

**United States Department of the Interior  
Bureau of Land Management**

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**Environmental Assessment  
for the Royal Gorge Field Office November 2013 Competitive  
Oil & Gas Lease Sale**

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Royal Gorge Field Office  
3028 E. Main  
Canon City, CO 81212

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# CHAPTER 1 - INTRODUCTION

## 1.1 IDENTIFYING INFORMATION

### BACKGROUND:

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976, to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

The BLM's Colorado State Office conducts quarterly competitive lease sales to sell available oil and gas lease parcels. A Notice of Competitive Lease Sale, which lists lease parcels to be offered at the auction, is published by the Colorado State Office at least 90 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Constraints on leasing and any future development of split estate parcels are determined by the BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale, the Colorado State Office sends a draft parcel list to each field office where the parcels are located. Field Office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing and that appropriate stipulations have been included; verify whether any new information has become available that might change any analysis conducted during the planning process; confirm that appropriate consultations have been conducted; and identify any special resource conditions of which potential bidders should be made aware. The nominated parcels are posted online for a two week public scoping period. This posting also includes the appropriate stipulations as identified in the relevant RMP. The BLM prepares an analysis consistent with the National Environmental Policy Act (NEPA), usually in the form of an Environmental Assessment (EA). Comments received from the public are reviewed and incorporated into the NEPA document, as applicable.

After the Field Office completes the draft parcel review and NEPA analysis and returns them to the State Office, a list of available lease parcels and associated stipulations is made available to the public through a Notice of Competitive Lease Sale (NCLS). Lease sale notices are posted on the Colorado BLM website at:

[http://www.blm.gov/nm/st/en/prog/energy/oil\\_and\\_gas/lease\\_sale\\_notices.html](http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas/lease_sale_notices.html). On rare occasions, the BLM may defer or withhold additional parcels prior to the day of the lease sale. In such cases, the BLM prepares an amendment to the sale notice.

If the parcels are not leased at the November 2013 lease sale, then they will remain available to be leased for a period of up to two years to any qualified lessee at the minimum bid cost. Parcels obtained in this way may be re-parceled by combining or deleting other previously offered lands. Mineral estate that does not get leased after an initial offering, and is not leased within a two year period, must go through a competitive lease sale process again prior to being leased.

The act of leasing does not authorize any development or use of the surface of lease lands, without further application and approval by the BLM.

The BLM may receive future Applications for Permit to Drill (APDs) for those parcels that are leased. When those APDs are received, additional site-specific NEPA analysis will be done.

Eleven parcels comprising 2,528.31 acres within the Royal Gorge Field Office (RGFO) were nominated for the November 2013 Competitive Oil and Gas Lease Sale. This figure is comprised of 1,183.46 acres of federal land and 1,344.85 acres of split-estate land. The legal descriptions of the nominated parcels are in [Attachment A](#).

This EA documents the review of the nominated parcels under the administration of the Royal Gorge Field Office. It serves to verify conformance with the approved land use plan and provides the rationale for deferring or dropping parcels from a lease sale.

In accordance with Colorado BLM Instruction Memorandum No. CO-2012-027 and BLM Instruction Memorandum No. 2010-117, this EA will be released for 30 days of public comment. Any comments received within the timeframe will be considered and incorporated into the EA as appropriate.

PROJECT NAME: November 2013 Competitive Oil and Gas Lease Sale

## **1.2 PROJECT LOCATION AND LEGAL DESCRIPTION**

### LEGAL DESCRIPTION:

Please see Attachments A, B, and C for legal locations and Attachment E for maps of the project locations.

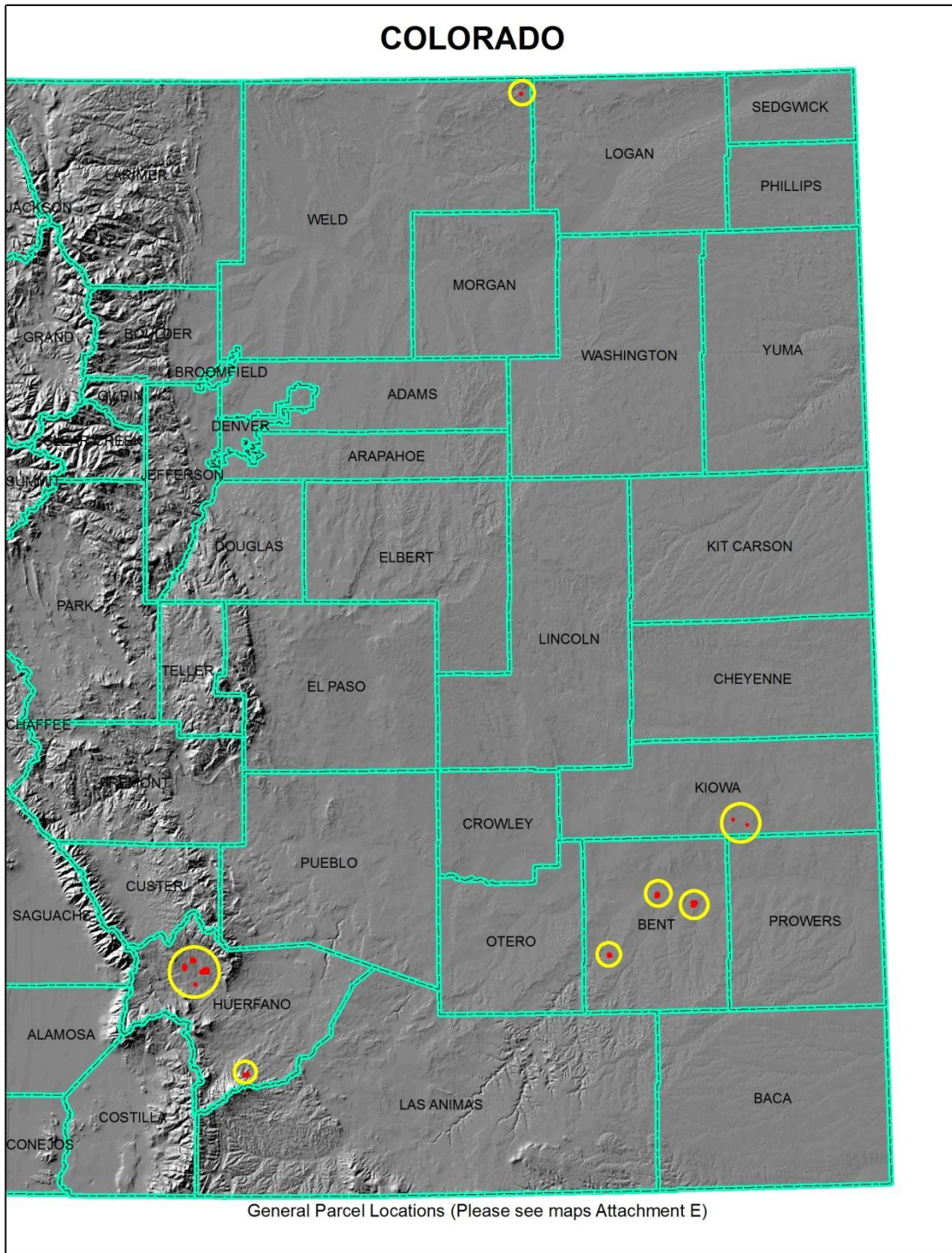
## **1.3 PURPOSE AND NEED**

The purpose of the Proposed Action is to consider opportunities for private individuals or companies to explore for and develop oil and gas resources on public lands through a competitive leasing process.

The need for the action is to respond to the nomination or expression of interest for leasing, consistent with the BLM's responsibility under the Mineral Leasing Act (MLA), as amended, to promote the development of oil and gas on the public domain. Parcels may be nominated by the public, the BLM or other agencies. The MLA establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA and other applicable laws, regulations, and policies.

### **1.3.1 Decision to be Made**

The BLM will decide whether or not to lease the nominated parcels and, if so, under what terms and conditions.



## 1.4 PUBLIC PARTICIPATION

### 1.4.1 Scoping

The principal goals of scoping are to identify issues, concerns, and potential impacts that require detailed analysis. The BLM uses both internal and external scoping to identify potentially affected resources and associated issues.

**Internal scoping** was conducted through interdisciplinary (ID) team meetings and discussion of the nominated parcels. The following issues were identified:

**Parcel 6672** is largely within the Queens State Wildlife Area (SWA). Would those wildlife elements and characteristic that define the SWA be compromised by leasing these two small tracts? Concerns revolved around riparian environments, waterfowl and shorebird habitats and potential bald eagle nest sites.

**Parcel 6671** has a potential for erodible soils.

**Parcel 6657**, adjacent to the Spanish Peaks Wilderness. Is there the potential for or does it maintain wilderness characteristics?

**Parcels 6657, 6658, 6659, 6660, 6661 and 6667** are in potential lynx habitat. U.S. Fish and Wildlife Service will be consulted on this issue.

**External scoping** was conducted by posting the nominated lease parcels including preliminary recommendations and stipulations for two weeks from February 12 through February 26, 2013. Stipulation summaries, GIS shapefiles, and maps were posted on the BLM Colorado State Office website:

[http://www.blm.gov/co/st/en/BLM\\_Programs/oilandgas/oil\\_and\\_gas\\_lease/2013/November 2013\\_lease\\_sale.html](http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/2013/November_2013_lease_sale.html). This allows the public an opportunity to provide comments, which are then analyzed and incorporated into the EA as appropriate. Letters were also mailed to affected private land surface owners whose land overlies federal minerals proposed for leasing.

A total of nine scoping comments were received from the public. All comments were focused on parcels in Huerfano County, in particular Parcels #6657 adjacent to the Spanish Peaks Wilderness and #6658 with federally owned surface currently leased for grazing and ranching operations.

Comments received for parcel #6657 were concerns regarding impacts to the remote relatively pristine nature of the tracts (situated adjacent to the Spanish Peaks Wilderness) and impacts that oil and gas development would have on critical elk habitat and depletion and contamination of groundwater through the reduction of hydrostatic pressure and unforeseen consequences of the fracking process.

The comments for parcel #6658 focused on impacts to ranching operations and to the economics of the ranch. Other impacts included impacts to critical elk habitat and elk calving as well as general wildlife habitat. The lack of available water and visual impacts were also brought forward.

One additional comment cited potential impacts to all Huerfano County parcels. In addition to those claimed impacts listed above the commenter lists economic impacts to ranch operations for parcel #6659 and impacts to antelope, eagle nesting sites and water resources for both 6658 and 6659. Although there are no current leases or development on parcels #6660, #6661 or #6667, the commenter cites the potential for nearby APDs and the impacts that they and any additional BLM development would have on groundwater and water supplies in general.

Comments were received from **Colorado Parks and Wildlife** with concerns related to parcel #6672 being located within the Queens State Wildlife Area (SWA). Specific concerns revolve around a portion of this small parcel (9.65 acres, section 8) being below the fluctuating shoreline of the reservoir and the remainder supporting a cottonwood grove home to a variety of birds and wildlife. In addition the parcel contains an unoccupied house, public restrooms, a boat ramp and a large parking area. Another very small portion (0.7 acres in section 23) not technically in the SWA but surrounded by the SWA, exists near the water line in a cottonwood grove and could only be accessed by crossing the SWA with a new road. CPW also indicated that concerns for other parcels were addressed with applied stipulations.

Issues Identified:

- Air
- Fluid minerals
- Terrestrial wildlife
- Migratory birds
- Wetland and riparian environments
- Soils
- Surface and ground water
- Economics
- Recreation
- Visual resources
- Lands with wilderness characteristics
- Forestry
- Range Management

Several issues were considered during project scoping but dismissed from detailed analysis because there would be no potentially significant effects related to the issues resulting from any of the alternatives presented below. The following resources were determined by an ID Team of resource specialists, following their onsite visit and review of the RMP and other data sources to, not be present or to not have the potential to be significantly impacted were: Realty Authorizations, Prime and Unique Farmlands, Special Designations (e.g. NLCS, ACEC), Cadastral Survey, Environmental Justice.

#### **1.4.2 Public Comment Period**

The preliminary draft of this EA and the unsigned Finding of No Significant Impact (FONSI) were made available for a 30-day public review and comment period beginning May 3, 2013 and

ending June 3, 2013. The document was made available online on the Royal Gorge Field Office web site and in the public room at the Royal Gorge Field Office. All comments received were concerning parcels in Huerfano County (#6657, #6658, #6659, #6660, #6661, #6667) and are summarized with responses in [Attachment F](#). Responses to comments did not result in additional alternatives, alterations to existing alternatives or the removal of offered parcels.

## **CHAPTER 2 - ALTERNATIVES**

### **2.1 INTRODUCTION**

The purpose of this chapter is to provide information on the Proposed Action and Alternatives. Alternatives considered but not analyzed in detail are also discussed.

### **2.2 ALTERNATIVES ANALYZED IN DETAIL**

#### **2.2.1 No Action Alternative**

The BLM NEPA Handbook (H-1790-1) states that for EAs the No Action Alternative generally means that the Proposed Action would not take place. In the case of a lease sale, the leasing of particular parcels would not take place.

The No Action Alternative would defer the lease parcels from the November 2013 lease sale. The parcels could be considered for inclusion in future lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding private, state, and federal leases.

#### **2.2.2 Proposed Action - Lease All Nominated Parcels in Conformance with the RMP**

Under this alternative, the BLM would lease Federal mineral estate in all 11 nominated parcels available for leasing in the resource area in accordance with the RGFO RMP (May 1996). The current lease sale includes parcels in Bent, Huerfano, Kiowa and Weld Counties. Those lands proposed for lease total 2,528.31 acres of federal mineral estate and are described in [Attachment A](#) and are shown with maps in [Attachment E](#). Lands offered for lease are a mix of federal and private surface. The lands have been grouped into appropriate lease parcels for competitive sale as oil and gas leases in accordance with the 43 CFR 3100 regulations. The leases would include the standard lease terms and conditions for development of the surface of oil and gas leases provided in 43 CFR 3100. Stipulations to protect other surface and subsurface resources would apply, as prescribed by the RMP. These stipulations are described in Attachment A.

#### **2.2.3 Preferred Alternative**

The BLM preferred alternative proposes to offer for sale the 10 parcels identified in [Attachment C](#) with appropriate stipulations and lease notices identified in Exhibit D. The preferred alternative differs from the proposed action by analyzing the deferral of parcel #6672 in Kiowa County. Parcel #6672 is comprised of two small sub-parcels totaling 10.35 acres in the Queens State Wildlife Area. The parcel is situated adjacent to playa reservoirs that are currently dry but



have the potential to fill depending on water availability. The parcel, in this alternative, is recommended for deferral to further analyze the effects of oil and gas development on waterfowl and shorebird habitat and rookeries as well as raptor and bald eagle nesting and winter roost sites, and the adequacy of applied stipulations to protect those values.

## **2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL**

An alternative was considered that would offer all of the parcels that are administratively available for leasing with a no surface occupancy stipulation. This alternative was not carried forward into detailed analysis because it is not supported by the RMP; it would only prohibit surface occupancy for oil and gas development; whereas, other non-oil and gas occupancy may not be similarly constrained. Further, it unnecessarily constrains oil and gas occupancy in areas where the RMP has determined that less restrictive stipulations would adequately mitigate the anticipated impact.

No other alternatives to the proposed action were identified that would meet the purpose and need of the proposed action.

## **2.4 Plan Conformance Review**

The proposed action was reviewed for conformance (43 CFR 1610.5, BLM 1617.3) with the following plan:

Name of Plan: Royal Gorge Resource Management Plan

Date Approved: May 13, 1996

Decision Number: 4-29, 8-28, 10-27

Decision Language: The BLM administered mineral estate will be open to fluid minerals leasing, exploration and production, subject to the lease terms and applicable lease stipulations.

Name of Plan: Northeast Resource Management Plan

Date Approved: September 1986 as amended November 1991

Decision Number: Oil and Gas element amendment to the RMP

Decision Language: 672,000 acres of BLM administered mineral estate within the Northeast Planning Area are open to oil and gas leasing and development, subject to the lease terms and (as applicable) lease stipulations.

The Royal Gorge and Northeast RMPs identified areas open for oil and gas leasing, and specified stipulations that would apply to leases. The proposed lease sales are within the areas identified as open to leasing. Based on the RMPs, specific stipulations are attached to each lease parcel.

## **CHAPTER 3 – AFFECTED ENVIRONMENT AND EFFECTS**

### **3.1 INTRODUCTION**

The CEQ Regulations state that NEPA documents “must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail” (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an environmental assessment (EA). Issues will be analyzed if: 1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or 2) if the issue is associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of the impacts.

The following issues were determined to not be present or not expected to be impacted by the proposed action and alternatives:

- Realty Authorization
- Prime and Unique Farmlands
- Special Designations (NLCS, ACEC)
- Cadastral Survey
- Environmental Justice

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the state. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands. The findings for each of the five standards are located in the respective resource section of Chapter 3.

### **3.2 ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE**

Under the No Action Alternative, the eleven parcels totaling 2,528.31 acres would not be leased. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. The No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease areas. The No Action Alternative is also used as the baseline for comparison of the alternatives.

The BLM assumes that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This reduction would diminish federal and state royalty income, and increase the potential for federal lands to be drained by wells on adjacent private or state lands. The public’s demand for oil and gas is not expected to change; oil and gas consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demographics, and weather or climate. If the parcels are not leased, energy demand would continue to be met by other sources such as imported fuel, alternative energy sources (e.g., wind, solar), and other domestic fuel production. This displacement of supply could offset any reductions in emissions and

disturbance achieved by not leasing the subject tracts in the short term. There is increased potential for drainage to occur from adjacent lands that are developed.

### **3.3 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS**

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations 40 CFR §1508.7 as “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . or person undertakes such other actions.” In its guidance, the CEQ has stated that the “cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds” using the concept of “project impact zone” (i.e., the area that might be influenced by the proposed action).

Offering and issuing leases for the subject parcels, in itself, would not result in cumulative impacts to any resource. Nevertheless, future development of the leases could be an indirect effect of leasing. The EISs for the governing RMPs, provide the BLM’s analysis of cumulative effects of oil and gas development based on the reasonable, foreseeable oil and gas development scenario. These analyses are incorporated by reference and are available at [http://www.blm.gov/co/st/en/BLM\\_Programs/land\\_use\\_planning/rmp.html](http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp.html). The cumulative impacts analysis in the EISs accounted for the potential impacts of development of lease parcels in the planning area as well as past, present and reasonably foreseeable actions known at that time. This analysis expands upon the existing analysis by incorporating new information.

The following activities will be considered in the cumulative impacts analysis of the proposed action and alternatives.

#### **Past Actions**

There has been no prior oil and gas activity on any of the offered parcels. BLM does not maintain information about non-mineral activity on split estate parcels on private land but evidence indicates that livestock grazing has been the predominant use. Of those parcels involving public land, numbers 6657, 6658 and 6667 have active grazing leases. No evidence suggests any other past actions by the BLM, affecting these parcels. Aerial photography and visits to the parcels on the eastern plains, indicate that over grazing and several years of drought conditions has produced an almost barren landscape in some locations. Parcel 6672 in Kiowa County is adjacent to Neenoshe and Neeskah reservoirs. Due to years of drought and redirecting the water that once filled these reservoirs, they are now little more than dry playas.

#### **Present Actions**

The only actions occurring currently on the offered parcels is the continued livestock grazing (those with active grazing).

#### **Reasonably Foreseeable Future Actions**

For those parcels involving public land there are no pending actions other than continued livestock grazing.

Weld County – this parcel is located in northeastern Weld County close to the Wyoming state-line and is estimated to have low future development potential ranging from 1 to 5 wells per township (Bureau of Land Management 2012). This parcel is roughly 40-45 miles northeast of the heavy development area known as the Wattenberg Field, whose future development potential is very high at greater than 150 wells per township. There are no applications for drilling currently being made near the parcel on private or split estate.

Huerfano County – these 5 parcels located in the center of the county are predicted to be in a low future development area numbering between 1 to 5 wells per township, although there has been leasing interest in this area since mid-to-late 2011 with some permitting activity starting in 2012 (Stillwell, et.al. 2012). The 6<sup>th</sup> parcel located on the boundary between Huerfano and Las Animas counties is also located in an area having low future development potential.

Kiowa County – this parcel is located in an area predicted to have low future development, estimated potential ranging from 1 to 5 wells per township. There is currently modest permitting activity in the area (two surrounding townships) with 6 approved wells and 1 pending well.

Bent County – these 3 parcels located roughly in the center of the county were categorized as being in an area having very low future development potential at less than one well drilled per township (Bureau of Land Management 2012) and there has been limited permitting activity in the area.

## **3.4 Environmental Consequences of Leasing and Potential Development**

### **3.4.1 Physical Resources**

#### **3.4.1.1 Air Quality and Climate**

##### **Proposed Action**

##### Affected Environment:

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). Exposure to air pollutant concentrations greater than the NAAQS has been shown to have a detrimental impact on human health and the environment. The EPA has delegated regulation of air quality under the federal Clean Air Act to the State of Colorado. The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division (APCD) administers Colorado's air quality control programs and is responsible for issuing permits for emission sources. The State has established the Colorado Ambient Air Quality Standards (CAAQS), which can be more, but not less stringent than the NAAQS. In addition to the criteria pollutants, regulations also exist to control the release of hazardous air pollutants (HAPs). HAPs are chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA currently lists 188 identified compounds as hazardous air pollutants, some of which can be emitted from oil and gas development operations, such as benzene, toluene, and formaldehyde. Ambient air quality standards for HAPs do not exist; rather these emissions are regulated by the source type, or

specific industrial sector responsible for the emissions. All of the counties in which the lease sale parcels are located are currently in attainment of all the NAAQS, with the exception of portions of Weld County.

**Table 3.4.1.1-1 NAAQS (EPA 2012)**

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
<a href="#">Carbon Monoxide</a> [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
<a href="#">Lead</a> [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m <sup>3</sup>	Not to be exceeded
<a href="#">Nitrogen Dioxide</a> [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual Mean
<a href="#">Ozone</a> [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
<a href="#">Particle Pollution</a> [Dec 14, 2012]	PM <sub>2.5</sub>	primary and secondary	Annual	12 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
			24-hour	35 µg/m <sup>3</sup>	98th percentile, averaged over 3 years
	PM <sub>10</sub>	primary and secondary	24-hour	150 µg/m <sup>3</sup>	Not to be exceeded more than once per year on average over 3 years
<a href="#">Sulfur Dioxide</a> [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary	Annual	0.03 ppm	Arithmetic Average
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Ambient air quality in the affected environment (i.e. compliance with the NAAQS) is demonstrated by monitoring for ground level (i.e. receptor height) atmospheric air pollutant concentrations. In general, the ambient air measurements show that existing air quality in the region is good. Concentrations for the various air pollutants are below the applicable state and federal ambient air quality standards. The majority of the parcels are located in the eastern plains counties, which are those to the east of the urbanized I-25 corridor. According to CDPHE, there have been a number of communities that were monitored for particulates and meteorology but not for any of the gaseous pollutants. The monitors were discontinued in the late 1970's and early 1980's after a review of the data showed that the concentrations were well below the standard and trending downward. Currently, there are two PM<sub>10</sub> monitoring sites and one

meteorological site in Lamar and a background PM<sub>2.5</sub> monitor in Elbert County. The Lamar monitors have recorded exceedances of the 24-hour PM<sub>10</sub> standard in the past three years, however CDPHE maintains the exceedances were associated with high winds and blowing dust from dry conditions.

Weld County has experienced ozone issues in the past and portions of the county are currently designated as non-attainment for the 8 hour ozone standard. The parcel is located outside of the non-attainment area. Ozone is not emitted directly from sources, but is chemically formed in the atmosphere via interactions of oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NO<sub>x</sub> and VOCs are Ozone precursors). Ozone formation and prediction is complex, and generally results from a combination of significant quantities of VOCs and NO<sub>x</sub> emissions from various sources within a region, and has the potential to be transported across long ranges.

The proposed lease parcels are generally located in the northern and southern portions of the Royal Gorge Field Office planning area boundaries. Table 3.4.1.1-2 below shows the parcel summary data on a per County basis. An analysis of the Colorado Oil and Gas Conservation Commission (COGCC) database for producing wells and production data within the County is also provided to convey the level of current intensity for oil and gas development within the vicinity of the parcels. Additionally, table 3.4.1.1-3 provides the county level emissions inventories and has been provided to describe the affected environment in terms of current emissions intensities.

