3.3.3 or 3.3.5 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.

5.0 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.

6.0 Oil and Gas Development Emissions Reduction Strategies & BMPs

Table 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 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 NO _x , PM, CO, and VOC emissions.		Dependent on availability of technology from engine manufacturers and, potentially differentials in cost for small operators.
Selective Catalytic Reduction (SCR) for drill rig engines and/or compressors.	NO _x emissions reduction, potential decreased formation of visibility impairing compounds and ozone. NO _x control efficiency of 95% achieved on drill rig engines. NO _x emission rate of 0.1 g/hp-hr achieved for compressors.	Potential NH ₃ 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.	NO _x emissions reduction, potential decreased formation of visibility impairing compounds, and ozone. NO _x control efficiency of 80-90% achieved for drill rig engines. NO _x 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.	NO _x 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.

Table 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 - Continued			
Improved engine technology (Tier 2, 3 or 4) for all mobile and non-road diesel engines.	Reduced NO _x , PM, CO, and VOC emissions.		Dependent on availability of technology from engine manufacturers.
Reduced emission (a.k.a. “green”) completions.	Reduction in VOC and CH ₄ 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 CH ₄ to CO ₂ .		
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 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
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.

Table 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 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.		
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.	

Table 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 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.

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Appendix 6

Hazardous Materials Management Plan



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Appendix 6

Hazardous Materials Management Plan

1.0 Introduction

This management plan is provided pursuant to Bureau of Land Management (BLM) Instruction Memoranda Number WO-93-344 and CO-97-023, which requires that all National Environmental Policy Act (NEPA) documents list and describe any hazardous and extremely hazardous materials that will be produced, used, stored, transported, or disposed of as a result of a proposed project. Hazardous materials, as defined herein, are those substances listed in the United States Environmental Protection Agency's (EPA's) List of Hazardous Substances (40 Code of Federal Regulations [CFR] Part 302) and extremely hazardous materials are those identified in the EPA's List of Extremely Hazardous Substances (40 CFR Part 355). For purposes of this discussion, compounds included in the Clean Air Act Section 112(r) as the List of Substances for Accidental Release Prevention (40 CFR Part 68) are also considered hazardous materials. Materials identified on any of these lists that are expected to be used or produced by oil and gas activities are discussed herein.

A list of hazardous and extremely hazardous materials that may be produced, used, stored, transported, or disposed of as a result of exploration and production operations is assembled in Table C-1. Where possible, the quantities of these products or materials have been estimated on a per-well basis.

Some potentially hazardous materials that may be used in small, unquantifiable amounts have been excluded from this management plan. These materials might include:

- Wastes, as defined by the Solid Waste Disposal Act;
- Wood products, manufactured items, and articles that do not release or otherwise result in exposure to a hazardous material under normal conditions of use (e.g., steel structures, automobiles, and tires); and
- Food, drugs, tobacco products, and other miscellaneous substances (e.g., WD-40, gasket sealants, and glues).

Project personnel will be directed to properly manage and dispose of hazardous materials. Solid wastes generated at well locations will be collected in approved waste facilities (e.g., dumpsters, cages). Each well location will be provided with one or more such facilities during drilling and completion operations. Solid wastes will be regularly removed from well locations and transported to an approved disposal facility.

Materials produced, used, stored, transported, or disposed of during the exploration and production phases of oil and gas activities may be hazardous or may contain hazardous constituents. The following discussion will address the hazardous substances generally associated with the lifecycle of a hydrocarbon well.

2.0 Production Streams

Oil and natural gas production from White River Field Office (WRFO) is primarily from the Cretaceous rock Mesaverde Group formation, as well as from other targeted deep formations. Water will be produced as a result of the extraction operations. Table C-1 lists and quantifies, where possible, the hazardous substances that may be found in the production streams.

2.1 Natural Gas

Natural gas produced from the wells will primarily contain methane, ethane, nitrogen, and carbon dioxide. Hexane, polynuclear aromatic hydrocarbons (PAHs), and polycyclic organic matter (POM) are hazardous substances that might be present in the gas stream of both oil and gas wells.

Produced natural gas from wells will be transported from each location through pipelines linking well locations to centralized processing facilities. The natural gas will eventually be delivered to consumers for combustion. Small quantities of gas may be vented or flared at certain well locations during well testing operations. Well completions and recompletions would be required to use green completion technologies unless the need for an exemption could be documented. During well completions that do not use green completion technology, flaring would be required. Venting of natural gas would not be allowed except during emergency situations. Regulations are consistent with New Source Performance Standard OOOO Regulations. Approval by the BLM and COGCC will be obtained prior to flaring operations. Natural gas storage facilities are not expected to be used.

2.2 Liquid Hydrocarbons

Liquid hydrocarbons are produced either as condensate from natural gas wells or from oil wells in the field office area. Oil wells also produce natural gas associated with the oil. Hexane, PAHs, and POM are hazardous substances that may be present in the gas stream of both oil and gas wells. Hydrogen sulfide is also present in the gas produced by some of the oil wells. This hydrogen sulfide is not naturally occurring, but has been generated by bacteria unintentionally introduced in the course of early waterflood projects. Benzene, POM, Ethylbenzene, Toluene, n-Hexane, Xylenes, and PAHs may also be present in the gas produced by oil wells.

