BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment for the RGFO November 2015 Competitive Oil & Gas Lease Sale

Competitive Oil & Gas Lease Sale

November, 2015

PREPARING OFFICE

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Chapter 1. Introduction

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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 (MLA) and the Federal Land Policy and Management Act of 1976 (FLPMA), 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 thirty day 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. 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 addendum to the sale notice.

If the parcels are not leased at the November, 2015 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 is not leased within a two-year period after an initial offering will no longer be available, and 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 by the operator and approval by the BLM.

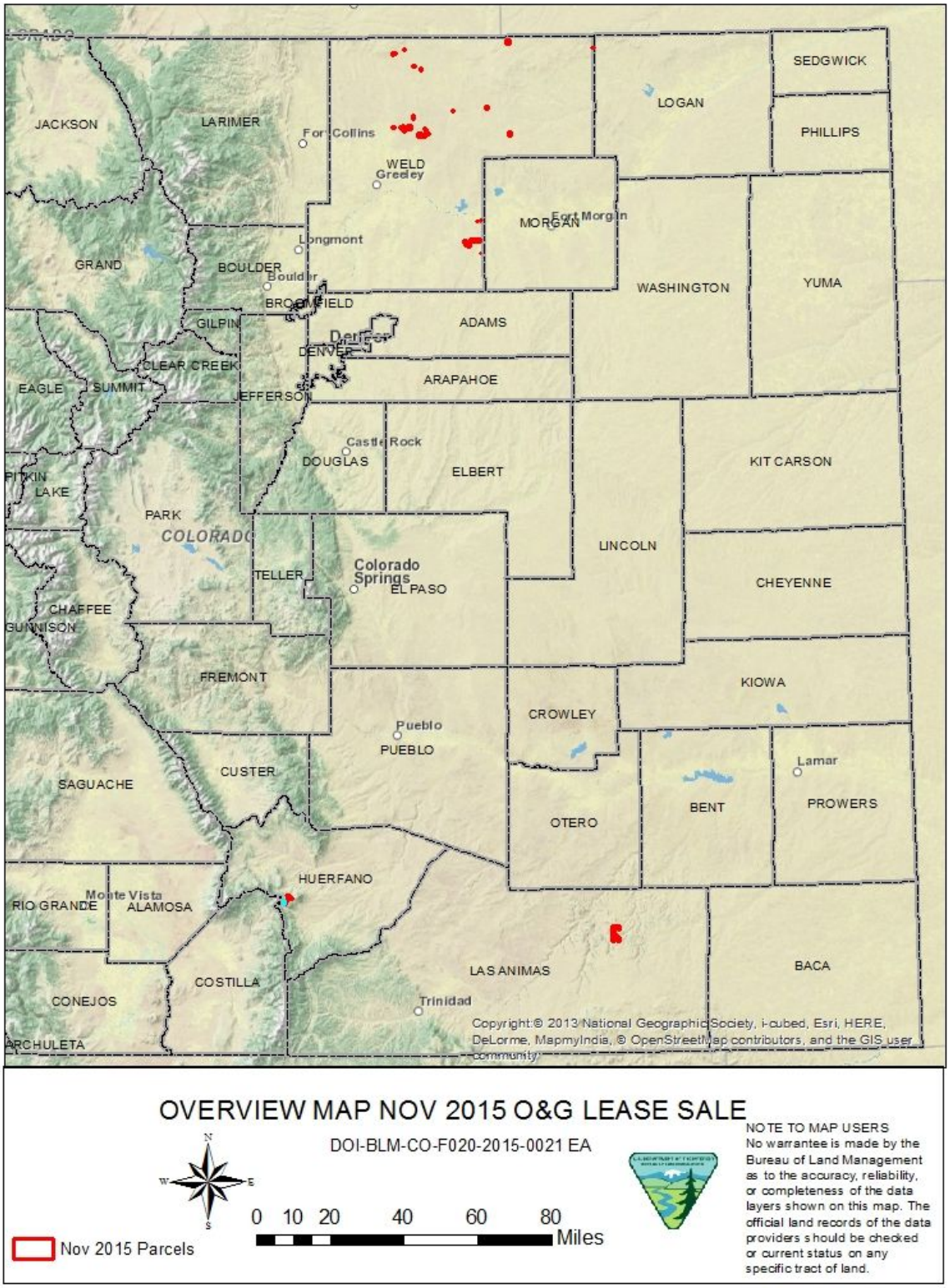
In the future, the BLM may receive Applications for Permit to Drill (APDs) for those parcels that are leased. If APDs are received, the BLM conducts additional site-specific NEPA analysis before deciding whether to approve the APD, and what conditions of approval (COA) should apply.

Twenty—one parcels comprising 11,150.390 acres within the Royal Gorge Field Office (RGFO) were nominated for the November 2015Competitive Oil and Gas Lease Sale. This figure is comprised of 961.58 acres of federal land and 10,188.81 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 the field office's recommendation to offer or to defer particular parcels from a lease sale.

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

1.2. Project Location and Legal Description



LEGAL DESCRIPTION:

Please see Attachments A, B, and C and E (Parcel Maps)

1.3. Purpose and Need for Action

The purpose of the Proposed Action is to consider opportunities for private individuals or companies to explore and develop oil and gas resources on specific 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 to lease the nominated parcels and, if so, under what terms and conditions.

1.4. Public Participation

1.4.1. Scoping, Public Involvement and Issues

The principal goal of scoping is 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 meetings of an interdisciplinary (ID) team of resource specialists and discussion of the nominated parcels. The following issues were identified:

General wildlife concerns, concerns related to fragile soils and steep slopes on some parcels, possible conflicts with recreation and reservoir operations on parcel 7353, which has a privately managed reservoir within part of its boundary.

External scoping was conducted by posting the nominated lease parcels, stipulations from the RMP, for thirty days from February 12, 2015 to March 16,, 2015. 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/2015/November_2015_lease_sale.html. This external scoping process gave the public an opportunity to provide comments, which the BLM considered and incorporated into the EA as appropriate. The BLM sent letters to land surface owners whose land overlies federal minerals proposed for leasing.

Issues Identified:

The only comment received during the public scoping period was from Colorado Parks and Wildlife (CPW), who sent a letter with various fish and wildlife related issues on some specific parcels. These issues were analyzed in the EA.

1.4.2. Public Comment Period

The preliminary EA and the unsigned Finding of No Significant Impact (FONSI) were available for a 30-day public review and comment period beginning May 4, 2015 and ending June 4, 2015. The document is available online at http://www.blm.gov/co/st/en/BLM_Programs/oilandgas/oil_and_gas_lease/20XX/month_year_lease_sale.html The BLM received comments from several different entities on various issues pertaining to the EA, and the lease sale. On May 27, the Huerfano County Federal Mineral Lease District commented that they disagreed with the deferral of the entire portions of lease parcels 7349 and 7350 outlined in the preferred alternative, citing economic issues and on June 8, Wild Earth Guardians commented that the EA failed to analyze air emissions, hydraulic fracturing, the social cost of carbon, climate change, and conformity under the clean air act. These comments were summarized and responded to in attachment F of this EA. In addition, the BLM received comments from Green Rockies Emerging Ecology Network and the Southern Chapter of the Territorial Daughters of Colorado on June 1, supporting the deferral of parcels 7349 and 7350 outlined in the preferred alternative, citing issues with the parcels including steep slopes and unstable, rocky soils, visual resource concerns, and permanent markers placed by Territorial Daughters of Colorado indicating the possible location of the Historic Taos Trail. On June 5, The E.M. and Mildred Estes Family Trust also submitted comments supporting the deferral of parcels 7349 and 7350 outlined in the preferred alternative citing steep slopes and unstable soils, presence of a rock glacier within parcel 7349, migratory bird and other wildlife issues, visual resource issues, and concerns related to hazardous materials. On May 5, The Arkansas Valley Audubon Society commented against Oil and Gas leasing in particular on the Pawnee National Grassland, however none of the parcels included in the proposed action or preferred alternative are Pawnee National Grassland parcels. Leasing of lands within the Pawnee National Grassland has been analyzed in a separate document. All comments were received via e-mail.

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Chapter 2. Proposed Actions and Alternatives

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2.1. Description of Alternatives Analyzed in Detail

2.1.1. 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.

Under the No Action Alternative, the BLM would defer all nominated lease parcels from the November, 2015 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.

2.1.2. Lease All Nominated Parcels in Conformance with the RMP

Under this alternative, the BLM would lease Federal mineral estate in all nominated parcels available for leasing in the resource area in accordance with the Northeast (November 1991, as amended) and RGFO (May, 1996) RMPs. The current lease sale includes 21 parcels in Huerfano, Las Animas and Weld Counties, totalling 11,150.39 acres of federal mineral estate that includes a combination of federal and private surface (see Attachment A). 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.

2.1.3. Preferred Alternative

Under the preferred alternative, the BLM would offer 10,049.63 acres for lease and defer1,100.76 acres from the sale. Attachment B lists all parcels or that would be deferred from the lease sale under the preferred alternative. Attachment C lists all parcels determined by this analysis to be available for lease from the preferred alternative with applied stipulations. Attachment D contains descriptions of the applicable stipulations, and Attachment E contains maps of the parcels.

Justification for deferrals: The deferral process for nominated parcels was established to address situations in which legitimate questions or controversy arises over the leasability of a parcel. The deferral process does not necessarily withdraw a parcel from the leasing arena, but merely indicates that further analysis is needed before possibly being reintroduced in a future lease sale.

2.2. Alternatives Considered but not Analyzed in Detail

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

2.3. Plan Conformance Review

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

Name of Plan: Northeast Record of Decision and Resource Management Plan (RMP)

Date Approved: September 1986 as amended November 1991

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.

Name of Plan: Royal Gorge Record of Decision and Resource Management Plan (RMP)

Date Approved: May 1996

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.

Chapter 3. Affected Environment and Effects

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

Forestry, Special Status Plants, Environmental Justice, Access and Transportation, Fire Management, Range Management, Prime and Unique Farmlands, Realty Authorizations and Land Tenure, Recreation, Special Designations, Areas of Critical Environmental Concern, Wild and Scenic Rivers, Lands with Wilderness Characteristics and Wilderness Study Areas.

3.2. Environmental Consequences of the No Action Alternative

The No Action Alternative is used as the baseline for comparison of the alternatives. Under the No Action Alternative, the 21 parcels totaling 11,150.39 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 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.

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 RMP/EIS, provides the BLM's analysis of cumulative effects of oil and gas development based on the reasonable, foreseeable oil and gas development scenario. This analysis is hereby incorporated by reference and is available at: http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp.html. The cumulative impacts analysis in the RMP/EIS 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 RMP/EIS analysis by incorporating new information.

The area of influence includes parcels in Huerfano County, in the vicinity of Mount Mestas in the Sangre De Christo range in south-central Colorado, Las Animas County in low elevation pinyon/juniper hills in southeastern Colorado, and the Weld County parcels in the northeastern plains of Colorado, a patchwork of dry land farming and uncultivated short grass prairie . The following activities will be considered in the cumulative impacts analysis of each alternative.

Past Actions:

The vast majority of the nominated acreage is split estate, where the surface is not managed by BLM. Some of the proposed parcels have had previous oil and gas development. 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. No evidence suggests any other past actions by the BLM, affecting these parcels. Aerial photography of the parcels on the eastern plains indicate that over grazing and several years of drought conditions have produced an almost barren landscape in some locations.

Present Actions:

The vast majority of the nominated acreage is split estate, where the surface is not managed by BLM. There is currently no fluid minerals development taking place on any of these parcels, as they are unleased at this time. There are no BLM activities taking place on the small amount of BLM managed surface acreage overlying the nominated parcels.

Reasonably Foreseeable Future Actions:

The RGFO completed a Reasonable Development (RFD) Scenario, which is an estimate of fluid mineral exploration, development, and production for the Royal Gorge Field Office for 20 years (2011-2030) based on information available at the time it was created. According to the RFD, the parcels in Weld County are in areas that range from high development potential (20–50 wells per township) to low potential (1–5 wells per township), the Huerfano county parcels range from low potential (1–5 wells per township) to very low potential (less than 1 well per township) and the Las Animas parcels all fall in an area with very low development potential (less than 1 well per township).

3.4. Environmental Consequences of Leasing and Potential Development

3.4.1. Physical Resources:

3.4.1.1. Air Quality and Climate:

Affected Environment:

The RGFO encompasses a large geographical area with an appreciable amount of daily meteorological and climatic variance. Characteristic features include low relative humidity, abundant sunshine, infrequent rains and snow, moderate to high wind movement, and a large daily and seasonal range in temperatures. In general, the mean temperatures in the northern portion of the field office range from 15.6 degrees F in January to 88.7 degrees F in July. Temperatures in the southern portion of the field office range from 17.4 to 94.3 degrees F in January and July respectively. Northern RGFO areas receive average annual precipitation of approximately 14.22 inches, while southern RGFO areas receive average annual precipitation of approximately 11.34 inches. A large proportion of the area precipitation (70 to 80 percent of the annual total) falls during the growing season from April through September. Winter precipitation is light and infrequent and usually brings dry air and strong winds that contribute to the aridity of the area. Summer precipitation over the plains comes largely from thunderstorm activity and is sometimes extremely heavy, which can contribute to localized flooding. It is more common, however, to be too dry. The region frequently suffers from drought and multi-year drought is more common than not. At the western edge of the plains and near the foothills of the mountains, there are a number of significant changes in climate. Average wind movement is less, but areas very near the mountains are subject to periodic, severe turbulent winds as high westerly winds move over the front range peaks. Temperature changes from day to day are not quite as great. Precipitation gradually decreases from the eastern border to a minimum near the mountains, but rapidly increases with the increasing elevation of the foothills and proximity to higher ranges. This milder corridor close to the mountains is where the majority of Colorado's population resides. Frequent winds and limited topographical influences in the majority of the RGFO provide excellent dispersion characteristics for distributing anthropogenic emissions.

Analysis indicators related to air quality can be described in terms of pollutant classes, standards, and concentrations. The overall health of any region's air quality is determined by monitoring for certain pollutants and determining if the measured concentration are below an applicable standard's limit. Areas where air quality concentrations are below the applicable standard are said to be in attainment with the National Ambient Air Quality Standards (NAAQS), whereas areas that currently violate a standard or have violated one in the past are designated as non-attainment or maintenance areas.

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards for criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter ($PM_{10}$and $PM_{2.5}$), sulfur dioxide (SO^2), 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, and thus ambient air quality standards must not be exceeded in areas where the general public has access. All of the criteria pollutants are directly emitted from a variety of source types, with the one exception being ground level ozone. Ozone is chemically

formed in the atmosphere via interactions of oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions ($NO_X$and VOCs are ozone precursors). 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 subject emissions sources. The State has established the Colorado Ambient Air Quality Standards (CAAQS), which can be more, but not less stringent then the NAAQS. In addition to the criteria pollutants, regulations also exist to control the release of toxic pollutants, otherwise known as hazardous air pollutants (HAPs). 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.

Table 3.1. NAAQS (EPA 2014)

Pollutant [final rule cite]		Primary / Secondary	Averaging Time	Level	Standard Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m3	Not to be exceeded
Nitrogen Dioxide [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
Ozone [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
Particle Pollution [Dec 14, 2012]	PM2.5	primary and secondary	Annual	12 µg/m3	Annual mean, averaged over 3 years
			24-hour	35 µg/m3	98th percentile, averaged over 3 years
	PM10	primary and secondary	24-hour	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010]		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
[38 FR 25678, Sept 14, 1973]		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Air quality for any region is influenced by the amount of pollutants that are released within the vicinity and up wind of that area, and can be highly dependent upon the contaminants chemical and physical properties. Additionally, an area's topography or terrain (such as mountains and valleys) and weather (such as wind direction and speed, temperature, air turbulence, air pressure, rainfall, and cloud cover) directly influence the way pollutants accumulate or disperse. Very few "online" (currently operating) air quality monitors exist in areas immediate to the nominated lease parcels. The following table provides air quality monitored values for APCD air monitors located in or near to the counties containing the nominated parcels.

Table 3.2. Ambient Air Quality Monitoring Data (see Level units above)

County	Pollutant	Averaging Period	Monitored Values		
			2011	2012	2013
Adams	CO	1-hour	2.4	2.2	2.4
Adams	CO	8-hour	1.6	1.3	1.5
Adams	NO_2	1-hour	64	64	58
Adams	O_3	8-hour	0.075	0.072	0.077
Adams	PM_{10}	24-hour	65	86	93
Adams	$PM_{2.5}$	24-hour	20	28.7	23
Adams	$PM_{2.5}$	Annual	7.6	8.6	8.5
Alamosa	PM_{10}	24-hour	130	116	104
Larimer	CO	1-hour	2.5	2.5	2
Larimer	CO	8-hour	1.3	1.7	1.2
Larimer	O_3	8-hour	0.08	0.079	0.082
Larimer	PM_{10}	24-hour	38	67	49
Larimer	$PM_{2.5}$	24-hour	18	26.6	19
Larimer	$PM_{2.5}$	Annual	5.7	7.3	6.7
Pueblo	PM_{10}	24-hour	52	50	62
Pueblo	$PM_{2.5}$	24-hour	14.1	16.7	30.2
Pueblo	$PM_{2.5}$	Annual	5.7	6.6	6.7
Weld	CO	1-hour	2.5	3.2	2.5
Weld	CO	8-hour	1.5	1.6	1.4
Weld	O_3	8-hour	0.077	0.074	0.073
Weld	PM_{10}	24-hour	46	91	47
Weld	$PM_{2.5}$	24-hour	26.9	32	23.1
Weld	$PM_{2.5}$	Annual	7.4	7.9	7.1

The following National Emissions Inventory (NEI) data for the lease parcel counties provides a reasonable correlation of emissions loading vs. measured concentrations on a regional basis.

Table 3.3. 2011 National Emissions Inventory Data for Lease Parcel Counties (tons per year)

County	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	SO_2	CO_2	CH_4	N_2O	HAPs
Huerfano	1,382	360	16,210	1,236	7,094	19	165,371	79	4	2,124
Las Animas	9,079	4,527	56,279	7,762	57,028	353	666,804	2,082	5	8,523
Weld	27,960	6,194	137,717	25,663	68,222	575	1,782,317	266	59	7,886

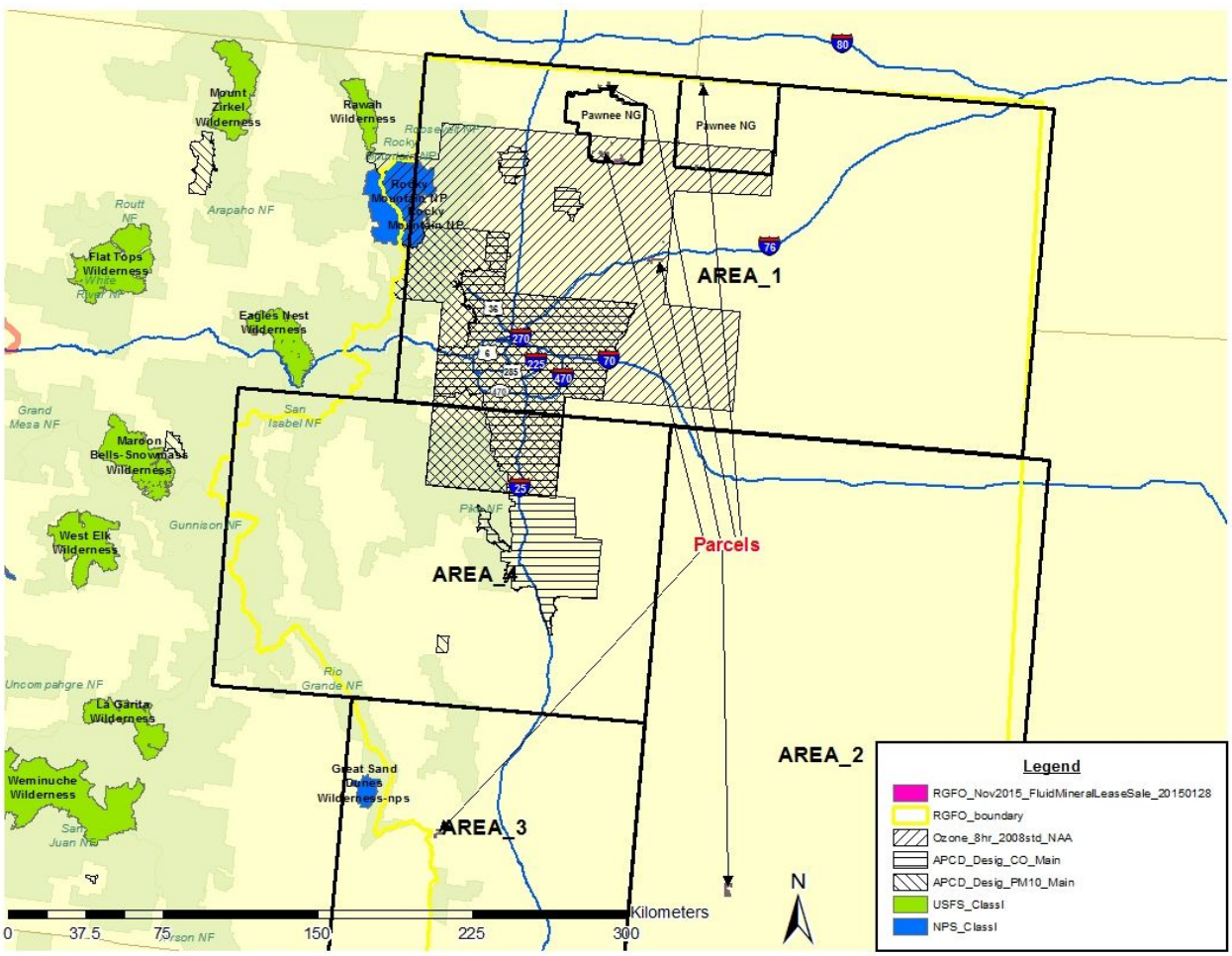
Air quality in the majority of the RGFO meets the standards, however in certain areas of the field office, measurements of pollutants either exceeded or violated an air quality standard. Historically, these problem areas have centered around the larger front range metropolitan areas that tend to have large amounts of pollutant emitting sources and activities. The RGFO currently has five areas that have a designation other than attainment / unclassifiable; the Denver Metro Area / Northern Front Range 8–hour O^3 Non-Attainment Area (NAA), the Colorado Springs CO Maintenance Area, and the Denver, Canon City and Larimer Co. PM_{10} Maintenance Areas. In these areas the state applies more stringent air pollution control requirements. With the exception of the Denver Metro Area / Northern Front Range 8–hour O^3 Non-Attainment Area, none of the parcels are located in any of these designated areas (see figure 3.1 below).