**Table 3.4.1.1-2 Parcel County Production Data (2011)**

County	Parcel ID	Total Parcel Acres	County Producing Wells	County Ave. Monthly Oil Prod. (bbl)	County Ave. Monthly Gas Prod. (Mcf)	County Ave. Monthly H <sub>2</sub> O Prod. (bbl)
Bent	6662, 6669, 6671, 6672	905.5	40	35	23,674	31
Huerfano	6657, 6658, 6659, 6660, 6661, 6667	1,562.8	80	0	1,171,339	44,363
Kiowa	6672	10.4	119	18,276	33,346	186,911
Weld	6664	40	22,324	2,220,679	19,966,060	954,833

**Table 3.4.1.1-3 County Emissions Inventory Data (EPA - 2008 NEI - TPY)**

County	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NH <sub>3</sub>	HAP
Bent	1,254	314	501	5,495	1,822	20	64,534	5	0	6	2,590
Huerfano	1,499	368	570	7,126	1,338	27	161,113	13	1	18	1,716
Kiowa	8,141	1,588	410	4,460	1,333	11	60,048	7	0	5	2,318
Weld	28,890	6,000	28,880	62,281	20,271	493	1,687,528	89	15	14,840	5,950

There is broad scientific consensus that humans are changing the chemical composition of Earth’s atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of trace greenhouse gasses (GHGs) such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and several industrial gases in our atmosphere. An increase in GHG emissions is said to result in an increase in the earth’s average surface temperature, primarily by trapping and decreasing the amount of heat energy radiated by the earth back into space. The phenomenon is commonly referred to as global warming. Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, collectively referred to as climate change. The Intergovernmental Panel on Climate Change (IPCC) has predicted that the average global temperature rise between 1990 and 2100 could be as great as 5.8°C (10.4°F), which could have massive deleterious impacts on the natural and human environments. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, from approximately 280 ppm in 1750 to 396 ppm in 2012 (as of June). The rate of change has also been increasing as more industrialization and population growth is occurring around the globe. This fact is demonstrated by data from the Mauna Loa CO<sub>2</sub> monitor in Hawaii that documents atmospheric concentrations of CO<sub>2</sub> going back to 1960, at which point the average annual CO<sub>2</sub> concentration was recorded at approximately 317 ppm. The record shows that approximately 70% of the increases in atmospheric CO<sub>2</sub> concentration, or build up, since pre-industrial times has occurred within the last 50 years. In the coming decades climate change may lead to changes in the Mountain West and Great Plains, such as increased drought and wild land fire potential.

Environmental Effects:

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: The decision to offer the identified parcels for lease would not result in any direct emissions of air pollutants. However, the future development of these leases will result in emissions of criteria, HAP and GHG pollutants. Subsequent development of any leases sold would result in both short and longer term incremental increases in overall emissions of pollutants, including GHGs. Developmental air impacts will be addressed in a subsequent analysis when lessees file an

Application for Permit to Drill (APD). All proposed activities including, but not limited to, exploratory drilling activities would be subject to applicable local, State, and Federal air quality laws and regulations.

Any subsequent activity authorized after APD approval could include soil disturbances resulting from the construction of well pads, access roads, pipelines, power lines, and drilling. Any disturbance is expected to cause increases in fugitive dust and potentially inhalable particulate matter (specifically PM<sub>10</sub> and PM<sub>2.5</sub>) in the project area and immediate vicinity. Particulate matter, mainly dust, may become airborne when drill rigs and other vehicles travel on dirt roads to drilling locations. Air quality may also be affected by exhaust emissions from engines used for drilling, transportation, gas processing, compression for transport in pipelines, and other uses.

These sources will contribute to potential short and longer term increases in the following criteria pollutants: carbon monoxide, ozone (a secondary pollutant, formed via photochemical reactions between VOC and NO<sub>x</sub> emissions), nitrogen dioxide, and sulfur dioxide. Non-criteria pollutants (for which no national standards have been set) such as carbon dioxide, methane and nitrous oxide (GHGs), air toxics (e.g., benzene), and total suspended particulates (TSP), as well as impacts to visibility, and atmospheric deposition, may also increase as a result of exploration and development.

During exploration and development, ‘natural gas’ may at times be flared and/or vented from conventional, coal bed methane, and shale wells (depending on the resources present on the lease). The gas is likely to contain volatile organic compounds that could also be emitted from reserve pits, produced water disposal facilities, and/or tanks located at the site. The development stage may likely include the installation of pipelines for transportation of raw product. New centralized collection, distribution and/or gas processing facilities may also be necessary.

The BLM will continue to evaluate the impacts of oil and gas exploration and development on the global climate, and apply appropriate management techniques and BMPs to address changing conditions. Research has identified the general potential impacts of anthropogenic GHG emissions and their effects on global climatic conditions. Anthropogenic GHGs differentially absorb and emit thermal radiation in the atmosphere and therefore may contribute incrementally to climate change. Changes in global temperatures and climate vary significantly with time, and are subject to a wide range of driving factors and complex interrelationships. Research on climate change impacts is an emerging and rapidly evolving area of science, but given the lack of adequate analysis methods it is not possible to identify specific local, regional, or global climate change impacts based on potential GHG emissions from any specific project’s incremental contributions to the global GHG burden.

At a minimum, operators must construct at least one producing well (unless the parcel is included in a unit as some point in the future) during the 10 year lease period in order to continue to hold the lease beyond the primary 10 year period. With that in mind, the BLM has developed an estimated average per well emissions inventory (table 3.4.1.1-5) based on current resource recovery methods (i.e. conventional oil and gas vs. coal bed methane) and our knowledge of development for areas similar to those parcels that have been nominated for lease. The emissions inventory is only useful for estimating the minimum indirect impacts of leasing. Since



it is unknown if the parcels would be explored and/or developed, or the extent of any subsequent exploration and development on either a temporal or spatial scale, it is not possible to reasonably assess air quality impacts through dispersion or other modeling at this time. However, the BLM will request or develop an actual exploration/development emissions inventory with project-specific information at the time that BLM receives a development proposal and performs a site-specific analysis.

**Table 3.4.1.1-4 Parcel Township Development & Minerals Data (2012)**

Parcel ID	Township Well Counts <sup>1</sup>	Township Producing Wells <sup>2</sup>	Federal Wells <sup>3</sup>	Wells / Section (640 ac) <sup>4</sup>	% Federal Mineral / Township <sup>5</sup>	Township RFD <sup>6</sup>	Potential Wells / Parcel <sup>7</sup>
6669	9	0	0	2	16.48	NA	1
6672	8	0	0	2	12.86	NA	1
6671	11	0	8	2	49.13	NA	1
6662	1	0	0	1	0.67	NA	1
6657	3	0	0	1	29.26	NA	2
6658	0	0	0	0	35.34	NA	2
6659	0	0	0	0	88.51	NA	6
6660							2
6661	0	0	0	0	25.46	NA	1
6667							1
6664	123	1	24	13	18.76	NA	1

<sup>1</sup> Colorado Oil and Gas Conservation Commission (COGCC) Database, Facilities Report 2012 for Townships where parcels are located.

<sup>2</sup> COGCC Database, Production (wells) Report (2012) for Townships where parcels are located.

<sup>3</sup> COGCC GIS Map Intersect Report (Federal minerals layer wells) for Townships where parcels are located.

<sup>4</sup> COGCC GIS Map Intersect Report (Township Sections), Maximum well counts in any one section within township where parcel is located (*note*: 36 sections per township, many sections do not have any wells).

<sup>5</sup> BLM GIS mineral layer intersect calculations (conventional and coal bed methane).

<sup>6</sup> RGFO 2012 RFD data is not publicly available at this time.

<sup>7</sup> Potential exploration and development wells are based on a statistical analysis of mineral potential, current development levels, producing wells, and in some cases where RFD is projected to be very low (i.e. less than 1 well per township), we assume at least one well or spud per parcel to hold the lease if economically recoverable minerals are found.

**Table 3.4.1.1-5 Per Well (type/phase) Emissions (Tons)**

Phase	PM <sub>10</sub>	PM <sub>2.5</sub>	VOC	CO	NO <sub>x</sub>	SO <sub>2</sub>	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HAP
Conventional Construction	5.21	0.64	0.05	0.23	0.72	0.02	108.1	0.00	0.00	0.01
CBM Construction	3.37	0.44	0.03	0.12	0.36	0.01	56.58	4.06	0.00	0.00
Conventional Production	1.15	0.15	6.67	1.30	0.73	0.00	251.9	17.14	0.00	0.43

CBM Production	2.25	0.25	13.10	1.13	0.62	0.00	181.6	19.05	0.00	1.31
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Some of the RGFO lease sale parcels are located relatively close to sensitive areas with respect to air quality. Specifically, these lease parcels are as close as 5 kilometers of the Sensitive Class II Area: Greenhorn Mtn. Wilderness and 25 kilometers due east of Class I Area: Great Sand Dunes National Park (Note: that there is a tall strip of Sangre de Cristo Mountains that separates these lease parcels and the Great Sand Dunes National Park). There is also a single lease parcel that borders the Spanish Peaks Wilderness Sensitive Class II Area. The BLM plans to assess project-specific impacts on these resources during the parcel development plan analysis or permitting stage. There will be much more detailed information at the parcel development plan or permitting stage that will allow the BLM to properly estimate potential emissions and determine potential air quality impacts to these sensitive areas using air quality modeling or other accepted tools. Substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations. BLM will make its approval of these activities subject to conditions of approval addressing air pollutant emissions, as appropriate.

Cumulative Impacts:

This lease sale, when combined with the past, present, and reasonably foreseeable future actions may contribute incrementally to the deterioration of air quality in the region. At present, any future potential cumulative impact is speculative at best, given that the pace, place, and specific equipment configurations of such development are unknown. Development of fluid minerals on these leases would result in additional surface and subsurface disturbances and emissions during drilling, completion, and production activities. The severity of these incremental impacts could be elevated based on the amount of contemporaneous development (i.e., either federal or private) in surrounding areas.

Currently however, there is only one producing well within any of the Townships (approx. 23,040 acres each) where the parcels are located. Approximately 158 wells have been drilled since record keeping began. The records indicate the majority of these wells were either dry and abandoned, abandoned locations, or plugged and abandoned. Exploration and development of these leases is not expected to have significant cumulative impacts within the region. As noted above, substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations.

Protective/Mitigation Measures:

Prior to approving development activities on a leased parcel, the BLM will conduct a cumulative impacts analysis that will consider the impacts of the operator’s development plans for the lease, to the extent reasonably foreseeable. The BLM’s analysis typically will consider the emissions inventory for the proposal, and may include estimated emissions from other development on or outside the lease. All operators must comply with applicable local, State and Federal air quality laws and regulations. As described in the lease notice that would be attached to the leases in the proposed action, BLM may require additional analyses (such as air dispersion modeling assessments) or impose specific mitigation measures within its authority as COA, based on the review of site-specific proposals or new information about the impacts of exploration and development activities in the region.

Oil and gas resources may be developed and produced subsequent to the proposed lease sale and may ultimately be utilized to produce energy. The BLM will evaluate potential impacts of emissions of regulated air pollutants (including GHGs) associated with the development of the oil and gas resources in a subsequent NEPA analysis at the lease development (typically APD) stage. Project specific GHG emissions can generally be quantified and compared to overall sector, regional, or global estimates to provide some estimate of the level and significance of any potential impacts. The BLM will continue to evaluate climatic variability and change in the future, and apply appropriate management techniques and policy to address changing conditions as developments occur.

### **Preferred Alternative**

Affected Environment: Affected environment remains the same as the proposed with the exception of the removal of parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as the proposed action minus those impacts incurred on parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as the proposed action minus any cumulative impacts that would have been incurred on parcel #6672 in Kiowa County.

Potential Future Mitigation: Same as proposed action.

### **3.4.1.2 Geologic and Mineral Resources**

#### **Proposed Action**

##### Affected Environment:

The proposed lease parcels are located in eastern Colorado within various geographic areas including the Denver-Julesburg Basin, Huerfano Park, the Raton Basin, and the Las Animas arch area in southeastern Colorado. The Las Animas Arch in southeastern Colorado contains subsurface sedimentary strata that range from Cambrian through Upper Cretaceous in age. The Denver Basin consists of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers. Huerfano Park is a Laramide structure developed between the Sangre de Cristo Mountains and the Wet Mountains. The Raton Basin is the southernmost Laramide basin in the Rocky Mountain Region.

Eastern Colorado supports a wide range of mineral development in addition to oil and gas, site specific geology would need to be analyzed during the APD NEPA process.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Sale of the parcels would allow development and recovery of oil and natural gas resources in the underlying oil and gas bearing formations. This activity could as well lead to increased development of federal mineral materials products for road and well pad construction to support oil and gas development.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

The minerals resources throughout Front Range are slowly being encumbered by various surface uses that may not be compatible with future mining activities. Without understanding the non-fluid mineral potential for the area of this proposed action, it is unknown if this action will contribute to a cumulative impact.

Potential Future Mitigation:

Site specific geology would need to be analyzed during the APD NEPA process to determine if a separate permit would be required for use of federal minerals in the construction of roads, pad building, or for any other construction needs. Federal mineral materials regulations also apply to split-estate (i.e. a private surface landowner could not dispose of federal mineral materials for this project, surface or subsurface, without prior authorization from the BLM).

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action with the exception of the removal of parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as the proposed action minus those impacts incurred on parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as the proposed action minus any cumulative impacts that would have been incurred on parcel #6672 in Kiowa County.

Potential Future Mitigation: Same as proposed action.

### **3.4.1.3 Minerals/Fluid**

**Proposed Action**

Affected Environment:

The 10 parcels are located in 3 different geographic areas within the Royal Gorge Field Office: 1) northeastern Weld County near the Wyoming border (1 parcel), 2) central and south-central Huerfano County (6 parcels), and 3) southeastern Colorado in Bent and Kiowa counties (4 parcels).

Weld County –This parcel is surrounded by a total of 32 wells that have been drilled in each of the eight sections that surround Section 10, however all the wells have been plugged and abandoned with the exception of one well that is currently shut-in and has never produced. The nearest producer is a Federal minerals J Sand oil well that is located three miles away in Section 6. The area is identified as having low to medium potential for oil & gas development (Bureau of Land Management 2012).

Huerfano County (Group 1) – These 5 parcels are centered around the town of Gardner. Historically, only natural gas and carbon dioxide (CO2) have been found in commercial quantities in this county. There are 5 approved drilling permits near the area where the

nominated parcels are located, 4 of which are using horizontal drilling technology to target the Niobrara Shale oil formation. Having sufficient water available to support sustained development may be a concern. The area is identified as having medium to high potential for oil & gas development.

Huerfano County (Group 2) – This parcel is located three sections away from past coalbed methane producing wells that were required to be plugged by the State of Colorado due to the presence of methane seeps found in the area. Confirmed seeps ranging between 1.1 and 10.0 ppm methane gas were found roughly in the northern half of T29S R67W and the very northern portion of T29S R66W. This is related to the issue where the State of Colorado required Petroglyph Energy to plug more than 50 of its producing wells (all fee minerals) in recent years, in addition to plugging wells operated by other companies. The State of Colorado concludes that the seeps appear to come from several different sources, that include gas from wells targeting the Vermejos Coal Formation that has been measured in the Poison Canyon Formation drinking aquifer, gas venting from wellheads and pipelines at the surface, gas seeping from ground surface near the Purgatorie River, and gas seeping that occurs from old underground mines. This is part of a bigger concern, as 59 methane seeps have been confirmed in Huerfano and Las Animas counties, and steps are being taken to mitigate the effects. In addition, coalbed methane gas wells in the parcel area can produce up to 1000 to 2000 barrels of water per day per well, which could lead to water disposal issues if the company isn't prepared for this.

Southeastern Colorado (Kiowa Group 1) – This parcel includes portions of land totaling 10.35 acres, which is located next to two water reservoirs. Bounded by gas production to the north and the west-southwest within 3 to 4 miles of the portion of land in Section 8. Numerous dry holes are in the area. The active area, has 6 approved drilling permits with another permit pending within two townships distant. The estimate is for this area to have medium to high potential for oil & gas development (Bureau of Land Management 2012) .

Southeastern Colorado (Bent Group 1) – The area near and between these 2 parcels include 12 wells that have been drilled and plugged, although 3 wells did have minor gas shows. The eastern parcel is located within 3 to 4 miles of a small, commercial gas field that is located to the northeast. The western parcel is located adjacent to a wildlife reserve and is less than a ¼ mile from a railroad and the small town of Hilton. Two drilling permits have been issued in the vicinity, one in Section 28, T24S, R49W and the second in Section 20, T22S, R50W. The estimate is for this area to have medium potential for oil & gas development (Bureau of Land Management 2012) .

Southeastern Colorado (Bent Group 2) – This parcel is located in a sparsely drilled area. The nearest drilled wells are located 3 to 4 miles away, and these wells have all been drilled and abandoned, many in the 1950s. Prior drilling density is roughly one well per township. No concerns. The area is estimated to have low to medium potential for oil & gas development (Bureau of Land Management 2012).

Surrounding private lands are also leased for oil and gas development, and may provide pads from which these leases could be directionally or horizontally drilled.

Environmental Consequences of the No Action Alternative:

Recoverable natural gas and oil resources obtained from well drilling operations would not be developed at this time. There is increased potential for drainage to occur from adjacent lands that are developed.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Leasing of the 11 parcels would allow for the development and recovery of oil and natural gas resources and help avoid draining of federal fluid minerals from nearby non-federal wells. The RGFO ensures the operator's proposed casing and cementing program is adequate to protect all existing resources, minerals, and fresh water zones, 43 CFR §3162.5-2(d).

Environmental Consequences of Leasing and Development - Cumulative Impacts:

As of 4/8/2013, there are 20,128 active wells in Weld County. In BLM's AFMSS database, there are 290 wells having Federal minerals. Of these, 80 are plugged leaving 210 active wells having Federal minerals.

In Huerfano County, 282 wells have been drilled to date and 228 have been plugged and abandoned, leaving 54 wells that are active or shut-in. Of these, 27 wells have Federal minerals.

In Kiowa County, 880 wells have been drilled and 734 have been plugged, leaving 146 wells producing or shut-in. Of these, only 2 wells remain having Federal minerals.

In Bent County, 262 wells have been drilled to date and 220 wells have been plugged, leaving 42 wells that are active. Of these, 1 well remains that has Federal minerals.

Cumulative impacts to the resource, should the lease be issued, would be the potential for draining these parcels of fluid minerals. Cumulative impacts to the environment would depend the potential of any of the given areas for future development but could include impacts from additional oil rigs, associated infrastructure, roads and pipelines.

Potential Future Mitigation: The RGFO ensures the operator's proposed casing and cementing program is adequate to protect all existing resources, minerals, and fresh water zones, 43 CFR §3162.5-2(d).

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action with the exception of the removal of parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Federal fluid minerals associated with the Kiowa County parcel would not be developed at this time, reducing, albeit in a minor way, the royalties to federal and local governments. Impacts to the environment from potential future development would not be sustained.

Environmental Consequences of Leasing and Development - Cumulative Impacts: With the removal of parcel #6672 additional cumulative impacts from development would not occur.

Potential Future Mitigation: See proposed action.

#### **3.4.1.4 Soils**

##### **Proposed Action**

###### Affected Environment:

The proposed lease parcels cover a large variety of soil types and conditions ranging from high elevation moist, cold soils in the Spanish Peaks area to lower elevation dry, warmer soils in the east. These soils and associated topography vary in their suitability for use as roads, fill and related infrastructure during subsequent exploration and production of the lease.

###### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The act of leasing the parcels for oil and gas development would have no direct impact on soil resources; however impacts at the exploration and development stage would have impacts on soils. The magnitude and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development.

At the exploration and development stage, soils would be physically disturbed through the removal and compaction of soil and the exposure of subsoils. Direct impacts at this stage would result from the construction of well pads, roads, powerlines and other infrastructure removing vegetation, exposing soil, mixing horizons, compaction, loss of productivity, and loss of soil through wind/water erosion. On most of the lease parcels, wind erosion would be expected to be minor; however on some of the parcels in the northeast plains wind erosion could be severe. Decreased soil productivity as a result of these impacts has the potential to hinder revegetation efforts and leave soils further exposed to erosion. Segregation and reapplication of surface soils would result in the mixing of shallow soil horizons, resulting in a blending of soil characteristics and types. This blending would modify physical characteristics of the soils, including structure, texture, and rock content, which could lead to reduced permeability and increased runoff from these areas.

Contamination of surface and subsurface soils can occur from leaks or spills of oil, produced water, and condensate liquids from wellheads, produced water sumps and condensate storage tanks. Leaks or spills of drilling and hydraulic fracturing chemicals, fuels and lubricants could also result in soil contamination. Such leaks or spills could compromise the productivity of the affected soils. Of these materials, leaks or spills of condensate would have the greatest potential environmental impact. Depending on the size and type of spill, the impact to soils would primarily consist of the loss of soil productivity. Typically, contaminated soils would be removed and disposed of in a permitted facility or would be bioremediated in place using techniques such as excavating and mulching to increase biotic activities that would break down petrochemicals into inert and/or common organic compounds. These direct impacts of the development phase are lessened through lease stipulations and the implementation of Best Management Practices.

###### Environmental Consequences of Leasing and Development - Cumulative Impacts:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect soil resources. These activities include: oil and gas development,

residential development, grazing, mining and recreation. At the 5<sup>th</sup> level watershed scale, the leasing and subsequent development of these parcels would add an additional impact to soil resources into the future. Most of this impact would be phased in and lessened as individual wells are completed and older wells are reclaimed.

Potential Future Mitigation:

As described in Conditions of Approval at the APD stage, operators could stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. If the well produces, the top soil can be used for interim reclamation of the areas of the well pad not in use. If the well is a dry hole, the soil can be used for immediate reclamation. The soil should not be stockpiled for more than one year. Soil stockpiling and re-spreading should be carried out under the advisement of BLM personnel. The impact to the soil would be remedied upon reclamation of well pads when the stockpiled soil that was specifically conserved to establish a seed bed is spread over well pads and vegetation re-establishes. Upon abandonment of wells and/or when access roads are no longer in service, the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in Conditions of Approval at the APD stage. An orderly system of road locations and road construction requirements (including regular maintenance) would alleviate potential impacts to the environment from the development of access roads.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: The impacts of the preferred alternative are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: The cumulative impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See Proposed Action

**3.4.1.5 Water (Surface and Groundwater, Floodplains)**

**Proposed Action**

Affected Environment:

*Surface Water:* The proposed lease parcels are located throughout the Arkansas River basin of Colorado with the exception of parcel #6664 situated in the South Platte drainage. These areas range from the headwater areas of these rivers in Huerfano County to the eastern plains near Kansas. In general, the water quality in these rivers is good near the headwaters and declines as one goes downstream. The major water quality concerns for these waters is generally sediment and heavy metals in the mountains and progresses to more organic and salinity related issues on the plains. Potential impacts to site specific water quality associated with any exploration and



development activities would be assessed for each location during specific project proposals (i.e. at the APD stage).

*Ground Water:* The proposed lease parcels are located throughout eastern Colorado in varying locations ranging from mountainous areas to the eastern plains. These leases occupy one of three general aquifers: the valley-fill and intermontane basin aquifers in the west within Huerfano County, the High Plains Aquifer in the far eastern plains, and the Dakota-Cheyenne Aquifer in the western portion of the eastern plains. Water quality in these aquifers is variable depending on which formation the water is located. In some formations, the water quality is very good, while in others, it is poor. Throughout the lease area, groundwater is relied upon for domestic and agricultural purposes.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The act of leasing the parcels for oil and gas development would have no direct impact on water resources; however activities at the exploration and development stage could have impacts to water quality. The magnitude and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. All parcels would be subject to all watershed protection ordinances of local municipalities.

*Surface Water:* Impacts to surface water resources would be associated with the surface disturbance from the construction of roads, pipelines, well pads, and powerlines. Specific impacts would be soil compaction caused by construction that would reduce the soil infiltration rates, in turn increasing runoff during precipitation events. Downstream effects of the increased runoff may include changes in downstream channel morphology such as bed and bank erosion or accretion. Impacts would be greatest shortly after the start of the activity and decrease over time. These impacts can also be mitigated by the implementation of Best Management Practices (BMP) that would design facilities with temporary runoff control measures that would slow down runoff and capture sediment. These BMP's would be included at the APD stage to address site specific conditions based on submitted Surface Use and Drilling Plans. Chemicals, or other fluids, accidentally spilled or leaked during the development process could result in the contamination of both ground and surface waters. Authorization of development projects would be further analyzed at the APD stage and require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

*Ground Water:* The eventual drilling of the proposed parcels would most likely pass through useable groundwater. Potential impacts to groundwater resources could occur if proper cementing and casing programs are not followed. This could include loss of well integrity, surface spills, or loss of fluids in the drilling and completion process. It is possible for chemical additives used in drilling activities to be introduced into the water producing formations without proper casing and cementing of the well bore. Changes in porosity or other properties of the rock being drilled through can result in the loss of drilling fluids. When this occurs, drilling fluids can be introduced into groundwater without proper cementing and casing. Site specific conditions and drilling practices determine the probability of this occurrence and determine the groundwater resources that could be impacted. In addition to changing the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the well bore; hydraulic fracturing can also introduce chemical additives into the producing formations.

Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. These additives are not always used in these drilling activities and some are likely to be benign such as bentonite clay and sand. Concentrations of these additives also vary considerably since different mixtures can be used for different purposes in oil and gas development and even in the same well bore. If contamination of aquifers from any source occurs, changes in groundwater quality could impact springs and residential wells that are sourced from the affected aquifers. Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones.

Known water bearing zones in the lease area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement is extended well beyond fresh-water zones to insure that drilling fluids remain within the well bore and do not enter groundwater.

Potential impacts to ground water at site specific locations are analyzed through the NEPA review process at the development stage when the APD is submitted. This process includes geologic and engineering reviews to ensure that cementing and casing programs are adequate to protect all downhole resources.

All water used would have to comply with Colorado state water rights regulations and a source of water would need to be secured by industry that would not harm senior water rights holders.

*Hydraulic Fracturing:* Fracturing (known as “fracking” in the oil and gas industry) is a process that uses high pressure pumps to develop pressure at the bottom of a well to crack the hydrocarbon formation. This aids extraction of oil and gas deposits that might be left behind by conventional oil and gas drilling and pumping technology.

Hydraulic fracturing is a 60-year-old process that is now being used more commonly as a result of advanced technology. About 95 percent of new wells in Colorado are fractured.

Wells are often treated during completion to improve the recovery of hydrocarbons by increasing the rate and volume of hydrocarbons moving from the natural oil and gas reservoir into the wellbore. These processes are known as well-stimulation treatments, which create new fluid passageways in the producing formation or remove blockages within existing passageways. They include fracturing, acidizing, and other mechanical and chemical treatments often used in combination. The results from different treatments are additive and complement each other.

This makes it possible to introduce fluids carrying sand, walnut hulls, or other small particles of material into the newly created crevices to keep the fractures open when the pressure is relieved. This process increases the flow rate and volume of reservoir fluids that move from the producing formation into the wellbore. The fracturing fluid is typically more than 99 percent water and sand, with small amounts of readily available chemical additives used to control the chemical and mechanical properties of the water and sand mixture.

The State of Colorado, through the Colorado Oil and Gas Conservation Commission (COGCC), establishes regulations to ensure that all resources including groundwater are protected. COGCC regulations establish casing and cementing standards to ensure that gas being produced from formations 8,000 feet deep does not leak into the shallower aquifers. These regulations require wells to be cased with steel pipe and the casing to be surrounded by cement to create a hydraulic seal within the annular space between the wall of the well bore and the steel pipe. In addition, in response to the recent concerns raised about hydraulic fracturing, the COGCC has amended the regulations to include requirements that address these concerns and will serve to further mitigate any potential impact from hydraulic fracturing.

In Colorado, the majority of fluids used in the fracturing process are recycled and no fluids are sent to wastewater treatment plants. Of the small percentage of disposed fluids, approximately 60 percent goes into deep and closely-regulated waste injection wells, 20 percent evaporates from lined pits and 20 percent is discharged as usable surface water under permits from the Colorado Water Quality Control Commission.

To ensure that hydraulic fracturing is conducted in a safe and environmentally sound manner, the BLM approves and regulates all drilling and completion operations, and related surface disturbance on Federal public and split estate lands. Operators must submit Applications for Permit to Drill (APDs) to the agency. Prior to approving an APD, a BLM Colorado geologist identifies all potential subsurface formations that will be penetrated by the wellbore. This includes all groundwater aquifers and any zones that would present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures.

Once the geologic analysis is completed, the BLM reviews the company's proposed casing and cementing programs to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist and all known or anticipated zones with potential risks.

During drilling, the BLM is on location during the casing and cementing of the groundwater-protective surface casing and other critical casing and cementing intervals. Before hydraulic fracturing takes place, all surface casing and some deeper, intermediate zones are required to be cemented from the bottom of the cased hole to the surface. The cemented well is pressure tested to ensure there are no leaks and a cement bond log is run to ensure the cement has bonded to the casing and the formation. If the fracturing of the well is considered to be a "non-routine" fracture for the area, the BLM will always be onsite during those operations as well as when abnormal conditions develop during the drilling or completion of a well.

#### Environmental Consequences of Leasing and Development - Cumulative Impacts:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect water quality. These activities include: oil and gas development, residential development, grazing, mining and recreation. At the 5<sup>th</sup> level watershed scale, the leasing and subsequent development of these parcels would add an additional impact to water resources into the future. Most of this impact would be phased in and lessened as individual wells are completed and older wells are reclaimed. Overall, it is not expected that the leasing

and possible future development of the parcels would cause long term degradation of water quality below State standards.

Potential Future Mitigation:

Due to the mountainous nature and complex geology of the proposed Huerfano County parcels, all parcels (#6657, 6658, 6659, 6660, 6661, and 6667) in Huerfano County would need the following mitigations that could be applied as conditions of approval at the APD stage to further protect water quality in the upper Huerfano Basin:

1. Pads would be sited and designed to divert offsite run-on around the pit. Run-on water may be diverted around the pit by sloping the pad or constructing diversion ditches or berms above and/or below the pad cut slope.
2. The BLM would require that an alternative to reserve, completion, and open production pits be used. Exceptions may only be granted in rare cases with sufficient justification (e.g., when sufficient protections are described in a design submitted for prior BLM approval) and after detailed NEPA analysis. When exceptions to this policy are granted, the BLM would consider more stringent operation, closure, and monitoring standards. In this situation, acceptable alternatives to reserve, completion, and production pits would be closed-loop drilling.
3. Below-grade enclosed tanks would not be permitted.
4. Above-grade tanks for storage of produced fluids must adhere to the following standards:
  - a. Secondary containment storage around the tanks for spill control must be capable of holding at least 125 percent of the volume of the largest tank inside the containment area.
  - b. The containment system must be capable of containing the wastes or product such that the material will not escape the containment system prior to cleanup.
  - c. Secondary containment structures shall be protected from livestock, wildlife, and human activities. This may be accomplished by fencing, graveling over earthen berms, expanded metal or grate covers, etc.

Additional site specific mitigation measures would be analyzed and added at the APD stage.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: The impacts of the preferred alternative are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: The cumulative impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See Proposed Action

## **3.4.2 Biological Resources**

### **3.4.2.1 Invasive Plants**

#### **Proposed Action**

##### Affected Environment:

Invasive species and noxious weeds occur on BLM surface acres within the affected area. Downy brome (cheatgrass) and other annual weeds are common along roadsides and on other disturbed areas. Houndstongue, Canada thistle, bull thistle, musk thistle, Russian thistle, spotted and diffuse knapweeds, leafy spurge, and hoary cress are also known to occur in these areas.

##### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

If drilling were to occur on these parcels subsequent activities would create an environment for and provide a mode of transport for invasive species and other noxious weeds to become established. Construction equipment and any other vehicles or equipment brought onto the site can introduce weed species. Wind, water, recreation vehicles, livestock and wildlife would also assist with the distribution of weed seed into the newly disturbed areas. Other species of noxious weeds can be introduced by vehicle traffic, livestock and wildlife and will readily spread into newly disturbed areas. Non-native and invasive weed species that occur on adjacent rangelands would occupy disturbed areas; the bare soils and the lack of competition from a perennial plant community would allow these weed species to grow unchecked and can affect the establishment of seeded plant species. Establishment of perennial grasses and other seeded plants as part of interim reclamation is expected to reduce the presence of invasive annual weeds.

##### Environmental Consequences of Leasing and Development - Cumulative Impacts:

In view of the current and historical widespread disturbances in the area such as livestock grazing and/or other agricultural practices and roads, the proposed action would have little cumulative impact. Long term impacts would be small and localized after successful interim reclamation practices are implemented.

##### Potential Future Mitigation:

The site should be monitored for non-native species prior to soil disturbing activities and for at least two growing seasons after the project area has been rehabilitated. All non-native species identified by monitoring should be treated. Proponent will be responsible for Monitoring and treatment of non-native species. Periodic monitoring would be done by BLM staff. At the APD stage, the operator may be required to control any invasive and/or non-native weeds that become established within the disturbed areas involved with drilling and operating the well and continue weed control actions throughout the life of the project.

The BLM and county weed and pest managers collaborate in their efforts to control weeds and find the best integrated approaches to achieve these results. For all actions on public lands that involve surface disturbance or rehabilitation, reasonable measures are required to prevent the introduction or spread of noxious weeds. These measures may include power washing or air

blasting of construction equipment to remove soil, oil, and vegetative parts and requirements for using certified weed-free seed and weed-free hay, mulch, and straw. In addition, any actions that result in the introduction or spread of invasive non-native or noxious weeds would be mitigated by standard weed management guidelines under the direction of the BLM.

### **Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action analysis minus parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: See proposed action. Impacts would not occur to parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: See proposed action. Cumulative impacts would be reduced with the exclusion of #6672.

Potential Future Mitigation: See proposed action.

### **3.4.2.2 Special Status Animals**

#### **Proposed Action**

Affected Environment:

The piping plover, least tern, and Canada lynx are federally listed species that may be impacted (based on existing spatial data collected from the BLM, CNHP and CPW) if proposed lease parcels are developed. The black-tailed prairie dog and Gunnison's prairie dog (federal candidate species), and the mountain plover, swift fox, Townsend's big eared bat, common kingsnake, milk snake, massasauga, northern goshawk, ferruginous hawk and bald eagle (BLM sensitive species) could potentially occur on parcels available for leasing.

All proposed lease parcels are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal. Protective measures for these species will be applied, if necessary, at the APD stage and might include the need to move development pads, enforce timing limitations, enforce no surface occupancy restrictions, etc. Additional NEPA will be completed as individual APDs are received for all the parcels identified in this document. Site specific field visits will be conducted as deemed necessary for those parcels that contain federally listed and sensitive species habitat.

American white pelican: Habitat includes rivers, lakes, reservoirs, estuaries, bays, and open marshes, sometimes inshore marine habitats. Pelicans rest/roost on islands and peninsulas. In Colorado, nests usually occur on islands or peninsulas (natural or dredge spoils) in freshwater reservoirs. Eggs are laid on the ground in a slight depression or on a mound of earth and debris 24-36 inches across, 15-20 inches high, usually on low, flat, or gently sloping terrain. Nest sites usually are in open areas but often near vegetation, driftwood, or large rocks. Many of the reservoirs within the RGFO resource area serve as important foraging and nesting locations. Parcel 6672 occurs near the boundary of Neenosh Reservoir; however, due to recent drought and water right lawsuits, the reservoir is dry and resembles upland habitat and is not habitat for white pelican.

Piping Plover: Breeding sites are generally found on islands, lakeshores, coastal shorelines, and river margins. Currently the only known piping plover habitat within the administrative boundaries of BLM-RGFO exists near Las Animas, Colorado along the edges of Adobe Creek, Neoneesh, Neegronda, Queen, and John Martin Reservoirs. Parcel 6672 occurs near the boundary of Neenosh Reservoir; however, due to recent drought and water right lawsuits, the reservoir is dry, resembling upland habitat. If the reservoir were full, the parcel lies outside the area shorebird habitat may exist.

Least Tern: The occurrence of breeding least terns is localized and is highly dependent on the presence of dry, exposed sandbars and favorable river flows that support a forage fish supply and isolate the sandbars from the riverbanks. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sandbars and gravel bars within a wide, unobstructed, water-filled river channel. Currently the only known piping plover habitat within the administrative boundaries of BLM-RGFO exists near Las Animas, Colorado along the edges of Adobe Creek, Neoneesh, Neegronda, Queen, and John Martin Reservoirs. Parcel 6672 occurs near the boundary of Neenosh Reservoir; however, due to recent drought and water right lawsuits, the reservoir is dry, resembling upland habitat. If the reservoir were full, the parcel lies outside the area shorebird habitat may exist.

Mountain Plover: Mountain Plover's are found throughout the Royal Gorge Field Office (RGFO) in suitable habitats. While the species is relatively rare they can be found generally in open, flat tablelands that display some function of disturbance such as drought, grazing, fire, etc. (Knopf and Miller 1994). Mountain Plover's occupy portions of Larimer, Weld, Logan, Morgan, Washington, Yuma, Adams, Arapahoe, Elbert, Lincoln, Kit Carson, El Paso, Cheyenne, Pueblo, Crowley, Kiowa, Otero, Bent, Prowers, Huerfano, Las Animas, Baca, and Park counties in the RGFO. Plover habitat associated with this assessment is located Huerfano, Bent, and Kiowa.

Gunnison's Prairie Dog: Historically, GPD had been found in South Park and other high elevation prairies throughout the RGFO. While GPD may be found throughout the RGFO in suitable habitats, the species is relatively rare. It can be found in portions of Fremont County, especially along the High Park road, the southern end of South Park along Badger Creek, and in Park, Huerfano, Chaffee and Lake Counties in the flat, gentle terrain with grassland habitat. Surveys have not been done that would provide more complete data on locations and extent of their range within RGFO.

Black-tailed prairie dog: The BLM considers the black-tailed prairie dog a sensitive species. Black-tailed prairie dogs primarily occur in scattered colonies throughout the eastern plains of Colorado. In the summer of 2001, Colorado started aerial surveys for black-tailed prairie dogs throughout their historic range. Based on known locations of black-tailed prairie dogs, transects were developed for each county to give a 95% confidence interval to the resulting data. Statewide 631,000 acres of black-tail prairie dog colonies were documented.

Swift Fox: Swift foxes primarily occur in short-grass and mixed-grass prairie in the eastern plains of Colorado. The distribution of swift foxes became severely reduced in concert with conversion of mid- and shortgrass prairies to agriculture. Swift fox dens occur in ridges, slopes,

hill tops, pastures, roadside ditches, fence rows and cultivated fields. Dens may be relatively close to human habitations and swift foxes occasionally den in human-made structures such as culverts. Swift foxes primarily consume animals, with leporids and rodents the most frequent prey.

Lynx: The lease sale includes parcels that are located within the Spanish Peaks and Wet Mountains Lynx Analysis Units. Parcels 6657, 6658 and 6659 occur within these units. While the parcels are located within the LAUs, all lands within the proposed lease parcels are mapped as non-habitat.

Townsend's big-eared bat: The Townsend's big-eared bat occurs throughout the west and in Colorado. Habitat associations include: coniferous forests, deserts, native prairies, riparian communities, and agricultural areas. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, with population centers occurring in areas dominated by exposed, cavity forming rock and/or historic mining districts. Townsend's habit of roosting on open surfaces makes it readily detectable, and it is often the species most frequently observed (commonly in low numbers) in caves and abandoned mines throughout its range. It has also been reported to utilize buildings, bridges, rock crevices and hollow trees as roost sites.

Foraging associations include: edge habitats along streams, adjacent to and within a variety of wooded habitats. They often travel large distances while foraging, including movements of over 10 miles during a single evening. Townsend's are a moth specialist with over 90% of its diet composed of lepidopterans.

The primary threat to the species is almost certainly disturbance or destruction of roost sites (e.g., recreational caving, mine reclamation, renewed mining in historic districts). This species is very sensitive to disturbance events and has been documented to abandon roost sites after human visitation. Both roosting and foraging habitat may be impacted by timber harvest practices. Pesticide spraying in forested and agricultural areas may affect the prey base.

Common king snake: Generally associated with lowland river valleys. In Southeastern Colorado it has been found near irrigated fields on the floodplain of the Arkansas River, in rural residential areas in plains grassland, near stream courses, and in other areas dominated by shortgrass prairie. Most activity occurs on the ground or in rodent burrows. Periods of inactivity are spent in burrows and logs, in or under old buildings, in other underground spaces, or beneath various types of cover.

Known from a few locations in southeastern Colorado (north to the vicinity of the Arkansas River) and a few sites in extreme southwestern Colorado (western Montezuma County), at elevations below about 5,200 feet. Generally difficult to find but may be locally fairly common in the very restricted range in Colorado.

Milk snake: Wide variety of habitats in Colorado, including shortgrass prairie, sandhills, shrubby hillsides, canyons and open stands of ponderosa pine with Gambel oak in the foothills, piñon-juniper woodlands, arid river valleys, and abandoned mines; generally stays hidden,



except at night; found under discarded railroad ties in sand-hill regions. Hibernation sites include rock crevices that may be shared with other snake species.

The species occurs throughout most of Colorado at elevations primarily below 8,000 feet and is generally scarce or at least hard to find, but locally fairly common.

Massasauga: Habitat in Colorado consists of dry plains grassland and sandhill areas. Massasaugas may be attracted to sandy soils supporting abundant rodent populations. The species occurs in the Great Lakes region of southern Ontario and western New York southwest through the Midwest and central and southern Great Plains to southeastern Arizona, northern Mexico, and southern Texas. It occurs in southeastern Colorado at elevations below about 5,500 feet.

Northern goshawk: Northern goshawks are associated with coniferous and mixed forests through much of the Northern hemisphere. Studies of nesting habitat show that goshawks nest in older-aged forests with variable tree species. The most consistent vegetative characteristic of goshawk nest sites is high percent canopy closure. Studies on habitat characteristics at goshawk sites have reported average canopy closure measurements ranging from 60% in eastern Oregon, 77% in northern California and 94% in northwestern California. Stand structure ranges from dense multi-layered stands in Oregon to open park-like understories in Colorado and California. Average tree size is just as variable with mean tree diameters ranging from 8-20 inches in Colorado, and 20 inches in Oregon. Goshawks appear to prefer north to east aspects for nest sites as stands on these aspects are typically denser and more suitable. Slope also appears important as nests are usually placed on flat to moderately sloped land where trees are able to grow larger and at a higher density (1-39%). The importance of the proximity of the nest area to water is not known.

Knowledge of the foraging habitat is poor. The goshawk is a height zone generalist, taking prey from the ground-shrub, shrub-canopy, and canopy layers and they have a preference for woodlands with large, mature trees. Meadows, streams, and aspen stands may be important to prey species on which the goshawk feeds. Goshawks, however, forage in a variety of habitats probably along edge as well as in deep forests, provided that there is available prey and the vegetation is not too dense to prevent flight. Prey plucking sites within the nesting territory is also a habitat characteristic related to foraging. Prey plucking sites usually consist of stumps, fallen logs, snags, arched trees, rocks, or horizontal tree limbs below the canopy. Available evidence suggests that two important resources, food and nest habitat, are the principle mechanisms limiting goshawk densities. Specifically, populations may be limited by shortage of nest sites; and where nest sites are readily available, densities may be limited by food abundance and availability.

Very little goshawk habitat is managed by the BLM. BLM lands are generally lower elevation forests consisting primarily of piñon-juniper vegetation. Currently, no known goshawk nests occur within the proposed lease parcels and only small areas within the proposed lease parcels would be considered suitable habitat for goshawk.

Ferruginous hawks: The ferruginous hawk inhabits grasslands and semidesert shrublands, and is rare in piñon-juniper woodlands. Breeding birds nest in isolated trees, on rock outcrops, structures such as windmills and power poles, or on the ground. Winter residents concentrate around prairie dog towns. Winter numbers and distribution fluctuate greatly according to the availability of prairie dogs; when a local prairie dog population dies off due to plague, hawk numbers decrease drastically. Migrants and winter residents may also occur in shrublands and agricultural areas.

Winter resident on eastern plains, at the same time it is a rare summer resident locally on eastern plains, and occurs very locally in Moffat and Routt counties, along the Book Cliffs, in the Grand Valley, and in the San Luis Valley.

Bald eagle: Colorado populations of bald eagles typically nest in large cottonwood trees along rivers and reservoirs. Eagle densities reach their peak during the winter months when migrants arrive from the north. The bald eagle is a common winter (December through February) visitor to the Arkansas River valley. Typically, up to five birds can be found from Leadville to Canon City, and up to five birds can be found from Canon City to Pueblo Reservoir. Bald eagle usage (winter roosting, nesting, etc.) occurs near several major riparian areas and reservoirs on the eastern plains.

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The act of leasing parcels for oil and gas development would have no direct impact on wildlife resources. However, the authorization to lease parcels for oil and gas development will likely result in future development at some locations. The magnitude and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. At this time, the speculative nature of this process does not provide specifics of development; therefore, specific impacts to terrestrial wildlife from development remain unknown. Potential effects of development for some species are below.

American white pelican: Impacts to American white pelican will be minimal. The reservoir in its current state offers no habitat for pelicans. However, if the reservoir were to fill to the high watermark, it is conceivable that pelicans will use the reservoir for nesting and foraging. A development activity buffer may be necessary to minimize disturbance to this species. Therefore, lease stipulation CO-17 has been applied to parcel 6672 to protect a buffered area near potential white pelican nesting and foraging areas.

Least Tern and Piping Plover: Impact to piping plover will be minimal. The reservoir in its current state offers no shorebird habitat. However, if the reservoir were to fill to the high watermark, it is conceivable that shorebirds and/or waterfowl may use a portion of the upland habitat for nesting. Lease stipulation CO-07 has been applied to parcel 6672 to protect waterfowl and shorebird habitat and rookeries.

Mountain Plover: Mountain plovers nest on nearly level ground (often near roads), adults and chicks often feed on or near roads, and roads may be used as travel corridors by mountain plovers. These factors make plovers susceptible to being killed by vehicles. Therefore, as oil and gas infrastructure is developed and used, an increase in the probability of plover mortality or

nest destruction will likely occur. While known nesting locations are currently unknown, plovers could potentially occur within parcels 6662, 6664, 6669, 6671, and 6672. Mitigation (plover nesting survey, timing limitations, etc.) to prevent take will be implemented at the APD stage.

**Black-tailed and Gunnison's Prairie Dog:** Within Black-tailed prairie dog range, areas have been classified as valuable for oil and gas development. Possible direct negative impacts associated with oil and gas development include clearing and crushing of vegetation, reduction in available habitat due to pad construction, road development and well operation, displacement and killing of animals, alteration of surface water drainage, and increased compaction of soils. Indirect effects include increased access into remote areas by shooters and OHV users. Gordon et al. (2003) found that shooting pressure was greatest at colonies with easy road access as compared to more remote colonies. Conversely, oil and gas development may provide areas with reduced shrub cover providing additional habitat for prairie dogs colonize.

**Swift Fox:** Oil and natural gas exploration fragment existing grasslands and increase road traffic and access by humans. Impacts of this type of disturbance on Swift Foxes are unknown, but both positive and negative effects may be expected. On the positive side, prey abundance for Swift Foxes may increase in the vicinity of roads. However, loss of local habitat, increased mortality due to road kills, trapping and accidental shooting may also result (Carbyn et al. 1994).

**Canada Lynx:** The lease sale includes parcels that are located within the Spanish Peaks and Wet Mountains Lynx Analysis Units. Parcels 6657, 6658 and 6659 occur within these units. While the parcels are located within the LAUs, and all lands within the proposed lease parcels is mapped as non-habitat contained primarily shortgrass prairie, piñon/juniper and mesic woodlands.

**Townsend's big eared bat:** It is unlikely that the proposed lease parcels offer habitat suitable for hibernation or rearing of young Townsend's big eared bat. Perhaps widely distributed singly or in small groups during the summer months, roosting bats may be subject to localized disturbance from development activity and relatively minor but long term reductions in the a real extent of mature woodland stands as sources of roost substrate.

**Reptile species:** Direct effects to the BLM sensitive reptile species could include injury or mortality as a result of construction, production, and maintenance activities. These effects would be most likely during the active season for these species, which is generally April to October. Indirect effects could include a greater susceptibility to predation if roads or pads are used to aid in temperature regulation. Overall, however, there is a low likelihood that these species would be substantially affected.

**Northern goshawk:** Goshawk nests could potentially occur in any parcel that involves mature piñon-juniper, mixed conifer, or aspen woodlands. The combination of expanded NSO and TL lease stipulations minimize or avoid adverse modification of nesting habitat. Raptor nest surveys are required prior to project implementation in those areas potentially influenced by proposed development activities. Information on functional nest sites found in the course of survey are used as the basis for applying timing limitations that reduce the risk of nest activity disruptions

that could result in reproductive failure or compromising the long-term utility of nest habitat. Raptors are protected by a suite of stipulations (CO-03, CO-18, and RG-05) that require no surface occupancy within one-eighth of a mile of nests and a timing limitation to protect raptor nesting and fledgling habitat.

**Ferruginous Hawk:** Ferruginous hawks have been documented to construct nests upon oil and gas related structures. However, these nests are less successful than nests built upon natural structures due to repeated human visitation. While the footprint of individual oil and gas wells is minimal relative to other energy developments, the total habitat lost to the network of wells and connecting roads can be considerable in areas undergoing full-field development. The potential for oil and gas related disturbance of nesting, foraging or roosting raptors arises not only from new well installation activities, including road and pad construction, drilling and equipment installation over the course of several weeks to months, but also from continual servicing and maintenance of wells over their production lifetime. Raptors are protected by a suite of stipulations (CO-03, CO-18, and RG-05) that require no surface occupancy within one-eighth of a mile of nests and a timing limitation to protect raptor nesting and fledgling habitat.