Liquid hydrocarbons will be stored in tanks at centralized production facilities. The tanks will be bermed to contain 110 percent storage capacity of the largest tank. Liquid hydrocarbons will be periodically removed from the storage tanks and transported via truck or pipeline outside the project area, in adherence to Department of Transportation (DOT) rules and regulations. Necessary regulatory approvals for the production, storage, and transport of liquid hydrocarbons, including the Oil Pollution Act of 1990 (storage of greater than 1,000,000 gallons), will be addressed before the initiation of liquid hydrocarbon production activities.

2.3 Produced Water

Produced water from wells within the project boundaries is expected to average 200 barrels per day per well. The water quality of the produced water varies and will be monitored periodically in accordance with Onshore Order 7. Water produced from the coal seams within the Mesaverde Group and other targeted formations are known to contain the following hazardous substances:

Antimony	Copper	Selenium
Arsenic	Cyanide	Silver
Barium	Lead	Sodium
Beryllium	Mercury	Thallium
Cadmium	Nickel	Zinc
Chromium	Radium 226	

Phenol, an extremely hazardous substance, is also found in the produced water stream. No other hazardous or extremely hazardous materials are known to be present.

Onshore Order 7 provides the information and procedural requirements that the operators will be required for the approval of applications for disposal of produced water generated from wells administered by the BLM. In addition, produced water disposal will be in accordance with Onshore Order 7 for Disposal of Produced Water. Within the WRFO, the primary means of disposal will be to transport by truck to permitted commercial disposal facilities or re-injected into underground aquifers as permitted by the COGCC. Agency authorizations that must be obtained before disposing of produced water include:

- BLM approval of disposal methodologies, and
- COGCC Water Quality Division approval of wastewater disposal (e.g., National Pollutant Discharge Elimination System [NPDES] permits and Underground Injection Control [UIC] permits).

3.0 Exploration and Production Activities

Exploration and production activities in the field office area will include geophysical, construction, drilling, testing, completion, production, maintenance, transportation, abandonment, and reclamation components.

Known hazardous and extremely hazardous materials typically used during exploration and production operations in the project area are listed in Table C-1 and generally fall into the following categories:

- Fuels;
- Lubricants;
- Coolant/antifreeze and heat transfer agents;
- Drilling fluids and reserve pit maintenance;
- Fracturing fluids;
- Cement and additives; and
- Miscellaneous materials.

4.0 Fuels

Gasoline, diesel, Jet A fuel, natural gas, and propane are the fuels that may be employed within the boundaries of the WRFO. Each of the fuels contains materials classified as hazardous. Gasoline and diesel will be used by vehicles providing transport to and from the project area. Diesel, gasoline, and Jet A fuel may be used for geophysical survey operations. Diesel fuel will also be used in drilling operations and construction equipment, and may be used as a minor component of fracturing fluids. Natural gas produced may be used to power compressor engines and other ancillary facilities. Propane may be used for miscellaneous heating purposes.

4.1 Gasoline

Gasoline will be used to power vehicles traveling to and from the project area. Gasoline will be purchased from regional vendors and primarily stored and transported in vehicle gas tanks. Some additional gasoline may be stored in appropriately designed and labeled 1- to 5-gallon containers for supplemental use as vehicle fuel. No large-scale storage of gasoline is anticipated. The hazardous substances expected to be present in gasoline include:

Benzene	Methyl tert-butyl ether	Toluene
Cyclohexane	Naphthalene	Xylenes
Ethylbenzene	PAHs	
n-Hexane	POM	

No extremely hazardous materials are expected to be present in the gasoline.

4.2 Diesel

Diesel fuel will be used to power transport vehicles, geophysical vehicles, drilling rigs, and construction equipment. Each well location will have aboveground storage tanks containing diesel fuel during drilling operations. Tanks will be filled by a local fuel supplier. Diesel fuel will be used, transported, and stored in accordance with all relevant local, state, and federal rules, regulations, and guidelines. The hazardous substances expected to be present in diesel fuel include:

Benzene	POM	Ethylbenzene
Toluene	Naphthalene	Xylenes
PAHs		

No extremely hazardous materials are expected to be present in the diesel fuel.

4.3 Jet A Fuel

Jet A fuel may be used to power geophysical vehicles. Jet A fuel will be purchased from regional vendors and primarily stored and transported in vehicle tanks. Some additional Jet A fuel may be stored in appropriately designed and labeled containers for supplemental use. No large-scale storage of Jet A fuel is anticipated. The hazardous substances expected to be present in Jet A fuel include:

Benzene	Methyl tert-butyl ether	Toluene
Cyclohexane	Naphthalene	Xylenes
Ethylbenzene	PAHs	n-Hexane
POM		

No extremely hazardous materials are expected to be present in the Jet A fuel.

4.4 Natural Gas

Natural gas produced on site may be burned to power compressor engines and other ancillary facilities. Hazardous materials expected to be present in natural gas include n-hexane, PAHs, and POM. No extremely hazardous materials are known to exist in the natural gas from the project area.

4.5 Propane

Propane may be used for miscellaneous heating purposes throughout the field office area. The propane will be purchased from regional vendors and transported and stored in appropriate tanks. No large-scale storage of propane is anticipated. The only hazardous material expected to be present in propane is propylene. No extremely hazardous materials are known to be present in propane.