Section 176(c) of the CAA, 42 U.S.C. § 7506, prohibits Federal entities from approving actions in non-attainment or maintenance areas that do not "conform" to the SIP. The purpose of this conformity requirement is to ensure that Federal activities: (1) do not interfere with the budgets in the SIPs; (2) do not cause or contribute to new violations of the NAAQS; and (3) do not

impede the ability to attain or maintain the NAAQS. To implement CAA Section 176(c), EPA issued the General Conformity Rule (40 CFR Part 93, Subpart B), which applies to all Federal actions not funded under U.S.C. Title 23 or the Federal Transit Act (BLM actions are not funded by U.S.C. Title 23 or the Federal Transit Act). The General Conformity Rule established emissions thresholds (40 CFR 93.153) for use in evaluating the conformity of a project. 40 CFR 93.153(b)(1). If the net emissions increases due to the project are less than these thresholds, no further conformity evaluation is required. 40 CFR 93.153(c)(1). If the emissions increases exceed any of these thresholds, a formal conformity determination is required. The rule also identifies other actions to which the conformity requirements do not apply. 40 CFR 93.153(c)(2), (d), (e). Certain other actions are "presumed to conform" with the applicable SIP. 40 CFR 93.153(f)-(i). The conformity determination can entail air quality modeling studies, consultation with EPA and state air quality agencies, and commitments to revise the SIP or to implement measures to mitigate air quality impacts. The BLM, as the federal entity with jurisdiction for the proposed action, must demonstrate that it has complied with the requirements of the General Conformity Rule, if applicable.

The following figure shows pertinent air quality parameters relative to the proposed action, which may include monitor locations, designated air quality regions, and Class I and sensitive Class II areas.

Figure 3.1. Spatial Air Quality Data for Proposed Action



Another relative indicator of air quality are the prevention of significant deterioration (PSD) increments. PSD increments, or the amount of air pollution an area is allowed to increase beyond the relative baseline level that was set for the area when the first PSD permit application was approved, prevents the air quality in clean (i.e. attainment) areas from deteriorating to the level set by the NAAQS. Although the PSD rule is only applicable to major stationary sources of air pollution, an increment analysis can provide a useful measure to determine how likely new sources of pollution (major or minor) could have a significant impact on regional air quality. Note, official PSD increment analyses are the sole responsibility of the APCD. Any subsequent analysis performed for NEPA purposes will be used for informational purposes only.

Table 3.4. PSD Increments (µg/m^3)(APCD 2012)

Pollutant	Period	Class I	Class II	Class III
Nitrogen Dioxide (NO_2)	Annual	2.5	25	50
Sulfur Dioxide (SO_2)	3–hr	25	512	700
	24–hr	5	91	182
	Annual	2	20	40
Particulate Matter < 10 µ (PM_{10})	24–hr	8	30	60
	Annual	4	17	34
Particulate Matter < 2.5 µ ($PM_{2.5}$)	24–hr	2	9	18
	Annual	1	4	8

Air quality related values (AQRVs) provide another measure of air quality with respect to atmospheric phenomena such as visibility impairment and pollutant deposition. Measuring AQRVs is particularly important in federally mandated Class I lands, which include areas such as national parks and wilderness areas. Class I areas are granted special air quality protections under Section 162(a) of the federal Clean Air Act.

Visibility impairment or haze is caused when sunlight encounters tiny pollution particles in the atmosphere, and is either absorbed or scattered which reduces the clarity and color of what can be seen. Visibility can be expressed in terms of deciviews (dv) or standard visual range (SVR). A change of one dv is approximately a 10% change in the light extinction coefficient (i.e. light that is scattered or absorbed and does not reach the observer), which is a small, but usually perceptible scenic change. Class I areas have statutory mandates to provide for natural visibility conditions such that visitors can experience a pristine environment free observable pollution effects. The ability of a pollutant to cause various degrees of visibility impacts is primarily a function of its physical size, and chemical composition and properties. Various visibility impacting pollutant species have been monitored via the Interagency Monitoring of Protected Visual Environments (IMPROVE) network in many of the sensitive Class I areas around the country since the 1980s. The federal land managers use a data analysis threshold (DAT) of 0.5 dv for projects that contribute to a visibility problem and a value of 1.0 dv for projects that cause visibility issues, FLAG 2010.

Deposition is the process by which pollutants are removed from the atmosphere via mechanical and chemical processes. When air pollutants such as sulfur and nitrogen are deposited into ecosystems, they may cause acidification, or enrichment of soils and surface waters. Atmospheric nitrogen and sulfur deposition may affect water chemistry, resulting in impacts to aquatic vegetation, invertebrate communities, amphibians, and fish. Deposition can also cause chemical changes in soils that alter soil microorganisms, plants, and trees. Although nitrogen is an essential plant nutrient, excess nitrogen from atmospheric deposition can stress ecosystems by favoring

some plant species and inhibiting the growth of others. These processes are measured via two distinct methodologies, i.e. wet and dry deposition monitors. The National Atmospheric Deposition Program (NADP) is a conglomerate of various wet chemistry monitoring networks designed to measure wet atmospheric deposition and study its effects on the environment. The network currently operates approximately 250 sites, many since the early 1980's. The Clean Air Status and Trends Network (CASTNET) is a national air quality monitoring network designed to provide data to assess trends in air quality, dry atmospheric deposition, and ecological effects due to changes in air pollutant emissions. CASTNET began collecting data in 1991 with the incorporation of 50 sites from the National Dry Deposition Network. CASTNET provides long-term monitoring of air quality in rural areas to determine trends in regional atmospheric nitrogen, sulfur, and ozone concentrations and deposition fluxes of sulfur and nitrogen pollutants. The federal land managers use a data analysis threshold (DAT) of 0.005 kg/hr-yr for nitrogen and sulfur deposition for determining the significance of any given project, FLAG 2010.

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 gases (GHGs) such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and several industrial gases in the Earth's atmosphere. An increase in GHG emissions is said to result in an increase in the earth's average surface temperature, primarily by trapping and thus 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, which is 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 the burning of fossil carbon fuel sources have caused GHG concentrations to increase measurably, from approximately 280 ppm in 1750 to 400 ppm in 2014 (as of April). 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_2 monitor in Hawaii that documents atmospheric concentrations of CO_2 going back to 1960, at which point the average annual CO_2 concentration was recorded at approximately 317 ppm. The record shows that approximately 70% of the increases in atmospheric CO_2 concentration since pre-industrial times occurred within the last 54 years.

Environmental Consequences of Leasing and Potential 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, any future development of these leases will result in emissions of criteria, HAP and GHG pollutants. Subsequent development would result in both short and longer term emissions of pollutants, including GHGs. Developmental air impacts will be examined in a subsequent analysis when lessees file an Application for Permit to Drill (APD). The analysis will evaluate if any contemporaneous incremental increases from project emissions would be expected to cause significant impacts at the local and regional scales. 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_{10} and $PM_{2.5}$) 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_X 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 include the installation of pipelines for transportation of raw product. New centralized collection, distribution and/or gas processing facilities may also be necessary.

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. In the coming decades climate change may lead to changes in the Mountain West and Great Plains, such as increased drought and wildland fire potential. The BLM will continue to evaluate the impacts of oil and gas exploration and development on the global climate as the science and analytical tools evolve, and will apply appropriate adaptive management techniques and BMPs to address changing conditions.

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) in order to continue to hold the lease beyond the 10 year preliminary lease term. With that in mind, the BLM has developed an estimated average per well emissions inventory 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 the nominated parcels. 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 modeling or another acceptable method at this time. However, the BLM will request or develop an exploration / development emissions inventory with project-specific information at the time that BLM receives a development proposal and performs a site-specific NEPA analysis.

Table 3.5. Typical per Well Emissions (tons)

Phase	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	SO_2	CO_2	CH_4	N_2O	HAPs
Conventional Construction	5.21	0.64	0.05	0.72	0.23	0.02	108.1	0.00	0.00	0.01
CBM Construction	3.37	0.44	0.03	0.36	0.12	0.01	56.58	4.06	0.00	0.00
Conventional Production	1.15	0.15	6.67	0.73	1.3	0.00	251.9	17.14	0.00	0.43
CBM Production	2.25	0.25	13.1	0.62	1.13	0.00	181.6	19.05	0.00	1.31

The BLM will assess project-specific impacts on air resources during the parcel development plan analysis or permitting stage. There will be much more detailed information at that stage to allow the BLM to more accurately estimate emissions and determine potential impacts to air quality. Substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations. BLM Instructional Memorandum CO-2015-009 provides detailed direction and methods for FO staff to follow during future project level analysis. Based on the outcome of our future analysis, BLM will make its approval of these activities subject to conditions of approval that will address air pollutant impacts and climate change pollutants as appropriate.

Applicability Analysis under CAA Section 176 (42 U.S.C. § 7506), and 40 CFR Part 93:

As discussed in the Affected Environment section, most of the nominated parcels are within a designated ozone nonattainment area. The BLM therefore is undertaking measures to comply with the CAA conformity requirement set forth in 42 U.S.C. § 7506. The BLM has evaluated the proposed lease sale in accordance with the provisions of 40 CFR Part 93, Subpart B. Based on a review of 40 CFR § 93.153(c), BLM has determined that the requirement to perform a full conformity determination does not apply to the proposed action for the following reasons.

Under 40 CFR 93.153(c)(2), a conformity determination is not required for actions "which would result in no emissions increase or an increase in emissions that is clearly de minimis." Leasing does not authorize emissions generating activities, and therefore does not directly result in an emissions increase.

A conformity determination also is not required "where the emissions (direct or indirect) are not reasonably foreseeable." 40 CFR § 93.153(c)(3). While BLM can make broad predictions about possible future emissions in a region for purposes of NEPA cumulative impacts analysis, it does not have specific information about whether or how the specific parcels under consideration may be developed during the initial 10 year lease period, such that a more precise emissions inventory could be reasonably estimated and compared to the thresholds provided in 40 CFR § 93.153(b). An onshore lease sale is analogous to the example provided in 40 CFR § 93.153(c)(3)(i), "Initial Outer Continental Shelf lease sales which are made on a broad scale and are followed by exploration and development plans on a project level." Similarly, development of an onshore lease requires subsequent BLM review and NEPA analysis of a specific development proposal.

Furthermore, 40 CFR § 93.153(d) provides, "[n]otwithstanding the other requirements of this subpart, a conformity determination is not required for the following Federal actions (or portion thereof): . . . The portion of an action that includes major or minor new or modified stationary sources that require a permit under the new source review (NSR) program (Section 110(a)(2)(c) and Section 173 of the [CAA]) or the prevention of significant deterioration program (title I, part C of the [CAA])." 40 CFR 93.153(d)(1). It is uncertain at this time, but highly likely, that several project design features, for example equipment sets, such as tanks, separates, compressions engines, pump jacks, and dehydration units, will require at least a minor new source review (i.e. permit) prior to constructing such facilities to implement any subsequent development proposals. Emissions from such permitted facilities would not be subject to the general conformity analysis provisions.

For all of these reasons, a conformity determination is not required for the sale of the leases under consideration.

Environmental Consequences of Leasing and Potential Development (Cumulative Impacts):

This lease sale, when combined with the past, present, and reasonably foreseeable future actions may, (through future development), contribute incrementally to the deterioration of air quality in the region. At present, any future potential cumulative impact is speculative, 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 disturbance and emissions during drilling, completion, and production activities. The severity of these incremental impacts could be elevated based on the amount of contemporaneous development (either federal or private) in surrounding areas. Notwithstanding the uncertainties described above, BLM has used mapping and a modeling study to estimate the potential cumulative impacts to air quality from leasing and development of the parcels under consideration in light of ongoing oil and gas exploration and development in the area.

To examine potential cumulative air quality impacts from activities that it authorizes, BLM has initiated the Colorado Air Resources Management Modeling Study (CARMMS). The study includes assessment of statewide impacts of projected oil and gas development (both federal and fee (i.e. private)) out to year 2021 for three development scenarios (low, medium, and high). Projections for development are based on either the most recent FO Reasonably Foreseeable Development (RFD) document (high scenario), or by projecting the current 5 year average development paces forward to 2021 (low scenarion). The medium scenario included the same well count projections as the high scenario, but assumed restricted emissions, where the high and low assumed current development practices and on the books emissions controls and regulations (2012). Each FO was modeled with the source apportionment (SA) option, meaning that incremental impacts to regional ozone and AQRVs from development within each field office are essentially tracked to better understand the significance of such development on impacted resources and populations. Additionally the RGFO was split into 5 SA areas, since the FO is so large. The CARMMS project leverages the work completed by the WestJumpAQMS, and the base model platform and model performance metrics are based on those products (2008). The complete report and associated data is available on our website at http://www.blm.gov/co/st/en/BLM_Information/nepa/air_quality.html.

The BLM continually tracks authorized oil and gas activity to determine which CARMMS scenario would be most appropriate to estimate air resource impacts correlations based on the source apportionment area's cumulative federal development and total production. Although

the predicted impacts will be based on future modeling results (2021), the differences in the impacts between the scenarios provide insight into understanding how mass emissions impact the atmosphere on a relative basis, and are thus useful for making qualitative correlations for the tracked emissions levels.

Table 3.6. Current Tracking Data (2014 COGCC & AFMSS Data)

Lease Parcel County / SA Area	Oil Production (bbl)	Gas Production (Mcf)	No. of Producing Wells	RGFO New Federal Wells Since 2011
Huerfano / Area 3	0	13,105,672	41	53
Las Animas / Area 2	0	87,641,596	3,055	
Weld / Area 1	76,632,950	375,250,994	25,632	

The majority of the new federal wells shown above have been spud within RGFO SA Area 1 (i.e. Weld County), and thus SA Area 1 is currently tracking higher than the low CARMMS scenario (9 new federal wells per year), but lower than the high scenario (47 new federal wells per year) on strictly a well count basis. Source apportionment areas two and three are currently tracking lower than the low CARMMS development scenario (9 and 4 new federal wells per year, respectively). Currently no SA area within the RGFO has exceeded the low scenario on a mass emissions basis, but given potential delay between leasing and any actual development, the BLM projects the current development forward and presents the representative CARMMS data to disclose the potential cumulative impacts. For source apportionment areas 1 some high development data are shown (non-federal development is trending toward the high CARMMS analysis scenario), and for SA areas 2 and 3, we present the low development scenario results. For all of the SA areas, air quality related value impacts and the other model values (NAAQS) are shown only for the highest impacted Class I area, monitor, and or unmonitored area value. This is simply because of the shear volume of data contained in the CARMMS report. Readers interested in viewing all of the available CARMMS data should refer to the link to our website above.

Considering the likelihood that any new oil and gas development would be established on the nominated lease parcels over the next few years and that the conservative CARMMS high scenario is based on aggressive oil and gas development projections that current development levels do not approach, we assume that emissions associated with any potential oil and gas developed through year 2021 on the nominated lease parcels are accounted for in the CARMMS projected year 2021 oil and gas emissions inventories (as modeled, see table below). The table also shows potential year 2021 direct GHG emissions by scenario, which were estimated by simply taking the conventional O&G "per well" emissions rates shown in Table 5 and multiplying by the number of potential new O&G wells associated with the RGFO high and low scenario estimates.

Table 3.7. RGFO O&G Emissions (tons) by SA Area[a]

RGFO SA Area / Scenario	Year	PM_{10}	$PM_{2.5}$	VOC	CO	NO_X	SO_2	CO_2	CH_4	NO_2
Area 1 / Baseline	2011	3,407	829	79,913	14,793	20,631	77	ND	ND	ND
Area 1 / High	2021	26,483	3,701	199,587	52,910	53,177	192	169,219	8,056	<1
Area 2/ Baseline	2011	108	72	5,003	4,053	4,224	4	ND	ND	ND
Area 2 / Low	2021	296	145	10,445	7,850	8,058	9	13,932	668	<1

Area 3/ Baseline	2011	363	95	2,333	10,983	8,648	4	ND	ND	ND
Area 3 / Low	2021	433	111	2,700	12,868	10,189	4	10,956	1,063	<1

[a]GHG emissions represent the federal portion only

Table 3.8. SA PSD Increment Evaluation (not regulatory, for informational purposes only)

SA Area	Impacted Class I Area	NO_2 (µg/m^3) Annual	PM_{10} (µg/m^3) 24–Hour	$PM_{2.5}$ (µg/m^3) 24–Hour	SO_2 (µg/m^3) 3–Hour
RGFO Area 1	Rocky Mountain NP	0.000	0.009	0.004	0.000
RGFO Area 2	Pecos Wilderness	0.000	0.000	0.000	0.000
RGFO Area 3	Great Sand Dunes NM	0.002	0.003	0.002	0.000

As shown above the CARMMS high scenario PSD pollutant concentrations at any Class I area due to new Federal oil and gas emissions are less than 2% of any PSD increment and are thus exceedingly low. The PSD program is a Clean Air Act permitting program for new and modified major air pollution sources and is administered in Colorado by the CDPHE Air Pollution Control Division (APCD). In this air quality assessment, PSD increment consumption comparisons are provided to evaluate the extent of environmental effects only, and do not constitute a regulatory consumption analysis.

Table 3.9. SA Visibility Impacts

SA Area / Group	Impacted Class I Area	Max Δdv	2021 Worst 20% dv at Class I	2021 Best 20% dv at Class I	2021 Worst % Change Relative to 2008 baseline	2021 Best % Change Relative to 2008 baseline
RGFO Area 1	Rocky Mountain NP	0.02253	11.15	1.87	7.4	2.1
RGFO Area 2	Pecos Wilderness	0.00197	10.82	4.61	4.5	-1.5
RGFO Area 3	Great Sand Dunes NM	0.01214	10.76	3.80	1.3	-6.1
Group R — All New Federal Oil and Gas (Colorado) Low Scenario	Flat Tops Wilderness	1.33	8.0	0.49	7.8	29
Group R — All New Federal Oil and Gas (Colorado) High Scenario	Flat tops Wilderness	1.64	8.07	0.55	7	20.3

Even though an individual SA area is not a project in the strictest sense of the FLAG guidance (i.e. leasing represents a cumulative impact, whereas development is more along the lines of a project related impact), the maximum dv are still below the project based thresholds, which are very low by design. For each field office SA area above, the maximum dv predicted by CARMMS is less than the 2010 FLAG factors described earlier in the document that are said to contribute to a visibility issue (0.5 dv). With respect to the cumulative visibility impacts, CARMMS predicts slight visibility degradation (<10%) at the Great Sand Dunes NM and the Pecos Wilderness on the 20% best visibility days, while forecasting improvements on the worst visibility days.

Table 3.10. SA Deposition Impacts

SA Area / Group	Impacted Class I Area	Maximum Nitrogen Deposition (kg/ha-yr)
RGFO Area 1	Rocky Mountain NP	0.0004
RGFO Area 2	All	0.0000
RGFO Area 3	Great Sand Dunes NM	0.0011
Group R — All New Federal Oil and Gas (Colorado) Low Scenario	Flat Tops Wilderness	0.0434
Group R — All New Federal Oil and Gas (Colorado) High Scenario	Flat Tops Wilderness	0.212

As noted above, an individual SA area is not a project in the strictest sense of the FLAG guidance. However,, the maximum predicted nitrogen deposition is still below the project based threshold, which is very low by design. For each field office SA area above, the maximum deposition predicted by CARMMS is less than the data analysis threshold of 0.005 kg/ha–yr. With respect to the cumulative deposition impacts, CARMMS predicts deposition that is not more than 10% of the FLM guidance (nitrogen critical load in Colorado Class I areas) of 2.3 kg/ha-yr. For a Project, the Acid Neutralizing Capacity (ANC) Level of Acceptable Change (LAC) threshold is no change greater than 10% for lakes with base ANC > 25 μeq/l and no change greater than 1 μeq/l for lakes with base ANC values < 25 μeq/l. The ANC calculations due to nitrogen and sulfur deposition from the RGFO SA Areas are all predicted to be below the USFS ANC LAC threshold at all sensitive lakes within the CARMMS domain.