**Bald eagle:** Bald eagle foraging and nesting is dispersed and opportunistic across the entire RGFO area, with most activity centered near major riparian and reservoir areas. Surface disturbing activities that have potential to disrupt important bald eagle seasonal use activities are subject to NSO and TL provisions established in the Royal Gorge RMP. These stipulations have been successful in protecting ongoing nest efforts and maintaining the long term utility of roost and nest sites in the resource area.

#### Environmental Consequences of Leasing and Development - Cumulative Impacts:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect wildlife resources. These activities include: oil and gas development, residential development, grazing, agriculture, mining and recreation. While the leasing of parcels will not compound these impacts, future oil and gas development may impose deleterious effects. Every parcel is unique and cumulative impacts will need to be thoroughly addressed in the development and APD stage. Stipulation CO-04 is a no surface occupancy stipulation to protect bald eagle roosts and nests and stipulation CO-23 is a timing limitation to protect winter roost sites. These stipulations will be applied to parcel 6672.

#### Potential Future Mitigation:

As a potential condition of approval at the development phase, a survey for Gunnison's and black-tail prairie dog and burrowing owls must be conducted where potential habitat exists. If this species is located, BLM may require that drilling operations be moved up to 200 meters to mitigate conflicts. Additionally, if development is to occur April 10 through July 10 a survey for nesting mountain plover will be required where habitat exists.

As a potential condition of approval, if a ferruginous constructs a nest upon any oil and gas related platforms (e.g. tanks), the BLM will be notified, an alternative nesting structure will be constructed, and the nest moved to the structure at the expense of the lessee.

#### **Preferred Alternative**

Affected Environment:

The affected environment is as described in the Proposed Action analysis minus parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Direct and Indirect Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Cumulative Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See proposed action.

### **3.4.2.3 Special Status Plants**

#### **Proposed Action**

Affected Environment:

One Colorado BLM sensitive plant species, the dwarf milkweed (*Asclepias unicalis*) occurs within proposed leasing parcels. The Gardner Butte Potential Conservation Area (PCA) contains a recorded element occurrence record. Proposed parcels 6658 and 6659 contain a portion of the Gardner Butte PCA. The distribution of known occurrences of *Asclepias uncialis* forms an arc along the flank of the Southern Rocky Mountains from northeastern Colorado to southwestern New Mexico and adjacent southeastern Arizona. The dwarf milkweed occupies shortgrass prairie habitat, often on sandstone-drive soils and gravelly or rocky slopes. The species generally occurs in elevations of 4000 to 6500 feet.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

A widespread source of habitat loss in eastern Colorado is the development of oil and gas resources. The Denver-Julesberg basin is the most active area in the state in terms of natural gas well permits and production (Colorado Oil and Gas Conservation Commission 2004). Currently most activity in eastern Colorado is concentrated in the Wattenberg field in southwestern Weld County and in Yuma County. The number of inactive wells in the basin shows that past drilling activities have probably altered habitat for a substantial portion of *Asclepias uncialis* habitat in northeastern Colorado.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

The obvious impact of oil and gas development is the potential destruction of *Asclepias uncialis* and the conversion of habitat during the construction of roads and pads. Habitat loss may have contributed to the apparent decline in the abundance of *Asclepias uncialis* since the mid-1800s. When compared with the mid- and tallgrass prairie, the conversion of shortgrass prairie to agriculture is limited. Nevertheless, Knopf and Samson (1997) estimated that 29 percent of the native shortgrass prairie in the United States has been converted to cropland or pasture. An analysis of satellite imagery for the Central Shortgrass Prairie (The Nature Conservancy 1998) indicated that only about 40 percent of the ecoregion remains in relatively large and intact parcels, unfragmented by tilling. Because *Asclepia uncialis* apparently does not persist in lands converted to agriculture, this threat has probably affected *Asclepia uncialis* occurrences in the

past. The current rate of conversion of native grassland to agriculture is low, but this is driven in part by market prices and remains a possibility in some areas (The Nature Conservancy 1998).

In the range of *Asclepias uncialis*, invasive species are most prevalent in areas disturbed by cultivation, especially in northeastern Colorado. The Nature Conservancy (1998) identified the major problem weeds in grasslands of the Central Shortgrass Prairie Ecoregion as leafy spurge (*Euphorbia esula*), cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola kali*), musk thistle (*Carduus nutans*), Canada thistle (*Cirsium canadensis*), knapweed (*Centaurea* spp.), and toadflax (*Linaria dalmatica*). Of these, only cheatgrass has been reported occurring with *Asclepias uncialis*, although invasives may be present but undocumented at other occurrences. The potential for exotic species to spread into *Asclepias uncialis* occurrences has been mentioned in connection with occurrences at Pueblo Reservoir, Garden Park, and the Piñon Canyon Maneuver Site. The potential interaction of *Asclepias uncialis* with exotic species has not been investigated. This species is typically not found in weedy areas, indicating that it may be sensitive to this form of habitat degradation.

Potential Future Mitigation:

At the very least, management activities should strive to maintain intact native habitat for known occurrences and the immediate surrounding areas. Prior to any surface disturbance on parcels 6658 and 6659, a survey for *Asclepias uncialis* should be conducted. If *Asclepias uncialis* is located, actions will be taken to protect the plant(s).

**Preferred Alternative**

Affected Environment:

The affected environment is as described in the Proposed Action analysis minus parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Direct and Indirect Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

Cumulative Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation:

See proposed action.

**3.4.2.4 Upland Vegetation**

**Proposed Action**

Affected Environment:

The proposed lease parcels are scattered across a wide area of eastern Colorado. The project area is historically short grass prairie that has been disturbed by long term livestock grazing and/or other agricultural practices. Common grasses include Needle and thread, prairie june grass, blue grama, galleta, three awn, ring muhly, and alkali sacaton. It is likely that the native plant community has been altered due to the long-term agricultural practices in the project area.

Environmental Consequences of Leasing and Development - Direct and Indirect

Impacts: Environmental Consequences of Leasing and Development: Generally oil and gas development involves complete removal of vegetation and at times re-contouring of the landscape to allow for resources to be retrieved. The type of ground activity associated with oil and gas development results in increased susceptibility to adverse impacts such as soil compaction, weed infestations and erosion (See Soils and Invasive, Non-Native Species sections). Due to these adverse impacts, establishment of native vegetation similar to adjacent undisturbed vegetation can take up to 30 years.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

In view of the current and historical widespread disturbances in the area such as livestock grazing, crop production and roads, the proposed action would have little cumulative impact. Long term impacts would be small and localized after successful interim reclamation practices are implemented.

Potential Future Mitigation: Proposed mitigation measures, including reclamation practices, would be developed upon review of a site specific APD and should development occur the well pad site and all associated infrastructure will be reclaimed to gold book standards.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the Proposed Action analysis minus parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Direct and Indirect Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Cumulative Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See proposed action

**3.4.2.5 Wetlands and Riparian Zones**

**Proposed Action**

Affected Environment:

Offered lease parcels for this sale occur across a wide spectrum of ecological settings over eastern Colorado, but most parcels are removed from wetland areas and are upland. Parcel 6672 is land in close proximity to the full pool elevation at two reservoirs (two parcels) at the Queens State Wildlife area. These reservoirs have dams with enhanced storage at natural playas and are combined with extensive ditch systems that deliver and store Arkansas River water. Past reservoir operations during wet periods allowed these parcels to be near the then reservoir shoreline. Water storage operations involving John Martin reservoir and changes with the Colorado-Kansas compact will limit in the future how often these water bodies are full, but there

is some low probability they could again be near wetlands of the reservoir. Presently all parcels except 6664 are located far from producing oil and gas activity. Future development, post leasing, would require roads, pipelines and other infrastructure requiring additional impact analysis that cannot be evaluated at this stage.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Leasing these parcels does not affect any wetland habitat. In the event of future development, resetting of proposed drill pad locations may be necessary to sustain protective distances from wetlands (NE-02, CO-28). Otherwise all parcels are upland and there is no direct affect of this lease sale or future drill pads directly affecting riparian or wetland habitat.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

With the exception of Parcel 6657 (on the lower north slope of Spanish Peaks), all lands are located in environment settings with substantial landscape level modification due to agriculture, livestock grazing, irrigation modification or some combination. Leasing and development on any parcel would be cumulative to these other impacts, but presently adjacent oil and gas development is absent on all parcels except Weld County parcel 6664. Oil and Gas development would bring roads, pipelines and other surface disturbance into agricultural areas. This may result in conflicts of land uses requiring additional infrastructure to separate uses such as additional fences, gates, cattle-guards, etc. Additional surface disturbances, depending upon proximity to waterways and wetlands, may alter overland flow rates and sediment delivery into wetland areas accelerating eutrophication or altering stream function.

Potential Future Mitigation:

Standard Conditions of Approval would be applied to any APD and would include moving drill pads to suitable location, and outside of Queens State Wildlife Area (SWA) boundaries.

**Preferred Alternative**

Affected Environment: Offered lease parcels for this sale occur across a wide spectrum of ecological settings over eastern Colorado, but most parcels are removed from wetland areas and are upland. Parcel 6672 is land in close proximity to the full pool elevation at two reservoirs (two parcels) at the Queens State Wildlife area, but is removed from this Alternative. Presently all parcels except 6664 are located far from producing oil and gas activity. Future development, post leasing, would require roads, pipelines and other infrastructure requiring additional impact analysis that cannot be evaluated at this stage.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Leasing these parcels does not affect any wetland habitat. In the event of future development, resetting of proposed drill pad locations may be necessary to sustain protective distances from wetlands and that stipulation is allowed for on any parcel potentially near water. Otherwise all parcels are upland and there is no direct affect of this lease sale or future drill pads directly affecting riparian or wetland habitat with the protective stipulations.

Environmental Consequences of Leasing and Development - Cumulative Impacts: With the exception of Parcel 6657 (on the lower north slope of Spanish Peaks), all lands are located in environment settings with substantial landscape level modification due to agriculture, livestock



grazing, irrigation modification or some combination. Leasing and development on any parcel would be cumulative to these other impacts, but presently adjacent oil and gas development is absent on all parcels except Weld County parcel 6664.

Potential Future Mitigation: Standard Conditions of Approval would be applied to any APD and would include moving drill pads to suitable location.

### **3.4.2.6 Aquatic Wildlife**

#### **Proposed Action**

##### Affected Environment:

No perennial aquatic wildlife habitat is involved with the lease of any parcel. Parcel 6672 (two individual land pieces) are within reservoir watershed boundaries of two separate reservoirs at the Queens SWA south of Eads Colorado. These public lands are managed through cooperative agreement by the Colorado Parks and Wildlife as lands incorporated into their State Wildlife Area. Presently these reservoirs are dry. Filling of these dam enhanced playa environments is less likely in future years than in the past because of water operation changes at John Martin Reservoir and changes brought about by the Colorado-Kansas water compact. Regardless, these reservoirs could fill through Arkansas River water diversion into supply ditches, or partially fill from localized rain. In either of those events future drilling could be in close proximity to aquatic habitat. All other parcels are in upland settings.

##### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Leasing of these parcels would not directly affect any aquatic habitat or wildlife under normal circumstances because they are within upland settings. Those parcels at Queens SWA have a NSO stipulation that requires well pads to be located off the parcels. Relocation could still be within the reservoir (historic playa) watersheds, but would be separated by distance not directly affecting the reservoirs under typical circumstances. The impact of future development necessitating roads, pipelines and other infrastructure would need to be evaluated later, but the act of leasing these parcels does not directly affect aquatic habitat.

##### Environmental Consequences of Leasing and Development - Cumulative Impacts:

With the exception of Parcel 6657 (on the lower north slope of Spanish Peaks), all lands are located in environment settings of substantial landscape level modification due to agriculture, livestock grazing, irrigation modification or some combination. Leasing and development on any parcel would be cumulative to these other impacts, but presently adjacent oil and gas development is absent on all parcels except Weld County parcel 6664. Oil and Gas development would bring roads, pipelines and other surface disturbance into agricultural areas. This may result in conflicts of land uses requiring additional infrastructure to separate uses such as additional fences, gates, cattle-guards, etc. Additional surface disturbances, depending upon proximity to waterways and wetlands, may alter overland flow rates and sediment delivery into wetland areas accelerating eutrophication or altering stream function.

##### Potential Future Mitigation:

Standard Conditions of Approval would be applied to any APD and would include moving drill pads to suitable location and likely outside of SWA boundaries.

### **Preferred Alternative**

Affected Environment: No perennial aquatic wildlife habitat is involved with the lease of any parcel. Parcel 6672 (two individual land parcels) are within reservoir watershed boundaries of two separate reservoirs at the Queens State Wildlife area south of Eads Colorado, but are deferred under this Alternative. These public lands are managed through cooperative agreement by the Colorado Parks and Wildlife as lands incorporated into their State Wildlife Area. All other parcels are in upland settings.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Leasing of these parcels would not directly affect any aquatic habitat or wildlife under normal circumstances because they are within upland settings. Future, development necessitating roads, pipelines and other infrastructure would need to be evaluated later, but the act of leasing these parcels does not directly affect aquatic habitat under normal circumstances.

Environmental Consequences of Leasing and Development - Cumulative Impacts: With the exception of Parcel 6657 (on the lower north slope of Spanish Peaks), all lands are located in environment settings of substantial landscape level modification due to agriculture, livestock grazing, irrigation modification or some combination. Leasing and development on any parcel would be cumulative to these other impacts, but presently adjacent oil and gas development is absent on all parcels except Weld County parcel 6664.

Potential Future Mitigation: Standard Conditions of Approval would be applied to any APD and would include moving drill pads to suitable location.

### **3.4.2.7 Terrestrial Wildlife**

#### **Proposed Action**

##### Affected Environment:

See the migratory bird section for a general habitat description of proposed lease parcels. The area encompassing the proposed lease parcels is vast and encompasses the full complement of big game (e.g., deer, elk, pronghorn, bighorn sheep) seasonal ranges. Most high elevation lease parcels are important reproduction areas for elk and bighorn sheep. Many of the lease parcels along valley floors and the eastern plains serve as winter range for deer, elk and pronghorn. Winter range is that part of the overall range of a species where 90 percent of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each data analysis unit.

All or portions of the following parcels contain big game (mule deer, elk, pronghorn, bighorn sheep) winter habitat: 6658, 6659, 6660, 6661, 6667, and 6672.

All or portions of the following parcels contain elk calving habitat: 6657.

Few raptor nest locations are known within the proposed lease parcels for two primary reasons, lack of information and the fact that many parcels are located on private surface. Lease stipulations attached to each parcel would require raptor nest surveys and maintain site

characteristics of existing nest. Timing limitations will reduce disruption of adult attendance at each known occupied nest location.

Several parcels are located in Colorado Natural Heritage Program (CNHP) Potential Conservation Areas (PCAs). A PCA may include a single occurrence of a rare element or a suite of rare elements or significant features. The goal is to identify a land area that can provide the habitat and ecological processes upon which a particular element or suite of elements depends for their continued existence. The best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, vegetative cover, as well as current and potential land uses. The proposed boundary does not automatically exclude all activity. Consideration of specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based. Affected PCAs include Gardner Butte, Central Shortgrass, Central Arkansas Playas, Arkansas River, Pawnee Grassland East.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The act of leasing the parcels for oil and gas development would have no direct impact on wildlife resources; however, impacts at the exploration and development stage could have impacts on wildlife. The magnitude and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development.

Leasing parcels for oil and gas development will likely result in future development at some locations. At this time, specifics of development are unknown; therefore, impacts to terrestrial wildlife caused by potential future development cannot be analyzed with accuracy at this stage. If a parcel is leased and development occurs, impacts likely to occur will be habitat loss and fragmentation (well pad construction, road construction, etc.). Wildlife could avoid preferred habitat because of human presence, noise from drilling and production facilities, increased road density and traffic. Sawyer et al. (2006) demonstrated an avoidance response by mule deer of well pads and roads in the development of a natural gas field in western Wyoming. The response was immediate (i.e., year 1 of development) and no evidence of acclimation occurred during the course of the 3 year study. However, the indirect habitat loss caused by an avoidance response of mule deer could be reduced by 38-63% with the use of advanced technologies and proper planning that minimize the number of well pads and amount of human activity associated with them (Sawyer et al. 2006). Elk have displayed similar avoidance characteristics as mule deer to oil and gas development. Radio collared elk in the Jack Marrow Hills, Wyoming displayed an avoidance buffer of 1000-m in winter and 2000-m in summer of roads and active well sites (Powell 2003). While habitat between the well sites in the studies listed above and the parcels in the RGFO lease sale may not be equal, a general assumption can be made that oil and gas development activities could alter habitat use of these terrestrial animals.

Raptors are protected by a combination of “no surface occupancy” and “timing limitation” stipulations are attached to parcels to reduce adverse effects of potential oil and gas development. This control method allows the protection of known active nest sites during the APD phase. While the footprint of individual wells is minimal, the total habitat lost to the network of wells and connecting roads can be considerable. The potential for oil and gas related

disturbances of nesting, foraging and roosting raptors arises not only from new well installation activities, including road and pad construction, drilling, and equipment installation over the course of several weeks to months, but also from continual servicing and maintenance of wells over their productive lifetime.

Several lease parcels are located within PCAs; however, the RGFO RMP and the North East RMP contain a suite of stipulations that will protect the elements outlined in each PCA in the event that leased parcels are eventually developed.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect wildlife resources. These activities include: oil and gas development, residential development, grazing, agriculture, mining and recreation. While the leasing of parcels will not compound these impacts, future oil and gas development may impose deleterious effects. Every parcel is unique and cumulative impacts will need to be thoroughly addressed in the APD stage.

Potential Future Mitigation:

Additional COA and requirements will likely be attached during the APD and development stage. Because of the lack raptor nesting information and the lease stipulations attached to each parcel a standard COA would require a raptor nest survey where habitat existed. If a nest were found, the stipulations would require the lessee to maintain the integrity of site characteristics for existing nests. Additionally, timing limitations will reduce disruption of adult attendance at each known occupied nest location.

**Preferred Alternative**

Affected Environment:

The affected environment is as described in the Proposed Action analysis minus parcel #6672.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See proposed action.

**3.4.2.8 Migratory Birds**

**Proposed Action**

Affected Environment:

BLM Instruction Memorandum No. 2008-050 provides guidance towards meeting the BLM's responsibilities under the Migratory Bird Treaty Act (MBTA) and Executive Order (EO) 13186. The guidance emphasizes management of habitat for species of conservation concern by avoiding or minimizing negative impacts and restoring and enhancing habitat quality.

Several habitat types are found within the area covered by this EA. At lower elevations the habitat types are primarily piñon pine and juniper. Open areas of mountain grassland are interspersed throughout the area and mountain shrubs such as currant and mountain mahogany are abundant, especially on south slopes. Piñon-juniper habitat supports the largest nesting bird species list of any upland vegetation type in the West. The richness of the piñon-juniper vegetation type, however, is important due to its middle elevation. Survey tallies in piñon-juniper are similar in species diversity to the best riparian. Several species are found in the piñon-juniper habitat and include: black-chinned hummingbird, gray flycatcher, Cassin's kingbird, gray vireo, piñon jay, juniper titmouse, black-throated gray warbler, Scott's oriole, ash-throated flycatcher, Bewick's wren, mountain chickadee, white-breasted nuthatch, and chipping sparrow.

Ponderosa pine, mixed conifer and mountain shrubland habitats are found at higher elevations in the project area. These sites are very dry and warm areas, with less than 25 in of precipitation annually. Mature ponderosa pine forests on dry sites are open, with mature trees achieving wide separation as they compete for limited soil moisture. Grassy ground cover is maintained by frequent low-intensity fires. Ponderosa pines are the largest conifers in Colorado and Gambel oak is a common component of the understory, typically in a shrubby form. Other common understory shrubs include mountain mahogany and wax currant. Tree species sometimes found mixed with ponderosa pine are junipers, piñon pine, aspen, white fir, and Douglas-fir. Birds typical of these habitat types include Merriam's turkey, Williamson's sapsucker, pygmy nuthatch, western bluebird, band-tailed pigeon, Mexican spotted owl, Grace's warbler, flammulated owl, red-breasted nuthatch, violet-green swallow, western tanager, and chipping sparrow.

Foothills riparian forests are distributed along stream systems in the foothills, lower mountains and mountain parks. In some areas the riparian forest is dominated by a deciduous component, especially narrowleaf cottonwood, a variety of willow species, box elder, mountain alder and river birch. The understory of these systems is typically rich, with a wide variety of shrubs and herbaceous plants. The Colorado Breeding Bird Atlas reported that foothills riparian forests dominated by deciduous trees comprised nearly 85% of all foothills riparian forests, while conifer-dominated systems comprised just over 15%. These two systems also exhibited somewhat different avian communities. Riparian areas represent a transition zone between the aquatic ecosystem and the drier uplands. The riparian zones are well defined, unique, and highly productive areas which are sensitive to disturbance. However in most western riparian systems 75% of the bird species use riparian areas during some part of their life cycle. In deciduous foothills riparian systems, yellow warbler is the species most frequently detected, followed by American robin, northern flicker, house wren, warbling vireo, song sparrow, western wood-pewee, and broad-tailed hummingbird.

The eastern plains of Colorado contains flat to gently rolling topography, with occasional canyons and bluffs. Elevations within Colorado range from about 3,200 ft. in Prowers County to about 6,000 ft. around Limon and near the foothills of the Rockies. Principal rivers include the South Platte, Arikaree, Big Sandy, Republican, and Arkansas. Precipitation is low, less than 20 in per year with most of that falling in spring and summer; total precipitation varies greatly between years at a given location and varies significantly more than in mixed grass or tallgrass

systems. Mean monthly temperatures range from 10°F in winter to 100°F in summer. Localized severe weather is not uncommon, and blizzards, hailstorms, and tornadoes occur in most years.

The dominant habitat in this physiographic area is shortgrass prairie. Shortgrass is dominated by two low-growing warm-season grasses, blue grama and buffalo grass; western wheatgrass is also present, along with taller vegetation including widespread prickly-pear cactus and yucca, and cholla in the south. Sandsage prairie is found where sandy soils occur, and is dominated by sand sagebrush and the grasses sand bluestem and prairie sand-reed. Mixed grass (needle-and-thread, side-oats grama) and tallgrass (big bluestem, little bluestem, switchgrass) communities occur locally.

A second habitat in this physiographic area is lowland riparian. In the shortgrass prairie, lowland riparian habitats occur along the few stream and river courses. Riparian vegetation is dominated by plains cottonwood, willow shrubs, and introduced species such as Russian-olive and Chinese elm. Trees were uncommon features of the shortgrass prairie before European settlement; development of woody vegetation has been facilitated in historical times by alteration of natural river flow regimes, a result of irrigation drawdown and reservoir construction for flood control.

The following birds are listed on the US Fish and Wildlife Service Birds of Conservation Concern (BCC) – 2008 List for BCR 16-Southern Rockies/Colorado Plateau and BCR 18-Shortgrass Prairie. These species have been identified as species that may be found in the project area, have declining populations and should be protected from habitat alterations.

The golden eagle is a bird of grasslands, shrublands, piñon-juniper woodlands, and ponderosa pine forests, may occur in most other habitats occasionally, especially in winter. Nests are placed on cliffs and sometimes in trees in rugged areas, and breeding birds range widely over surrounding habitats.

Flammulated owls prefer old-growth or mature ponderosa pine, apparently due to the presence of large broken-top and lightning-damaged snags and trees for nesting cavities, large cavities excavated by Northern Flickers and other woodpeckers, open structure of trees and under story for foraging, and high prey availability. They will utilize other habitats with similar structure, such as open mixed-conifer and aspen forests. Key habitat features seem to be the presence of large trees and snags, scattered clusters of shrubs or saplings, clearings, and a high abundance of nocturnal arthropod prey.

Northern harrier's reside throughout Colorado, with highest densities on the eastern plains, mountain parks, and western valleys. These hawks feed on small mammals, birds, reptiles, and amphibians. They hunt by flying low over wetlands, grasslands, shrublands, and croplands.

Peregrine falcons in Colorado breed on cliffs and rock outcrops from 4,500-9000 feet in elevation. They most commonly chosen cliffs lie within piñon-juniper and ponderosa pine zones. These falcons feed on smaller birds almost exclusively, with White-throated swifts and rock doves being among their favored prey.

Prairie falcons nest in scattered locations throughout the state where they inhabit the grassland and cliff/rock habitat types. These falcons breed on cliffs and rock outcrops, and their diet during the breeding season is a mix of passerines and small mammals.