5.0 Lubricants

Various lubricants, including motor oils, hydraulic oils, transmission oils, compressor lube oils, and greases, will be used in project equipment and machinery. Lubricants may contain hazardous substances, particularly:

Barium	Lead	PAHs
Cadmium	Manganese	POM
Copper	Nickel	Zinc

No extremely hazardous materials are known to be present in the lubricants required for the proposed project. The lubricants will be used, stored, transported, and disposed of following manufacturers' guidelines and local, state, and federal requirements.

6.0 Coolant/Antifreeze and Heat Transfer Agents

Various materials will be used as coolant/antifreeze and heat transfer agents in association with exploration and development. Ethylene glycol, a hazardous substance, will be used as an engine coolant/antifreeze in vehicles, construction equipment, gas dehydrators, and drilling and workover rigs. In addition, ethylene glycol will be used as a heat transfer fluid during well completion and maintenance operations. No extremely hazardous materials are known to be present in the coolant/antifreeze and heat transfer agents required for the proposed project. Ethylene glycol will be disposed of in accordance with applicable local, state, and federal rules and regulations.

7.0 Drilling Fluids and Reserve Pit Maintenance

Water-based mud (drilling fluids) is the most commonly used method for drilling wells within the analysis area. When drilling to set the surface casing, drilling fluid will be composed only of fresh water, bentonite, and/or a benign lost circulation material that does not pose a risk of harm to human health or the environment (e.g., cedar bark, shredded cane stalks, mineral fiber and hair, mica flakes, ground and sized limestone or marble, wood, nut hulls, corncobs, or cotton hulls). Drilling fluid additives consist of clays and other materials used in accordance with standard industry practices. Drilling fluid additives that are expected to be used and their hazardous and extremely hazardous components are listed in Table C-1. Drilling operations will be conducted in compliance with applicable the BLM and COGCC rules and regulations.

Drilling fluid additives will be transported to well locations during drilling operations in appropriate sacks and other containers, in compliance with DOT regulations. Drilling fluids, cuttings, and water will be stored in reserve pits. The following protection actions will be employed at the reserve pits, as deemed appropriate by the BLM and COGCC: netting to protect waterfowl, other birds, and bats; pit liners to protect shallow groundwater aquifers and to conserve water; and perimeter fencing to protect wildlife. Following drilling and completion operations, the reserve pit contents will be evaporated or solidified in place, the pit backfilled, and the surface reclaimed. Reserve pit solidification and closure procedures will be approved by the BLM or COGCC before implementation. Alternatively, reserve pit contents may be removed and disposed of at an appropriate off-site facility in a manner commensurate with applicable local, state, and federal regulations.

8.0 Fracturing Fluids

It is standard practice that a well will be hydraulically fractured periodically to augment gas flow rates. Fracturing fluids potentially containing hazardous substances that may be used within the project area are listed in Table C-1.

Fracturing fluids and additives will be transported to well locations in bulk or in appropriately designed and labeled containers. Transportation of fracturing fluids and additives will be in adherence with DOT rules and regulations.

During fracturing, fluids are pumped under pressure down the wellbore and out through perforations in the casing into the formation. The pressurized fluid enters the formation and induces hydraulic fractures. When the pressure is released at the surface, a portion of the fracturing fluids will be forced back into the wellbore and up to the surface into a reserve pit with a liner. The fracturing fluids will then be transported off site for reuse or disposal at an authorized facility. The BLM and COGCC will determine the appropriate disposal of fracturing fluids on a case-by-case basis.

9.0 Cement and Additives

Well completion and abandonment operations include cementing and plugging various segments of the wellbore to protect freshwater aquifers and other downhole resources. Materials potentially used for cementing operations include cement, calcium hydroxide, calcium chloride, pozzolans, sodium bicarbonate, potassium chloride, and insulating oil. An unknown quantity of cement and additives will be transported in bulk to each well location. These additives might contain the hazardous material classes of fine mineral fibers, PAHs, and POM. Small quantities might also be transported and stored on site in 50-pound sacks. Wells will be cased and cemented as directed and approved by the BLM for federal minerals, and COGCC for state and patented minerals.

10.0 Miscellaneous Materials

Miscellaneous materials will be used during geophysical, construction, drilling, testing, completion, production, maintenance, transportation, abandonment, and reclamation activities. Miscellaneous materials potentially containing hazardous substances that might be used within the project area are listed in Table C-1. Quantities of these miscellaneous materials are unknown. Materials will be transported to the site by service and supply companies and will be used, stored, transported, and disposed of following manufacturers' guidelines and local, state, and federal requirements. In conformance with all applicable regulatory requirements, industry-standard pipeline materials, equipment, techniques, and procedures will be employed during construction, testing, operation, and maintenance activities to ensure pipeline safety and efficiency.

11.0 Pipeline Materials

Natural gas produced from wells will be transported from each location through pipelines. Industry standard pipeline equipment, materials, techniques, and procedures, in conformance with all applicable regulatory requirements, will be employed during construction, testing, operation, and maintenance of the project. All necessary authorizing actions for natural gas pipelines will be addressed prior to installation.

Materials utilized for pipeline construction, operation, and maintenance that may contain hazardous materials will be handled in accordance with applicable state and federal regulations.