Table 3.11. SA Ozone and Particulate Matter Impacts UAA

SA Area / Group	Max O_3 Contribution (ppb)	Correspond-ing O_3 4th MDA8	% Max Contribution	Max $PM_{2.5}$ Contribution (μg/m^3)	Corresponding $PM_{2.5}$ 8th Daily Average	% Max Contribution
RGFO Area 1	0.0021	76.29	0.00%	0.0253	39.1	0.06%
RGFO Area 2	0.0000	76.90	0.00%	0.0002	39.7	0.00%
RGFO Area 3	0.0002	76.96	0.00%	0.0029	39.9	0.01%
Group R — All New Federal Oil and Gas (Colorado) Low Scenario	0.8622	76.96	1.12%	0.0229	49.9	0.00%
Group R — All New Federal Oil and Gas (Colorado) High Scenario	3.2125	76.47	4.20%	0.1126	49.9	0.23%

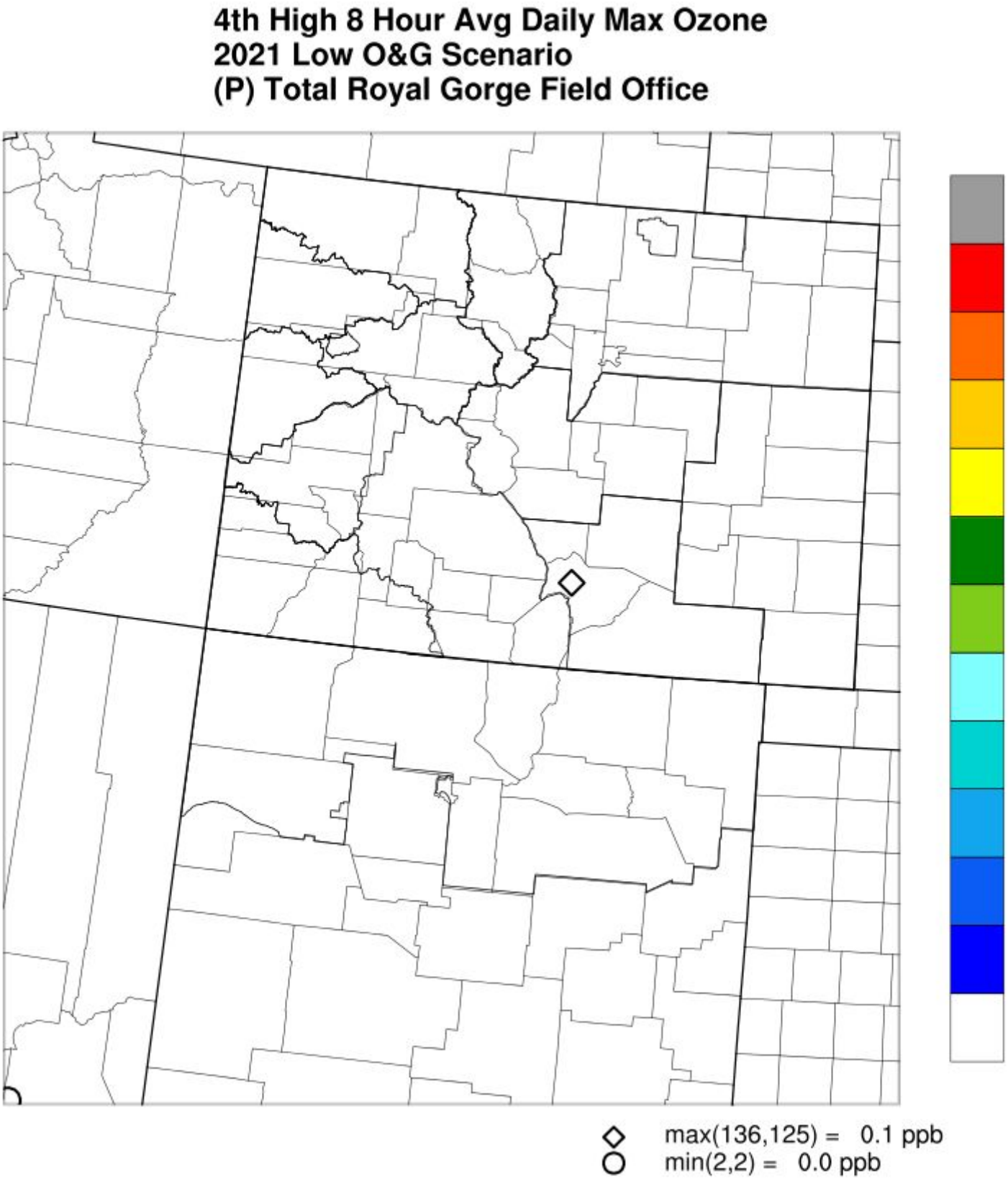
The maximum contributions to 4th high daily maximum 8-hour concentrations are expected to be minimal with respect to the 75 ppb 8-hour ozone standard, and the maximum contributions to any modeled exceedance (above NAAQS) are expected to be much less than 1% of the current ozone standard. For full cumulative ozone design value projections at regional ozone monitoring sites, the maximum current year 8-hour ozone design concentration (DVC; based on 2006-2010 observations) is 82.0 ppb at the Rocky Flats North (CO_Jefferson_006) monitor and is projected to be reduced to 79.5 ppb and 78.1 ppb for the CARMMS 2021 High and Low development scenarios, respectively. Group R (all new federal oil and gas in Colorado) is projected to contribute 0.9 and 0.3 ppb of attributable ozone to the Rocky Flats monitor from the CARMMS 2021 High and Low development scenarios, respectively. With the exception

of the Larimer County, Colorado monitors, modeled ozone predictions at all monitors within the modeling domain are lower for 2021. For the ozone design value projection unmonitored area analysis (UAA, analysis for areas with no monitors), the geographical extent (i.e. size) of the overall area of ozone design value exceedances is reduced (from 2008 to 2021) and the CARMMS difference plot below shows the largest ozone reduction in the Denver area while there are slight ozone increases just east of Fort Collins, Colorado.

The maximum contribution to the 8th high maximum 24-hour $PM_{2.5}$ concentration is minimal with respect to the 35 ug/m^3 24-hour standard. The $PM_{2.5}$ CARMMS plots below show changes in 8th highest daily average $PM_{2.5}$concentrations (2021 High Scenario minus Base Year 2008 concentrations) and emissions source apportioned to the RGFO. As shown in the figures, concentrations are expected to increase in major Colorado Front Range cities and near some surface mining operations in Colorado, but are not expected to be significant from the RGFO oil and gas sources (max = 0.7 µg/m^3).

The NO_2 one hour CARMMS plots generally show decreases in future cumulative NO_2 concentrations, and are again not expected to be significant from the RGFO oil and gas sources (max = 14.4 µg/m^3).

Figure 3.2. RGFO & Cumulative Change Ozone Plots (CARMMS — Low Scenario)


4th High 8 Hour Avg Daily Max Ozone
2021 Low O&G Scenario
(P) Total Royal Gorge Field Office
max(136,125) = 0.1 ppb
min(2,2) = 0.0 ppb

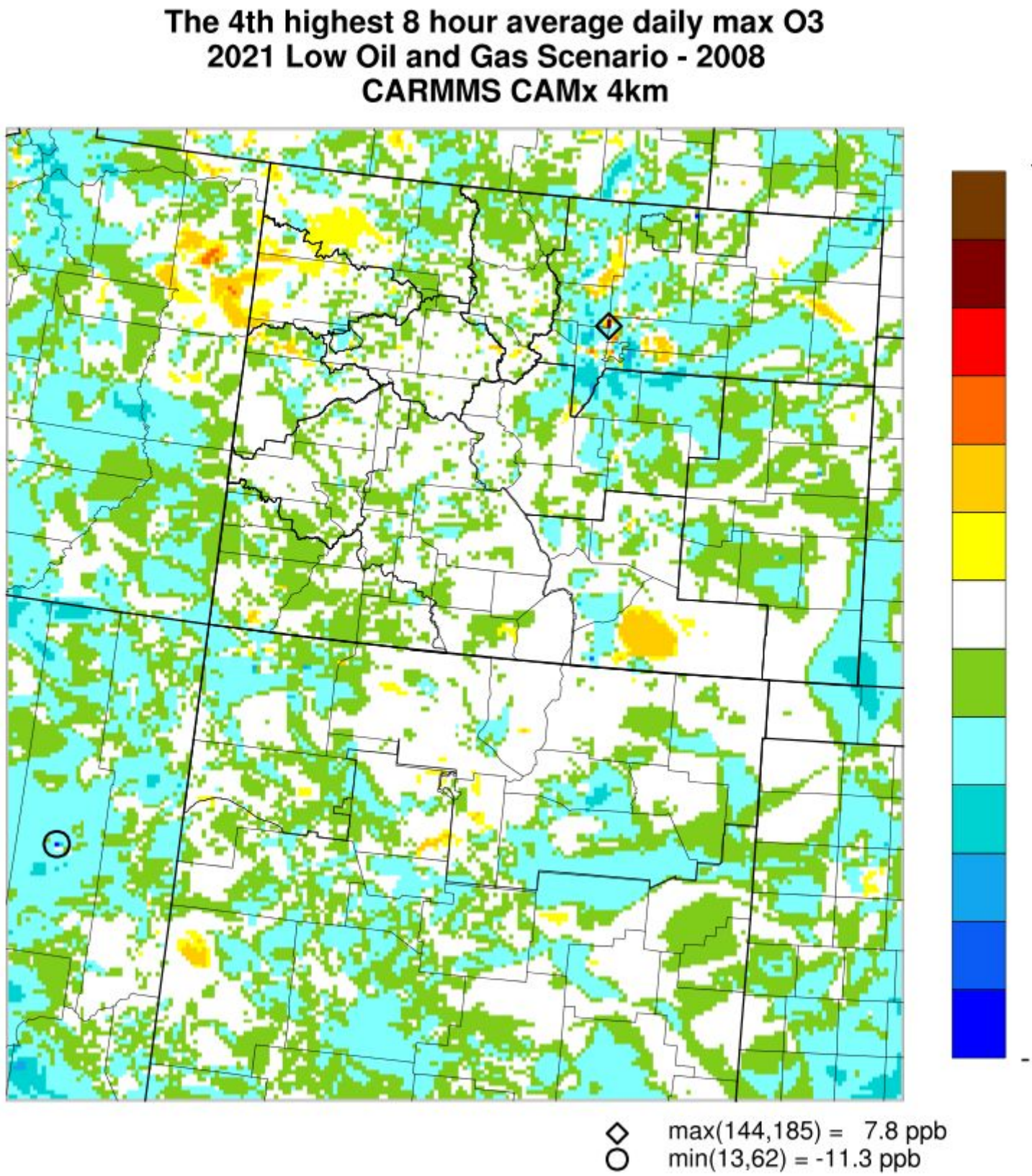
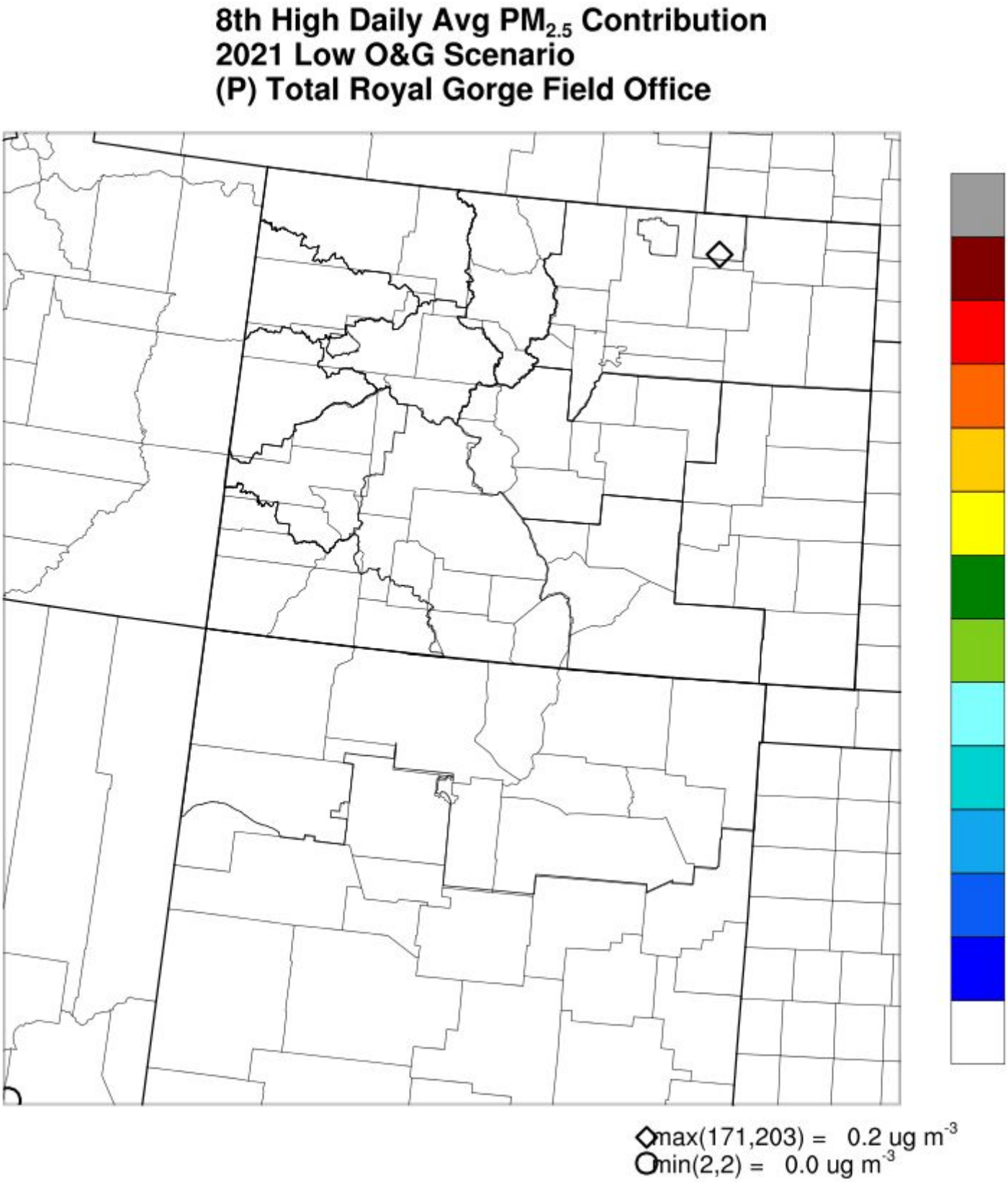


Figure 3.3. RGFO & Cumulative Change $PM_{2.5}$ Plots (CARMMS — Low Scenario)


8th High Daily Avg PM2.5 Contribution
2021 Low O&G Scenario
(P) Total Royal Gorge Field Office
max(171,203) = 0.2 ug m-3
min(2,2) = 0.0 ug m-3

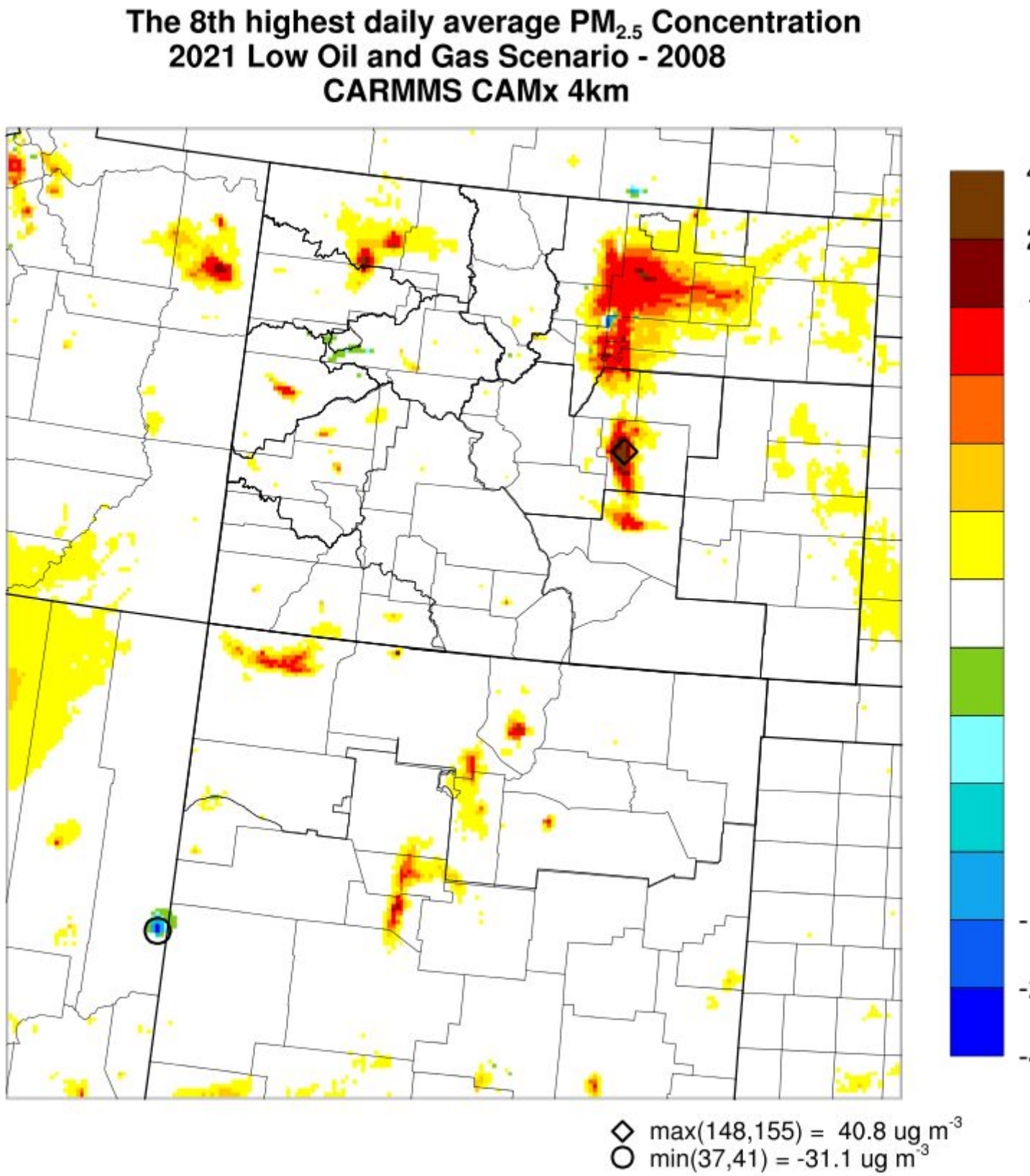
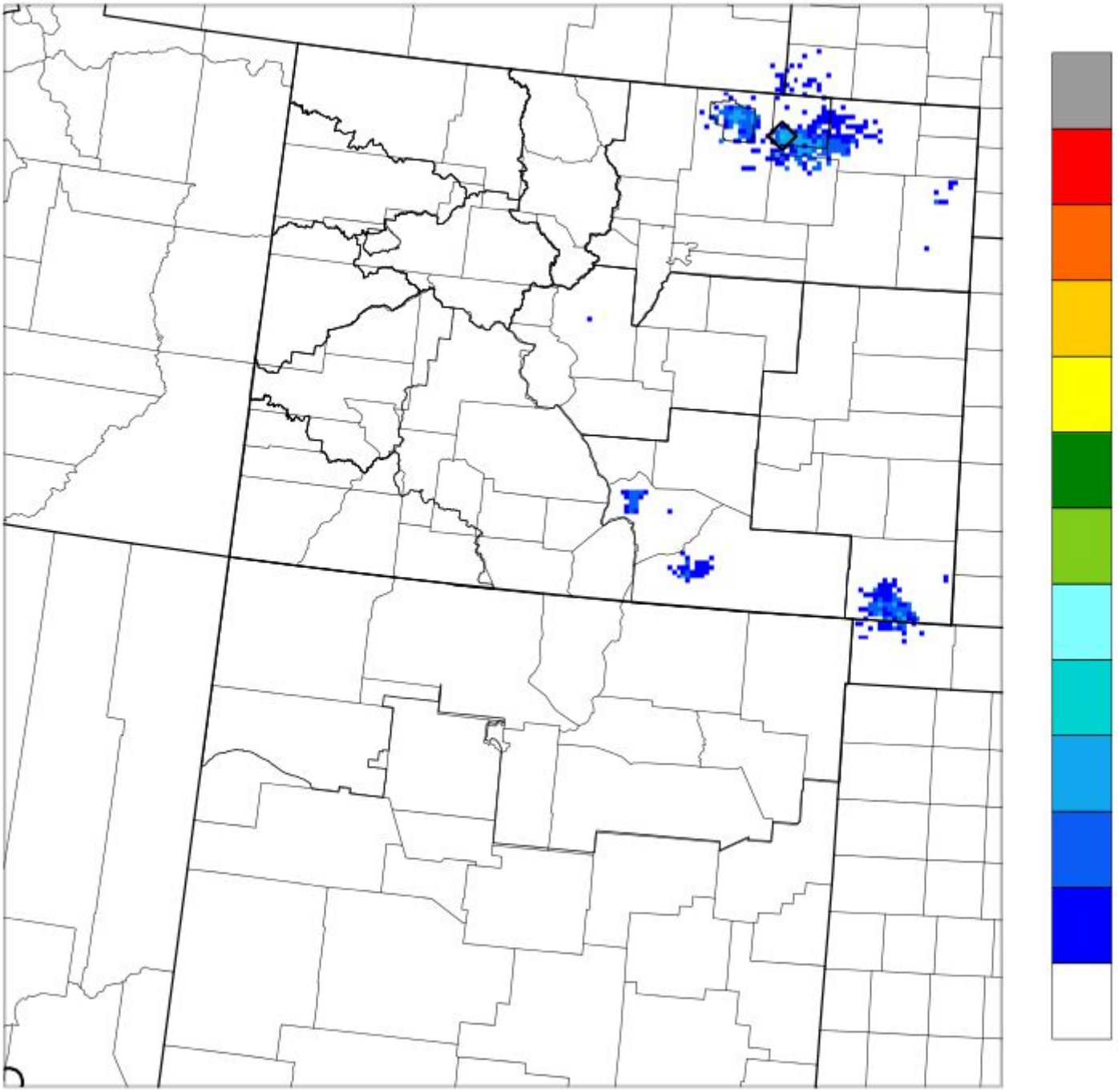
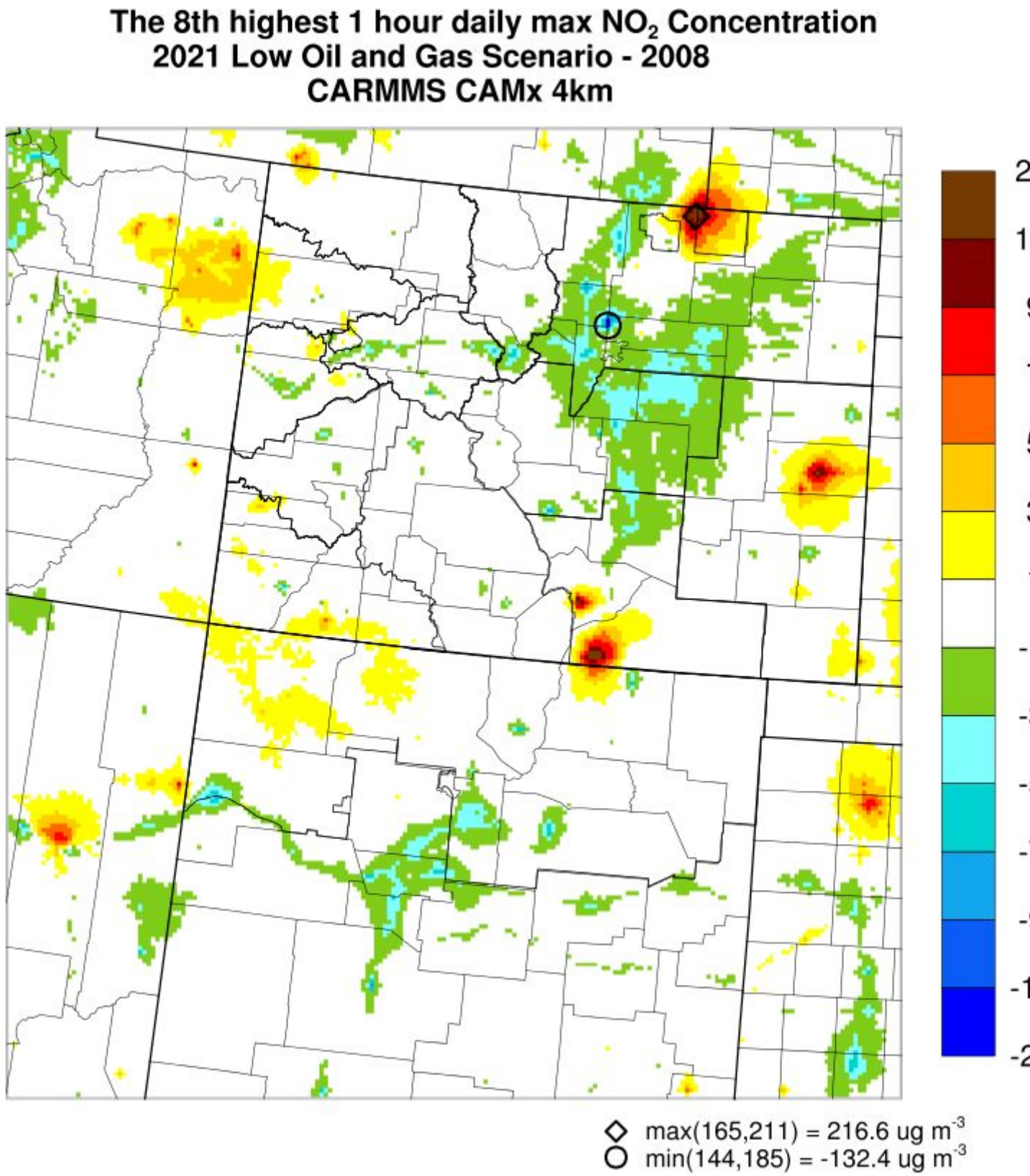