Williamson's sapsuckers breed in forested regions and in Colorado populations are concentrated along the eastern edge of the Rockies. Williamson's sapsuckers nest primarily in ponderosa pine and in aspen components of mixed-conifer. They often place nest cavities in aspen trees, and often choose nest trees in aspen stands adjacent to open ponderosa pine or mixed-conifer forest.

The Gray vireo nests in western Colorado and on the eastern slope of Las Animas County. Gray Vireos are piñon-juniper woodland obligates. Gray Vireos usually inhabit stands dominated by juniper or thin stands of pure juniper. They construct nests of dry grasses, plant fibers, stems, and hair, often camouflaging them with sagebrush leaves.

Piñon jays range the semiarid lands of the West. The Colorado Breeding Bird Atlas map shows them south of a diagonal line drawn from the northwest corner to the southeast corner of the state. Piñon jays are piñon and juniper obligates in Colorado and nest commonly at the lower elevations of piñon-juniper woodlands, often where junipers dominate. A few nest in ponderosa pine. They prefer extensive stands far from high human activity.

Black-throated gray warblers are fairly common summer residents in piñon-juniper woodlands across the southwestern half of Colorado. Some surveys show these warblers to be the most frequently encountered birds in the piñon-juniper woodland. Black-throated gray warblers, in Colorado, are piñon-juniper obligates, preferring tall, dense piñon-juniper woodlands.

Virginia's warblers in Colorado nest between 5,000 and 9,000' elevation. They breed most abundantly in the western quarter of the state, along the eastern slope foothills, and in the Upper Arkansas River drainage. Virginia's warblers nest in dense shrublands and on scrub-adorned slopes of mesas, foothills, open ravines, and mountain valleys in semiarid country. They use scrubby brush, piñon-juniper woodland with a well-developed shrubby understory, ravines covered with scrub oak and dense shrublands--especially gambel oak. They also breed in open ponderosa pine savannahs that have a dense understory of tall shrubs.

Grace's warblers breed from southwestern Colorado and southern Utah, south through central Arizona, western New Mexico, and into north-central Mexico. Grace's warblers inhabit open ponderosa pine forests with pines 16 feet tall, especially with a shrubby understory, usually gambel oak.

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Leasing will have no impact on migratory bird individuals, populations or habitat. If leases are developed, surface disturbing activities, such as road building or pad and pipeline construction will destroy existing habitat. If surface disturbing activities occur during the nesting season, "take" of nests may occur. Noise and human activity generated during construction, drilling, and production phases will likely result in a larger impact footprint than the disturbance footprint alone.

Migratory birds may be burned or killed by exhaust vents, heater-treaters, flare stacks, etc., if perched at the opening while in operation. An increase in activity, i.e. road traffic, will likely result in an increase in vehicular collisions with migratory birds. If oil and/or gas is found in economically feasible quantities, it is likely additional development will occur.

Appropriate lease stipulations to protect some migratory birds and their habitats were attached to parcels and described in Attachment C. Further, at the field development and APD stage it is standard procedure to include a COA on all APDs that alerts the operator to their responsibility under the Migratory Bird Treaty Act to prevent the “take” (pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill). The COA will ensure that operators take measures to prevent destruction of nests and effectively preclude migratory bird access to, or contact with, reserve pit contents that possess toxic properties (i.e., through ingestion or exposure) or have potential to compromise the water-repellent properties of birds’ plumage.

#### Environmental Consequences of Leasing and Development - Cumulative Impacts:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect migratory bird resources. These activities include: oil and gas development, residential development, grazing, agriculture, mining and recreation. In areas where human development had previously modified the natural environment (i.e. agricultural, settlement, past oil and gas development) it is likely that migratory bird species richness and diversity had been forfeited. However, new oil and gas development will likely cause an additive negative impact to most species of migratory birds currently present at the site. While the leasing of parcels will not compound these impacts, future oil and gas development may impose deleterious effects. Every parcel is unique and cumulative impacts will need to be addressed in the APD stage.

#### Potential Future Mitigation:

To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a “take” of migratory birds. Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, the breeding and brood rearing season for most Colorado migratory birds. The provision will not apply to completion activities in disturbed areas that were initiated prior to May 15 and continue into the 60-day period.

An exception to this timing limitation will be granted if nesting surveys conducted no more than one week prior to vegetation-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions.

#### **Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action analysis minus parcel #6672.



Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Impacts are as described in the proposed action analysis minus impacts incurred on parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Impacts are as described in the proposed action analysis minus impacts incurred on parcel #6672.

Potential Future Mitigation: See proposed action.

### **3.4.2.9 Forestry**

#### **Proposed Action**

##### Affected Environment:

The most common forest type found on these BLM parcels is pinyon pine and juniper, typically known as PJ woodlands. The second most common forest type is the mixed conifer consisting of ponderosa pine and Douglas-fir. The tree species found within the area are hardy drought tolerant trees that are well suited to the landscape. Forest management recommendations to ensure optimum tree health include providing adequate space, water, and avoid the wounding of the trees. Generally an overcrowded forest is more susceptible to catastrophic wildfire, insect infestations and diseases.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Trees would be cleared from the from the well site and access roads.

Environmental Consequences of Leasing and Development - Cumulative Impacts: There will be a small loss of forested acres. Exact acreage is difficult to determine until APD stage impacts are analyzed. This small impact would occur on the Huerfano County parcels where pinyon/juniper woodlands exist.

##### Potential Future Mitigation:

At the development or APD stage, timber to be cleared for the well sites and access roads shall be paid for prior to removal. The RGFO forester shall be contacted 2 weeks prior to the timber clearing. Timber will be purchased at the RGFO appraised prices depending on species and size.

#### **Preferred Alternative**

Affected Environment: No additional forestry resources will be affected by this alternative.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as proposed alternative.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as proposed alternative.

Potential Future Mitigation: Same as proposed alternative.

### 3.4.3 Heritage Resources and Human Environment

#### 3.4.3.1 Cultural Resources

##### **Proposed Action**

##### Affected Environment:

**Paleoindian** sites are scarce in the eastern half of Colorado. During the years 10,000-5500 BC, Paleoindian populations appear to have subsisted on large game (based on associated lithic tools), and probably supplemented their diets with a variety of small game and vegetal materials. Paleoindian materials from the Clovis period (9500-8950 BC) have been reported for southeastern Colorado, and although not extensive, Folsom and Plano artifacts seem to suggest an increase in population through time. It appears that Paleoindian populations were living in relatively small groups, and seem to have been mostly nomadic.

Many more cultural materials dating to the **Archaic** period (5500 BC-AD 500) have been found. The general size reduction of lithic tools, coupled with the presence of groundstone and vegetal evidence, suggests that a gradual shift in subsistence from large game to smaller game and possible horticulture was taking place. As early as 7800 BP, Archaic populations were living in pithouses, and, later, in structures with stone foundations. Based on these and other data, it appears that Archaic groups were sedentary to some extent.

Evidence of the **Formative and Late Prehistoric/Protohistoric** periods (AD 500-1600) occupations is spotty in the mountain region. While some scholars interpret data from these periods as representing a clearly defined "mountain formative culture", the majority still believe that the mountains were inhabited seasonally by Plains-oriented groups. However, there is little to indicate substantial Formative or Late Prehistoric/Protohistoric settlement in the mountains, most likely due to a nomadic lifestyle.

The appearance of pottery and stemmed, corner-notched projectile points in the archaeological record suggest a change in culture in the Colorado Plains around AD 100. The **Late Prehistoric** (AD 100-1725) was a time when aboriginal populations in eastern Colorado seemed to have adopted a more sedentary lifestyle than in previous times. The construction of complex structural sites, the adoption of pottery and the increased dependence on horticulture (in the southeastern Plains) are all suggestive of less mobility.

Sites dating to the protohistoric period (beginning with the **Diversification Period**, AD 1450-1725) are difficult to identify. In southeastern Colorado, sites of that time period are dated based on the presence of "Apachean" traits, like pottery, rock art, and stone circles. In northeastern Colorado, the Dismal River Aspect (AD 1525-1725) is distinguished by shallow pithouses, bell-shaped roasting pits, and by Dismal River Gray Ware ceramics.

The **Protohistoric** was a time of increasing population movement, and was further complicated by the arrival of the Spanish, and, later, the Euro-Americans. Starting in 1725, and continuing until they were entirely eliminated by the 1870s, Native American groups identified as the

Plains, Jicarilla, and Kiowa Apaches; the Utes; the Arapaho; the Comanches; the Cheyennes; and occasionally the Crow, Shoshoni, and the Blackfeet, were known to occupy the Plains region.

Europeans first explored southeastern Colorado in 1540. By 1822, Spanish dominance of the area ended. The Santa Fe Trail was established that year, bringing American populations into the region. Commercial ranching commenced in the 1860s, and the Homestead Act of 1862 increased the population further. By 1870, all Native American groups had been subdued, following several decades of violence. Buffalo hunting, popular among Euro-Americans in the early 1800s, finally decimated any remaining animals by 1880. After 1900, sugar beet production and dryland farming and ranching were the dominant industries in the area. The Great Depression of 1929 and the Dust Bowl of the 1930s combined to cause severe problems for agriculturalists. By 1941, programs created by the Roosevelt administration and the industrial needs resulting from the U. S. entry into World War II had greatly improved the economy. Agriculture continues to predominate as the largest revenue-producing industry in eastern Colorado.

BLM conducted a literature review of records in the BLM-RGFO field office and database, and reviewed relevant information in the Compass database maintained by the Colorado Office of Archaeology and Historic Preservation. The records indicate that no inventories for cultural resources have been completed on the proposed lease parcels. Although no sites or isolated finds have been recorded on the parcels, the two tracts that comprise Parcel 6672 are located adjacent to Neenoshe and Neeskah Reservoirs (5KW137), two of the Great Plains Reservoirs that are field eligible for the National Register of Historic Places.

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Because the proposed lease sale does not involve ground disturbance, the proposed undertaking will have no effect on historic properties. Any future development of parcels that are purchased as a result of the lease sale will be subject to additional Section 106 compliance, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects. At that time, any adverse effects of proposed development on the historic reservoirs will be identified and mitigated, if necessary. The BLM notified the Colorado State Historic Preservation Officer (“SHPO”) of these determinations, and the SHPO concurred with BLM’s determinations [CR-RG-13-121 (L)].

BLM also consulted with the National Park Service regarding the proximity of Parcels 6671, 6672, and 6669 to the Santa Fe National Historic Trail. In an e-mail dated February 26, 2013, Michael Elliot of the NPS concurred with BLM’s determination that the proposed lease sale will have no effect on the visual setting or the trail itself.

#### Environmental Consequences of Leasing and Development - Cumulative Impacts:

None known at present. However, Any future development of parcels that are purchased as a result of the lease sale will be subject to additional Section 106 compliance, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects. At that time, any adverse effects of proposed development on the historic reservoirs will be identified and mitigated, if necessary.

Potential Future Mitigation: None at present

### **Preferred Alternative**

Affected Environment: See proposed action. Note that the two tracts that comprise Parcel 6672, located adjacent to Neenoshe and Neeskah Reservoirs (5KW137, both of them historic properties), are excluded from this alternative.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as proposed action.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as proposed action.

Potential Future Mitigation: Same as proposed action.

### **3.4.3.2 Native American Religious Concerns**

#### **Proposed Action**

##### Affected Environment:

The mountains and Plains in Colorado were inhabited by numerous tribes throughout history. Because of their nomadic culture, Plains populations used items that were easily transported and light, and therefore generally left little material evidence of habitation or traditional cultural properties. Although sacred locales are present on the lands within the RGFO jurisdiction, no known sites are present on any of the parcels included in the lease sale.

A consultation with potentially interested Native American tribes has been completed [CR-RG-13-112 (NA)], and no concerns were identified. The BLM contacted the following tribes: Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Tribe of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, the Ute Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe.

##### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The proposed undertaking will have no effect on any known sacred or traditional sites. However, any future development of parcels that are purchased as a result of the lease sale will be subject to additional Section 106 compliance, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects, which might include such sites.

##### Environmental Consequences of Leasing and Development - Cumulative Impacts:

None known at present. However, any future development of parcels that are purchased as a result of the lease sale will be subject to additional Section 106 compliance, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects, which might include such sites.

Potential Future Mitigation: None at present.

### **Preferred Alternative**

Affected Environment: Same as proposed action.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as proposed action.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as proposed action.

Potential Future Mitigation: Same as proposed action.

### **3.4.3.3 Social and Economic Conditions**

#### **Proposed Action**

Affected Environment:

Executive Order 12898 requires federal agencies to assess projects to “identify and address the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” There are no environmental justice communities in the study area, either based on race, ethnicity, or income. The areas involved in the lease sale are rural in nature, and small communities and sparsely populated subdivisions exist within variable distances from the proposed lease parcels.

#### **Profile of County Demographics, 2000-2011**

	Bent	Huerfano	Kiowa	Weld	Colorado	U.S.
Population (2011*)	6,164	6,829	1,728	248,441	4,966,061	306,603,772
Population (2000)	5,998	7,862	1,622	180,936	4,301,261	281,421,906
Population Percent Change (2000-2010*)	2.8%	-13.1%	6.5%	37.3%	15.5%	8.9%
Housing Vacancy Rate	12.3%	38.2%	26.3%	7.7%	11.7%	12.4%

\* The data in this table are calculated by ACS using annual surveys conducted during 2006-2010 and are representative of average characteristics during this period.

Data Sources: U.S. Department of Commerce. 2012. Census Bureau, American Community Survey Office, Washington, D.C.; U.S. Department of Commerce. 2000. Census Bureau, Systems Support Division, Washington, D.C.

The six-county region has experienced varying degrees of fluid mineral development. Currently the majority of oil and gas production within the Royal Gorge field office is on private mineral estate. Weld County contains the majority of current oil and gas wells within the area of impact. Employees in the oil and gas sector within these counties earn an average of approximately \$76,000 per year (US Department of Labor. 2012. Bureau of Labor Statistics, Quarterly Census of Employment and Wages).

The following table reports the average annual fluid minerals production for each county, including an estimated revenue value, figured using the average national wellhead prices from 2012: Oil at \$94.05/bbl and natural gas at \$2.66/MCF (US Department of Energy. 2012. US Energy Information Administration). The production values are averaged over the past ten full years of production (2003-2012); (Colorado Oil and Gas Conservation Commission <http://cogcc.state.co.us/>).

**Average Annual Production and Revenue**

	Bent	Huerfano	Kiowa	Weld	Total
Oil Production (Thousand bbl)	0.4	0	169.7	17,595.1	17,830.9
Oil Revenue (Thousand)	\$42	\$0	\$15,959	\$1,654,819	\$1,676,998
Gas Production (MMCF)	450	18,057	606	205,157	225,941
Gas Revenue (Thousand)	\$1,197	\$48,033	\$1,612	\$545,718	\$601,003

Federal oil and gas leases generate a one-time lease bonus bid as well as annual rents. The minimum competitive lease bid is \$2.00 per acre. If parcels do not receive the minimum bid they may be leased later as noncompetitive leases that don't generate bonus bids. Within the Royal Gorge field office, average bonus bids are approximately \$50 per acre for oil and gas leases. Lease rental is \$1.50 per acre per year for the first five years and \$2.00 per acre per year thereafter. Typically, oil and gas leases expire after 10 years unless held by production. During the lease period annual lease rents continue until one or more wells are drilled that result in production and associated royalties. The royalty rate is 12.5 percent of revenue associated with mineral extraction on federal leases. The State of Colorado receives 49% of the total revenue associated with federal mineral leases.

Federal mineral lease revenue for the State of Colorado is divided thusly: 48.3 percent of all state mineral lease rent and royalty receipts are sent to the State Education Fund (to fund K-12 education), up to \$65 million in FY 2009 – FY 2011, and growing at four percent per year thereafter. Any amounts greater than the upper limit flow to the Higher Education Capital Fund. 10 percent of all state mineral lease rent and royalty receipts are sent to the Colorado Water Conservation Board (CWCB), up to \$13 million in FY 2009, and growing at four percent per year thereafter. Any amounts greater than the upper limit flow to the Higher Education Capital Fund. 1.7 percent of all state mineral lease rent and royalty receipts is distributed directly to local school districts originating the FML revenue or providing residence to energy employees and their children. 40 percent of all state mineral lease rent and royalty receipts are sent to the Colorado Department of Local Affairs, which then distributes half of the total amount received to a grant program, designed to provide assistance with offsetting community impacts due to

mining, and the remaining half directly to the counties and municipalities originating the FML revenue or providing residence to energy employees.

Bonus payments are allocated separately from rents and royalties, in the following manner: 50 percent of all state mineral lease bonus payments are allocated to two separate higher education trust funds: the "Revenues Fund" and the "Maintenance and Reserve Fund". The Revenues Fund receives the first \$50 million of bonus payments to pay debt service on outstanding higher education certificates of participation (COPs). The Maintenance and Reserve Fund receives 50 percent of any bonus payment allocations greater than \$50 million. These funds are designated for controlled maintenance on higher education facilities and other purposes. The remaining 50 percent of state mineral lease bonus payments are allocated to the Local Government Permanent Fund, which is designed to accumulate excess funds in trust for distribution in years during which FML revenues decline by ten percent or more from the preceding year.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

No minority or low income populations would be directly affected in the vicinity of the proposed action.

The direct effect of the proposed action would be the payments received, if any, from the leasing of the 2,528.31 acres of federal mineral estate, or a subset thereof. Indirect effects that might result, should exploration and development of the leases occur, could include increased employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to federal, state, and county governments related to lease payments, royalty payments, severance taxes, and property taxes. Other effects could include the potential for a small increase in transportation, roads, noise, and recreation disturbance associated with development. These effects would apply to all public land users in the project area. Any potential increase in residents due to employment opportunities would not significantly affect the state of local housing availability.

It is, however, highly speculative to predict exact effects of this action, as there are no guarantees that the leases will receive bids, that any leased parcels will be developed, or that any developed parcels will produce any fluid minerals. A rough estimate for the amount to be raised in the lease sale can be determined using recent lease sales in the field office as a guideline. In the Royal Gorge Field Office, approximately 75% of all acres proposed for leasing are bid upon, with an average bid of approximately \$50 per acre. Using these values, the lease sale could result in \$102,300 in total bonus bids, though the actual amount may vary widely. To predict the results of future development would be too speculative in nature. Any APD received in would result in future NEPA analysis taking place, in which further socio-economic effects would be examined. Likewise, any negative socio-economic effects resulting from disturbance and drilling on leased parcels would also be examined in future site-specific analysis. It is unknown when, where, how, or if future surface disturbing activities associated with oil and gas exploration and development such as well sites, roads, facilities, and associated infrastructure would be proposed. It is also not known how many wells, if any, would be drilled and/or completed, the types of technologies and equipment would be used and the types of infrastructure needed for production of oil and gas. Thus, the types, magnitude and duration of potential impacts cannot be precisely quantified at this time, and would vary according to many factors.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

Any possible future development of fluid mineral resources resulting from this lease sale would be in addition to the current level of development, as examined in the affected environment.

Potential Future Mitigation: None

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action with the exception of the removal of parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: The affected environment and impacts are as described in the Proposed Action analysis minus impacts incurred on parcel #6672, a reduction of 10.35 acres.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as the proposed action minus any cumulative impacts that would have been incurred on parcel #6672 in Kiowa County.

Potential Future Mitigation: None

**3.4.3.5 Paleontological Resources**

Affected Environment:

Occurrences of paleontological resources are closely tied to the geologic units that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Using the Potential Fossil Yield Classification (PFYC) system, geologic units are classified base on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossil and their sensitivity to adverse impacts, with a higher class number indicating higher potential (WO IM2008-009).

All of the proposed lease sale parcels are contain geologic formations that are classified as PFYC 3 to PFYC 5 formations that have an unknown or moderate to likely potential of containing significant paleontological resources that could potentially be impacted by activities associated with oil and gas leasing. The formations affected, their known fossil types, and their PFYC values are as follows (Tweto 1979, BLM Colorado State Office PFYC chart):

<b>Formation</b>	<b>Fossil Types</b>	<b>PFYC</b>
Cretaceous Dakota Sandstone	Various invertebrate, vertebrate, and plant fossils, including conifer cones	3
Cretaceous Purgatoire Formation	Vertebrate Trace Fossils	3
Cretaceous Niobrara Formation	Various invertebrates including clams, oysters, baculites, scaphites, burrows, and cephalopods	3



Tertiary Huerfano Formation	Various mammals, including rodents, marsupials, primates, carnivores, condylarths, artiodactyls, and perissodactyls (including horses), and other vertebrates, forams and other invertebrates, and wood	4-5
Tertiary Cuchara Formation	Various mammals, including creodonts, condylarths, pantodonts, carnivores, primates, and perissodactyls	4-5
Quaternary Eolian Deposits	Various	3
Tertiary Ogallala Formation	Various vertebrates, invertebrates, and wood	5
Tertiary White River Formation	Various vertebrates, invertebrates, and wood	5

**Environmental Consequences of Leasing and Development:**

Locations for proposed oil or gas well pads, pipelines, and associated infrastructure on these parcels will be subject to further analysis for the protection of paleontological resources during APD/development stage NEPA review.

Areas that contain geologic formations that are PFYC 3, 4, and 5, for which new surface disturbance is proposed on or adjacent to bedrock (native sedimentary stone) including disturbance that may penetrate protective soil cover and disturb bedrock, may be subject to an inventory that shall be performed by a BLM permitted paleontologist and approved by the appropriate RGFO specialist. Surface disturbing activities in many areas including PFYC 4 and 5 may also require monitoring by a permitted paleontologist.

**Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:**

Direct impacts to or destruction of fossils would occur from unmitigated activities conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities on or near the lease parcels. Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the leasing action would have the beneficial impact in that ground disturbance activities might result in the discovery of important fossil resources. The following lands are likely to contain significant paleontological resources and are subject to Exhibit CO-29 to alert lessee of (PFYC 4 and 5) paleontological area inventory requirement to protect paleontological values are as follows: 6657, 6658, 6659, 6660, 6661, 6662, 6664, 6667, 6669, 6671, 6672.

**Environmental Consequences of Leasing and Development - Cumulative Impacts:**

Cumulative impacts to paleontological resources could result from surface disturbing activities associated with potential development, when added to past, present, and reasonably foreseeable future actions, but would not be expected to contribute to cumulative impacts to paleontological resources in the lease area if protective mitigation measures are followed.

Potential Future Mitigation:

Mitigations will be developed during the NEPA review of individual ground disturbing activities. Typically, such mitigations include provisions for the monitoring of ground disturbance by a BLM permitted paleontologist, a requirement for the operator to inform all persons associated with the project of relevant Federal laws protecting fossil resources, and requirements regarding the disclosure of inadvertent fossil discoveries during construction or operation to the RGFO.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action analysis minus parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: See proposed action. Impacts would not occur to parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: See proposed action. Cumulative impacts would be reduced with the exclusion of #6672.

Potential Future Mitigation: See proposed action.

### **3.4.3.6 Visual Resources**

**Proposed Action**

Affected Environment:

Visual Resource Management (VRM) classes along with the corresponding VRM Objectives were established in the Royal Gorge Field Office in 1996 with the approval of the Royal Gorge Resource Area Resource Management Plan (RMP) for BLM managed surface. Visual Resource Management objectives corresponding to the various management classes provide standards for analyzing and evaluating proposed projects. Projects are evaluated using the Contract Rating System to determine if it meets VRM objectives established by the RMP.

The majority of the parcels proposed for leasing occur on private surface in areas that have already been highly modified including roads, houses, and agricultural development and have not been assigned a VRM management category.

A portion of parcel #6657 is located on the northern toe at the base of the Spanish Peaks in Huerfano County approximately 6 miles south of La Veta, Colorado on BLM managed surface. The landscape in this area is primarily dominated by the impressive Spanish Peaks characterized by a steep mountain rising quickly from the plains and surrounding valleys. The vastness of the plains to the east and the Wet Mountains to the north are also dominant landscape features. The heavily timbered parcels are surrounded by private land on three sides with the Spanish Peaks

Wilderness area managed by the US Forest Service making up the southern parcel boundary. The management objective for this parcel is VRM Class II where the objective is to retain the existing character of the landscape with a low level of change to the characteristic landscape and where management activities may be seen, but should not attract the attention of the casual observer.

Parcel # 6660 and the majority of parcel #6658 are located 2-3 miles outside of Gardner, Colorado off of State Highway 69 on BLM managed surface with a VRM Class IV area where the management objective is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high and management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. The landscape where these parcels are located is comprised of rolling hills and buttes with pinyon/juniper woodlands. When viewed from Gardner, the Wet Mountains serve as the background and dominate landscape feature. The parcels are surrounded by private land with developments typical of large acreage ranches.