12.0 Combustion Emissions

Gasoline and diesel engines, flaring of natural gas, and fired production equipment will produce combustion emissions within the project area. The complete oxidation of hydrocarbon fuel yields only carbon dioxide and water as combustion products. However, complete combustion is seldom achieved. Unburned hydrocarbons, particulate matter, carbon monoxide, nitrogen oxides, and possibly sulfur oxides will be components of the exhaust streams. The formation of ozone from the photolysis of nitrogen oxides will also be expected. A listing of the hazardous and extremely hazardous materials potentially present in combustion emissions is provided in Table C-1.

Unburned hydrocarbons might contain potentially hazardous PAHs; particulate matter may contain metal-based particles from metallic lubricating oil additives and engine wear. Hazardous materials in the particulate matter might include compounds of lead, cadmium, nickel, copper, manganese, barium, and zinc. Particulate matter emissions and larger unburned hydrocarbons will eventually settle out onto the ground surface; whereas, gaseous emissions will react with other air constituents as components of the nitrogen, sulfur, and carbon cycles.

Nitrogen dioxide, sulfur dioxide, sulfur trioxide, and ozone are potential combustion emissions classified as extremely hazardous materials. Releases of these or other materials will not exceed allowable thresholds established by the Prevention of Significant Deterioration and the National Ambient Air Quality Standards.

13.0 Policy and Procedure

Project operators and their contractors will ensure production, use, storage, transport, and disposal of hazardous and extremely hazardous materials associated with the proposed project in strict accordance with applicable existing or hereafter promulgated federal, state, and local government rules, regulations, and guidelines. Oil and gas activities involving the production, use, or disposal of hazardous or extremely hazardous materials will be conducted in such a manner so as to minimize potential environmental impacts.

Operators will comply with emergency reporting requirements for releases of hazardous materials. Releases of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR Part 117, will be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended. The materials for which such notification must be given are the extremely hazardous substances listed under the Emergency Planning and Community Right to Know Act, Section 302, and the hazardous substances designated under Section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is released, prompt notice of the release will be given to the BLM's Authorized Officer and other appropriate local, state, and federal agencies.

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In addition, notice of any spill or leakage (i.e., any undesirable event), as defined in BLM NTL-3A, shall be given to the Authorized Officer and other such local, state, and federal officials, as required by law.

Operators will prepare and implement, as necessary, the following plans and policies:

- Spill prevention and control countermeasure plans;
- Storm water pollution prevention plans;
- Liquid hydrocarbon spill response plans;
- Inventories of hazardous chemical categories pursuant to Section 312 of the Superfund Amendments and Reauthorization Act, as amended; and
- Emergency response plans.

Copies of the above will be maintained by the operators, as required by regulation, and will be made available upon request.

Exploration and production activities in the field office area will comply with regulations promulgated under the RCRA, CERCLA, the Clean Water Act, the Safe Drinking Water Act, the Toxic Substances Control Act, the Occupational Safety and Health Act, the Clean Air Act, and NEPA, as appropriate. In addition, project activities will comply with applicable state rules and regulations relating to hazardous material handling, storage, transportation, management, disposal, and reporting.