Figure 3.4. RGFO & Cumulative Change NO_2 Plots (CARMMS — Low Scenario)

8th High 1 Hour Daily max NO_2 Contribution
2021 Low O&G Scenario
(P) Total Royal Gorge Field Office



◇ max(167,204) = 2.1 ug m^{-3}
○ min(2,2) = 0.0 ug m^{-3}


The 8th highest 1 hour daily max NO_2 Concentration
2021 Low Oil and Gas Scenario - 2008
CARMMS CAMx 4km
max(165,211) = 216.6 ug m^{-3}
min(144,185) = -132.4 ug m^{-3}

As future oil and gas development occurs in the RGFO, the BLM Colorado will add project-specific emissions (based on approved APDs) to total regional emissions estimates to compare the RGFO oil and gas and other regional emissions rates modeled in cumulative air quality modeling studies (CARMMS) along with the corresponding modeling results to confirm whether the modeled emissions predicted in the cumulative impacts analysis accurately describe the actual emissions from activities approved by the BLM Colorado, and whether any refinement of the model is needed.

To estimate the cumulative GHG emissions from the RGFO SA areas, the BLM assumed a well life of 25 years and multiplied it by the annual production emissions from the wells. When added to the construction emissions the estimate for cumulative well count GHGs is approximately 9,459,794 metric tons of carbon dioxide equivalent (CO2(e)). The total provided does not account for the ultimate use or consumption of any produced minerals at this time due to the fact that the ultimate form of use and any additional processing required to render the product to sufficient quality (which would cause changes to the quantity of product) cannot be predicted with any reasonable certainty. Additionally, it should be noted that production values (also estimated at this time) could vary significantly over the life of the project, making any prediction of the quantities of GHG emitted highly speculative.

The CDPHE used the EPA's State Inventory Tool to estimate future years GHG emissions inventories for Colorado. In year 2020, it is estimated that Colorado's annual GHG emissions will be approximately 126,060,000 metric tons CO2(e). The cumulative RFD (federal and non-federal minerals) emissions represent about 7.5% of the state of Colorado's year 2020 annual GHG emissions. Given the relative magnitude of greenhouse gas emissions associated with the development of the SA wells as compared to the state's annual GHG emission levels, the GHG contribution associated with the SA (federal) wells is extremely small.

To provide additional context, the EPA has recently modeled global climate change impacts from a model source emitting 20% more GHGs than a 1500MW coal-fired steam electric generating plant (approx. 14,132,586 metric tons per year of CO2, 273.6 metric tons per year of nitrous oxide, and 136.8 metric tons per year of methane). It estimated a hypothetical maximum mean global temperature value increase resulting from such a project. The results ranged from 0.00022 and 0.00035 degrees celsius occurring approximately 50 years after the facility begins operation. The modeled changes are extremely small, and any downsizing of these results from the global scale would produce greater uncertainty in the predictions. The EPA concluded that even assuming such an increase in temperature could be downscaled to a particular location, it "would be too small to physically measure or detect", see Letter from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation re: "Endangered Species Act and GHG Emitting Activities (Oct. 3, 2008). The RFD emissions are a fraction of the EPAs modeled source and are shorter in duration, and therefore leasing and development of the proposed parcels would have no measurable impact on the climate.

With respect to GHG emissions, the following predictions were identified by the EPA for the Mountain West and Great Plains region:

—The region will experience warmer temperatures with less snowfall.

—Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.

— Earlier snowmelt means that peak stream flow will be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs will be drier.

—More frequent, more severe, and possibly longer-lasting droughts will occur.

—Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.

— Drier conditions will reduce the range and health of ponderosa and lodge pole pine forests, and increase the susceptibility to fire.

—Grasslands and rangelands could expand into previously forested areas.

—Ecosystems will be stressed and wildlife such as the mountain line, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

If these predictions are realized as mounting evidence suggests is already occurring, there could be impacts to other resources within the region. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Warmer temperatures with decreased snowfall could have an impact on a particular plants ability to sustain itself within its current range. An increased length of growing season in higher elevations could lead to a corresponding variation in vegetation and change in species composition. These types of changes would be most significant for special status plants that typically occupy a very specific ecological niche. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened or endangered plants may be accelerated. Invasive plant species would be more likely to out-compete native species.

Increases in winter temperatures in the mountains could have impacts on traditional big game migration patterns. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Warmer winters with less snow would impact the Canada lynx by removing a competitive advantage they have over other mountain predators. Earlier snowmelt could also have impacts on cold water fish species that occupy streams throughout the planning area. Climate change could affect seasonal frequency of flooding and alteration of floodplains, which could impact riparian conditions. More frequent and severe droughts would have impacts on many wildlife species throughout the region as well as vegetative composition and availability of livestock forage in some areas. Climate change could increase the growing season within the region, which could result in more forage production provided there is sufficient precipitation. Drier conditions could have severe impacts on forests and woodlands and could leave these areas more susceptible to insect damage and at higher risk of catastrophic wildfires. Increased fire activity and intensity would increase greenhouse gas emissions, providing for a negative feedback loop. In fact most of the predicted changes on a global scale have some level of a predicted negative feedback loop, exacerbating adverse impacts.

Mitigation:

Substantial emission-generating activities cannot occur without further BLM analysis and approval of proposals for exploration and development operations. BLM may make its approval of these activities subject to conditions of approval (COA) addressing air pollutant emissions, as appropriate. Prior to approving development activities on a leased parcel, the BLM will conduct a

project level impacts analysis that will consider the impacts of the operator's development plans for the lease, to the extent reasonably foreseeable. The BLM's analyses will typically consider the emissions inventory for the proposal, and estimated emissions from other development on and 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 by the public as demand dictates. 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.

3.4.1.2. Hydrology/Water Quality:

Affected Environment:

Most of the surface ownership of the lands being proposed for leasing is privately owned; therefore BLM has no site specific information about water quality on those parcels. In general, most of the water quality in these areas is good and there is very little surface water.

Surface Water: The proposed lease parcels are located in the South Platte River basin of Colorado, east of I-25, and in southeast Colorado, in the Arkansas River Basin. These areas range from the headwater type areas of these rivers in Arapahoe County (South Platte Basin) and Las Animas and Huerfano Counties (Arkansas Basin) to the foothills and eastern plains. In general, the water quality in these rivers is good near the headwaters and declines as one moves 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.

Ground Water: The majority of proposed lease parcels are located in the northeastern plains of Colorado, except for the few parcels in Huerfano and Las Animas counties, which are in the southeastern mountains and foothills of Colorado. These leases occupy one of two general aquifers: the High Plains Aquifer in the far eastern plains, and the Dakota-Cheyenne Aquifer in the western portion of the eastern plains and in the southeast portion of the state. Parcels 7349 and 7350, located in Huerfano County, are in a mountainous area, and no designated aquifer is located under them, however there is potential for groundwater in the crystalline structure of the rock underlying the parcels. Water quality in these aquifers is variable depending on the formation in which the water is located.

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 and quantity. The magnitude and location of direct and indirect effects cannot be

predicted with accuracy until the site-specific APD stage of development. No lease stipulations for the proposed parcels specifically address either surface or groundwater quality. Stipulations CO-26 and CO-27, however, address soils and slope stability issues that would directly protect soils and water quality by minimizing erosion for applicable parcels in areas covered by the Northeast RMP. The leasing of these parcels would not affect whether or not these lands meet Public Land Health Standards; but development could negatively affect water quality. With adherence to state and federal regulations, and proper BMP implementation, water quality should still meet standards with future development. Similar to water quality, water quantity impacts cannot be predicted with accuracy until the site specific APD stage. Many factors, such as well type, depth, and the use of recycled water, influence the amount, timing and location of water used in oil and gas development. Water usage is largely regulated by the State of Colorado's water rights system and operators would need to obtain a legal source of water.

Surface Water: Impacts to surface water resources would be associated with the surface disturbance from the construction of roads, pipelines, well pads, and power lines. 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 BMPs that would design facilities with temporary runoff control measures that would slow down runoff and capture sediment. These BMPs would be applied 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 permits would require full compliance with BLM directives and state regulations that relate to surface and groundwater protection.

Ground Water: If the proposed parcels are developed, drilling 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 and completion 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.

If the parcels are developed, wells within the parcels may be completed using hydraulic fracturing techniques. Hydraulic fracturing can change the physical properties of producing formations by increasing the flow of water, gas, and/or oil around the well bore, and can also introduce chemical additives into the producing formations. Types of chemical additives used in completion activities may include acids, hydrocarbons, thickening agents, gelling agents lubricants, and other additives that are operator and location specific. The largest components in hydraulic fracturing fluid are water and sand. The state of Colorado requires operators to publicly disclose all chemicals in hydraulic fracturing fluids used on all wells completed in Colorado using hydraulic fracturing techniques on frac focus, a database available to the public online at http://fracfocus.org/ .
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 from other geologic formations (including the hydrocarbon producing zones), and any completion fluids introduced in the wellbore. Engineering reviews at the APD stage and inspections at the drilling and completion stages of the project are conducted to ensure compliance with this regulation. The State of Colorado regulates hydraulic fracturing, and requires mitigation to other wells within 1500' of wells to be hydraulically fractured, to protect fresh water zones and the surface at these offset wells.

Known usable water bearing zones in the lease area are protected by drilling requirements and, with proper practices and adherence to state and federal regulations, 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.

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 5th 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.

Water is used to drill and complete oil and gas wells. It is not known at the lease stage how many (if any) wells will be drilled on a given lease parcel, how many parcels will be developed, and how much water may be used for each potential well. Factors such as the type of well to be drilled (vertical, directional or horizontal), method of well completion (hydraulic fracturing, acidizing ect.) total measured depth of well, and geologic conditions of the formations all determine how much water may be required for each well. This information is not known at the lease stage, and will be analyzed at the APD stage. The act of oil and gas leasing does not directly result in any water use.

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.

Potential Future Mitigation: The soils mitigation (interim and final reclamation), along with additional construction requirements (onshore order #2, engineering reviews), at the APD stage is adequate to protect water resources on the parcels being proposed for leasing. Additional site specific mitigation measures would be analyzed and may be added at the APD stage.

3.4.1.2.1. Minerals/Fluid:

Affected Environment: The twenty-one nominated parcels are located in northeast and southeast Colorado. The development potential ranges from high (20–50 wells per township) to very low (less than one well per township).

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Leasing of the twenty-one 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. If development of the parcels takes place, it would result in the extraction of hydrocarbon resources from the targeted zones of the leases.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Should the leases be issued, would be the potential for development resulting in draining these parcels of fluid minerals. Cumulative impacts to the fluid mineral resource would depend on the potential of any of the given areas for future development.

3.4.1.3. Soils:

Affected Environment:

The proposed lease parcels cover a large variety of soil types and conditions ranging from high elevation, colder soils and exposed rock outcrops in the on Mestas / Rough Mountain area to lower elevation dry, warmer soils on the northeast plains. 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:

Most of the surface ownership of the lands being proposed for leasing is privately owned; therefore no site specific knowledge of soil resources is available. In general, most of the soils in these areas are in good condition; however many have been used in cultivated agricultural fields for some time. The leasing of these parcels would not have an effect on whether or not these lands meet Public Land Health Standards; but at the development stage there would be instances where soils are affected negatively. With proper Best Management Practice (BMP) implementation, soil resource impacts would be mitigated and would still meet standards with future development.

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 with accuracy until the site-specific APD stage of development. Parcels with fragile soils and steep, unstable slopes that are in parts of the field office covered by the Northeast RMP can be protected with stipulations CO-26 and CO-27, however these stipulations are not available in the Royal Gorge RMP, so they cannot be applied to leases that fall within the Royal Gorge RMP boundaries.

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, power lines 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.

Parcels in the Northeast planning area (areas covered by the Northeast RMP) with soils that have aliquot parts with a high erosion hazard have had stipulation CO-26 applied that requires the operator submit a construction/reclamation plan that includes specific criteria to protect soils. Parcels that have aliquot parts with slopes over 40% have had stipulation CO-27 applied that requires the operator submit an engineering/reclamation plan that includes specific criteria to address slopes and protect site productivity. Stipulations CO–26 and CO-27 are not available under the Royal Gorge RMP, therefore they can not be applied to parcels in the Royal Gorge resource area.

Parcels 7349 and 7350 have very unstable rock outcrop soils with up to 80% slopes, which are unsuitable for pad construction. Attempting to construct a drilling pad in this location would likely cause severe soil erosion and excessive runoff, and make proper reclamation virtually impossible. This could severely impact water quality downstream, and result in a loss of available topsoil on the location. Since there are no stipulations available under the Royal Gorge RMP to mitigate these concerns, such as a no surface occupancy for these types of soils and slopes, these parcels are recommended for deferral under the preferred alternative. These parcels may be considered for future lease sales if suitable stipulations to protect soils are adopted with a plan amendment.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

The proposed lease parcels are scattered throughout the eastern Colorado, from the plains to the north to the mountains and foothills in the south, and have various current surface uses. The main uses of these parcels is currently either native grassland grazing or some sort of cultivated agriculture. Current oil and gas development locates several wells on each pad. Often times these pads are shared with wells that are entirely non-federal and the development of the federal leases add very little to the surface impact. Overall, the leasing of these proposed parcels would add little to the overall soil impacts in the area.

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.

3.4.2. Biological Resources

3.4.2.1. Invasive Plants:

Affected Environment: Invasive plants are common in the area due to livestock grazing and other agricultural practices. It is likely that the native plant community has been altered due to the long-term agricultural practices in the area.

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: Due to the long-term exposure of the project area to agricultural practices, expected cumulative impacts are thought to be minor.

Potential Future Mitigation: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. 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.

3.4.2.2. Migratory Birds:

Affected Environment: The 2010 Memorandum of Understanding between the BLM and US Fish and Wildlife Service on migratory birds (BLM MOU WO-230–2010–04 and BLM Instruction Memorandum No. 2011-007) 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 migratory bird and raptor species of conservation concern by avoiding or minimizing negative impacts and restoring and enhancing habitat quality.

The majority of proposed parcels are located in the shortgrass prairie physiographic area, located on the eastern plains of Colorado in Weld and Las Animas Counties. Most of these parcels are split estate, with the surface privately owned and the minerals owned by another entity. These parcels are characterized by flat to gently rolling topography, with occasional canyons and bluffs. Elevations range from about 4,500 feet in Las Animas County to 5,250 feet in Weld County. Principal rivers include the South Platte and Purgatorie. 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.

Within a half-mile of the proposed parcels in Weld and Las Animas Counties, the dominant vegetation type in this physiographic area are shortgrass prairie and agricultural land (crop and livestock pasture). 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.

Another vegetation cover type in the shortgrass prairie physiographic area is lowland riparian and lake shore vegetation. These areas are dominated by plains cottonwood, wouldow shrubs, and introduced invasive 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. Some pinon pine and juniper woodlands occur in the Las Animas County parcels.

Parcels located in the Southern Rockies physiographic area in Huerfano County range in elevation from 8,250 to 10,185 feet. The surface of most of these parcels are managed by BLM, however some split estate parcels are also within this group. The principal river is the Huerfano. Within a 1/2 mile of the proposed parcels in Huerfano County, the vegetation present is highly variable. The following vegetation cover types are present: big sagebrush, piñon pine and juniper woodlands, Gamble oak, ponderosa pine, mixed conifer, aspen mixed conifer, cliffs, montane and subalpine wet meadows and grasslands, lodgepole pine, subalpine riparian, Engelmann spruce and subalpine fir forest, and alpine bedrock and scree.

The following birds and raptors are listed as BLM priority migratory species, birds of conservation concern by the Colorado Partners in Flight, or are 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 are believed to winter and/or breed in or near the project area, have declining populations and should be protected from habitat alterations. Federally listed threatened, endangered and proposed and BLM sensitive bird species that are also migratory or described as birds of concern are analyzed in the Special Status Species section of this document.