A small portion of parcel #6672 is BLM surface that is within the Queens State Wildlife Area and that is managed by the State of Colorado under a cooperative management agreement. The landscape is typical of the area and is relatively flat to rolling hills with low lying vegetation and high levels of development including roads, houses, and agricultural development.

#### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

For the areas proposed for leasing that already have high levels of human modification the proposed action would introduce visual contrasts but at limited levels given the context of the project area, the level of existing development, and the use of best management practices (BMPs) if the lease were to go into production.

Given the rolling terrain, current tree cover, and other development in the area the proposed action would most likely introduce weak visual contrasts on parcels #6658 and 6660. Several major county roads already exist in the area reducing the level of contrast introduced by the construction of roads and pads if the parcels were developed. The terrain and vegetation provide opportunities to locate developments associated with leasing so they are screened from view from highly traveled areas and private residences and would meet the VRM Class IV objectives for these parcels.

Leasing of the portions of parcel #6657 at the base of the Spanish Peaks would most likely introduce weak to no visual contrasts with the surrounding landscape as viewed from key observation points. Contrasts would most likely occur in color and line associated with access routes and the pad. Long-term infrastructure would be screened by the large trees. The closest major travel route is approximately 6 miles away from the parcel on State Highway 12 and the community of La Veta where the views are primarily dominated by the Spanish Peaks themselves and the vastness of the valley making the parcels and any development associated with proposed action not readily noticeable. Other development in the area including private residences and ranches and associated infrastructure would have similar contrasts in line and

color as the proposed action making it less readily noticeable. The heavily timbered nature of the parcels would also allow for the screening of infrastructure if the parcels were developed. These visual impacts would be greater for private land owners that are closer to the parcels but given the context of the site there would still only be weak contrasts meeting the class II VRM management objectives for the parcels.

Environmental Consequences, Cumulative Impacts: Should the leases eventually go to development. There would be the visual impact of additional infrastructure on the land. Depending on the location, these cumulative impacts would vary depending on the visual impacts from other sources.

Potential Future Mitigation: The BMPs could include painting equipment a proper color that blends with the environment and locating facilities so they are off of ridges are screened from nearby residences and are not “skylined”. In split estate areas where there is less development these contrasts would most likely be more readily noticeable due to the lack of other structures or human modifications in the area. BMPs would also be applied to reduce these impacts.

### **Preferred Alternative**

Affected Environment: Same as proposed action except for the lease of parcel #6672 in the Queens State Wildlife Area.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Similar to the proposed action minus the introduction of visual impacts from leasing on parcel #6672 within the Queens State Wildlife Area.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as proposed action.

Potential Future Mitigation: Same as proposed action.

### **3.4.3.7 Hazardous or Solid Wastes**

#### **Proposed Action**

##### Affected Environment:

It is assumed that conditions associated with the proposed project site, both surface and subsurface, are currently clean and that there is no known contamination. A determination will be made by the operator prior to initiating the project, if there is evidence that demonstrates otherwise (such as solid or hazardous substances have been previously used, stored, or disposed of at the project site).

##### Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

The act of leasing the parcels for oil and gas development will not involve the use and management of petroleum products or hazardous substances. However, these activities will take place at the exploration and development stage. The magnitude and location of potential direct and indirect effects cannot be understood or analyzed until the site-specific APD stage of development.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

This action may lead to future operations that would use some type of chemical or petroleum product. However, if mitigation measures are implemented for this action, then future impacts would be limited.

Potential Future Mitigation:

The following mitigations are applied as COAs and assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action analysis minus parcel #6672 in Kiowa County.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: See proposed action. Impacts would not occur to parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: See proposed action. Cumulative impacts would be reduced with the exclusion of #6672.

Potential Future Mitigation: See proposed action.

### **3.4.3.8 Lands with Wilderness Characteristics**

**Proposed Action**

Affected Environment: BLM Manual 6310 provides guidance on updating wilderness characteristics inventories for all BLM managed lands and disclosing impacts of a proposed action on wilderness characteristics if present. The majority of the parcels do not meet the size criteria. However, two parcels, both numbered #6657 (west and east parcels) are directly

adjacent to the Spanish Peaks Wilderness Area so a thorough inventory was conducted on September 26, 2011 by BLM staff. The inventory concluded that the parcels did not meet the naturalness criteria, nor have outstanding opportunities for solitude or primitive recreation, given the small size of the parcels along with the land ownership pattern limiting access and related management challenges.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: None, as the parcels do not have wilderness characteristics.

Environmental Consequences of Leasing and Development - Cumulative Impacts: None.

Potential Future Mitigation: None.

### **Preferred Alternative**

Affected Environment: Same as proposed action.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Same as proposed action.

Environmental Consequences of Leasing and Development - Cumulative Impacts: None.

Potential Future Mitigation: None.

## **3.4.4 Land Resources**

### **3.4.4.1 Recreation**

#### **Proposed Action**

Affected Environment:

The majority of the parcels proposed for lease are located on lands whose surface ownership is not public and no public recreation use occurs or are BLM managed surface but are “land locked” by private ownership with no public recreation use occurring. The BLM surface lands within parcel #6672 and the Queens State Wildlife Area are primarily used for hunting water fowl and upland bird species at unknown levels. Since the reservoir in that area is dry fishing no longer occurs there. Lands within parcel 6658 and 6660 see relatively small amounts of dispersed recreation including hunting and driving for pleasure. Parcel #6657 sees some recreation use associated with the adjacent private land owners who constructed an unauthorized hiking trail and travel through the area on an ATV on the old road network. Public recreation use is extremely limited.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

On the parcels that are either “land locked” or are located on private surface there is no public recreation use and therefore impacts to recreation would be minimal or none.

Leasing and development of the portion of parcel #6672 within the Queens State Wildlife Area would impact both the physical and social setting of the area by introducing additional roads and

other human elements that are not directly related to recreation facilities. Due to the very small size of the parcel there are limited options to locate the facility so that it is screened and not visible from recreational users. Recreation users would most likely choose to avoid this area, especially during drilling operations but other areas would still be available for hunting use.

The leasing and development of BLM surface on parcels # 6658 and 6660 would introduce minor changes in the physical setting the area since there are already primitive roads within or directly adjacent to the parcels. During drilling operations the change in social setting would most likely displace the low level of dispersed recreation use that the parcels receive. There are other nearby places that could be used for similar activities and settings and the impacts would be relatively short term.

The leasing and development of parcel #6657 would alter the physical setting of the area and the social setting during drilling operations. This would most likely displace the small amounts of recreation use that the parcel currently sees or would still be traveled through to get to other destinations including the Spanish Peaks Wilderness area. Impacts to recreation use would be minor.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Because oil and gas development mostly occurs on private land and/or occurs in areas rarely used by recreationists, there is effectively no or very little cumulative impacts to the recreation resource.

Potential Future Mitigation: None

#### **Preferred Alternative**

Affected Environment: Similar to proposed action minus parcel #6672 within the Queens State Wildlife Area.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Similar to the proposed action except there would be no impacts to the Queens State Wildlife Area in association with the leasing of parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Same as proposed action.

Potential Future Mitigation: None.

#### **3.4.4.2 Range Management**

##### **Proposed Action**

Affected Environment:

Most of this area supports short grass prairie. Needleandthread, prairie junegrass, blue grama, galleta, threeawn, ring muhly, and alkali sacaton are the major species. It is likely that the native plant community has been altered due to the long-term grazing practices and crop agriculture in the project area. The nominated parcels include a few livestock grazing allotments administered

by the BLM Royal Gorge Field Office. There may be fences, water developments, and other rangeland improvement projects within the proposed parcels.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts:

Direct and Indirect Impacts: The actual amount of direct and indirect effects to livestock grazing in any given allotment cannot be predicted until the site-specific APD stage of development. Generally there is an initial loss of forage (animal unit month or AUMs) associated with each development-related disturbance. The amount of forage loss will vary based on the productivity of the affected ecological site prior to disturbance as well as the amount of the disturbance that is reclaimed and the success of re-vegetation actions. Livestock forage loss will also vary based on the distance of that site from livestock water sources. Areas with steeper topography are used less by livestock so forage losses resulting from development in those areas have less impact on livestock grazing. The forage loss is reduced by 50-60 percent after successful interim reclamation. After successful final reclamation herbaceous forage production will likely be slightly higher than pre-disturbance levels until woody re-vegetation reestablishes.

Rangeland improvements such as fences, corrals, and watering facilities could be impacted by road and pad construction. Placement of facilities near rangeland improvement projects could compromise their usefulness, particularly during the development stage. In addition closeness to water can increase potential for stock to use the pad areas for resting, rubbing, and potential exposure to other drilling related hazards. Livestock might avoid an area during the period of active development due to the increased activity and noise levels.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

In general, the proposed action would have little cumulative impacts to the range resource, largely since many of the oil and gas leases and development occur on private property. Those oil and gas well pads occurring on BLM grazing allotments are fewer and generally have a small enough footprint that grazing is little effected.

Potential Future Mitigation:

Development actions would avoid rangeland improvement projects (e.g., ponds, tanks, waterlines, fences, corrals, cattle-guards, gates etc.) if possible but if they could not be avoided, the project proponent would relocate the rangeland improvement facilities to an adjacent BLM designated site and reconstruct them to BLM specifications to maintain their original function and purpose. If fences would be affected by development, the project proponent would install temporary fencing to prevent unwanted livestock movement between allotments or pastures. Long term trend monitoring sites would be avoided if at all possible. The BLM notifies grazing permittees on a site-by-site basis as part of the APD process. Best Management Practices would be incorporated into the COAs during evaluation of a specific project or APD.

**Preferred Alternative**

Affected Environment: The affected environment is as described in the proposed action analysis minus parcel #6672 in Kiowa County.



Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: See proposed action. Impacts would not occur to parcel #6672.

Environmental Consequences of Leasing and Development - Cumulative Impacts: See proposed action. Cumulative impacts would be reduced with the exclusion of #6672.

Potential Future Mitigation: See proposed action.

## **CHAPTER 4– COORDINATION AND CONSULTATION**

### **PERSONS/AGENCIES CONSULTED**

Prior to the development of the EA, notification letters were sent to the Colorado Parks and Wildlife (CPW), Native American Tribes and all surface land owners.

CPW was notified of the nominated parcels and the upcoming lease sale in a letter from the BLM state office. Steve Yamashita, Northeast Regional Manager, of CPW submitted comments to the field office on a letter dated February 19, 2013.

BLM also coordinated and had an informal conference with US Fish and Wildlife Service regarding impacts to listed species.

BLM consulted the National Park Service regarding the Santa Fe Trail.

BLM consulted the Colorado State Historic Preservation Office regarding the effects of the proposed undertaking on historic properties.

BLM consulted with the Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Tribe of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, the Ute Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe, regarding potential effects of the undertaking on known sacred or traditional sites.

### **LIST OF PREPARERS AND PARTICIPANTS**

#### **INTERDISCIPLINARY REVIEW**

<b>Name</b>	<b>Title</b>	<b>Resource</b>
Martin Weimer	FRDO NEPA Coordinator	Project Lead

<b>Name</b>	<b>Title</b>	<b>Resource</b>
Chad Meister	Air Quality Scientist	Air Quality / Climate
Stephanie Carter/Melissa Smeins	Geologist	Solid Minerals, Paleontology, Hazardous and Solid Wastes
Marvin Hendricks	Petroleum Engineer	Fluid Minerals
John Smeins	Hydrologist	Water Quality (Ground and surface), Soils
John Lamman	Range Specialist	Invasive Plants, Rangeland Mgt., Prime and Unique Farmlands, Upland Vegetation
Matt Rustand	Wildlife Biologist	Special Status Plants and Animals, Wildlife Terrestrial, Migratory Birds
Dave Gilbert	Fisheries Biologist	Wildlife Aquatic, Wetlands and Riparian
Ken Reed	Forester	Forestry
Monica Weimer	Archaeologist	Cultural Resources, Native American Religious Concerns
David Epstein	Economist	Socioeconomics, Environmental Justice
Kalem Lenard	Recreation Planner	Visuals, Lands with Wilderness Characteristics, Special Designations, Recreation, Access and Transportation
Vera Matthews/Steve Craddock	Realty Specialist	Realty Authorizations
Bob Hurley	Fire Management Officer	Fire Management
Jeff Covington	Surveyor	Cadastral Survey

## **CHAPTER 5 - REFERENCES**

Bureau of Land Management (BLM). 1993. Draft Resource Management Plan and Environmental Impact Statement. Royal Gorge Field Office. Canon City, Colorado.

Bureau of Land Management. 1996. Royal Gorge Resource Area Resource Management Plan and Record of Decision. Royal Gorge Field Office. Canon City, Colorado.

Bureau of Land Management. 2008. H-1790-1 National Environmental Policy Handbook. Washington, D.C.

Bureau of Land Management. 1986. Northeast Resource Area Resource Management Plan

and Record of Decision. Northeast Field Office. Denver, Colorado.

Bureau of Land Management. 1991. Colorado Oil and Gas Leasing and Development, Final Environmental Impact Statement. Lakewood, Colorado.

Bureau of Land Management. 2012. Reasonable Foreseeable Development Scenario for Oil and Gas, Royal Gorge Field Office, Colorado.

**Attachment A – All Nominated Parcels**  
**All Nominated Parcels/Proposed Action With Stipulations for Lease November 2013 -**  
**Colorado Competitive Oil & Gas Lease Sale**

THE FOLLOWING ACQUIRED LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

**PARCEL 6669**

PM: 6 T: 0230S R: 0490W

Section 22: S2;

U.S. Interest 25%

Section 27: NW;

U.S. Interest 50%

Bent County Colorado 480 Acres

PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6672**

PM: 6 T: 0200S R: 0470W

Section 8: W2SW;

Section 8: EXCL R/W C-0123376;

Section 23: SENW;

Section 23: EXCL R/W C-0123376;

Kiowa County Colorado 10.35 Acres

PVT/BLM; BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect mule deer winter range.

All lands are subject to Exhibit RG-10 to protect bald eagle wintering habitat.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-04 to protect bald eagle roosts or nests.

All lands are subject to Exhibit CO-07 to protect waterfowl and shorebird habitat and rookeries.

All lands are subject to Exhibit CO-17 to protect white pelican nesting and feeding habitat.

All lands are subject to Exhibit CO-23 to protect bald eagle winter roost sites

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6671**

PM: 6 T: 0230S R: 0500W  
Section 7: Lots 2-4;  
Section 7: SENW,E2SW;

Bent County Colorado 254.55 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6662**

PM: 6 T: 0250S R: 0520W  
Section 30: Lots 1,2; E2NW;

Bent County Colorado 160.65 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6657**

PM: 6 T: 0300S R: 0670W  
Section 18: Lot4;  
Section 18: SESW,E2SE;

Huerfano County Colorado 157.81 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

**PARCEL 6658**

PM: 6 T: 0260S R: 0690W  
Section 8: E2SW,SE;  
Section 9: ALL;

Huerfano County Colorado 880 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

The following lands are subject to Exhibit RG-09 to protect wild turkey habitat:

PM: 6 T: 0260S R: 0690W  
Section 9: ALL;

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6659**

PM: 6 T: 0250S R: 0700W  
Section 25: S2NW,SW,W2SE;

Huerfano County Colorado 320 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit RG-09 to protect wild turkey habitat.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6660**

PM: 6 T: 0260S R: 0700W  
Section 3: Lots 5,6;

Huerfano County Colorado 104.95 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6661**

PM: 6 T: 0260S R: 0700W  
Section 3: E2SW;

Huerfano County Colorado 80 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6667**

PM: 6 T: 0260S R: 0700W  
Section 25: SESE;

Huerfano County Colorado 40 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6664**

PM: 6 T: 0110N R: 0560W  
Section 10: NWNW;

Weld County Colorado 40 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.



**Attachment B - Parcels Available for Lease with Deferred Portions  
Nov 2013 - Colorado Competitive Oil & Gas Lease Sale**

**Available portion of PARCEL ID: 6672**

None

**Deferred portion of PARCEL ID: 6672**

PM: 6 T: 0200S R: 0470W

Section 8: W2SW;

Section 8: EXCL R/W C-0123376;

Section 23: SENW;

Section 23: EXCL R/W C-0123376;

Protection of special values at the State  
Wildlife Area (SWA)

Kiowa County Colorado 10.35 Acres  
PVT/BLM; BLM/BLM; CCDO: RGRA

**Attachment C - Parcels Available for Lease with Applied Stipulations**  
**November 2013 - Colorado Competitive Oil & Gas Lease Sale**

**RGFO November Lease Sale**

THE FOLLOWING ACQUIRED LANDS ARE SUBJECT TO FILINGS IN THE MANNER SPECIFIED IN THE APPLICABLE PORTIONS OF THE REGULATIONS IN 43 CFR, SUBPART 3120.

**PARCEL 6669**

PM: 6 T: 0230S R: 0490W

Section 22: S2;

U.S. Interest 25%

Section 27: NW;

U.S. Interest 50%

Bent County Colorado 480 Acres

PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6671**

PM: 6 T: 0230S R: 0500W

Section 7: Lots 2-4;

Section 7: SENW,E2SW;

Bent County Colorado 254.55 Acres

PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6662**

PM: 6 T: 0250S R: 0520W

Section 30: Lots 1,2; E2NW;

Bent County Colorado 160.65 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-19 to protect ferruginous hawk nesting and fledgling habitat.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6657**

PM: 6 T: 0300S R: 0670W

Section 18: Lot4;

Section 18: SESW,E2SE;

Huerfano County Colorado 157.81 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6658**

PM: 6 T: 0260S R: 0690W

Section 8: E2SW,SE;

Section 9: ALL;

Huerfano County Colorado 880 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

The following lands are subject to Exhibit RG-09 to protect wild turkey habitat:

PM: 6 T: 0260S R: 0690W

Section 9: ALL;

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6659**

PM: 6 T: 0250S R: 0700W  
Section 25: S2NW,SW,W2SE;

Huerfano County Colorado 320 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit RG-09 to protect wild turkey habitat.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6660**

PM: 6 T: 0260S R: 0700W  
Section 3: Lots 5,6;

Huerfano County Colorado 104.95 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6661**

PM: 6 T: 0260S R: 0700W

Section 3: E2SW;

Huerfano County Colorado      80 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6667**

PM: 6 T: 0260S R: 0700W  
Section 25: SESE;

Huerfano County Colorado      40 Acres  
BLM/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

**PARCEL 6664**

PM: 6 T: 0110N R: 0560W  
Section 10: NWNW;

Weld County Colorado      40 Acres  
PVT/BLM; CCDO: RGRA

All lands are subject to Exhibit RG-08 to protect deer and elk winter ranges.

All lands are subject to Exhibit CO-03 to protect raptor nests.

All lands are subject to Exhibit CO-18 to protect raptor nesting and fledgling habitat.

All lands are subject to Exhibit CO-29 to alert lessee of Class I and II paleontological area inventory requirement.

All lands are subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal.

All lands are subject to Exhibit CO-39 to protect cultural resources.

## **Attachment D - Stipulation Exhibits**

### **EXHIBIT CO-03**

Lease Number:

#### **NO SURFACE OCCUPANCY STIPULATION**

No surface occupancy or use is allowed on the lands described below (legal description or other description):

For the purpose of:

To protect raptor nests within a one-eighth mile radius from the site.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

An exception may be granted depending on current usage, or on the geographical relationship to topographic barriers and vegetation screening.

### **EXHIBIT CO-04**

Lease Number:

#### **NO SURFACE OCCUPANCY STIPULATION**

No surface occupancy or use is allowed on the lands described below (legal description or other description):

For the purpose of:

To protect bald eagle roosts and nests within a one-quarter mile radius from the site.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

An exception may be granted to this stipulation depending on the current usage of the site, or the geographical relationship to the topographic barriers and vegetation screening.

Lease Number:

#### EXHIBIT CO-07

Lease Number:

#### NO SURFACE OCCUPANCY STIPULATION

No surface occupancy or use is allowed on the lands described below (legal description or other description):

For the purpose of:

To protect waterfowl and shorebird habitat and rookeries within significant production areas.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

#### EXHIBIT CO-17

Lease Number:

#### TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

March 16 through September 30

For the purpose of (reasons):

To protect white pelican nesting and feeding habitat during usage.



Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

#### EXHIBIT CO-18

Lease Number:

#### TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

February 1 through August 15

For the purpose of (reasons):

To protect raptor (this includes golden eagles, all accipiters, falcons [except the kestrels], all butteos, and owls) nesting and fledgling habitat during usage for one-quarter mile around the nest site.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

Exceptions may be granted during years when the nest site is unoccupied, when occupancy ends by or after May 15, or once the young have fledged and dispersed from the nest.

#### EXHIBIT CO-19

Lease Number:

#### TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

February 1 through August 15

For the purpose of (reasons):

To protect ferruginous hawk nesting and fledgling habitat during usage for a one-quarter mile buffer around the nest.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

Exceptions may be granted during years when a nest site is unoccupied, when occupancy ends by or after May 15, or once the young have fledged and dispersed from the nest.

#### EXHIBIT CO-23

Lease Number:

#### TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

November 16 through April 15

On the lands described below:

For the purpose of (reasons):

To protect bald eagle winter roost sites within a one-half mile buffer around the site

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

Exceptions may be granted for partial or complete visual screening of the oil and gas activity from the primary zone (that is, one-quarter mile around the roost site).

EXHIBIT CO-28

Lease Number:

CONTROLLED SURFACE USE STIPULATION

Surface occupancy or use is subject to the following special operating constraints.

On the lands described below:

For the purpose of:

To protect perennial water impoundments and streams, and/or riparian/wetland vegetation by moving oil and gas exploration and development beyond the riparian vegetation zone.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Exception Criteria:

Exceptions may be granted only if an on-site impact analysis shows no degradation of the resource values.

EXHIBIT CO-29

Lease Number:

LEASE NOTICE

The lessee is hereby notified that prior to any surface disturbing activities, an inventory of paleontological resources (fossils) may be required. Mitigation may be required **such as monitoring in any area of PFYC 4 or 5 surface disturbance and also** 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 100 meters. 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).

On the lands described below:

## EXHIBIT CO-34

Lease Number:

### ENDANGERED SPECIES ACT SECTION 7 CONSULTATION STIPULATION

The lease area 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 a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

## EXHIBIT CO-39

Lease Number:

### CONTROLLED SURFACE USE STIPULATION

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, E.O.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 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.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

EXHIBIT RG-08

Lease Number:

TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

December 1 through March 31

For the purpose of (reasons):

To protect deer and elk winter ranges.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

EXHIBIT RG-09

Lease Number:

TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

April 1 through July 31

For the purpose of (reasons):

To protect wild turkey habitat.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

EXHIBIT RG-10

Lease Number:

TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities.