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Production Streams			
Natural Gas			
			0.003-5.0 mmcf ⁽³⁾
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
Produced Water			
			50-500 bpd ⁽³⁾
	⁽¹⁾ Antimony	7440-36-0	
	⁽¹⁾ Arsenic	7440-38-2	
	⁽¹⁾ Barium	7440-39-3	
	⁽¹⁾ Beryllium	7440-41-7	
	⁽¹⁾ Cadmium	7440-43-9	
	⁽¹⁾ Chromium	7440-47-3	
	⁽¹⁾ Copper	7440-50-8	
	⁽¹⁾ Cyanide	--	
	⁽¹⁾ Lead	7439-92-1	
	⁽¹⁾ Mercury	7439-97-6	
	⁽¹⁾ Nickel	7440-02-0	
	⁽²⁾ Phenols	108-95-2	
	⁽¹⁾ Radium 226	--	
	Selenium	7782-49-2	
	⁽¹⁾ Silver	7440-22-4	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
	⁽¹⁾ Sodium	7440-23-5	
	⁽¹⁾ Thallium	7440-28-0	
	⁽¹⁾ Zinc	7440-66-6	
Liquid Hydrocarbons			
			UNK
	⁽¹⁾ Benzene	71-43-2	
	⁽¹⁾ Ethylbenzene	100-41-4	
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	1330-20-7	
Fuels			
Gasoline			UNK
	⁽¹⁾ Benzene	71-43-2	
	⁽¹⁾ Cyclohexane	110-82-7	
	⁽¹⁾ Ethylbenzene	100-41-4	
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ Methyl tert-butyl ether	1634-04-4	
	⁽¹⁾ Naphthalene	91-20-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	1330-20-7	
Diesel			UNK
	⁽¹⁾ Benzene	71-43-2	
	⁽¹⁾ Ethylbenzene	10041-4	
	⁽¹⁾ Naphthalene	91-20-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	108-38-3	
Jet A Fuel			UNK
	⁽¹⁾ Benzene	71-43-2	
	⁽¹⁾ Cyclohexane	110-82-7	
	⁽¹⁾ Ethylbenzene	100-41-4	
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ Methyl tert-butyl ether	1634-04-4	
	⁽¹⁾ Naphthalene	91-20-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	108-38-3	
Natural Gas			UNK
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Propane			UNK
	⁽¹⁾ Propylene	115-07-1	
Lubricants			UNK
	⁽¹⁾ Barium	7440-39-3	
	⁽¹⁾ Cadmium	7440133-9	
	⁽¹⁾ Copper ⁽¹⁾ Lead	7440-50-8	
	⁽¹⁾ Lead	7439-92-1	
	⁽¹⁾ Manganese	7439-96-5	
	⁽¹⁾ Nickel	7440-02-0	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Zinc	7440-66-6	
Coolant/ Antifreeze and Heat Transfer Agents			
	⁽¹⁾ Ethylene glycol	107-21-1	UNK
Drilling Fluids			
Barite	⁽¹⁾ Barium compounds	--	16,000 lb
	⁽¹⁾ Fine mineral fibers	--	
Bentonite	⁽¹⁾ Fine mineral fibers	--	45,000 lb
Caustic Soda	⁽¹⁾ Sodium hydroxide	1310-73-2	750 lb
Glutaraldehyde	⁽¹⁾ Isopropyl alcohol	67-63-0	20 gal
Lime	⁽¹⁾ Fine mineral fibers	--	3,500 lb
Mica	⁽¹⁾ Fine mineral fibers	--	600 lb
Modified Tannin	⁽¹⁾ Ferrous sulfate	7720-78-7	250 lb
	⁽¹⁾ Fine mineral fibers	--	
Phosphate Esters	⁽¹⁾ Methanol	67-56-1	100 gal
Polyacrylamides	⁽²⁾ Acrylamide	79-06-1	100 gal
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
Retarder	⁽¹⁾ Fine mineral fibers	--	400 lb
Fracturing Fluids			
Biocides	⁽¹⁾ Fine mineral fibers	--	UNK
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
Breakers	⁽¹⁾ Copper compounds	--	UNK
	⁽¹⁾ Ethylene glycol	107-21-1	
	⁽¹⁾ Fine mineral fibers	--	
	⁽¹⁾ Glycol ethers	--	
Clay Stabilizer	⁽¹⁾ Fine mineral fibers	--	UNK
	⁽¹⁾ Glycol ethers	--	
	⁽¹⁾ Isopropyl alcohol	67-63-0	
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Crosslinkers	⁽¹⁾ Ammonium chloride	12125-02-9	UNK
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ Potassium hydroxide	1310-58-3	
	⁽¹⁾ Zirconium nitrate	13746-89-9	
	⁽¹⁾ Zirconium sulfate	14644-61-2	
Foaming Agent	⁽¹⁾ Glycol ethers	--	UNK
Gelling Agent	⁽¹⁾ Benzene	71-43-2	UNK
	⁽¹⁾ Ethylbenzene	100-41-4	
	⁽¹⁾ Methyl tert-butyl ether	1634-04-4	
	⁽¹⁾ Napthalene	91-20-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Sodium hydroxide	1310-73-2	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	1330-20-7	
pH Buffers	⁽¹⁾ Acetic acid	64-19-7	UNK
	⁽¹⁾ Benzoic acid	65-85-0	
	⁽¹⁾ Fumaric acid	110-17-8	
	⁽¹⁾ Hydrochloric acid	7647-01-0	
	⁽¹⁾ Sodium hydroxide	1310-73-2	
Sands	⁽¹⁾ Fine mineral fibers	--	UNK
Solvents	⁽¹⁾ Glycol ethers	--	UNK
Surfactants	⁽¹⁾ Glycol ethers	--	UNK
	⁽¹⁾ Isopropyl alcohol	67-63-0	
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
Cement and Additives			
Anti-Foamer	⁽¹⁾ Glycol ethers	--	100 lb
Calcium Chloride Flake	⁽¹⁾ Fine mineral fibers	--	2,500 lb
Cellophane Flake	⁽¹⁾ Fine mineral fibers	--	300 lb
Cement	⁽¹⁾ Aluminum oxide	1344-28-1	77,000 lb
	⁽¹⁾ Fine mineral fibers	--	
Chemical Wash	⁽¹⁾ Ammonium hydroxide	1336-21-6	850 gal
	⁽¹⁾ Glycol ethers	--	
Diatomaceous Earth	⁽¹⁾ Fine mineral fibers	91053-39-3	1,000 lb
Extenders	⁽¹⁾ Aluminum oxide	1344-28-1	17,500 lb
	⁽¹⁾ Fine mineral fibers	--	
Fluid Loss Additive	⁽²⁾ Acrylamide	79-06-1	900 lb
	⁽¹⁾ Fine mineral fibers	--	
	⁽¹⁾ Naphthalene	91-20-3	
Friction Reducer	⁽¹⁾ Fine mineral fibers	--	160 lb
	⁽¹⁾ Naphthalene	91-20-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
Mud Flash	⁽¹⁾ Fine mineral fibers	--	250 lb
Retarder	⁽¹⁾ Fine mineral fibers	--	100 lb