Table 3.12. BLM Priority, Colorado Partners in Flight & US Fish and Wildlife Service Migratory Birds of Conservation Concern in Central Shortgrass Prairie Physiographic Area

Species in 36 Central Shortgrass Prairie Physiographic Area	Associated Vegetation in Planning Area	Important Habitat in Planning Area	CO Breeding Dates	Status
prairie falcon (*Falco mexicanus*)	shortgrass prairie, crop fields, feedlots	breeding	March 10 to July 25	Colorado Partners In Flight & Landbird Conservation Priority Birds
short-eared owl (*Asio flammeus*) 5	prairie & mountain wetland	breeding, winter	March 15 to August 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
northern harrier (*Circus cyaneus*)	prairie wetland	breeding, winter	April 11 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
Lewis' woodpecker (*Melanerpes lewis*)	prairie & mountain lowland riparian	breeding, winter	April 15 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
McCown's larkspur (*Calcarius mccownii*)	shortgrass prairie	breeding	May 1 to July 31	Colorado Partners In Flight & Landbird Conservation Priority Birds
upland sandpiper (*Bartramia longicauda*) 5	shortgrass prairie	breeding	May 1 toJuly 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
lark bunting (*Calamospiza melanocorys*)	shortgrass prairie	breeding	May 5 to August 5	BLM Priority Migratory Birds
Bell's vireo (*Vireo bellii*)	prairie lowland riparian	breeding	May 20 to July 31	Colorado Partners In Flight & Landbird Conservation Priority Birds
Cassin's sparrow (*Aimophila cassini*i)	arid mountain grasslands	breeding	May 21 to August 5	BLM Priority Migratory Birds
grasshopper sparrow (*Ammodramus savannarum*)	shortgrass prairie	breeding	June 1 to July 31	Colorado Partners In Flight & Landbird Conservation Priority Birds

Table 3.13. BLM Priority, Colorado Partners in Flight & US Fish and Wildlife Service Migratory Birds of Conservation Concern in Southern Rocky Mountain Physiographic Area

Species in 62 Southern Rocky Mountains Physiographic Area	Associated Vegetation in Planning Area	Important Habitat in Planning Area	CO Breeding Dates	Status
golden eagle (*Aquila chrysaetos*)	mountain grasslands, cliffs	breeding, winter	February 1 to August 15	Colorado Partners In Flight & Landbird Conservation Priority Birds
boreal owl (*Aegolius funereus*)	spruce - fir forest	breeding, winter	February 10 to August 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
American dipper (*Cinclus mexicanus*)	high elevation riparian, swiftly flowing streams	breeding, winter	February 21 to August 15	Colorado Partners In Flight & Landbird Conservation Priority Birds
pinyon jay (*Gymnorhinus cyanocephalus*)	pinon pine juniper woodlands	breeding	February 21 to August 20	Colorado Partners In Flight & Landbird Conservation Priority Birds
horned lark (*Eremophila alpestris*) 5	shortgrass prairie	breeding, winter	March 1 to August 20	BLM Priority Migratory Birds

Cassin's finch (*Carpodacus cassinii*)	mountain riparian, conifer, aspen	winter	April 10 to August 20	BLM Priority Migratory Birds
loggerhead shrike (*Lanius ludovicianus*)	mountain grasslands	breeding	April 10 to August 20	BLM Priority Migratory Birds
Swainson's hawk (*Buteo swainsoni*)	mountain grasslands	breeding	April 14 to August 20	BLM Priority Migratory Birds
band-tailed pigeon (Patagioenas fasciata)	ponderosa pine forest	breeding	April 21 to September 30	Colorado Partners In Flight & Landbird Conservation Priority Birds
juniper titmouse (*Baeolophus ridgwayi*)	pinon pine juniper woodlands	breeding	May 1 to August 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
Williamson's sapsucker (*Sphyrapicus thyroideus*)	mountain riparian, mixed conifer forest	breeding	May 1 to August 15	BLM Priority Migratory Birds
broad-tailed hummingbird (*Selasphorus platycercus*)	aspen forest, open woodlands	breeding	May 1 to August 20	Colorado Partners In Flight & Landbird Conservation Priority Birds
green-tailed towhee (*Pipilo chlorurus*)	mountain shrub	breeding	May 1 to August 20	Colorado Partners In Flight & Landbird Conservation Priority Birds
lazuli bunting (*Passerina amoena*)	mountain lowland riparian, mountain shrubs, open woodland	breeding	May 5 to August 15	Colorado Partners In Flight & Landbird Conservation Priority Birds
violet-green swallow (*Tachycineta thalassina*)	aspen forest, open woodlands, snags	breeding	May 5 to August 20	Colorado Partners In Flight & Landbird Conservation Priority Birds
red-naped sapsucker (*Sphyrapicus nuchalis*)	aspen forest	breeding	May 10 to August 25	Colorado Partners In Flight & Landbird Conservation Priority Birds
flammulated owl (*Psiloscops flammeolus*)	open ponderosa pine forest	breeding	May 11 to August 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
Grace's warbler (*Dendroica graciae*)	ponderosa pine forest	breeding	May 15 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
gray vireo (*Vireo vicinior*)	deciduous shrubs/pinon pine juniper woodlands	breeding	May 15 to July 25	Colorado Partners In Flight & Landbird Conservation Priority Birds
Cordilleran flycatcher (*Empidonax occidentalis*)	high elevation riparian	breeding	May 20 to August 10	Colorado Partners In Flight & Landbird Conservation Priority Birds
Wilson's warbler (*Cardellina pusilla*)	high elevation riparian, shrub thickets, beaver ponds, lakes	breeding	May 20 to July 25	Colorado Partners In Flight & Landbird Conservation Priority Birds
Virginia's warbler (*Oreothlypis virginiae*)	mountain riparian, mountain shrubs	breeding	May 25 to August 15	BLM Priority Migratory Birds
MacGillivray's warbler (*Geothlypis tolmiei*)	high elevation riparian, dense understory & shrub	breeding	May 25 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
Hammond's flycatcher (*Empidonax hammondii*)	spruce - fir forest, cool forests	breeding	May 30 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
olive-sided flycatcher (*Contopus cooperi*)	spruce - fir forest, snags, edge of wetlands	breeding	June 1 to July 31	Colorado Partners In Flight & Landbird Conservation Priority Birds

American pipit (*Anthus rubescens*)	alpine tundra	breeding, winter	June 10 to August 20	Colorado Partners In Flight & Landbird Conservation Priority Birds
veery (*Catharus fuscescens*)	mountain wetlands, forests	breeding	June 11 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
black swift (*Cypseloides niger*)	mountains cliffs	breeding	June 15 to October 5	Colorado Partners In Flight & Landbird Conservation Priority Birds
purple martin (*Progne subis*)	aspen forest	breeding	June 5 to August 5	Colorado Partners In Flight & Landbird Conservation Priority Birds

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.

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.

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.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Leasing would 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 could destroy or degrade existing habitat for migratory birds and raptors. If surface disturbing activities occur during the nesting season, "take" of nests and/or chicks may occur. Noise and human activity generated during construction, drilling, and production phases would likely result in a larger impact footprint then the disturbance footprint alone. Foraging, perching and roosting habitat for migratory birds and raptors may also be lost or degraded. Future development could attract predatory species, such as coyote, fox, racoons, American crow, etc. to nesting areas, which could affect reproductive success and foraging of migratory birds and raptors. Development could also introduce invasive plant materials into the areas, or spread existing occurrences into the areas, thereby degrading suitable breeding and foraging habitat for migratory birds and raptors if present.

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, would 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 would occur, resulting in more migratory bird habitat loss and affected individual birds.

Appropriate lease stipulations to protect some migratory birds and their habitats were attached to parcels and described in Attachments A and 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 would 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 compromised. However, new oil and gas development would likely cause an additive negative impact to most species of migratory birds currently present at the site. While the leasing of parcels would not compound these impacts, future oil and gas development may impose deleterious effects. Every parcel is unique and cumulative impacts would 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 2011–007, to reduce impacts to BLM Priority Migratory Birds, Colorado Partners in Flight and US Fish And Wildlife Service Birds of Conservation Concern (BCC), conservation measures would be necessary.

Raptor nest surveys would be required during the breeding season prior to construction by a qualified surveyor using pre-approved survey protocols. If raptor nests are detected, then a No Surface Occupancy and Timing Limitation stipulations would be required as appropriate for that species (Attachment A and C).

For all other migratory birds listed in the affected environment, a no habitat disturbance (e.g. removal of vegetation such as timber, brush, or grass, road creation, etc.) would be required during the breeding and brood rearing season of Colorado migratory birds. This is generally between May 15 to July 15, however this 60 day timeframe may be adjusted by a BLM wildlife biologist to a more appropriate time frame specifically for the Colorado migratory birds described in the affected environment at the time of application for permit to drill.

The provision would not apply to construction and development activities located in previously disturbed areas that were initiated prior to May 1st. This is because it is assumed that habitat loss from construction would occur prior to the start of breeding season, making those sites unsuitable for bird breeding activities.

An exception to this timing limitation would be granted if migratory bird and raptor nesting surveys, conducted during the bird breeding season and no more than one week prior to construction and development activities, demonstrate that no bird or raptor nests or breeding activities are located within 30 meters (100 feet) of the action area. Bird breeding surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions following pre-approved survey protocols.

Any secondary containment system would be covered in a manner to prevent access by migratory birds. The operator would construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may

result in a "take" of individual migratory birds or nests that are protected by MBTA would not be allowed.

3.4.2.3. Special Status Animals:

Affected Environment: The following federally threatened and endangered species have the potential to occur within the proposed parcels available for leasing, or be affected by parcel development at a later stage, including offsite impacts.

Table 3.14.

Species Name	Listing Status	Environmental conditions need for habitat	Critical habitat designated by the Secretary of the Interior (74 Federal Register 36, CFR Part 17, PL-93-205, Section 4, 1978)
Birds			
interior least tern *(Sternula antillarum)*[a]	Endangered	Breeding Habitat: Shallow water bodies during summer, rivers, sand pit ponds, barren ground surrounded by water, migratory in Colorado from mid to late May until fall, upstream water depletions of North Platte, South Platte and Laramie River basins described as a threat to downstream populations	Not designated
piping plover (*Charadrius melodus*)[a]	Threatened	Breeding Habitat: Prairie lakes, reservoir shores, migratory in Colorado from April, open sand beaches, wet sand, near snowy plovers, killdeer and spotted sandpipers, upstream water depletions of North Platte, South Platte and Laramie River basins described as a threat to downstream populations	not in Colorado
southwest willow flycatcher (*Empidonax traillii extimus*)	Endangered	Breeding Habitat: Southern-most portions of Colorado in deciduous willow carrs and cottonwood riparian corridors with other native shrubs and trees greater than 13 ft. in height with high canopy cover and dense hiding cover greater than 1.24 acres in size up to 8,500 ft. elevation, migratory in Colorado by mid-May with abundant insect populations (USFWS 1995)	Designated in: La Plata, Alamosa, Conejos, and Costilla Counties, California, Nevada, Utah, New Mexico, Arizona
whooping crane (*Grus americana*) [a]	Endangered, Experimental Population, Non-Essential	Breeding Habitat: Large seasonal or permanently flooded palustrine wetlands complexes with potholes, including croplands, salt marshes, or tidal flats with insects, crayfish, frogs, small fish, and open expanses near wetlands for roosting, incidental migratory species in Colorado but upstream water depletions of North Platte, South Platte and Laramie River basins described as a threat to downstream populations	Proposed, not in Colorado
Mammals			

black-footed ferret (*Mustela nigripes*)	Endangered, Experimental Population, Non-Essential	Breeding, Foraging Habitat: Mountain and prairie grasslands where prairie dog colonies greater than 802 acres in size.	Not designated
Canada lynx (*Lynx canadensis*)	Threatened	Breeding, Foraging, Movement Habitat: Dense spruce-fir, Douglas-fir, early seral lodgepole pine, mature lodgepole pine with developing understory of spruce-fir and aspen in subalpine life zone and timberline, using caves, rock crevices, banks, coarse woody debris for denning, closely associated with snowshoe hare	Designated but not in Colorado (USFWS 2014)
New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	Endangered	Breeding & Foraging Habitat: Riparian corridors and wetlands with flowing water and persistent emergent herbaceous wetlands of *Carex rostrata* or *Phalaris arundinacea* alliances, or willow or alder dominated scrub-shrub sites with saturated soils, residual heraceous height greater than 27 inches and greater than 61 inches of sedges, rushes, grasses and forbs expanding to greater than 5.6 linear feet by 330 lateral feet to include adjacent floodplain and uplands (USFWS 2013)	Proposed in: La Plata, Archuleta, and Las Animas Counties, Arizona and New Mexico
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	Threatened	Breeding & Foraging Habitat: Riparian habitats east of Laramie mountains and south of the North Platte River, well-developed riparian vegetation with dense multistoried horizontal cover dominated by willows and a well-developed understory of grasses and forbs; adjacent, upland grasslands within 300 feet of the 100 year floodplain that are relatively undisturbed; flowing water; up to 7,600 feet in elevation; in Larimer, Boulder, Weld, Jefferson, and El Paso Counties of Colorado (NatureServe 2014, USFWS 2010)	Designated in: Boulder, El Paso, Jefferson, & Larimer Counties (USFWS 2010)
Flowering Plants			
Colorado butterfly plant (*Guara neomexicana spp. Coloradensis*)	Threatened	Facultative Wetland species endemic to northeast Colorado, including Boulder, Broomfield, Douglas, Jefferson, Larimer and Weld counties in sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie at elevations of 5,800 to 6,200 ft. in elevation; flowers June to September, fruits July to October (Nature Serve 2014, USFWS 2015)	Designated but not in Colorado (USFWS 2005)

Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Threatened	Facultative Wetland uncommon species, in seasonally moist soils and wet meadows of drainages, found in riparian wetlands, herbaceous dominated meadows in the floodplains of perennial streams in Boulder, El Paso, Jefferson, Larimer, Moffat and Weld Counties; requires occasional fluvial disturbances, such as flooding, from 4,500 to 6,800 feet elevation, flowers July to September (NatureServe 2014, USFWS 1992)	Not designated
Western prairie -fringed orchid (*Platanthera praeclara*) [a]	Threatened	Facultative Wetland to Obligate Wetland species found in full sun on moist to wet unplowed calcereous soils of tallgrass prairie and sedge meadows in undisturbed environments and roadside ditches, tallgrass prairie and sedge meadows flooded 1-2 weeks annually, 1.2 m tall perennial herb, NatureServe and USFWS do not indicate this species present in Colorado but upstream water depletions of North Platte, South Platte and Laramie River basins described as a threat to downstream populations, flowers mid June to late July, (NatureServe 2014, USFWS 2015)	Not designated
Fish			
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	Threatened	Cold water streams and lakes currently known in the South Platte River basin	Not designated
Pallid sturgeon (*Scaphirhynchuys albus*) [a]	Endangered	Not known in Colorado but upstream water depletions of North Platte, South Platte and Laramie River basins described as a threat to downstream populations	Not designated

[a]Water depletions in the North Platte, South Platte, and Laramie River Basins may affect the species and/or critical habitat associated with the Platte River in Nebraska.

The following BLM sensitive species (black-tailed prairie dog, swift fox, Townsend's big eared bat, common kingsnake, milk snake, massasauga, mountain plover, American white pelican, ferruginous hawk and bald eagle) potentially occur on parcels available for leasing, or could be affected by parcel development at a later stage, including offsite impacts.

All proposed lease parcels are subject to lease stipulation Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate, or other special status plant or animal species. Protective measures for these species would 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 (Attachment A and C). The necessity of site specific field surveys would be determined at the time individual APDs are received.

Interior least tern, piping plover, whooping crane, Western prairie fringed orchid and pallid sturgeon: Additional analysis, including downstream effects to interior least tern, piping plover, whooping crane, Western prairie fringed orchid and pallid sturgeon, and Section 7 consultation, as necessary, would be completed as individual APDs are received for the parcels identified in this document for projects that may cause water depletions to the South Platte River. Because the proposed act of leasing these parcels would not directly involve water depletions, and because it is

not possible to determine if water depletions would occur at a later time with parcel development, there will be no further discussion of interior least tern, piping plover, whooping crane, Western prairie fringed orchid and pallid sturgeon in this document.

Canada Lynx: The Huerfano County lease sale parcels that are located adjacent to the La Veta Pass Lynx Linkage Area, but they are not within a Lynx Analysis Unit. Some primary and secondary Canada lynx habitat occurs within these parcels, yet it is not known if the condition of that habitat is high or marginal quality. More suitable habitat for lynx is believed to occur adjacent to those proposed parcels, on privately owned lands within the La Veta Pass Lynx Linkage Area.

Southwest willow flycatcher, Preble's meadow jumping mouse, New Mexico meadow jumping mouse, Colorado butterfly plant, Ute ladies'-tresses orchid and green-backed cutthroat trout: These species are dependent upon healthy riparian systems, and this condition may be located within or near some of the proposed parcels. Due to land use practices, habitat for these species is assumed to be in marginal condition on privately owned surface lands, and are in suitable but fair condition on BLM surface managed lands.

Green-backed cutthroat trout: The Huerfano parcels are located within the historic geographic range of the Arkansas River Basin of this species, which exists in first and second order streams. The habitat in these parcels are not occupied and are not identified for recovery of this species.

Black-footed ferret: Suitable habitat for black-footed ferret, which is dependent upon large prairie dog colonies, may be present on the privately owned parcels in Weld and Las Animas Counties. According to USGS distribution models and Colorado Parks and Wildlife release site data for black-footed ferret, this species is not believed to be present in Weld, Huerfano or Las Animas Counties[1] .

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.

Townsend's big-eared bat: 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

[1]US Geological Survey Gap Analysis Program. 2011. National GAP vertebrate species distribution model. Available: http://gapanalysis.usgs.gov/species

(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 lepidopteron.

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. Massasauga 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.

Mountain Plover: Mountain Plovers 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 agricultural production, drought, grazing, fire, etc. (Knopf and Miller 1994). Plover habitat associated with this assessment is located Baca, El Paso, Elbert, Huerfano, Kiowa, Kit Carson, Bent, Lincoln, Washington, and Weld.

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 and major riparian systems within the RGFO resource area serve as important foraging and nesting locations. Parcels 6911, 6932, and 7004 occur within pelican.

Ferruginous hawks: The ferruginous hawk inhabits grasslands and semi-desert 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. Ferruginous hawks are typically winter resident on eastern plains, but may nest in this area on occasion.

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 RFGO. 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 federally listed threatened, endangered, or BLM sensitive species. However, the authorization to lease parcels for oil and gas development would 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.

Canada Lynx: A small loss of lynx habitat would be expected from lease development on the some of the Huerfano parcels. This loss would be expected to be insignificant and discountable due to the limited number of acres that would be affected. Since there is not a Lynx Analysis Unit present in that location, the minor loss of habitat would not affect the ability for individual lynx to forage, den, move or disperse.

Southwest willow flycatcher, Preble's meadow jumping mouse, New Mexico meadow jumping mouse, Colorado butterfly plant, Ute ladies'-tresses orchid, green-backed cutthroat trout: Habitats for these riparian dependent species may be affected in the following ways due to future parcel development:

- Lost or degraded southwest willow flycatcher breeding habitat, Preble's meadow jumping mouse breeding and foraging habitat, Colorado butterfly plant habitat, and Ute ladies'-tresses orchid habitat in Weld County
- Lost or degraded New Mexico meadow jumping mouse breeding and foraging habitat in Las Animas County
- Degraded green-backed cutthroat trout habitat in Huerfano County

If those habitats are occupied, then the potential exists for individual animals and plants to be affected in terms of their ability to reproduce, etc. Individual animals could be displaced, and

the ability to disperse, hide and forage may be affected. In rare cases, take may also occur and to ensure this would not occur, both site specific surveys and stipulations would be necessary (Attachment A and C).

Black-tailed 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).

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.

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, the probability of plover mortality or nest destruction would likely increase. While known nesting locations are currently unknown, mitigation (plover nesting survey, timing limitations, etc.) to prevent take would be implemented at the APD stage.

American white pelican: Impacts to American white pelican would 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 would 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 7353 to protect a buffered area near potential white pelican nesting and foraging areas.

Ferruginous Hawk: Ferruginous hawks have been document 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. It is widely noted that 1/8 of a mile buffer for ferruginous hawk is highly ineffective protection based on the best available science, and that this does not protect inactive nests which may be used in alternate years[2]. This species is very sensitive to disturbance during breeding season, and such actions would cause nest failure, including abandonment of chicks; best available science emphasizes a one-mile buffer. New stipulations developed for this species for a 1/2 mile buffer may be incorporated into future leases.

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 (CO-04 and CO-23) established in the Royal Gorge RMP. Like ferruginous hawk, the 1/4 mile buffer in stipulation CO-23 is insufficient at protecting winter roosting, and a 1/2 mile buffer is needed. Also, this stipulation does not protect roosting during maintenance and operational activities, which can still cause abandonment of roosts and can affect foraging. New stipulations developed for this species my be incorporated into future leases. Under present circumstances, these stipulations would apply (Attachment A and C).

Environmental Consequences of Leasing and Development - Cumulative Impacts: Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect federally listed threatened, endangered, proposed and BLM sensitive species. These activities include: oil and gas development, residential development, grazing, agriculture, mining and recreation. While the leasing of parcels would not compound these impacts, future oil and gas development may impose deleterious effects on these species and their habitats. Every parcel is unique and cumulative impacts would need to be thoroughly addressed in the development and APD stage.

Potential Future Mitigation: As a potential condition of approval at the development phase, a survey for federally listed and BLM sensitive species must be conducted where potential habitat exists. If these species are located, BLM may implement timing limitations and/or spatial buffers to mitigate conflicts to the extent the RGFO Resource Management Plan, Northeast Resource Management Plan, and the Code of Federal Regulations (43 C.F.R. § 3101.1-2) allow.

Additionally, if development is to occur April 10 through July 10, a survey for nesting mountain plover would be required where habitat exists.

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

[2]US Fish and Wildlife Service, 2008. Guidelines for raptor conservation in the western United States. US Fish and Wildlife Service Division of Migratory Bird Management, Washington DC

3.4.2.4. Upland Vegetation:

Affected Environment: Most of the plains area supports short prairie grasses. Needleandthread, prairie junegrass, blue grama, galleta, cholla, 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, crop agriculture or both.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: 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; this impact is primarily associated with parcels in short-grass prairie and not cultivated agriculture. The type of ground activity associated with oil and gas development does result in increased susceptibility to adverse impacts such as soil compaction, weed infestations and erosion (See Soils and Invasive Plants sections). Due to these adverse impacts, establishment of native vegetation similar to adjacent undisturbed vegetation in rangelands can take up to 30 years. Projects in cropland areas would likely continue in that vain once sites are rehabilitated.

Environmental Consequences of Leasing and Development - Cumulative Impacts: The proposed lease parcels are scattered in areas where the main uses are either native grassland grazing or cultivated agriculture. Leasing within cultivated agriculture would have little, if any, cumulative impact to upland vegetation. Leasing and any future development within native grassland areas, even if they are currently grazed, could increase the amount of area without native vegetation. Also see the soils section.

Potential Future Mitigation: Will be addressed at the APD stage.