December 1 through March 31

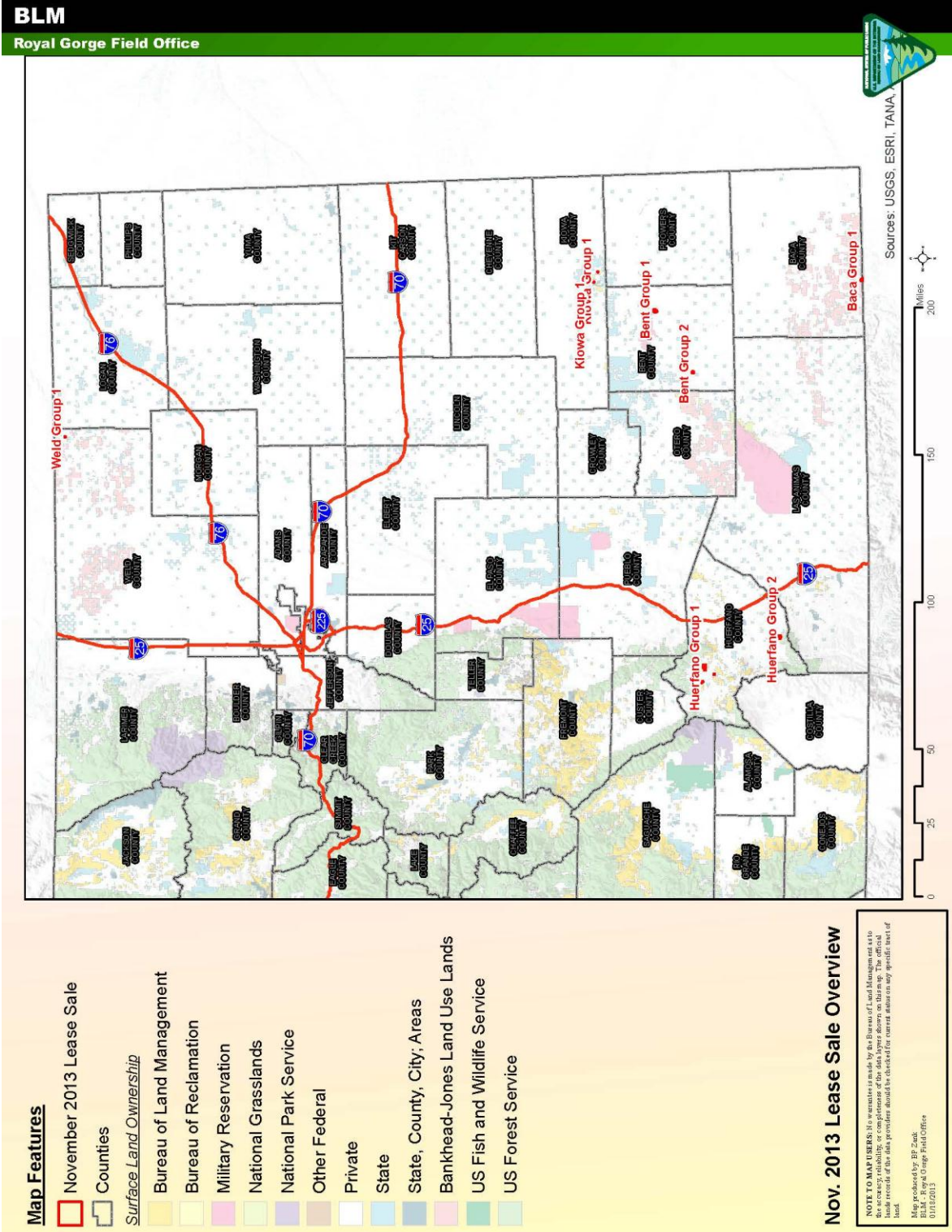
For the purpose of (reasons):

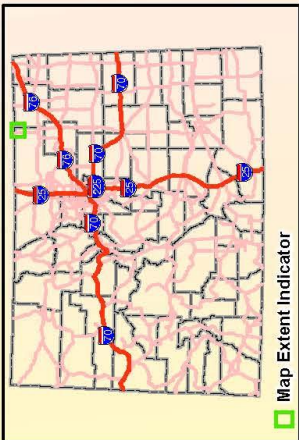
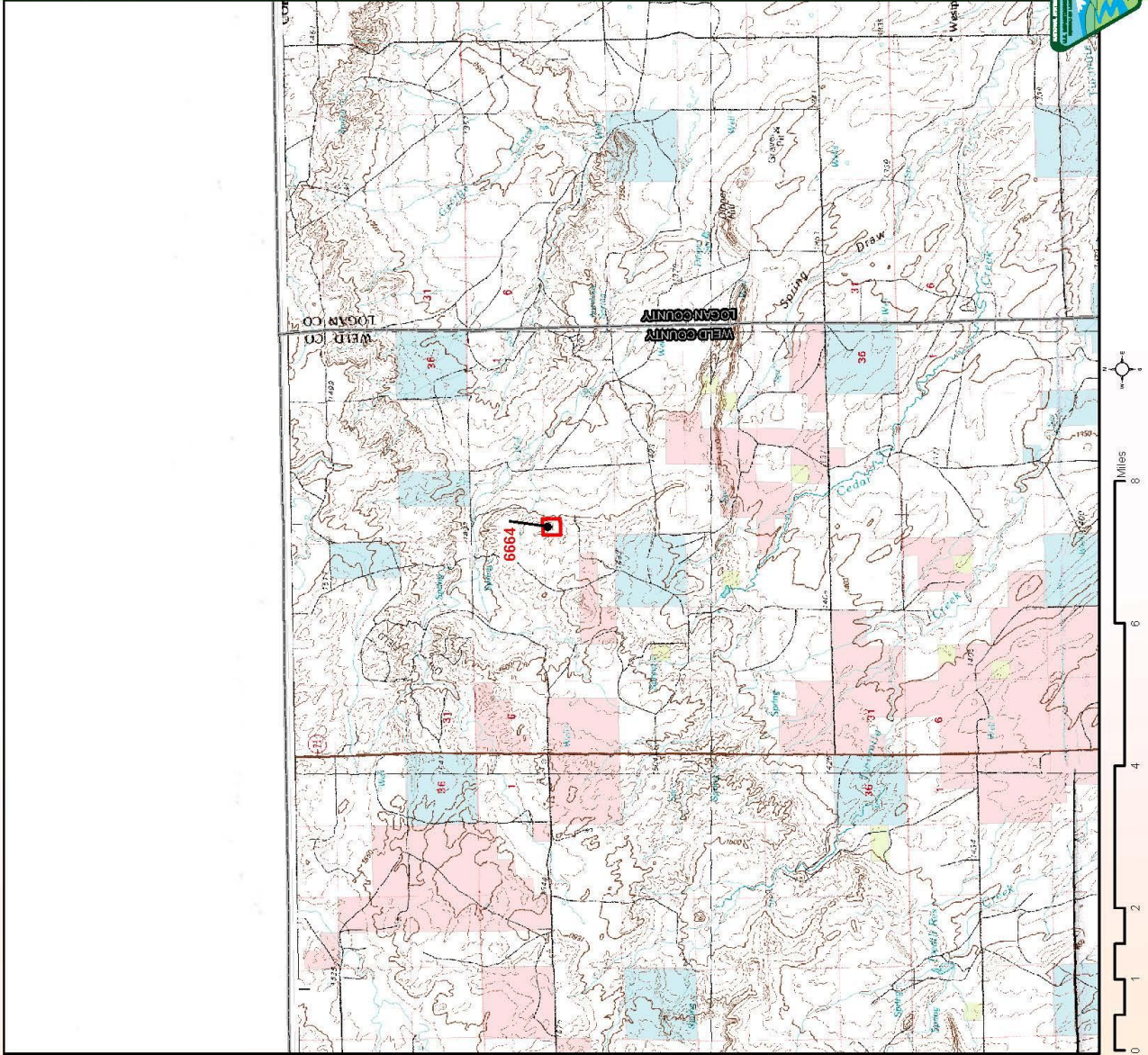
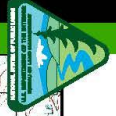
To protect bald eagle wintering habitat.

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of the stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

# Attachment E – Maps

## Lease Overview





**Map Features**

November 2013 Lease Sale

Counties

Surface Land Ownership

National Grasslands

Private

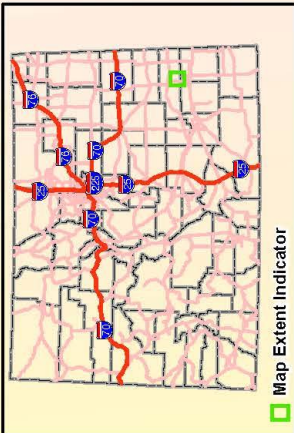
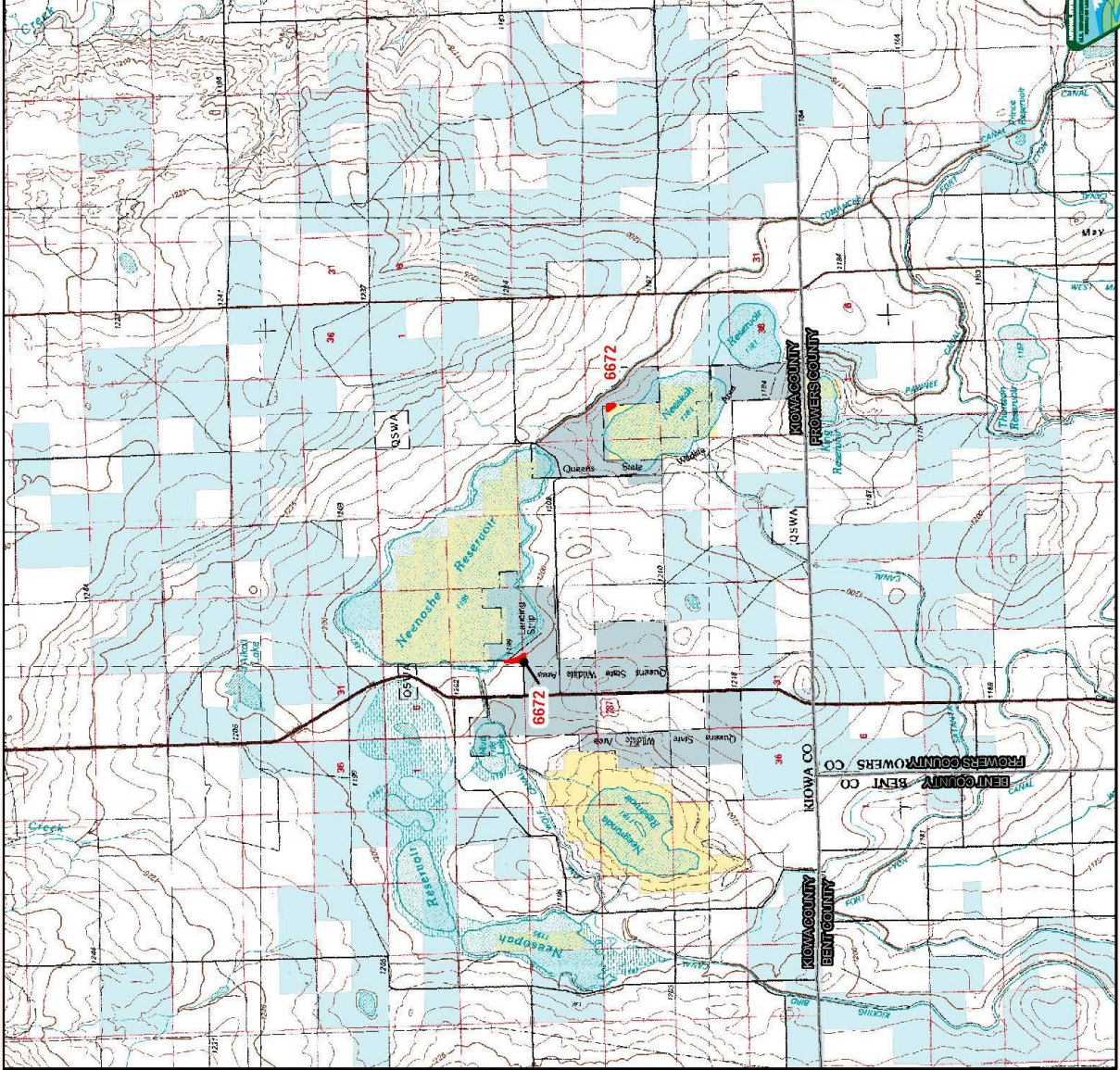
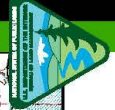
State








Bankhead-Jones Land Use Lands

**Weld Group 1**

NOTE TO MAP USERS: No warranty is made by the Bureau of Land Management as to the accuracy of the data provided. Users should check for current status on any specific tract of land.  
BLM - Royal Gorge Field Office  
03/14/2013

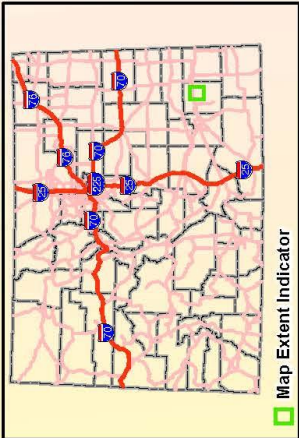
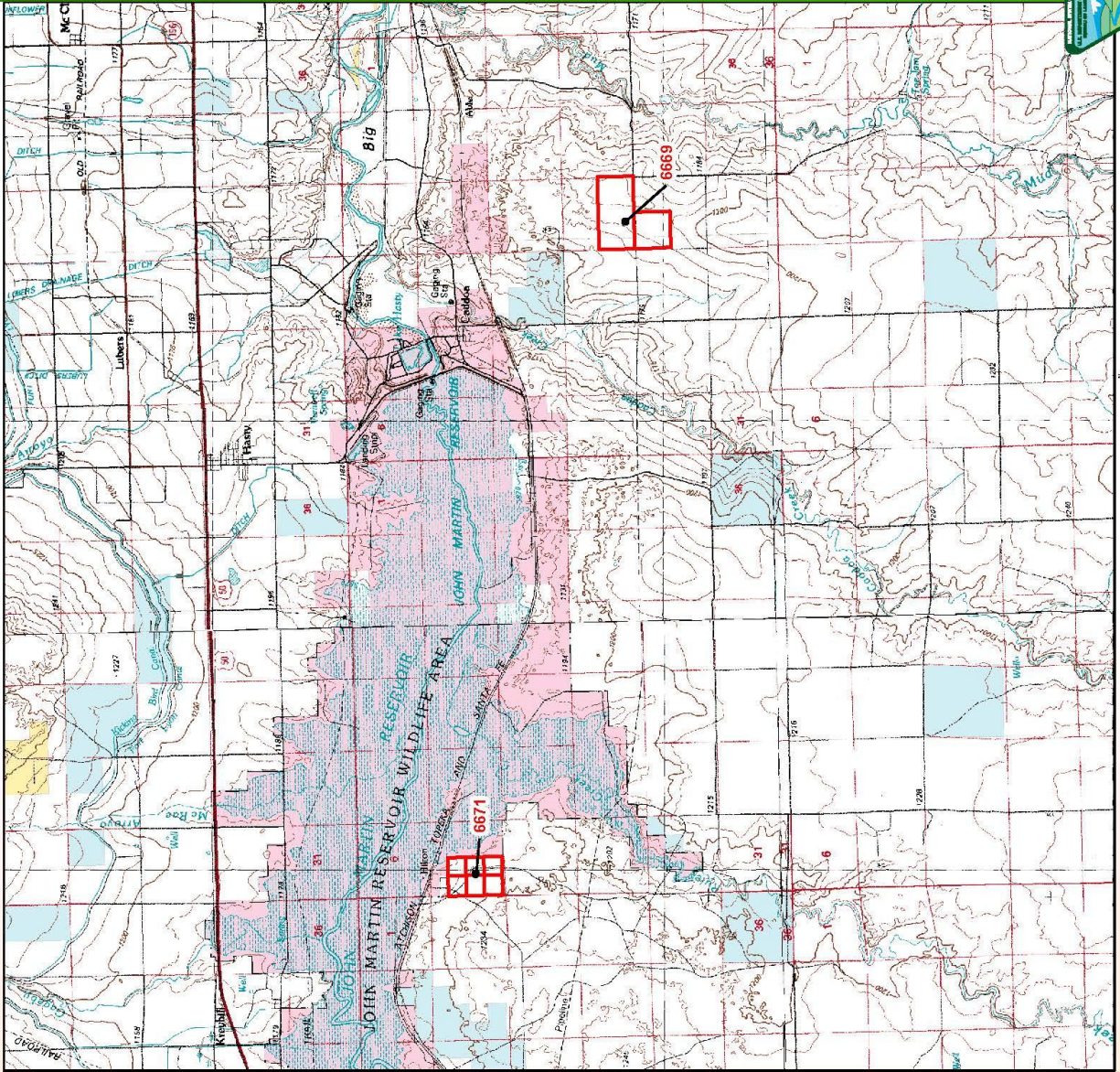
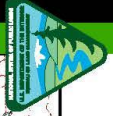




-  Map Extent Indicator
- Map Features**
-  November 2013 Lease Sale
-  Counties
- Surface Land Ownership**
-  Bureau of Land Management
-  Private
-  State
-  State, County, City, Areas

**Kiowa Group 1**

NOTE TO MAP USERS: No warranty is made by the Bureau of Land Management as to the accuracy of the data provided. Users should check for current status on any specific tract of land.  
BLM - Royal Gorge Field Office  
9/31/2013

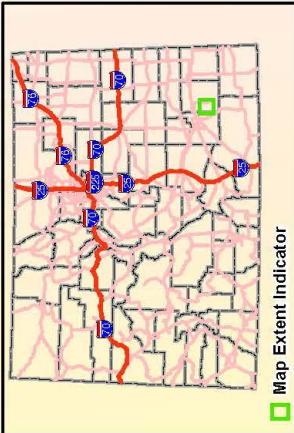
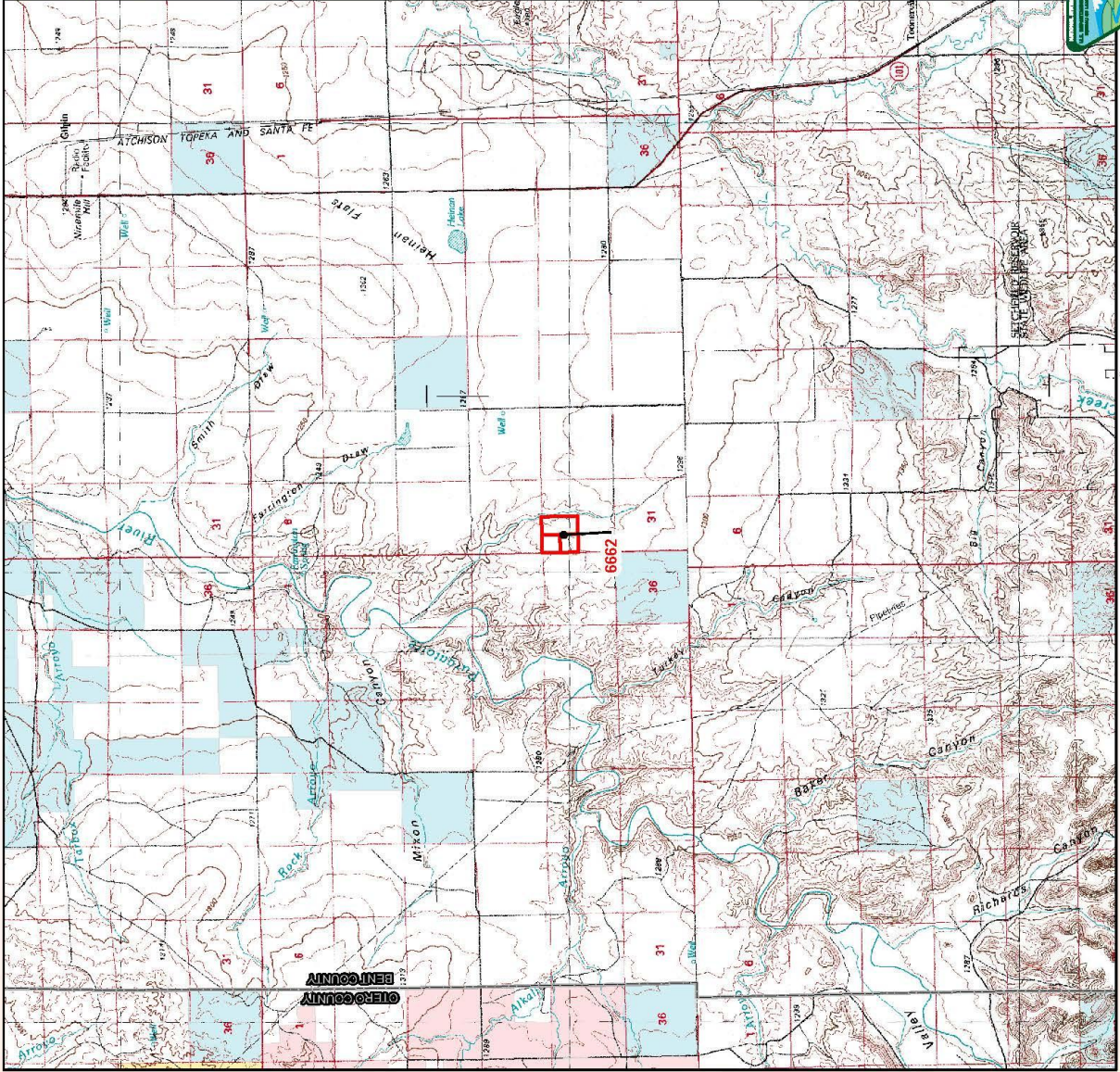


- Map Features**
- November 2013 Lease Sale
  - Counties
- Surface Land Ownership**
- Bureau of Land Management
  - Military Reservation
  - Private
  - State

**Bent Group 1**

NOTE TO MAP USERS: Users are advised that the Bureau of Land Management is not responsible for the accuracy of the data provided on this map. The accuracy of the records of the data providers should be checked for current status on any specific tract of land.

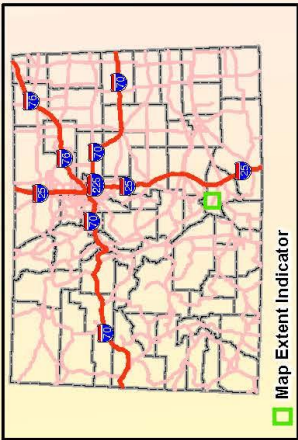
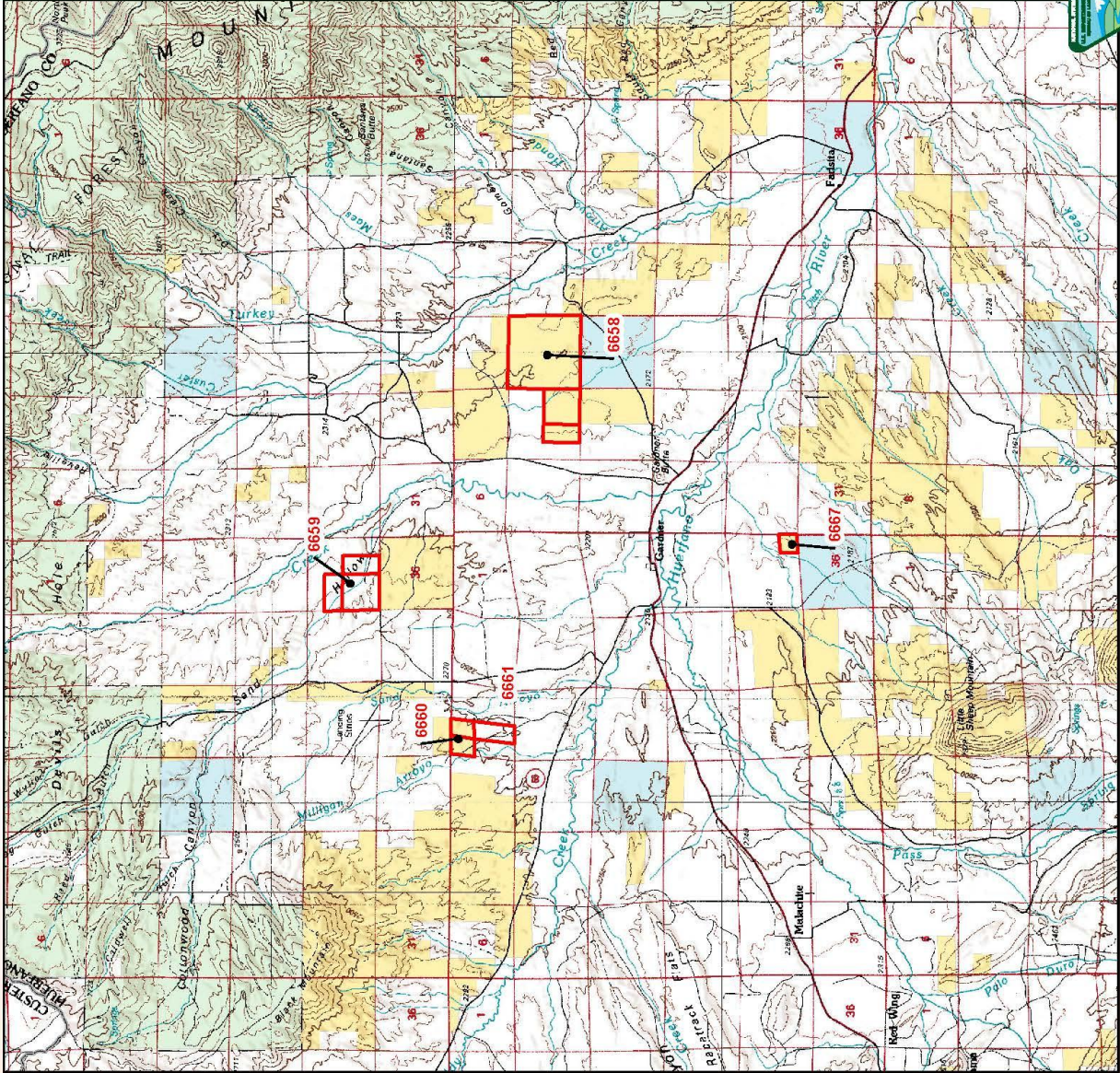
BLM - Royal Gorge Field Office  
03/14/2013



- Map Extent Indicator
- Map Features**
- November 2013 Lease Sale
- Counties
- Surface Land Ownership**
- Bureau of Land Management
- Private
- State
- Bankhead-Jones Land Use Lands

**Bent Group 2**

NOTE TO MAP USERS: No warranty is made by the Bureau of Land Management as to the accuracy of the data provided. Users should check for current status on any specific tract of land.  
BLM - Royal Gorge Field Office  
03/16/2013