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Salt	⁽¹⁾ Fine mineral fibers	--	2,570 lb
Silica Flour	⁽¹⁾ Fine mineral fibers	--	4,800 lb
Miscellaneous Materials			
Acids	⁽¹⁾ Acetic anhydride	108-24-7	UNK
	⁽¹⁾ Formic acid	64-18-6	
	⁽¹⁾ Sodium chromate	777-11-3	
	⁽²⁾ Sulfuric acid	7664-93-9	
Batteries	⁽¹⁾ Cadmium	744043-9	UNK
	⁽²⁾ Cadmium oxide	1306-19-0	
	⁽¹⁾ Lead	7439-92-1	
	⁽¹⁾ Nickel hydroxide	7440-02-0	
	⁽¹⁾ Potassium hydroxide	1310-58-3	
	⁽²⁾ Sulfuric acid	7664-93-9	
Biocides	⁽²⁾ Formaldehyde	50-00-0	UNK
	⁽¹⁾ Isopropyl alcohol	67-63-0	
	⁽¹⁾ Methanol	67-56-1	
Cleaners	⁽¹⁾ Hydrochloric acid	7647-01-0	
Corrosion Inhibitors	⁽¹⁾ 4,4' Methylene dianiline	101-77-9	
	⁽¹⁾ Acetic acid	64-19-7	
	⁽¹⁾ Ammonium bisulfite	10192-30-0	
	⁽¹⁾ Diethylamine	109-89-7	
	⁽¹⁾ Dodecylbenzenesulfonic acid	27176-87-0	
	⁽¹⁾ Ethylene glycol	107-21-1	
	⁽¹⁾ Isobutyl alcohol	78-83-1	
	⁽¹⁾ Isopropyl alcohol	67-63-0	
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ Naphthalene	91-20-3	
	⁽¹⁾ Sodium nitrite	7632-00-0	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	1330-20-7	
	⁽¹⁾ Zinc carbonate	3486-35-9	
	Emulsion Breakers	⁽¹⁾ Acetic acid	64-19-7
⁽¹⁾ Acetone		67-64-1	
⁽¹⁾ Ammonium chloride		12125-02-9	
⁽¹⁾ Benzoic acid		65-85-0	
⁽¹⁾ Isopropyl alcohol		67-63-0	
⁽¹⁾ Methanol		67-56-1	
⁽¹⁾ Naphthalene		91-20-3	
⁽¹⁾ Toluene		108-88-3	
⁽¹⁾ Xylenes		1330-20-7	
	⁽¹⁾ Zinc chloride	7646-85-7	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well	
Explosives, Fuses Detonators, and Boosters				
	Benzene	71-43-2	UNK	
	⁽¹⁾ Ethylbenzene	100-41-4		
	⁽¹⁾ Ethylene glycol	107-21-1		
	⁽¹⁾ Lead compounds	7439-92-1		
	⁽¹⁾ Methyl tert-butyl ether	1634-04-0		
	⁽¹⁾ Naphthalene	91-20-3		
	⁽²⁾ Nitric acid	7697-37-2		
	⁽¹⁾ Nitroglycerine	55-63-0		
	⁽¹⁾ PAHs	--		
	⁽¹⁾ POM	--		
	⁽¹⁾ Toluene	108-88-3		
	⁽¹⁾ Xylenes	1330-20-7		
Fertilizers	UNK	--	UNK	
Herbicides	UNK	--	UNK	
Lead-Free Thread Compound	⁽¹⁾ Copper	7440-50-8	25 gal	
	⁽¹⁾ Zinc	7440-66-6		
Methanol	⁽¹⁾ Methanol	67-56-1	200 gal	
Motor oil	⁽¹⁾ Zinc Compounds	--	220 gal	
Paints	⁽¹⁾ Barium	7440-39-3	UNK	
	⁽¹⁾ n-Butyl alcohol	71-36-3		
	⁽¹⁾ Cobalt	7440-48-4		
	⁽¹⁾ Lead	7439-92-1		
	⁽¹⁾ Manganese	7438-96-5		
	⁽¹⁾ PAHs	--		
	⁽¹⁾ POM	--		
	⁽²⁾ Sulfuric acid	7664-93-9		
	⁽¹⁾ Toluene	108-88-3		
	⁽¹⁾ Triethylamine	121-44-8		
	⁽¹⁾ Xylenes	1330-20-7		
	Paraffin Control	⁽²⁾ Carbon disulfide	75-15-0	UNK
		⁽¹⁾ Ethylbenzene	100-41-4	
⁽¹⁾ Methanol		67-56-1		
⁽¹⁾ Toluene		108-88-3		
⁽¹⁾ Xylenes		1330-20-7		
Photoreceptors	⁽¹⁾ Selenium	7782-49-2	UNK	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Pipeline			
Coating	⁽¹⁾ Aluminum oxide	1334-28-1	UNK
Cupric Sulfate Solution	⁽¹⁾ Cupric sulfate	7758-98-7	UNK
	⁽¹⁾ Sulfuric acid	7664-93-9	
Diethanolamine	⁽¹⁾ Diethanolamine	111-42-2	UNK
LP Gas	⁽¹⁾ Benzene	71-43-2	UNK
	⁽¹⁾ n-Hexane	110-54-3	
	⁽¹⁾ Propylene	115-07-1	
Molecular Sieves	⁽¹⁾ Aluminum oxide	1344-28-1	UNK
Pipeline Primer	⁽¹⁾ Naphthalene	91-20-3	UNK
	⁽¹⁾ Toluene	108-88-3	
Potassium Hydroxide Solution	⁽¹⁾ Potassium hydroxide	1310-58-3	UNK
Rubber Resin	⁽¹⁾ Acetone	67-64-1	UNK
Coatings	⁽¹⁾ Ethyl acetate	141-78-6	
	⁽¹⁾ Methyl ethyl ketone	78-93-3	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylene	1330-20-7	
Scale Inhibitors	⁽¹⁾ Acetic acid	64-19-7	UNK
	⁽¹⁾ Ethylene diamine	60-00-4	
	⁽¹⁾ Tetraacetic acid	--	
	⁽¹⁾ Ethylene glycol	107-21-1	
	⁽¹⁾ Formaldehyde	50-00-0	
	⁽¹⁾ Hydrochloric acid	7647-01-0	
	⁽¹⁾ Isopropyl alcohol	67-63-1	
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ Nitrilotriacetic acid	139-13-9	
	Sealants	⁽¹⁾ 1,1,1-trichloroethane	71-55-6
⁽¹⁾ n-Hexane		110-54-3	
⁽¹⁾ PAHs		--	
⁽¹⁾ POM		--	
Solvents	⁽¹⁾ 1,1,1-trichloroethane	71-55-6	UNK
	⁽¹⁾ Acetone	67-64-1	
	⁽¹⁾ t-Butyl alcohol	75-65-0	
	⁽¹⁾ Carbon tetrachloride	56-23-5	
	⁽¹⁾ Isopropyl alcohol	67-63-0	
	⁽¹⁾ Methyl ethyl ketone	108-10-1	
	⁽¹⁾ Methanol	67-56-1	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ POM	--	
	⁽¹⁾ Toluene	108-88-3	
⁽¹⁾ Xylenes	1330-20-7		
Starting Fluid	⁽¹⁾ Ethyl ether	60-29-7	UNK
Surfactants	⁽²⁾ Ethylene diamine	107-15-3	UNK
	⁽¹⁾ Isopropyl alcohol	67-56-1	