3.4.2.5. Wetlands and Riparian Zones:

Affected Environment: This text is for all parcels, grouping the three alternatives even though the Preferred Alternative removes parcels on Mount Maestes in Huerfano County. Similarly, a No Action or No Lease Alternative has no overlap or involvement with any parcel: Parcels offered for lease under this action relative to wetlands or riparian resources fall into three broad categories: 1) Relatively flat topography with little overland flow, no wetlands present and no well-defined drainages within the parcel; 2) predominantly upland, but may intercept ephemeral, intermittent or rarely perennial small drainages that sometimes possess riparian habitat, and constructed collection basins may occur to store precipitation primarily for livestock purposes; riparian habitat may exist because of the stored water, but otherwise the parcels have relatively dry drainages; and 3) parcels within or that contain portions of waterways where open water, wetlands, or some wetland transition zone is present.

All parcels under consideration are in eastern Colorado, or on high elevation areas of Mount Maestes in Huerfano County. Lease parcels are primarily in smaller watersheds within South Platte tributaries within the RGFO. Precipitation in much of eastern Colorado generally does not yield perennial flowing streams with associated wetland development until watershed area becomes large or impoundment of seasonal water has occurred. Most parcels are closer to their headwater areas than down gradient in thelarge watershed. Parcels on Mount Maestes are upland primarily, but the higher precipitation can form wetlands away from drainages in seep areas, and headwater drainage areas.

Playa environments exist on the landscape in the vicinity of some parcels, but rarely, are present on the actual lease parcel. Playa conditions in eastern Colorado are generally uncommon, or infrequent enough that they do not generally alter land use practices and are often grazed or tilled similar to surrounding uplands. Playa areas however were identified because during extensive precipitation, wetlands characteristics can begin to develop and because of the unique seasonal habitat they provide.

Lease parcels occur across different counties yielding varying habitat types and land uses. When leases occur on split estate parcels far removed from public land, BLM generally lacks site specific inventory for the purposes of characterizing resources. In those instances, BLM evaluates various sources of information to determine potential wetland resource. BLM makes wetland determination though study of GIS information upon parcels such as stream courses, vegetation, drainage area, etc. Aerial photography interpretation in combination with field verification is also used. When wetlands are identified as potentially being present, stipulation CO-28 is applied to the parcel which alerts of possible wetland or riparian resources where BLM may restrict specific development location. Riparian protection stipulations are added to individual parcels, or portions of lease parcels when waterways, streams, arroyos, wetlands, ponds, playas, reservoirs and the like are believed likely to exist. It is possible wetland areas within a drainage network are not present due to drought conditions, etc., but without longer term evaluation, wetland protection is prudent. Wetlands in marginal areas can be expressed through varying climate cycles disrupting analysis accuracy so potential areas are protected by stipulation. Stipulations may be relaxed on some parcels at a later date

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Leasing does not subject wetland resources to direct impact. Potential drilling and infrastructure modifications for field development however can directly or indirectly affect wetland or riparian areas at a later time. Change to upland runoff from vegetation disturbance at roadways, drill pads, etc. can result in accelerated erosion and sediment deposition into water ways and generally is the primary impact, but wetland obligate species disturbance can also occur. With the CO-28 stipulation attached to certain parcels where wetland conditions are encountered infrastructure would be moved to minimize or eliminate impacts. Land use has greatly modified eastern Colorado's wetland resource potential; however locating development infrastructure away from riparian resources reduces or alleviates additional modification within a watershed riparian or wetland areas. Under the preferred alternative, no leasing would occur on Mount Maestes, but under an the proposed action alternative (not preferred alternative), CO-28 is also applied. Other stipulations given in the appendix also indirectly protect wetland resources.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Regional variation in land use modification occurs in the counties where leasing is proposed. Overall disturbance varies from minimal on parcels near headwater regions to extensive with change coming from agricultural and other activities in the vicinity of lease parcels. On certain parcels post lease development would be intrusive where development would be noticeable altering disturbance regimes in proximity to riparian areas and wetlands. In other locations, development would be masked by extensive agriculture or other surface uses within modified drainage-ways and possibly in proximity to other oil and gas development. Cumulative impact analysis at the scale and stage of the lease is less informative than at the APD stage

Potential Future Mitigation: At the APD stage, RGFO will need to evaluate if location stipulations alone are sufficient to protect wetland resources or if other protective measures are necessary.

RGFO will need to incorporate appropriate oil and gas development BMPs to limit and buffer overland runoff from being accelerated into drainages

3.4.2.6. Aquatic Wildlife:

Affected Environment: This text is for all parcels, grouping the three alternatives even though the Preferred Alternative removes parcels on Mount Meastes in Huerfano County. Similarly, a No Action or No Lease Alternative has no overlap or involvement with any parcel: See also Wetland and Riparian discussion above. These lease parcels are primarily in smaller watersheds within South Platte and Arkansas tributaries within the RGFO. The watershed, habitat present, species that may have been introduced, elevation, and other variables determine the aquatic species composition in proximity to a particular lease parcel. Parcels however are generally upland with only small drainages dividing upland areas. Frogs, toads, salamanders and some aquatic turtles are more likely to be near lease parcels than fish due to general intermittent conditions. Parcels with defined intermittent or perennial drainages receive the riparian protective stipulation to locate drilling away from wetlands and generally eliminate overlap between aquatic environments and exploration or development. Ephemeral channels can also receive protection if determination is not conclusive whether wetlands or at least seasonal aquatic habitat could be supported periodically. Drier drainages can form wetland characteristics (and aquatic habitat) during wet cycles over several years and infrequent wet areas can be important to certain aquatic wildlife species. Some lease parcels are adjacent to playas and can yield similar infrequent but important habitat.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: The lease sale action does not subject aquatic habitat resources or wildlife species to any direct impact. Potential well pad and infrastructure modifications related to field development at a later stage could directly or indirectly affect habitats on some parcels. Generally, effects are limited to change in upland area runoff due to vegetation disturbance and from roadways, drill pads, etc. which can result in accelerated erosion and deposition of sediments into water ways affecting aquatic habitat. With the CO-28 stipulation attached to certain parcels, pad location would be moved to minimize or eliminate impacts if riparian or wetland aquatic habitat conditions are encountered at the development stage. Other non-oil and gas related land uses have previously modified many eastern Colorado aquatic resource potentials from native conditions, but locating infrastructure away from aquatic habitat serves to limit additional modification. Information for aquatic wildlife species presence, by drainage, or within certain areas is available and was used to determine relative risk of impact to any single species at a specific parcel location. No individual parcel or cluster of parcels is known to overlap or interact with an isolated species found only in limited regional area.

Environmental Consequences of Leasing and Development - Cumulative Impacts: Historic aquatic habitat modifying land uses vary from minimal to extensive resulting from grazing, agricultural modification, irrigation, reservoirs, and other modifications. Post-lease development in certain parcels would be intrusive where development would be noticeable altering disturbance regimes along riparian areas. In other locations, development would be masked by extensive agriculture, within modified drainage-ways or in proximity to other oil and gas development. Cumulative impact analysis at the scale and stage of the lease is less informative than at the APD stage.

Potential Future Mitigation: At the APD stage RGFO will need to evaluate if development location stipulations are sufficient to protect wetland resource or if small aquatic habitats possibly

not located by remote sensing exist. Environmental analysis then will also show whether, in addition to location modification (CO-28), additional protective measures may be necessary. Additional protective BMP's would be incorporated to development designs.

3.4.2.7. Terrestrial Wildlife:

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, stretching the entirety of the high plains in Colorado. The area encompasses the full complement of deer and pronghorn seasonal ranges. 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. However, winter range on the Great Plains is difficult to quantify due to the similarity of most habitat in this regions. Therefore, great expanses of land are labeled as winter range to encompass 90 percent of animals negating some value defined winter range in this region.

All or portions of the following parcels contain big game (mule deer, pronghorn) winter habitat: 7227, 7292, 7314, 7316, 7317, 7318, 7319, 7320, 7321, 7324, 7326, 7328, 7329, 7354, 7355, 7356, and 7353.

Elk require a combination of open meadows for foraging and woodlands for hiding cover, calving and thermal regulation. Aspen, regenerating conifer stands and shrublands provide foraging and cover opportunities required during elk calving periods. Bighorn sheep lambing habitat includes most precipitous, inaccessible cliffs near forage, and generally has a dry, southern exposure. Pronghorn antelope typically inhabit, low, rolling, expansive lands with less than 30 percent slope. They require a mix of grass, forbs, and browse with a readily available water source. During and soon after parturition, female mule deer prefer areas with concealment cover, such as areas with dense vegetation, with "ideal" fawning habitat for mule deer to include small areas (1-5 acres) of low shrubs or small trees 2 to 6 feet tall, with about 50% canopy cover, slopes <15%, and water within 600 feet .

All or portions of the following parcels contain big game young rearing habitat: 7317, 7349, and 7350.

Few raptor nest locations are known within the proposed lease parcels, primarily due to a lack of information. This information gap is a result of the lack of public surface estate on the Great Plains. Lease stipulations attached to each parcel would require raptor nest surveys and maintain site characteristics of existing nest. Timing limitations and No Surface Occupancy stipulations would be required to 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 Eagle Rock Ranch at Chalk Bluffs, Owl Creek South, Pawnee Grassland East and West, Purgatoire Canyon, Purgatoire River and Tributaries, and South Platte River.

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.

Parcels that contain big game winter habitat would have either stipulation CO-09 (TL) or RG-08 (TL) attached to protect the resource. Leasing parcels for oil and gas development would likely result in future development at some locations. Parcels that contain big game post-parturition habitat have associated stipulations attached: pronghorn fawning habitat (CO-11), bighorn sheep lambing (RG-13), and elk calving habitat (RG-14). 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 would 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 would need to be protected by a combination of “no surface occupancy” and “timing limitation” stipulations that are attached to leases to reduce adverse effects of potential oil and gas development (Attachment A and C). 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 Northeast RMP contain a suite of stipulations that would 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 would not

compound these impacts, future oil and gas development may impose deleterious effects. Every parcel is unique and cumulative impacts would need to be thoroughly addressed in the APD stage.

Potential Future Mitigation: Because of the lack of 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, including a No Surface Occupancy and/or Timing Limit stipulation to reduce disruption of adult attendance at each known occupied nest location (Attachment A and C).

3.4.3. Heritage Resources and Human Environment:

3.4.3.1. Cultural Resources:

Affected Environment: Paleoindian sites are relatively scarce in the eastern half of Colorado, although a relatively large number are located in Weld County. 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 six inventories for cultural resources have been completed on portions of three proposed lease parcels, for a total of 70.3 acres, or about .003% of the total acreage that comprises the lease sale.

Twelve sites and five isolated finds have been recorded on or adjacent to proposed lease parcels, including Empire Reservoir (5WL2430), which is eligible for the National Register of Historic Places (NRHP). All of the other sites are aboriginal, and because nine of them are evaluated as "Needs data" or "Not assessed", they are treated as if they are NRHP-eligible.

Parcel 7353 is about .9 mile to the south of the possible location of the Central Overland Historic Trail .that is currently under a National Park Service (NPS) Feasibility Study as a National Historic Trail (NHT). No known trail locations are recorded in this study area. When consulted in 2014 on another segment of this study segment, the NPS replied that

"…the Central Overland Emigrant Routes across Colorado, Wyoming, Utah, and Nevada are the subject of a congressionally authorized study to evaluate whether they (and many other routes) should be added to the existing California National Historic Trail (NHT). They are not designated NHT routes at this time, so this office of the National Park Service has no administrative authority with regard to them. To avoid the appearance of having predetermined the results of our feasibility study, we abstain from commenting on potential impacts and effects to those undesignated routes."

With no definitive evidence that the trail is located in the study area, BLM recommends that the proposed lease sale will have no effect on the proposed trail corridor.

Environmental Consequences of Leasing and Development - Direct and Indirect Impacts: Because the Proposed Alternative does not involve ground disturbance, or indirect impacts to the proposed trail corridor, it will have no effect on historic properties. Future lease development that might affect historic properties will be subject to Stipulation CSU-39. This lease stipulation requires additional cultural resources work pursuant to Section 106 of the National Historic Preservation Act, 54 U.S.C. § 306108, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects. At that time, any adverse effects of

proposed development on the historic reservoir will be identified and mitigated, if necessary. In an informational letter dated February 6, 2015, BLM notified the Colorado State Historic Preservation Officer ("SHPO") of these determinations (see CR-RG-15-118 L).

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 cultural resources work pursuant to Section 106 of the National Historic Preservation Act, 54 U.S.C. § 306108, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects. At that time, any adverse effects of proposed development on the historic reservoir will be identified and mitigated, if necessary.

Potential Future Mitigation: None anticipated.

3.4.3.2. Native American Religious Concerns:

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-15-114 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: No concerns yet identified.

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

Potential Future Mitigation: None anticipated.

3.4.3.3. 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).

Many of the proposed lease sale parcels 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):

Formation	Fossil Types	PFYC
Eolian Deposits	Bison and various	3
Quaternary Landslide Deposits	Has potential to contain significant fossils dependent upon parent material	3
Tertiary Ogallala	Various significant mammals including horses	5
Tertiary White River	Various vertebrates, invertebrates, and wood	5
Tertiary Cuchara	Various mammals, including creodonts, condylarths, pantodonts, carnivores, primates, and perissodactyls	5
Tertiary Poison Canyon	Various vertebrates and plants	5
Cretaceous Vermejo	Various vertebrates, invertebrates, and plants	5
Cretaceous Laramie	Various dinosaur tracks; ceratopsian, hadrosaur, and carnivorous dinosaurs; and some plants	3
Cretaceous Burro Canyon Sandstone, Dakota Sandstone, Purgatoire	Various invertebrate, vertebrate, and plant fossils, including conifer cones	3
Cretaceous Greenhorn Limestone, Graneros, Carlile	Various invertebrates, including forams and ammonites	3
Jurassic Morrison, Ralston Creek, Entrada	Various and many dinosaurs, fish, amphibians, mammals, and a diverse fauna of fresh-water molluscs	5
Triassic Dockum Group	Various vertebrates including amphibians, reptiles	3
Permian/Pennsylvanian, Sangre De Cristo	Invertebrates including brachiopods, bryozoans, crinoids, ostracodes, conodonts (thought to be vertebrates), and plants	5

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

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.

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: 7227, 7292, 7314, 7316, 7317, 7318, 7319, 7320, 7321, 7324, 7326, 7328, 7329, 7349, 7350 (part of parcel 7350 contains Class 5 formations that are on BLM surface and will require a pre-work survey), 7351, 7352, 7353, 7354, 7355, 7356

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.

3.4.3.4. Social and Economic Conditions:

Affected Environment: Demographic, economic, and geographic features influence and define the nature of local economic and social activity. Among these features are the local population, the presence and proximity of cities or regional business centers, industrial organization, infrastructure, geography, and unique area amenities. The affected social and economic environment (study area) is focused upon Huerfano, Las Animas, and Weld County, Colorado within the Royal Gorge Field Office. The distribution of social and economic effects is based on acres and parcels leased and as social networks and business patterns within these three counties.

Of the three counties in the study area Weld County is the most populous with a population of 258,780 followed by Las Animas with a population of 15,136 and Huerfano with a population of 6,625 (DOC, 2013). Both Huerfano and Las Animas counties have high levels of employment in agriculture, retail, and government sectors where employment in these sectors totals 43% of total county employment in Huerfano County and 47% of total county employment in Las Animas County compared to 33% of total county employment in Weld (DOC, 2013). These counties are characteristic of Colorado's economic dependence on natural resources as an economic base. Different regions in Colorado have varying economic dependence upon natural resource extraction which is highlighted by the State's 1.5% of total employment in the mining sector (the mining sector includes oil and gas industries). Both Las Animas County and Weld County have greater levels of employment in the mining sector than the State average with 6.5% of total county employment in the mining sector in Las Animas and 5.5% in Weld County (DOC, 2013). Data is not available for the mining sector employment in Huerfano County.

Huerfano, Las Animas, and Weld County have experienced varying level of effort in fluid mineral development. Las Animas has a 1,314 producing gas wells and 3 producing oil wells, Weld County has approximately 22,000 producing oil and gas wells wells, and Huerfano County has 28 producing gas wells and no producing oil wells (DOI, 2015a). Additionally, production of oil and gas from 2010 to present has declined in Huerfano and Las Animas counties, while it has increased in Weld County. The average annual fluid minerals production for each county is listed in Table 1. The production values are averaged over the past five full years from 2010 through 2014 (COGCC, 2015).

Table 1. Oil and Gas Production by County and Colorado Total Production 2010-2014

	Oil Production (barrels)	Gas Production (MCF)
Huerfano County	58	14,337,169
Las Animas County	555	89,277,348
Weld County	20,853,876	211,275,294

Leasing mineral rights for the development of Federal minerals generates public revenue through the bonus bids paid at lease auctions and annual rents collected on leased parcels not held by production. Nominated parcels approved for leasing are offered by the BLM at a minimum rate of $2.00 per acre at the lease sale. These sales are competitive and parcels with high potential for oil and gas production often command bonus bids in excess of the minimum bid. In addition to bonus bids, lessees are required to pay rent annually until production begins on the leased parcel, or until the lease expires. These rent payments are equal to $1.50 an acre for the first five years and $2.00 an acre for the second five years of the lease.

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 as such: 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. Ten percent of all state mineral lease rent and royalty receipts are sent to the Colorado Water Conservation Board, 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 are distributed directly to local school districts originating the revenue or providing residence to energy employees and their children. Forty 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 Federal mineral lease 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. 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 Federal mineral lease revenues decline by ten percent or more from the preceding year.

Over the past five years twenty lease parcels have been sold in Weld County, sixteen have been sold in Huerfano County, and there have been no sales in Las Animas County. From these sales the maximum bid on a parcel was $3800.00/acre and the minimum bid on a parcel was $2.00/acre for an average bid $214.10/acre with standard deviation of $717.51/acre. The maximum bid of $3800.00/acre and the second highest bid of $2250/acre were for parcels in Weld County. These two bids exceed the third highest bid of $200/acre for a parcel in Huerfano County by an order of magnitude. By removing bids two standard deviations from the average, in this case the two

highest bids, as outliers the average bid for Royal Gorge Field Office sales over the past five years is $48.76/acre (DOI, 2015b).

During the lease period annual lease rents continue until one or more wells are drilled that result in production and associated royalties. The Federal oil and gas royalties on production from public domain minerals equal 12.5 percent of the value of production (43 CFR 3103.3.1).

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

The direct effect of the proposed action would be the payments received, if any, from the leasing all or a subset of the 11,150.39 acres of federal mineral estate. 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, and noise disturbance associated with development. These effects would apply to all public land users in the project area.

Due to energy market volatility and the dynamics of the oil and gas industry the BLM cannot predict the exact effects of this action, as there are no guarantees that the leases will receive bids, and that any leased parcels will be developed or that developed parcels will produce any fluid minerals. An estimate for the amount to be raised in the lease sale from bonus bids can be estimated using the five year average from lease sales in the field office multiplied by the total acreage for sale multiplied by the percent of parcels sold. From 2013 through 2015 approximately 80% (DOI, 2015) of all parcels proposed for leasing within the Royal Gorge Field Office are bid upon. The average bids from sales within the Royal Gorge Field Office from 2010 through 2014 is approximately $48.76/acre with outliers from past sales removed to $214.10/acre using all bids from past sales. Based on this information the November 2015 lease sale could result in $434,996.39 to $1,909,937.91 in total bonus bids, though the actual amount may vary based on numerous factors.

As previously noted the BLM cannot predict whether any of the leases sold will be developed. However, any Application for Permit to Dill received will require future NEPA analysis, in which further socio-economic effects would be examined including 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

3.4.3.5. Environmental Justice:

Affected Environment and Direct and Indirect Impacts of Leasing and Development::

Executive Order 12898 requires Federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety impacts on minority and low income populations. A review of current US Census data indicates that low income and minority populations in Huerfano and Las Animas counties meet the criteria for environmental justice consideration. While the lease sale is not expected to result in any disproportionately high or adverse impacts on minority and low-income populations, it is possible that development of the lease may have disproportionately high or adverse impacts on minority and low-income populations. As such, any Application for Permit to Dill received will require future NEPA analysis, in which any disproportionately high or adverse impacts on minority and low-income populations resulting from disturbance and drilling on leased parcels will be assessed.

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

3.4.3.6. Visual Resources:

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.

Affected Environment:

Throughout the lease area there are many activities currently occurring, along with historic impacts, which affect visual 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 negative effects. Every parcel is unique and cumulative impacts will need to be thoroughly addressed in the APD stage.

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. If leases were developed structures associated with this activity could be introduced on the landscape such as roads, pads, buildings, and pump infrastructure potentially creating contrasts in form, texture, color, and line at varying levels. These effects would need to be evaluated later at the APD stage.

At least three of the proposed lease parcels in Weld County are located within 4 miles of the Pawnee Pioneer Trails Scenic and Historic Byway. The byway showcases the history of agriculture but recognizes that O&G extraction has been in existence since the 1950s. The byway's predominant views are the short prairie grasses with broad expansive prairie land. The most noticeable landmark along the byway is Pawnee Buttes within Pawnee National Grassland. The parcels adjacent to the byway are parcel nos. 7317, 7328, 7329. The proposed action of a lease sale does not affect the view shed from the Byway but if development is proposed, visual resource impacts would need to be evaluated at that time.

In Huerfano County, parcel number 7349 is visible from the highway over La Veta Pass. The lease proposal would not affect the visual resource but if proposed for development, the visual resource would need to be evaluated for its effect on the casual observer travelling the highway.

Environmental Consequences of Leasing and Development - Cumulative Impacts:

The cumulative impacts of the lease sale are minimal. The impacts escalate if the leases go into development. Additional infrastructure would be added to an area dominated by roads, drill pads, and production facilities. Concerns expressed in the visual resources inventory indicate that O&G is becoming the dominant scenery and threatens the landscape integrity.