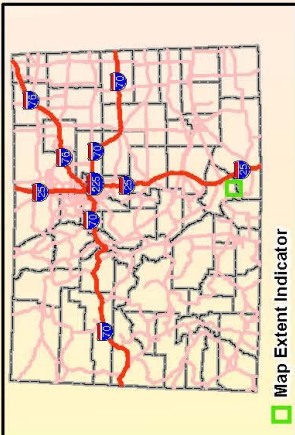
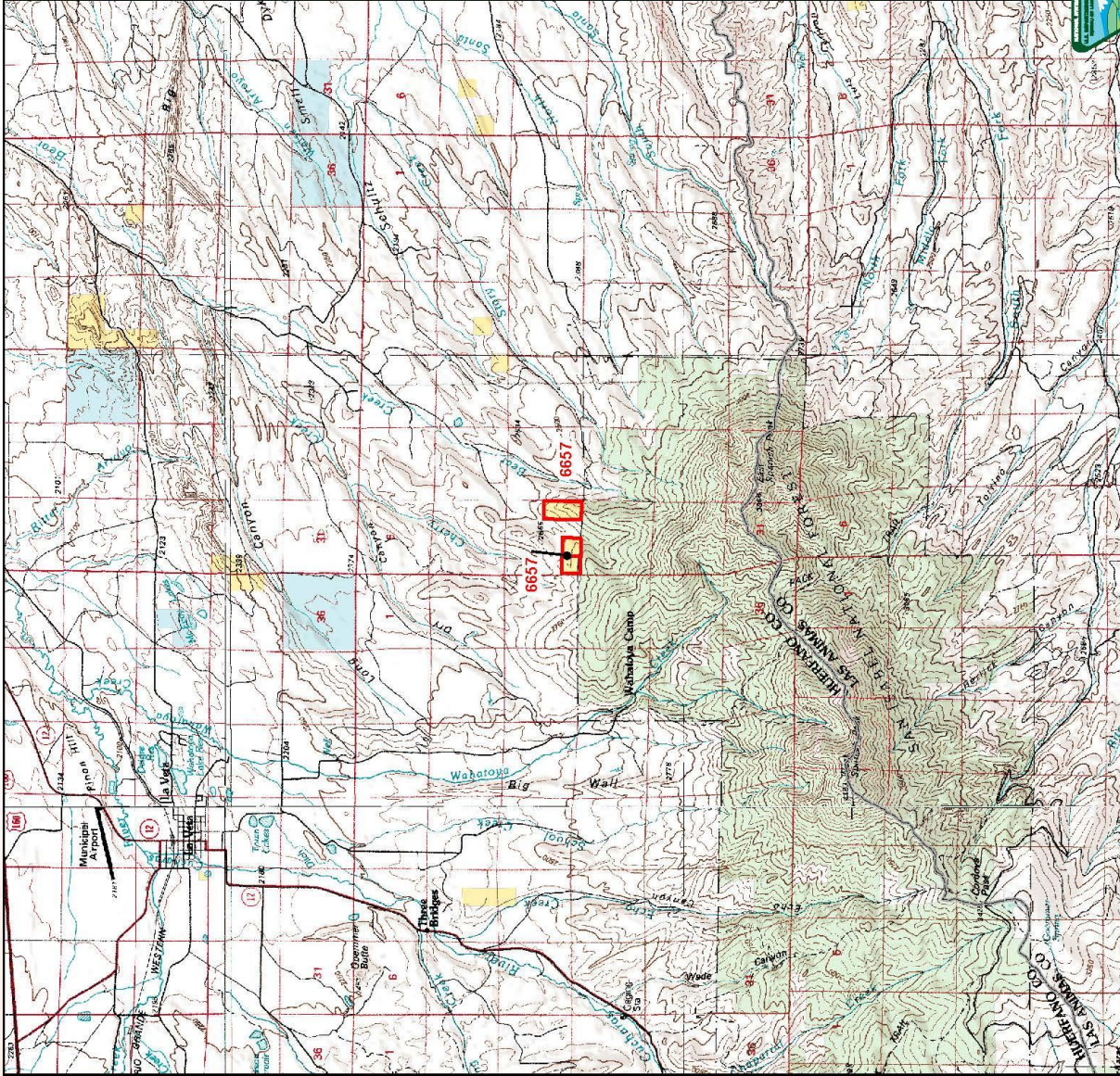


- Map Extent Indicator
- Map Features**
- November 2013 Lease Sale
- Counties
- Surface Land Ownership**
- Bureau of Land Management
- Private
- State
- US Forest Service

**Huerfano Group 1**

NOTE TO MAP USERS: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data layer shown on this map. The official book records of the data providers should be checked for current status on any specific tract of land.

BLM - Royal Gorge Field Office  
03/14/2013



**Map Features**

- November 2013 Lease Sale
- Counties

Surface Land Ownership

- Bureau of Land Management
- Private
- State
- US Forest Service

**Huerfano Group 2**

NOTE TO MAP USERS: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land record of the data provider should be checked for current status on any specific tract of land.  
BLM - Royal Gorge Field Office  
03/14/2013

**Attachment F – Summary of Public Comments and Responses  
November 2013 Oil & Gas Lease EA**

**Summary of Substantial Public Comments Topics**

A summary of topics raised by public comments are addressed below or in each of the relevant resource sections of the EA and if warranted considered in modifying the proposed action. Some issues raised by the public are related to development stage oil and gas activity while others are commonly addressed during the lease stage. Copies of public comments received are available for viewing at the Royal Gorge Field Office. Comments are either presented verbatim or summarized if multiple commenters had similar comments (commenter’s initials follow the comment). A summary of public comment topics to the draft EA is as follows:

<b>COMMENTS TOPIC SUMMARY</b>	<b>BLM RESPONSE</b>
<b>Wildlife</b>	
Parcel #6657 and #6658 are stipulated for elk winter range but no provision is made for elk calving habitat (Rky Mtn Wild, JB, SF, RM).	Parcel #6658 is not within a known elk production area. The Royal Gorge RMP does not contain a stipulation that may be attached to protect elk calving habitat. Additionally, the act of leasing will have no impact on elk calving habitat. If an application for a permit to drill (“APD”) is sent to the BLM for this particular parcel where the surface disturbance occurs within the parcel boundary, a condition of approval (COA) may be developed to protect elk calving habitat if appropriate.
Parcel #6657, #6658, #6659 Lynx - BLM should consider the guidelines in the Southern Rockies Lynx amendment to the forest plans (Rky Mtn Wild).	Portions of the listed parcels occur within the Spanish Peaks Lynx Analysis Unit; however, the habitat characteristics present (grassland, piñon/juniper woodland, mesic mixed coniferous forest) within parcels are not considered to be lynx habitat.
Parcel #6671, #6672 Bald Eagle - Please follow the FWS’ Guidelines for Raptor Conservation in the Western United States. The above listed parcels will impact bald eagle winter range and should be deferred or proper stipulations should be attached to these parcels aimed at protection of the species (Rky Mtn Wild).	Parcel #6671 does not occur within bald eagle winter habitat (shortgrass prairie and shrubland) and no known winter roost sites occur in the vicinity of parcel #6671. Parcel #6672 has stipulation RG-10 to protect bald eagle winter roost sites. Stipulation RG-10 is consistent with the FWS’ Guidelines for Raptor Conservation in the Western United States.
Parcel #6658, #6659 Dwarf Milkweed - Prior to any leasing or surface disturbance on parcels 6658 and 6659, a survey for dwarf milkweed should be conducted that analyzes the leasing decisions based on current conditions and information (Rky Mtn Wild).	If an application for a permit to drill (“APD”) is sent to the BLM for this particular parcel where the proposed surface disturbance would occur within the parcel boundary, a survey for <i>Asclepia uncialis</i> would be conducted where surface disturbance is proposed to occur before approval of any surface-disturbing activities, as stated in the draft environmental assessment. If <i>Asclepia uncialis</i> is located, actions will be taken to protect the plant(s).
Huerfano County Parcels #6657, #6658, #6659, #6660, #6661 and #6667 The land areas in rural	Protective stipulations for wildlife have been applied where appropriate. The act of leasing will have no

Huerfano County that are used as habitats by elk, bear, deer, lynx, turkey, cougar, and other animals. Given the age of the RMP there is a clear need to re-inventory, document and map these habitats before a decision regarding oil and gas leasing can be made (CHC, BK, JTM, HM, MH, SF)	impact on wildlife habitat. Field visits were made to the parcels and the most recent CPW files and data were used in the analysis. If an application for a permit to drill (“APD”) is sent to the BLM for these parcels where the surface disturbance would occur within the parcel boundary, additional conditions of approval (COAs) may be developed to protect wildlife resources.
Parcel #6658, #6659 Comment that a large herd of pronghorn antelope inhabit the area. (JB, JTM)	Winter range is the limiting factor for most big game species in Colorado. Stipulation RG-10 has been attached to the listed parcels to prevent disturbance to big game species during the critical winter period.
Parcel #6659 There would be impacts to golden eagle nesting. (JB,SF)	Stipulations have been attached to this parcel to protect nesting raptors (CO-03 and CO-18).
<b>Visual Resources</b>	
Parcel #6657 is classed as VRM class II where the objective is to retain the existing character of the landscape and where management activities may be seen, but should not attract the attention of the casual observer. BLM should conduct an analysis on the possible impact that oil and gas development will have on the visual landscape (Rky Mtn Wild).	Section 3.4.3.6 Visual Resources analyzes the impacts that oil and gas development would have on visual resources for parcel #6657. It concludes that the proposed action would most likely introduce contrasts in color and line in association with pad and road development but would not be readily visible to the casual observer from State Highway 12 where the closest key observation point is located.
All Huerfano County Parcels. This is a scenically beautiful area, and that could be damaged by oil and gas operations. General visual impacts. (HM, SC)	Section 3.4.3.6 Visual Resources analyzes the impacts that oil and gas development would have on visual resources in association with the proposed action. The BMPs could include painting equipment a proper color that blends with the environment and locating facilities so they are off of ridges are screened from nearby residences and are not “skylined”.
<b>Wilderness and LWC</b>	
Parcel #6657 It is unimaginable that the huge industrial nature of fracing this area would not be glaringly obvious to the casual observer. The heavily timbered nature of the area was not placed there for screening of industrial activity, and to suggest that this is the case is astounding. Also to conclude that the parcel was not natural due to past abuses and exploitation, is to categorize it as being valueless for solitude and therefore suited for even further desecration. (KA&JE, RM)	<p>Section 3.4.3.6 Visual Resources analyzes the impacts that oil and gas development would have on visual resources for parcel #6657. It concludes that the proposed action would most likely introduce contrasts in color and line in association with pad and road development but would not be readily visible to the casual observer from State Highway 12 where the closest key observation point is located. The discussion in the EA was modified to better clarify the analysis process.</p> <p>Section 3.4.3.8 addresses impacts to land with wilderness characteristics. BLM Manual 6310 provides guidance and policy in determining if BLM managed lands meet the criteria for having wilderness characteristics. The inventory concluded that the #6657 parcels did not have sufficient naturalness, nor outstanding opportunities for solitude, nor primitive recreation given the small size of the parcels along with the land ownership pattern limiting access and creating management challenges. In addition it found that it did not contain naturalness due to evidence of past logging including two constructed roads and the eastern parcel was not natural based on a constructed trail marked with</p>

	orange spray paint blazes. The EA was modified to clarify the findings of the inventory for wilderness characteristics.
<b>Transportation</b>	
Parcel #6657 is a Roadless Area under the 2001 Rule Boundaries USFS 2008. The invasive nature of oil and gas roads and infrastructure can increase the risk of erosion, landslides, and slope failure, endangering the health of watersheds that provide drinking water to local communities and critical habitat for fish and wildlife (Rky Mtn Wild).	<p>The US Forest Service 2001 Roadless Rule only applies to US Forest Service managed lands. Parcel #6657 is on lands managed by the BLM and therefore the US Forest Service 2001 Roadless Rule is not applicable.</p> <p>All oil and gas infrastructure and operations must follow BLMs Gold Book standards for oil and gas exploration and development. This includes taking into account geology and other environmental conditions when developing infrastructure, to minimize or eliminate failures that would result in unmitigatable impacts to the human or natural environment. (See The Gold Book – Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development)</p>
<b>Hydrology</b>	
Parcel #6657 these parcels on the north face of East Spanish Peaks are within the hydrographic boundary that would have an impact on the watershed that has already witnessed contamination from deep coal bed methane activity by Petroglyph Energy, Inc. Unique geology created by the radiating igneous intrusions (dikes and sills) that include the north face of East Spanish Peak is thought to have allowed for increased deep water transmission from Petroglyphs activities. In fact, altered zones of shale associated with dikes and sills can be looked upon as conduits through which water can move readily.[1] Any oil and gas activity which will drill into these unique geologic areas with contaminated water at any level risks contamination of the aquifer. (ARW, JB, SF)	<p>Onshore Order #2 requires that the proposed casing and cementing programs be conducted to protect and/or isolate all usable water zones. This would include isolating the well bore through any possible transmission zones.</p> <p>Section 3.1.4.5 discloses that eventual drilling of the proposed parcels would most likely pass through useable groundwater, and the potential impacts to groundwater resources that could occur if proper cementing and casing programs are not followed. Please see Section 3.1.4.5 for a full discussion of potential impacts to groundwater.</p>
All Huerfano County Parcels. Water availability is in short supply in the region. What impact will the oil and gas development have on these resources. Where would industry get all their water for fracing operations? Are the surface, ground water aquifer issues being addressed? (JB, JTM, JM, SF)	While oil and gas drilling can lead to water quantity issues, water rights and quantity are the jurisdiction of the state. Since the Huerfano and Arkansas river basins are over appropriated already, any new oil and gas development would be required to obtain water from existing sources, i.e. purchasing from municipal or agricultural supplies that are willing to sell or lease.
Parcels #6658, #6659 “There could be possible contamination of surface and groundwater from chemical spills.” (SC)	Standard Best Management Practices, such as pit lining, setbacks, closed loop drilling, etc., are applied at the APD stage of development that mitigate the possibility spills reaching surface or ground water.
<b>NEPA</b>	
The Draft EA contains only two alternatives: a “not present” and “not expected” to be impacted by the proposed action or alternative. Draft EA at 9. This range of alternatives is not consistent with the National Environmental Policy Act (NEPA), however, which requires BLM to “[r]igorously explore and objectively evaluate all reasonable alternatives” to proposed federal	With the leasing process any given parcel is either leased or not leased. The Royal Gorge Resource Management Plan (1996) has identified the parcels in the November 2013 lease sale as being available for lease. All nominated parcels that are in conformance with the land use plan make up the proposed alternative. The draft EA contains the proposed alternative and a no action (no



actions (Rky Mtn Wild).	leasing) alternative. The decision-maker may choose either alternative, or elements of each (including deferral or removal of one or more parcels from the sale) when making the decision regarding parcels to be offered in the November 2013 lease sale. Alternately, if through analysis a certain parcel or parcels are removed from consideration, the list of remaining parcels could be used to make up a third alternative.
Parcels #6657, #6658 through #6661 and #6667. The EA references information and decisions from the Royal Gorge RMP that is 17 years out of date. New circumstances and conditions have arisen making the RMP leasing decisions obsolete.	Decisions for leasing in the Royal Gorge and North East RMPs are based on provisions and exceptions as listed in the Mineral Leasing Act of 1920 as interpreted by 43CFR 3100. Resource values are evaluated during RMP development and RMP decisions protect these values by removing a parcel from leasing or applying stipulations that protect the resource value while allowing leasing and development to proceed. The analysis in a leasing EA allows for new conditions or information about a parcel to be evaluated to determine the potential for new significant impacts beyond those identified in the RMP EIS and whether there is a need for a parcel to be removed or deferred for further analysis or additional protective stipulations.
All Huerfano County Parcels. More clarity and detail is required when describing the “Nov 2013 RGFO parcels with stipulations,” namely the stipulations should be described with greater particularity. (DL)	The protective stipulations assigned to each parcel are listed with that parcel in Attachment A of proposed parcels at the end of the EA. These are further described in the Exhibits attachment. The sale notice and amendments reflect the final list of parcels to be offered and their associated stipulations. The stipulations are derived from analysis in the RMP and federal law such as Endangered Species Act or the National Historic Preservation Act.
<b>Oil and Gas</b>	
Huerfano County Parcels #6657, #6658, #6659, #6660 #6661 and #6667 In the past several years, we have learned that oil and gas development in general, and especially <u>injection wells</u> and <u>hydraulic fracturing</u> , have the proven potential to damage nearby USFS and BLM lands, plants, wildlife and humans due to air and water pollution and induced seismic activity. These changes in oil and gas activity are either ignored or glossed over in the EA (CHC, HM, SC).	<p>The BLM acknowledges the fact that oil &amp; gas development has the potential to impact the lands where this takes place, and takes responsibility in trying to limit adverse impacts as much as possible.</p> <p>There may have been limited instances where development stage activities have impacted public lands, the environment and water resources. However, the actual occurrence of detrimental events is far less frequent than the commenter implies. Water injection (also known as waterflooding) and hydraulic fracturing for purposes of increasing oil production have been in use since the 1880s and since 1947 has become a standard industry practice. While fracing has received attention in the mainstream media only during the past 10 years, this stimulation practice had been used routinely on most of the nation’s wells for the preceding 50 years with no major issues noted. Although subsurface conditions cannot always be anticipated, both federal and state oversight along with applied best management practices insure that wells are properly drilled and cased to eliminate or minimize the potential for impacts to the environment.</p>

	<p>The State of Colorado permits and oversees the operation of underground water injection wells, and scientists there conduct analysis to determine in advance the maximum allowable pressure (psi) and injection rate (barrels per day) that an injection well can safely operate at in order to not exceed known reservoir pressures.</p>
<p>Parcel #6657 Petroglyph stopped its CBM Operations and ceased discharging produced water into the Cucharas River in July 2007 following meetings with COGCC staff regarding the potential threats to public health, safety, and welfare, and the environment related to the presence of methane gas in domestic water wells. The Director of COGCC issued a Cease and Desist Order on October 16, 2007 shutting down Petroglyph's CBM Operations. Subsequent orders were issued by the Director in November 2007 and January 2008, extending the Cease and Desist Order and requiring Petroglyph to implement a Methane Investigation, Monitoring and Mitigation Plan. This matter remains pending before COGCC.</p> <p>I believe it is critical to account for presence of contamination that has occurred since the Royal Gorge Resource Management Plan has been adopted. This plan supposedly covers the Huerfano County parcels #6657, as well as #6661, #6667, #6658. No EA should be issued until the Plan is update with this type of information. (ARW, KA&amp;JE)</p>	<p>As most of this comment describes the actions taken by another regulatory agency in response to events on private and State of Colorado lands, the BLM contacted COGCC to confirm this incident, and that natural gas from the producing zone had entered the shallow groundwater formations sourcing water supply wells located nearby. See discussion in section 3.4.1.3 of the EA.</p> <p>COGCC stated that the factors, or combination of factors, contributing to this situation remain unknown, although it is likely: 1) the geology in this particular area (located 6 to 7 miles away from parcel #6657) is complex, likely unique and localized, and may or may not apply to parcel #6657 (and less likely for parcels #6661, #6667 and #6658 located 18 to 24 miles to the northwest), 2) the operator may have over-produced the wells (coalbed methane wells can initially produce 1000s of barrels of water daily) which could have led to fingering of natural gas in the Vermejo coals formation and into nearby-wellbore areas, 3) methane seeps in the vicinity may have been caused by uncased wells that were known to have been drilled in the 1930's, and 4) pockets of methane may be coming from old underground mining operations that were conducted many years ago. Mitigation measures have been taken by the State of Colorado to limit the contamination in attempting to protect the fresh water resource.</p> <p>The exact cause for the presence of methane gas in some of the water wells has yet to be determined. The 50+ coalbed methane (CBM) wells drilled by Petroglyph (and subsequently plugged) were located solely on private lands and State of Colorado lands, not federal lands. Should this parcel be leased, Federal and State of Colorado regulatory agencies will impose mitigation requirements that should prevent this situation from occurring again .</p> <p>COGCC stated in summary that if the Federal lease is issued, and an operator submit an Application for Permit to Drill (APD) for a CBM well, COGCC likely would apply additional drilling and completion restrictions as permitting Conditions of Approval (COAs). These requirements stem directly as a result of the problems Petroglyph and other operators encountered in this area.</p> <p>Similarly, BLM evaluates the drilling plan (whether it is</p>

	<p>a shallow CBM well or a deep well) and surface use plan (whether the well is located on BLM surface or split estate lands) for each APD it receives to consider potential adverse impacts to the resources that are present, and identify appropriate conditions of approval. This ensures that the well is properly drilled, cased and cemented, and appropriate mitigation is implemented to protect all resources that are present.</p> <p>It is inaccurate to assume an operator would acquire the lease to develop this parcel solely for Vermejo CBM production, as the oil companies are currently exploring the Raton Basin and targeting deeper zones having production potential such as the Pierre Shale and Niobrara Shale formations.</p>
<p>All Huerfano County parcels. BLM lands belong to the people, but when they are leased and then used for oil and /or gas exploration and development, the public can find themselves locked out of their neighboring BLM lands as we see has happened in Las Animas County to the south of us. (RM)</p>	<p>BLM land is managed for sustained yield of resources and for multiple uses, such as livestock production, commercial timber production, mining, oil and gas development, and public and commercial recreation (outfitting/guiding). Multiple uses, including public recreation, are allowed to take place at the same time, on the same parcels of BLM land, as outlined in the Resource Management Plan. Areas of BLM with oil and gas development remain open to the public for recreation and other permitted uses.</p> <p>In cases where the surface is privately owned (split estate), the BLM cannot grant the public access to the privately owned surface.</p>
<p>Parcels #6657, #6659, #6660, #6661, #6667 One of our major concerns is the lights generated by oil and gas rigs. We have dark skies that are recognized around the state and nation as being some of the best for astronomers viewing stars. If this oil and gas sale lease does happen, I would ask you to make it a provision of the sale that all lighting be directionally pointed downward and that all lights be shielded to reduce their impact on these dark skies of ours. (RM, SC)</p>	<p>A lease stipulation cannot be created solely for the purpose of addressing the impacts associated from drilling rig lighting. However a Condition of Approval (COA) can be created and attached to an oil company's approved Application for Permit to Drill (APD) that requires the operator to shield and focus the rig lighting in a downward direction to minimize light pollution, as long as this doesn't impact public safety and the safety of the rig crew.</p>
<p>Parcel #6657 BLM should factor in the tremendous amount of truck traffic and high pressure, high powered pumps and compressors, huge volumes of water, fracking materials, and produced waste water and petroleum. There would be fluid transmitting lines, valves, tanks, plus semi trailer trucks pounding up and down dusty county roads, past residences, in the midst of hikers, and Boy Scout Ranch campers. By probability alone, there will be accidents, leaks, and human error. (KA&amp;JE)</p>	<p>At the APD stage, the operator will submit a specific plan of operations, from which BLM can assess which, if any, of these potential impacts would be present with their proposed action.</p>
<p><b>Range, Grazing &amp; Weeds</b></p>	
<p>Parcel #6658 Leased by the Scott Dugan Ranch. Leasing and developing this parcel would put an economic strain on the ranch and severely limit access to the grazing lease by the rancher. (JB)</p>	<p>There is no lease or grazing permit currently issued for parcel #6658. Any such use of the parcel would be in grazing trespass.</p>
<p>All Huerfano County Parcels. General interference with ranching and leasing operations. (HM, JM, SF)</p>	<p>Oil and gas development will have a short term minor impact to ranching and leasing operations as discussed</p>

	in section 3.4.4.2 of the EA.
The Environmental Assessment for the Royal Gorge Field Office November 2013 Competitive Oil & Gas Lease Sale states that "non-native and invasive weed species that occur on adjacent rangelands would occupy disturbed areas; the bare soils and the lack of competition from a perennial plant community would allow these weed species to grow unchecked and can affect the establishment of seeded plant species". We would be concerned that the sheer expense of restoring bare soils would be prohibitive, and probably impossible to accomplish. (KA&JE)	The EA describes mitigation measures and reclamation practices described in the analysis for invasive plants, section 2.4.2.1 of the EA to control invasive species.  Additionally, a reclamation plan is required as part of submitting an APD. 43CFR3162.5-1 requires the operator to reclaim the disturbed surface in a manner approved or reasonably prescribed by the BLM.
<b>Cultural Resources</b>	
Parcel #6658 There is an ancient Native American campsite where many, many artifacts and arrowheads have been found on this proposed lease property. It is essential that a paleontological inventory be done of this specific site and of the entire lease sale area. (RM)	If an application for a permit to drill ("APD") is sent to the BLM for this particular parcel, a complete inventory, evaluation, and if necessary, mitigation of any affected historic properties will be conducted before the APD is approved. All sites present on BLM-administered are protected by the Archaeological Resources Protection Act, and criminal penalties apply to any person in violation of that act.