Table 1.0. Materials Potentially Used or Produced during Construction, Drilling, Production, and Reclamation Operations

Source	Material	CAS No.	Approximate Quantities Used or Produced Per Well
Combustion Emissions			
Combustion Products	⁽²⁾ Formaldehyde	50-00-0	
	⁽²⁾ Nitrogen dioxide	10102-44-0	
	⁽²⁾ Ozone	10028-15-6	
	⁽²⁾ Sulfur dioxide	7446-09-5	
	⁽²⁾ Sulfur trioxide	7446-11-9	
Unburned Hydrocarbons	⁽¹⁾ Benzene	71-43-2	
	⁽¹⁾ Ethylbenzene	100-41-4	
	⁽¹⁾ n-Hexane	100-54-3	
	⁽¹⁾ PAHs	--	
	⁽¹⁾ Toluene	108-88-3	
	⁽¹⁾ Xylenes	1330-20-7	
	Particulate Matter	⁽¹⁾ Barium	7440-39-3
⁽¹⁾ Cadmium		7440-43-9	
⁽¹⁾ Copper		7440-50-8	
⁽¹⁾ Fine mineral fibers		--	
⁽¹⁾ Lead		7439-92-1	
⁽¹⁾ Manganese		7439-96-5	
⁽¹⁾ Nickel		7440-02-0	
⁽¹⁾ POM		--	
	⁽¹⁾ Zinc	7440-66-6	

NOTES:

-- = Not Assigned

bpd = barrels per day

gal = gallons

lb = pounds

mmcf = million cubic feet per day

PAHs = polynuclear aromatic hydrocarbons

POM = polycyclic organic matter

UNK = unknown

⁽¹⁾Hazardous Substances include those compounds identified in EPA’s List of Hazardous Substances (40 CFR Part 302) and List of Substances for Accidental Release Prevention (40 CFR Part 68).

⁽²⁾Extremely Hazardous Substances include those compounds identified in EPA’s List of Extremely Hazardous Substances (40 CFR Part 355).

⁽³⁾BLM 1997, Reasonable Foreseeable Development Scenario for Oil and Gas Activities in the BLM White River Field Office: Rio Blanco, Moffat and Garfield Counties, Colorado.

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Appendix 7

Management Decisions Modified From the 1997 White River RMP



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Appendix 7

Management Decisions Modified From the 1997 White River RMP

1.0 INTRODUCTION

It is the intention for the WRFO Oil and Gas Development RMP Amendment to provide comprehensive management direction necessary for oil and gas exploration and development within the planning area. The following table shows management decisions that were not addressed in either the Draft or Proposed WRFO Oil and Gas Development RMPA for the resource identified. In order to clarify that only management direction provided in the Oil and Gas Development RMPA is used to manage oil and gas exploration and development in the WRFO, text was either added to or deleted in the 1997 White River RMP. The table below indicates where these changes have been made.