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.

3.4.3.7. Wastes, Hazardous or Solid:

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 on Federal Lands.
- 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. State and/or Federal regulations may apply to pit construction and removal.

3.4.4. Resource Uses:

3.4.4.3. Scenic Byways:

Affected Environment: At least three of the proposed lease parcels in Weld County are located within 4 miles of the Pawnee Pioneer Trails Scenic and Historic Byway. The byway showcases the history of agriculture but recognizes that O&G extraction has been in existence since the 1950s. The byway's predominant views are the short prairie grasses with broad expansive prairie land. The most noticeable landmark along the byway is Pawnee Buttes within Pawnee National Grassland.

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

The parcels adjacent to the byway are parcel nos. 7317, 7328, 7329. The proposed action of a lease sale does not affect the view shed from the Byway but if development is proposed, visual resource impacts would need to be evaluated at that time (see the Visual Resource section, 3.4.3.6).

Environmental Consequences of Leasing and Development - Cumulative Impacts: None with the proposed action.

Potential Future Mitigation: None needed with the lease sale. If development is proposed, the view from the scenic byway would have to be evaluated for its affects.

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Chapter 4. Coordination and Consultation

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PERSONS/AGENCIES CONSULTED

BLM consulted with the following in the preparation of this EA:

CPW, United States Bureau of Reclamation, surface owners of split estate nominated lease parcels, Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Nation 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, Pawnee Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe.

LIST OF PREPARERS AND PARTICIPANTS

INTERDISCIPLINARY REVIEW

Name	Title	Resource
Aaron Richter	Natural Resource Specialist	Project Lead, Fluid Minerals, Water Quality, Soils
Chad Meister/ Forrest Cook	Air Quality Scientist	Air Quality / Climate
Melissa Smeins	Geologist	Solid Minerals, Paleontology, Hazardous and Solid Wastes
Aaron Richter	Oil and Gas NRS	Fluid Minerals
John Lamman	Range Specialist	Invasive Plants, Rangeland Mgt., Prime and Unique Farmlands, Upland Vegetation
Matt Rustand and Lara Duran	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
Martin Hensley	Economist	Socioeconomics, Environmental Justice
Linda Skinner	Recreation Planner	Visuals, Lands with Wilderness Characteristics, Special Designations, Recreation, Access and Transportation
Rich Rotte	Realty Specialist	Realty Authorizations
Dave Parker	Surveyor	Cadastral Survey

Attachments:

Attachment A – All Nominated Parcels/Proposed Action with Stipulations for Lease

Attachment B – Recommended Parcel Deferrals

Attachment C – Preferred Alternative Parcels with Stipulations for Lease

Attachment D – Stipulation Exhibits

Attachment E – Maps

Attachment F— Comment Summaries and Responses

Attachment A - Parcels Proposed for Lease

NOVEMBER 12, 2015 LEASE SALE

The proposed alternative is offer for lease 21 parcels containing 11,150.390 acres of Federal lands in the State of Colorado for oil and gas development.

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 ID: 7227

T.0080N., R.0590W., 6TH PM
Section 31: EAST 335 ACRES; U.S. Interest 28.13%

Weld County
Colorado 335.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0590W., 6TH PM
Section 31: NENE

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7321

T.0120N., R.0590W., 6TH PM

Section 30: Lot 1-4;	U.S. Interest 100.00%
Section 30: E2,E2W2;	U.S. Interest 100.00%

Weld County
Colorado 660.870 Acres

All lands are subject to Exhibit CO-02 to protect grouse dancing grounds

All lands are subject to Exhibit CO-03 to protect raptor nests
.
All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7319

T.0090N., R.0600W., 6TH PM

Section 30: NE;	U.S. Interest 100.00%

Weld County

Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7317

T.0080N., R.0630W., 6TH PM

Section 20: SE;	U.S. Interest 100.00%
Section 28: W2;	U.S. Interest 100.00%
Section 31: Lot 1-4;	U.S. Interest 100.00%
Section 31: E2,E2W2;	U.S. Interest 100.00%
Section 32: E2;	U.S. Interest 100.00%
Section 33: N2;	U.S. Interest 100.00%

Weld County
Colorado 1752.800 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

The following lands are subject to Exhibit CO-11 to protect antelope fawning:

T.0080N., R.0630W., 6TH PM
Section 31: SESE;
Section 32: S2NE,SE;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 paleontological area inventory requirement

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0630W., 6TH PM
Section 31: Lot 1-4;
Section 31: E2,E2W2;
Section 32: E2;

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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7316

T.0110N., R.0630W., 6TH PM
Section 31: SE; U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7328

T.0080N., R.0640W., 6TH PM

Section 2: Lot 2;	U.S. Interest 100.00%
Section 2: SWNE,W2SE;	U.S. Interest 100.00%

Weld County
Colorado 156.560 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0640W., 6TH PM
Section 2: Lot 2;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7329

T.0080N., R.0640W., 6TH PM

Section 20: N2,SE;	U.S. Interest 100.00%
Section 22: ALL;	U.S. Interest 100.00%
Section 28: NW;	U.S. Interest 100.00%

Weld County
Colorado 1280.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7326

T.0110N., R.0640W., 6TH PM

Section 26: SE;	U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7314

T.0080N., R.0650W., 6TH PM
Section 24: NW; U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

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

PARCEL ID: 7351

T.0290S., R.0550W., 6TH PM
Section 25: NE,E2NW,N2SE,SESE;
Section 26: ALL;
Section 35: W2W2;

Las Animas County
Colorado 1160.000 Acres

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0290S., R.0550W., 6TH PM
Section 25: NWNE,E2NW,E2SE;
Section 26: N2NE,SWNE,SENW,NESW,S2SE;
Section 35: SWNW,W2SW;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit RG-07 to protect wild turkey during the critical winter periods.

PVT/BLM; COF: RGFO

PARCEL ID: 7352

T.0300S., R.0550W., 6TH PM

Section 1: S2NW,SW;
Section 2: Lot 1-4;
Section 2: S2N2,S2;
Section 11: N2,SW,SWSE;
Section 12: S2NE,NW,E2SW,SE;

Las Animas County
Colorado 1883.840 Acres

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit RG-07 to protect wild turkey during the critical winter periods.

PVT/BLM; COF: RGFO

PARCEL ID: 7350
Recommended for Deferral: to protect fragile soils, steep slopes, and for wildlife issues.

T.0280S., R.0690W., 6TH PM

Section 7: Lot 3;
Section 7: NESW, NWSE, SESE;
Section 17: SWNE,S2NW,N2SW;
Section 18: Lot 3,4;
Section 18: E2SW, W2SE,NESE;

T.0280S., R.0700W., 6TH PM
Section 24: E2;

Huerfano County
Colorado 940.760 Acres

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

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

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

The following lands are subject to Exhibit RG-14 to protect elk calving:

T.0280S., R.0690W., 6TH PM
Section 18: Lot 3;

The following lands are subject to Exhibit RG-13 to protect Rocky Mountain bighorn sheep lambing and winter range:

T.0280S., R.0690W., 6TH PM
Section 18: E2SW;
Section 18: Lot 3, 4;

T.0280S., R.0700W., 6TH PM
Section 24: E2;

BLM; COF: RGFO

PARCEL ID: 7349
Recommended for Deferral: to protect fragile soils, steep slopes, and for wildlife issues.

T.0280S., R.0700W., 6TH PM
Section 24: E2W2;

Huerfano County
Colorado 160.000 Acres

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

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

All lands are subject to Exhibit RG-13 to protect Rocky Mountain bighorn sheep lambing and winter range.

PVT/BLM; COF: RGFO

PARCEL ID: 7320

T.0110N., R.0560W., 6TH PM
Section 1: N2SE;

Weld County

Colorado 80.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-26 to protect fragile soils

All lands are subject to Exhibit CO-27 to protect steep slopes

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7354

T.0020N., R.0610W., 6TH PM
Section 11: NESE;

Weld County
Colorado 40.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7355

T.0030N., R.0610W., 6TH PM
Section 26: NE;
Section 27: N2;
Section 28: N2;

Weld County
Colorado 800.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7356

T.0030N., R.0610W., 6TH PM
Section 29: S2SE;
Section 30: E2;
Section 31: E2NE;
Section 32: NE,N2SE;

Weld County
Colorado 720.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7353

T.0040N., R.0610W., 6TH PM
Section 25: NESW;
Section 25: EXCL RES COD-0-13729;
Section 26: SESE;
Section 26: EXCL RES COD-0-13729;
Section 35: NWNW;
Section 35: EXCL RES COD-0-13729;

Weld County
Colorado 20.820 Acres

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-09 to protect big game winter habitat.

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

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-22 to protect bald eagle nesting habitat

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

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

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit NE-01 to protect reservoir and railroad rights-of-way improvements and to preserve public safety

All lands are subject to Exhibit NE-02 to protect riparian and wildlife values near reservoirs and rivers

All lands are subject to Exhibit NE-03 to protect recreational and scenic values of state, county, and municipal parks

BLM; COF: RGFO

PARCEL ID: 7318

T.0090N., R.0620W., 6TH PM
Section 27: SESW;

Weld County
Colorado 40.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7324

T.0110N., R.0640W., 6TH PM
Section 4: Lot 3,4;
Section 4: S2NW;

Weld County
Colorado 159.740 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-26 to protect fragile soils

All lands are subject to Exhibit CO-27 to protect steep slopes

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7292

T.0110N., R.0650W., 6TH PM
Section 12: NENE,W2NE,NW,NWSW;

Weld County
Colorado 320.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

Attachment B
Parcels Recommended for Deferral under the preferred alternative

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

PARCEL ID: 7350, entire parcel

T.0280S., R.0690W., 6TH PM Section 7: Lot 3; Section 7: NESW, NWSE, SESE; Section 17: SWNE,S2NW,N2SW; Section 18: Lot 3,4; Section 18: E2SW, W2SE,NESE; T.0280S., R.0700W., 6TH PM Section 24: E2;	Recommended for deferral so further analysis can be completed prior to making a leasing decision on parcel, because portions of parcel contain steep slopes and fragile soils, and various wildlife concerns. All or part of parcel may be leased in future sale after further analysis.

Huerfano County
Colorado 940.760 Acres

BLM; COF: RGFO

PARCEL ID: 7349, entire parcel

T.0280S., R.0700W., 6TH PM Section 24: E2W2; Huerfano County Colorado 160.000 Acres PVT/BLM; COF: RGFO	Recommended for deferral so further analysis can be completed prior to making a leasing decision on parcel, because portions of parcel contain steep slopes and fragile soils and various wildlife concerns. All or part of parcel may be leased in future sale after further analysis.

Attachment C
Parcels Available for Lease with Applied Stipulations

NOVEMBER 12, 2015 LEASE SALE

The preferred alternative is to offer for lease 19 parcels containing 10,049.63 acres of Federal lands in the State of Colorado for oil and gas development.

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 ID: 7227

T.0080N., R.0590W., 6TH PM
Section 31: EAST 335 ACRES; U.S. Interest 28.13%

Weld County
Colorado 335.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0590W., 6TH PM
Section 31: NENE

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7321

T.0120N., R.0590W., 6TH PM

Section 30: Lot 1-4;	U.S. Interest 100.00%
Section 30: E2,E2W2;	U.S. Interest 100.00%

Weld County
Colorado 660.870 Acres

All lands are subject to Exhibit CO-02 to protect grouse dancing grounds

All lands are subject to Exhibit CO-03 to protect raptor nests
.
All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7319

T.0090N., R.0600W., 6TH PM

Section 30: NE;	U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7317

T.0080N., R.0630W., 6TH PM

Section 20: SE;	U.S. Interest 100.00%
Section 28: W2;	U.S. Interest 100.00%
Section 31: Lot 1-4;	U.S. Interest 100.00%
Section 31: E2,E2W2;	U.S. Interest 100.00%
Section 32: E2;	U.S. Interest 100.00%
Section 33: N2;	U.S. Interest 100.00%

Weld County
Colorado 1752.800 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

The following lands are subject to Exhibit CO-11 to protect antelope fawning:

T.0080N., R.0630W., 6TH PM

Section 31: SESE;
Section 32: S2NE,SE;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 paleontological area inventory requirement

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0630W., 6TH PM
Section 31: Lot 1-4;
Section 31: E2,E2W2;
Section 32: E2;

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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7316

T.0110N., R.0630W., 6TH PM
Section 31: SE; U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7328

T.0080N., R.0640W., 6TH PM

Section 2: Lot 2;	U.S. Interest 100.00%
Section 2: SWNE,W2SE;	U.S. Interest 100.00%

Weld County
Colorado 156.560 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0080N., R.0640W., 6TH PM
Section 2: Lot 2;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7329

T.0080N., R.0640W., 6TH PM

Section 20: N2,SE;	U.S. Interest 100.00%
Section 22: ALL;	U.S. Interest 100.00%
Section 28: NW;	U.S. Interest 100.00%

Weld County
Colorado 1280.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7326

T.0110N., R.0640W., 6TH PM

Section 26: SE;	U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7314

T.0080N., R.0650W., 6TH PM
Section 24: NW; U.S. Interest 100.00%

Weld County
Colorado 160.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

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

PARCEL ID: 7351

T.0290S., R.0550W., 6TH PM
Section 25: NE,E2NW,N2SE,SESE;
Section 26: ALL;
Section 35: W2W2;

Las Animas County
Colorado 1160.000 Acres

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.

The following lands are subject to Exhibit CO-28 to protect riparian/wetland vegetation:

T.0290S., R.0550W., 6TH PM
Section 25: NWNE,E2NW,E2SE;
Section 26: N2NE,SWNE,SENW,NESW,S2SE;
Section 35: SWNW,W2SW;

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit RG-07 to protect wild turkey during the critical winter periods.

PVT/BLM; COF: RGFO

PARCEL ID: 7352

T.0300S., R.0550W., 6TH PM
Section 1: S2NW,SW;
Section 2: Lot 1-4;
Section 2: S2N2,S2;
Section 11: N2,SW,SWSE;
Section 12: S2NE,NW,E2SW,SE;

Las Animas County
Colorado 1883.840 Acres

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit RG-07 to protect wild turkey during the critical winter periods.

PVT/BLM; COF: RGFO

PARCEL ID: 7320

T.0110N., R.0560W., 6TH PM
Section 1: N2SE;

Weld County
Colorado 80.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-26 to protect fragile soils

All lands are subject to Exhibit CO-27 to protect steep slopes

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7354

T.0020N., R.0610W., 6TH PM
Section 11: NESE;

Weld County
Colorado 40.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7355

T.0030N., R.0610W., 6TH PM
Section 26: NE;
Section 27: N2;
Section 28: N2;

Weld County
Colorado 800.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7356

T.0030N., R.0610W., 6TH PM
Section 29: S2SE;

Section 30: E2;
Section 31: E2NE;
Section 32: NE,N2SE;

Weld County
Colorado 720.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat.

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7353

T.0040N., R.0610W., 6TH PM
Section 25: NESW;
Section 25: EXCL RES COD-0-13729;
Section 26: SESE;
Section 26: EXCL RES COD-0-13729;
Section 35: NWNW;
Section 35: EXCL RES COD-0-13729;

Weld County
Colorado 20.820 Acres

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-09 to protect big game winter habitat.

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

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-22 to protect bald eagle nesting habitat

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

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

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

All lands are subject to Exhibit NE-01 to protect reservoir and railroad rights-of-way improvements and to preserve public safety

All lands are subject to Exhibit NE-02 to protect riparian and wildlife values near reservoirs and rivers

All lands are subject to Exhibit NE-03 to protect recreational and scenic values of state, county, and municipal parks

BLM; COF: RGFO

PARCEL ID: 7318

T.0090N., R.0620W., 6TH PM
Section 27: SESW;

Weld County
Colorado 40.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7324

T.0110N., R.0640W., 6TH PM
Section 4: Lot 3,4;
Section 4: S2NW;

Weld County
Colorado 159.740 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-26 to protect fragile soils

All lands are subject to Exhibit CO-27 to protect steep slopes

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

PARCEL ID: 7292

T.0110N., R.0650W., 6TH PM
Section 12: NENE,W2NE,NW,NWSW;

Weld County
Colorado 320.000 Acres

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

All lands are subject to Exhibit CO-09 to protect big game winter habitat

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-28 to protect riparian/wetland vegetation

All lands are subject to Exhibit CO-29 to alert lessee of PFYC 4 and 5 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

All lands are subject to Exhibit CO-56 to alert lessee of potential supplementary air analysis

PVT/BLM; COF: RGFO

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.

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-09

Lease Number: <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 April 30

On the lands described below:

> <LEGAL_DESCRIPTIONS>

For the purpose of (reasons):

> To protect big game (mule deer, elk, pronghorn antelope, and bighorn sheep) winter range, including crucial winter habitat and other definable winter range as mapped by the Colorado Division of Wildlife. This may apply to sundry notice that require an environmental analysis.

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:
An exception may be granted under mild winter conditions for the last 60 days of the closure.

EXHIBIT CO-11

Lease Number: <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.

May 1 through July 15

On the lands described below:

<LEGAL_DESCRIPTIONS>

For the purpose of (reasons):

To protect pronghorn antelope fawning

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-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-26

Lease Number: <LEASE_NUMBER>

CONTROLLED SURFACE USE STIPULATION

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

On the lands described below:

<LEGAL_DESCRIPTIONS>

For the purpose of:

Protecting fragile soils. Prior to surface disturbance of fragile soils, it must be demonstrated to the Authorized Officer through a plan of development that the following performance objectives will be met.

Performance Objectives:

I. Maintain the soil productivity of the site.

II. Protect off-site areas by preventing accelerated soil erosion (such as land-sliding, gullying, drilling, piping, etc.) from occurring.

III. Protect water quality and quantity of adjacent surface and groundwater sources.

IV. Select the best possible site for development in order to prevent impacts to the soil and water resources.

Fragile soil areas, in which the performance objective will be enforced, are defined as follows:

a. Areas rated as highly or severely erodible by wind or water, as described by the Soil Conservation Service in the Area Soil Survey Report or as described by on-site inspection.

b. Areas with slopes greater than or equal to 35 percent, if they also have one of the following soil characteristics:

(1) a surface texture that is sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay or clay;
(2) a depth to bedrock that is less than 20 inches;
(3) an erosion condition that is rated as poor; or
(4) a K factor of greater than 0.32.

Performance Standards:

I. All sediments generated from the surface-disturbing activity will be retained on site.

II. Vehicle use would be limited to existing roads and trails.

III. All new permanent roads would be built to meet primary road standards (BLM standards) and their location approved by the Authorized Officer. For oil and gas purposes, permanent roads are those used for production.

IV. All geophysical and geochemical exploration would be conducted by helicopter, horseback, on foot, or from existing roads.

V. Any sediment control structures, reserve pits, or disposal pits would be designed to contain a 100-year, 6-hour storm event. Storage volumes within these structures would have a design life of 25 years.

VI. Before reserve pits and production pits would be reclaimed, all residue would be removed and trucked off-site to an approved disposal site.

VII. Reclamation of disturbed surfaces would be initiated before November 1 each year.

VIII. All reclamation plans would be approved by the Authorized Officer in advance and might require an increase in the bond.

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. See also Geothermal PEIS ROD section 2.3.3 at page 2-6.)

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_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 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 may require the relocation of the surface disturbance activity over 200 meters. Inventory and any subsequent mitigation shall be conducted by a BLM permitted paleontologist.

On the lands described below:

<LEGAL_DESCRIPTIONS>

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 CO-56

Lease Number:

LEASE NOTICE

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

On the lands described below:

EXHIBIT NE-01

Lease Number: <LEASE_NUMBER>

NO SURFACE OCCUPANCY STIPULATION

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

<LEGAL_DESCRIPTIONS>

For the purpose of:

> To protect reservoir and railroad rights-of-way improvements and to preserve public safety by prohibiting incompatible uses within established rights-of-way.

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 when lessee demonstrates to the satisfaction of the authorized office that these lands can be occupied without damage to improvements or compromising safety.

EXHIBIT NE-02

Lease Number: <LEASE_NUMBER>

NO SURFACE OCCUPANCY STIPULATION

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

> <LEGAL_DESCRIPTIONS>

For the purpose of:

> To protecting riparian and wildlife values and resources near reservoirs and rivers (including South Platte and South Republican Rivers and Prewitt, Julesburg, Prospect, Horsecreek, Milton, Lower Latham Rivershed, Empire, Bijou, and Ft. Collins reservoir

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 NE-03

Lease Number: <LEASE_NUMBER>

NO SURFACE OCCUPANCY STIPULATION

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

<LEGAL_DESCRIPTIONS>

For the purpose of:

To protect recreational and scenic values in state, county, and municipal parks.