2.0 CHANGES MADE TO 1997 WHITE RIVER RMP RELEVANT TO OIL AND GAS DEVELOPMENT

1997 WR RMP Page	Document Section	Clarifying Text (Additions are shown in gray highlights; deletions are shown with a strikethrough.)
2-2	Soils	Appropriate stipulations and conditions of approval listed in Appendix A and Appendix B, respectively, will be used in the design of all BLM-initiated surface disturbing activities and for developing conditions for all new land use authorizations, except for oil and gas exploration and development activities.
2-2	Soils	Legal descriptions for the acreage identified in the soil related stipulations in Appendix A will be placed in a computer data base. The data base will be utilized by CSO personnel to attach special surface stipulations to all new oil and gas leases
2-3	Surface Water	Surface stipulations listed in Appendix A will be applied to all new oil and gas leases and other new surface-disturbing activities, except for oil and gas development.
2-3	Ground Water	Lessees/operators/applicants will be required to use the appropriate COAs listed in Appendix B in designing their proposed projects, except for oil and gas exploration and development activities.
2-4	Water Rights	Depleted or dry oil and gas mineral exploration and development wells, that could provide an adequate source of water for livestock and wildlife, will be reviewed for conversion to a water well at the time a Notice of Intent to abandon the well has been submitted. Operators/Lessees of the identified wells may be liable for plugging-back the well to the desired aquifer zone. Liability for the well will then be assumed by the BLM.
2-5	Oil and Gas	Surface stipulations and lease notices will be entered into a computer data base by legal description. The BLM Colorado State Office leasing section personnel will then utilize the data base to append applicable stipulations and notices to new leases.

Appendix 7 – Management Decisions Modified from the 1997 White River RMP

1997 WR RMP Page	Document Section	Clarifying Text (Additions are shown in gray highlights; deletions are shown with a strikethrough.)
2-5	Oil and Gas	An environmental analysis document will be prepared for all Applications for Permit to Drill (APD) and Sundry Notices (SN) proposing new surface disturbance or unique and unusual downhole workover operations. A decision will be made, based on the environmental document, whether to deny or approve the planned operation, or to exempt, modify or waive an existing lease stipulation. Exemptions will be handled administratively in accordance with the language included in the specific stipulation. It should be noted that a stipulation could be excepted, modified, or waived as stated in the stipulation, without preparing an RMP amendment.
2-17	Threatened and Endangered Plant Species	This stipulation will apply to all surface disturbing activities within these areas, except for oil and gas exploration and development activities.
2-17	Threatened and Endangered Plant Species	All known and potential T/E habitat, including ACECs, will be exclusion areas for new Rights-of- Way authorizations, except for oil and gas exploration and development activities.
2-18	Threatened and Endangered Plant Species	The BLM Colorado State Office will place a NSO stipulation on new oil and gas leases issued in both known and potential T/E habitat. The Area Manager will attach the NSO stipulation to all other surface-disturbing land use authorizations approved in these habitat areas, except for oil and gas exploration and development.
2-18	Sensitive Plants and RVAs	NSO stipulations will be attached to all use authorizations, except for oil and gas exploration and development, encompassing these areas.
2-19	Sensitive Plants and RVAs	The BLM Colorado State Office personnel will attach a NSO stipulation to all surface-disturbing use authorizations except for new oil and gas leases issued within the above identified ACECs, and the known and potential habitat for sensitive plant and RVA locations. The Area Manager will also attach a NSO stipulation to all surface-disturbing use authorizations proposed within these sensitive plant and RVA locations.
2-22	Woodlands	Commercial and non-commercial woodlands removed as a result of development (i.e., oil shale, oil and gas, sodium) will be appraised and purchased prior to removal.
2-29	Big Game	Stipulations listed in Appendix A will be applied to all BLM- conducted and permitted surface-use activities in big game habitats, except for oil and gas exploration and development activities.
2-31	Raptors	NSO and TL stipulations will be applied, where appropriate (See Appendix A), to all permitted surface use activities, except for oil and gas exploration and development activities, through various use authorizations or leasing processes.
2-33	Grouse	NSO, TL and CSU stipulations will be applied, where appropriate, to all permitted surface use activities, except for oil and gas exploration and development activities, through various use authorizations and leasing processes.
2-33	Grouse	A CSU stipulation will be applied to all permitted land use activities, except for oil and gas exploration and development activities, that involve the modification of aspen, serviceberry and chokecherry communities north of Highway 40.
2-36	Special Status Species	NSO, TL and CSU stipulations associated with black-footed ferret, bald eagle, Colorado River cutthroat trout, ferruginous hawk, and northern

Appendix 7 – Management Decisions Modified from the 1997 White River RMP

1997 WR RMP Page	Document Section	Clarifying Text (Additions are shown in gray highlights; deletions are shown with a strikethrough.)
		goshawk (see Appendix. A), will be applied, where appropriate, to all use authorizations and leasing processes, except for oil and gas exploration and development activities.
2-57	General Implementation Schedule	Surface Stipulations identified in Appendix A will be in effect for new oil and gas leases and other surface disturbing activities other than oil and gas exploration and development authorized on BLM lands;
2-57	General Implementation Schedule	A computer data base of legal descriptions associated with the Surface Stipulations identified in Appendix A will be developed and maintained for use by White River and Colorado State Office personnel.
A-1	Appendix A	Where applicable, these stipulations would be applied to all surface disturbing activities associated with land use authorizations, permits, and leases issued on BLM administered lands, with the exception of oil and gas exploration and development which would follow guidance in the 2015 Oil and Gas Development RMPA.
A-1	Appendix A	The stipulation codes and legal descriptions will be placed in a computer data base in the Colorado State Office (CSO). CSO personnel will utilize the data base to attach applicable stipulations or notices to new oil and gas lease parcels that will be sold at auction.
B-1	Appendix B	These conditions will apply, where appropriate, to all use authorizations, including BLM initiated projects with the exception of oil and gas exploration and development which would follow guidance in the 2015 Oil and Gas Development RMPA.
B-6	Appendix B	Oil and Gas Mineral Exploration and Development Wells

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