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 NE-09

Lease Number: <LEASE_NUMBER>

AIR FORCE CABLE NOTICE

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

<LEGAL_DESCRIPTIONS>

For the purpose of:

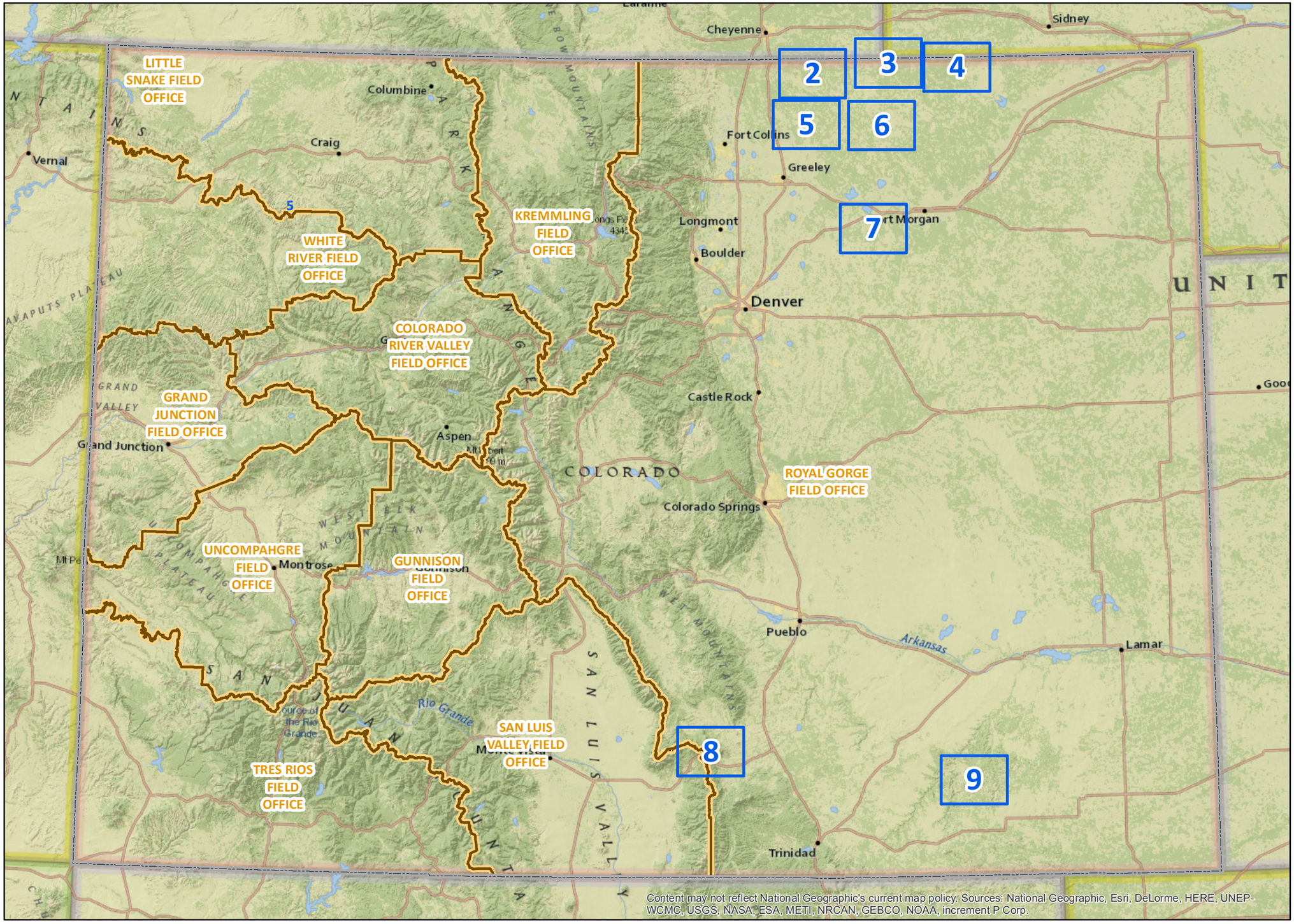
To protect underground cables. Proposed operations located near Air Force underground cables will be moved so as to not interfere with cable performance.

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 when lessee demonstrates to the satisfaction of the authorized office that these lands can be occupied without damage to improvements or

Attachment E, Parcel Maps



Legend

- Detailed Map View Pages
- State Boundary
- BLM Field Office Boundaries

Please click on the Close Up Map Pages to see more detail.

3

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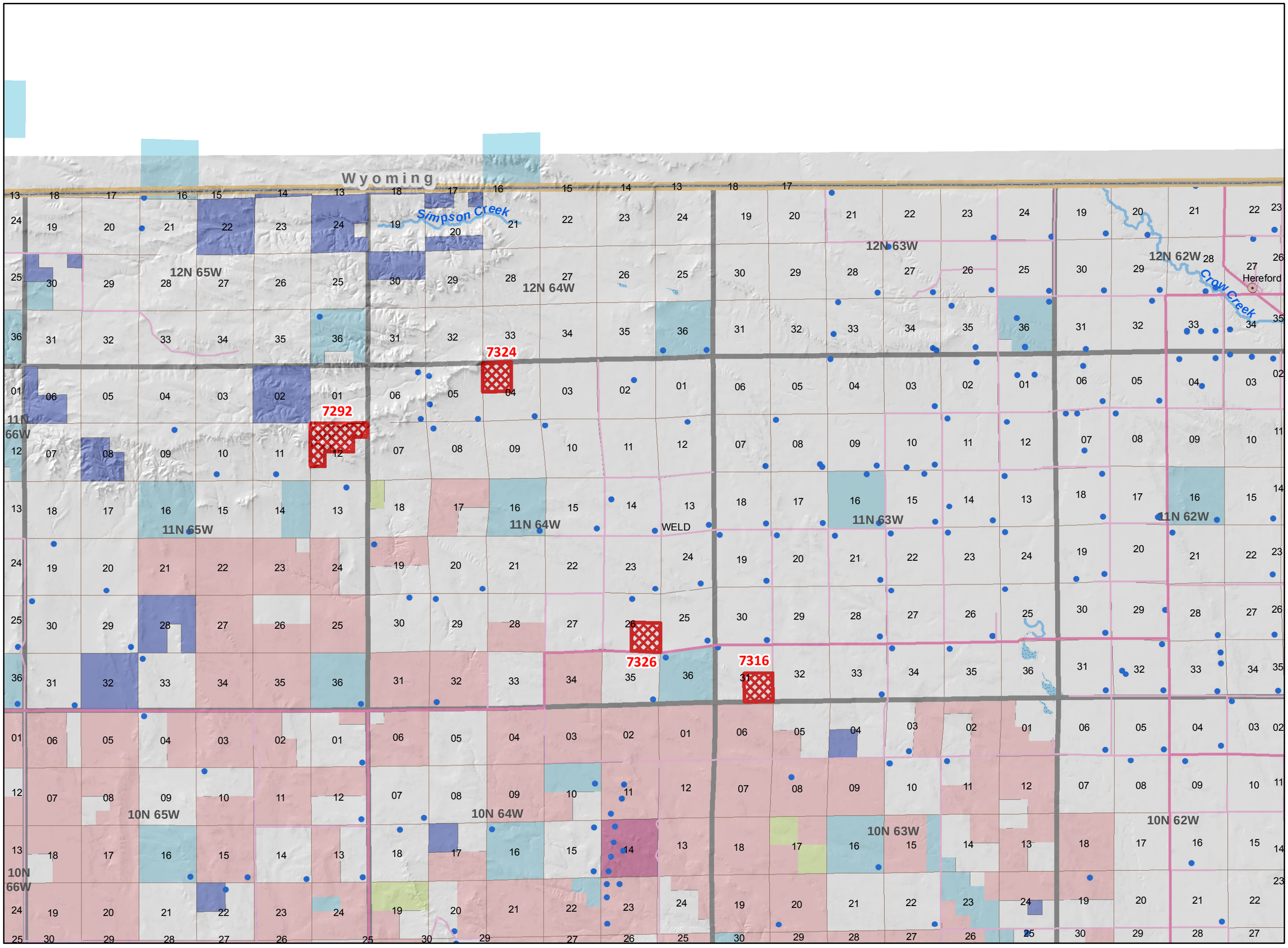
Click on the Page NavigationTools to return to this Index map on Page 1.

Bureau of Land Management
Competitive Oil & Gas Lease Sale
November, 2015

NOTE TO MAP USERS
No warrantee 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 records should be checked for the current status on any specific tract of land.



Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

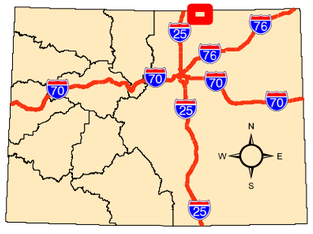
Oil and Gas Leases

- Non-Producing Leases
- Producing Leases
- National Grasslands
- Private
- State
- Bankhead-Jones Land Use Lands
- Township & Range
- Sections
- Lakes and Reservoirs
- CDOT Local Roads
- Streams

2 Miles

Map Page Location
Page Number 2

ROYAL GORGE FIELD OFFICE



Bureau of Land Management
Competitive Oil & Gas Lease Sale
November, 2015

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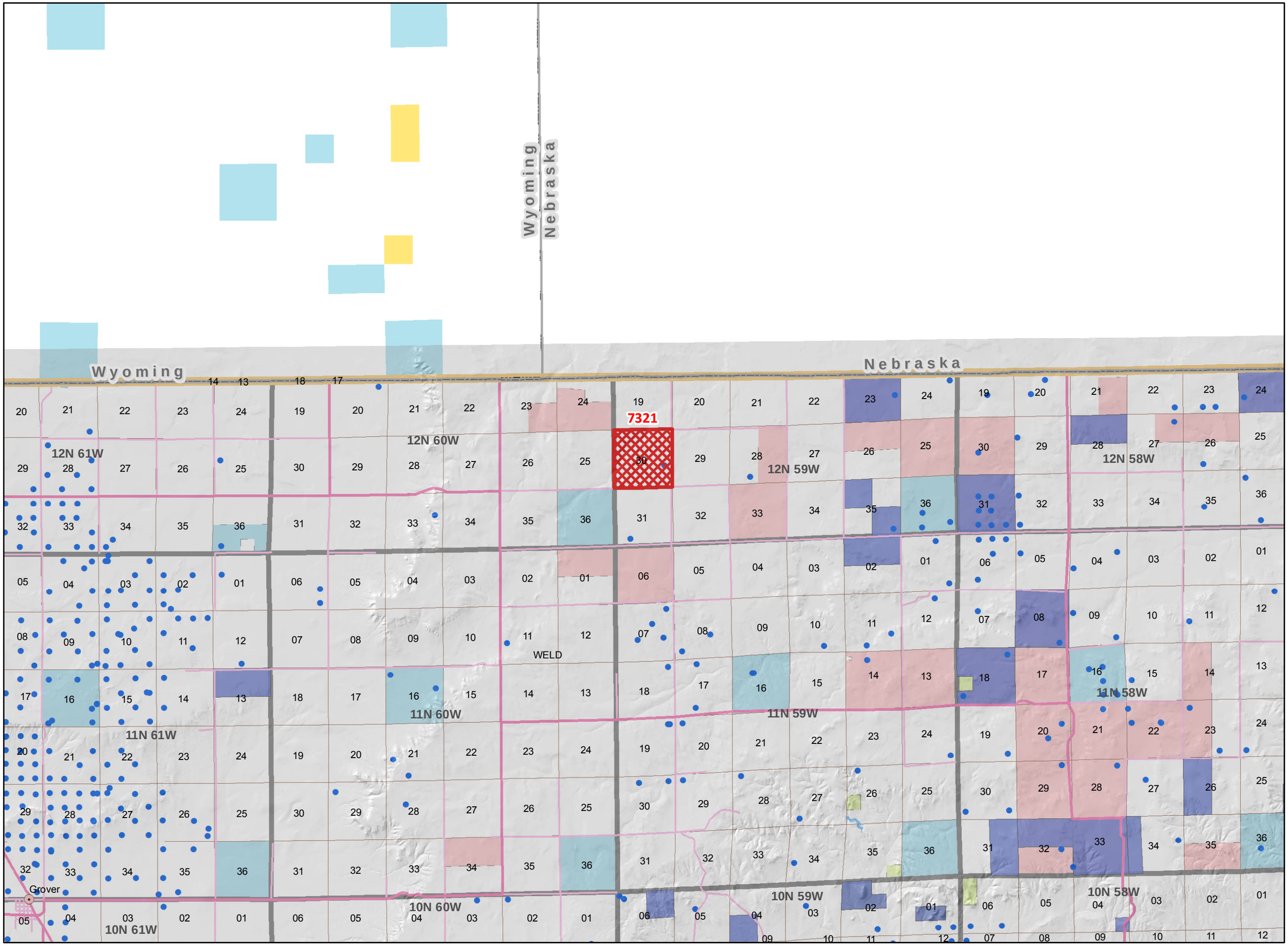


Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

Oil and Gas Leases

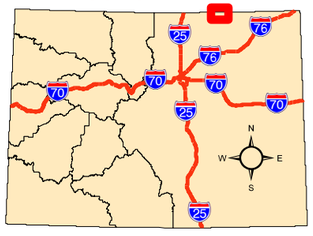
- Non-Producing Leases
- National Grasslands
- Private
- State
- Bankhead-Jones Land Use Lands
- Township & Range
- Sections
- Lakes and Reservoirs
- CDOT Local Roads
- Streams

2 Miles

Map Page Location

Page Number 3

ROYAL GORGE FIELD OFFICE



Bureau of Land Management
Competitive Oil & Gas Lease Sale
November, 2015

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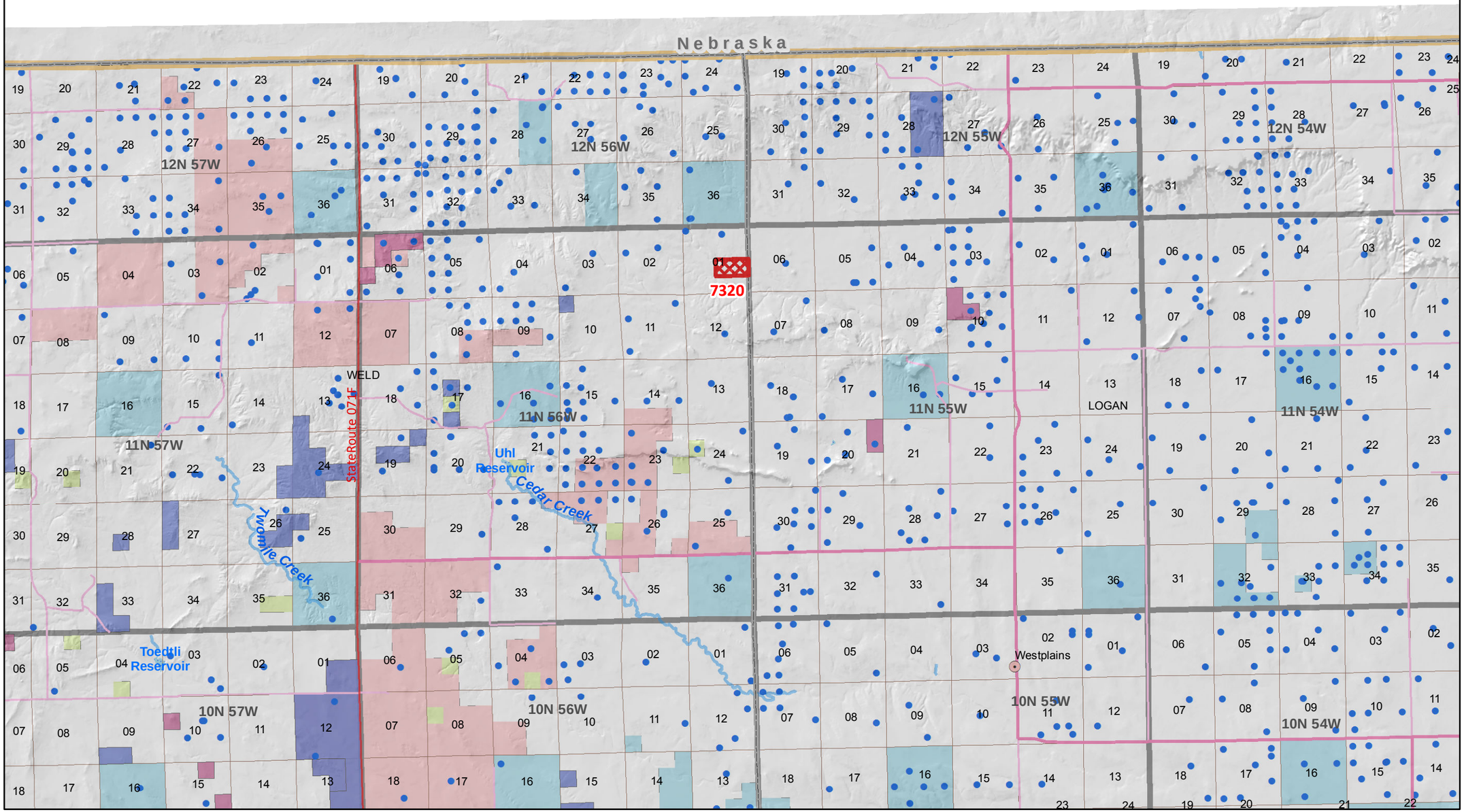


Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

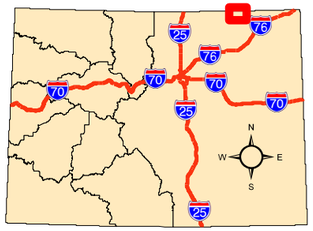
Oil and Gas Leases

- Non-Producing Leases
- Producing Leases
- National Grasslands
- Private
- State
- Bankhead-Jones Land Use Lands
- Township & Range
- Sections
- Lakes and Reservoirs
- Minor Highways
- CDOT Local Roads
- Streams

2 Miles

Map Page Location
Page Number 4

ROYAL GORGE FIELD OFFICE



Bureau of Land Management
Competitive Oil & Gas Lease Sale
November, 2015

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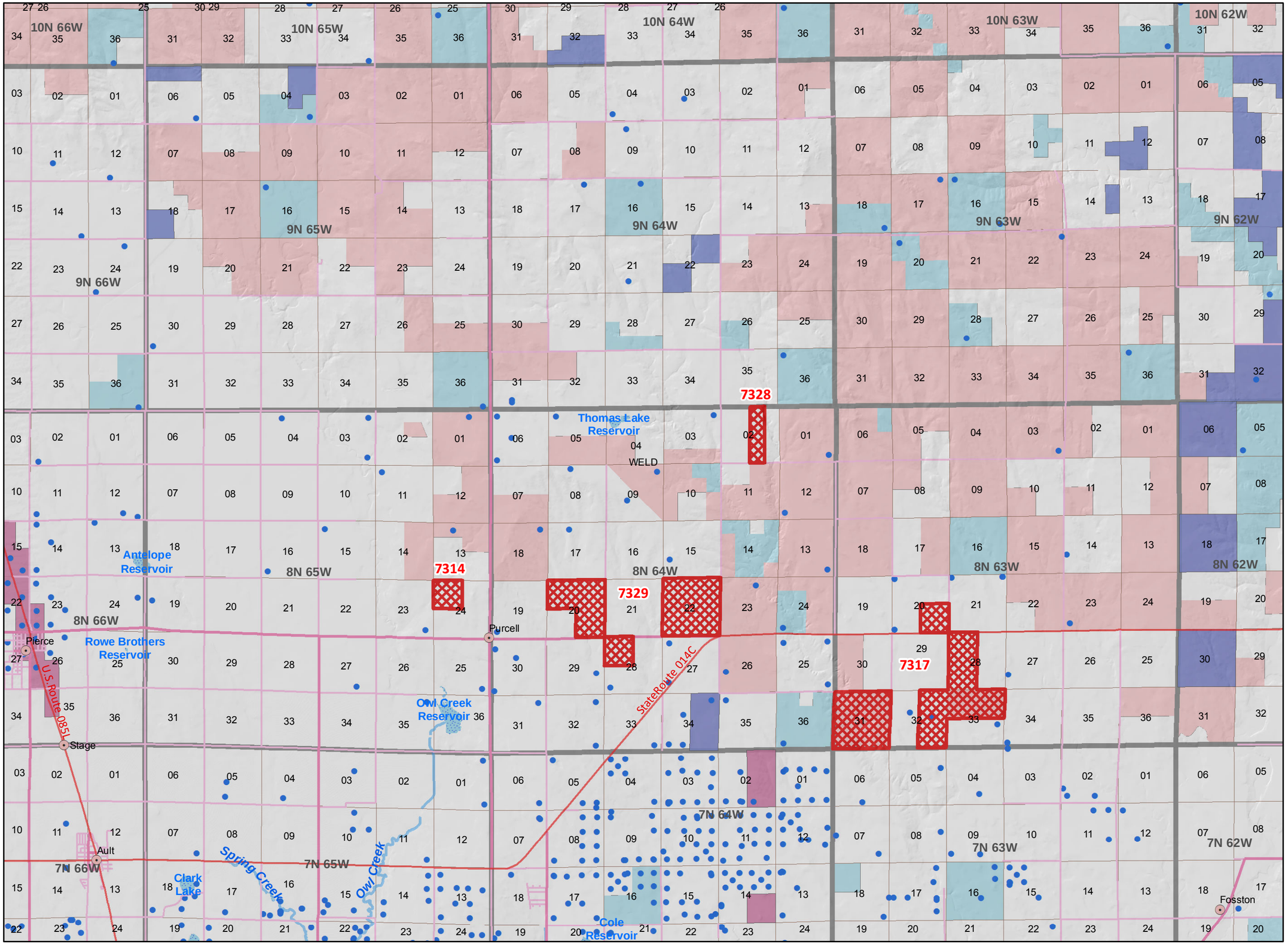


Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

Oil and Gas Leases

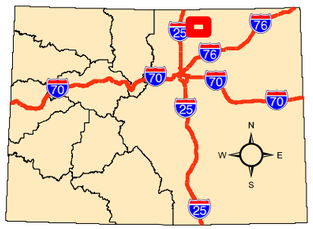
- Non-Producing Leases
- Producing Leases
- Private
- State
- Bankhead-Jones Land Use Lands
- Township & Range
- Sections
- Lakes and Reservoirs
- Minor Highways
- CDOT Local Roads
- Streams

2 Miles

Map Page Location

Page Number 5

ROYAL GORGE FIELD OFFICE



Bureau of Land Management
Competitive Oil & Gas Lease Sale
November, 2015

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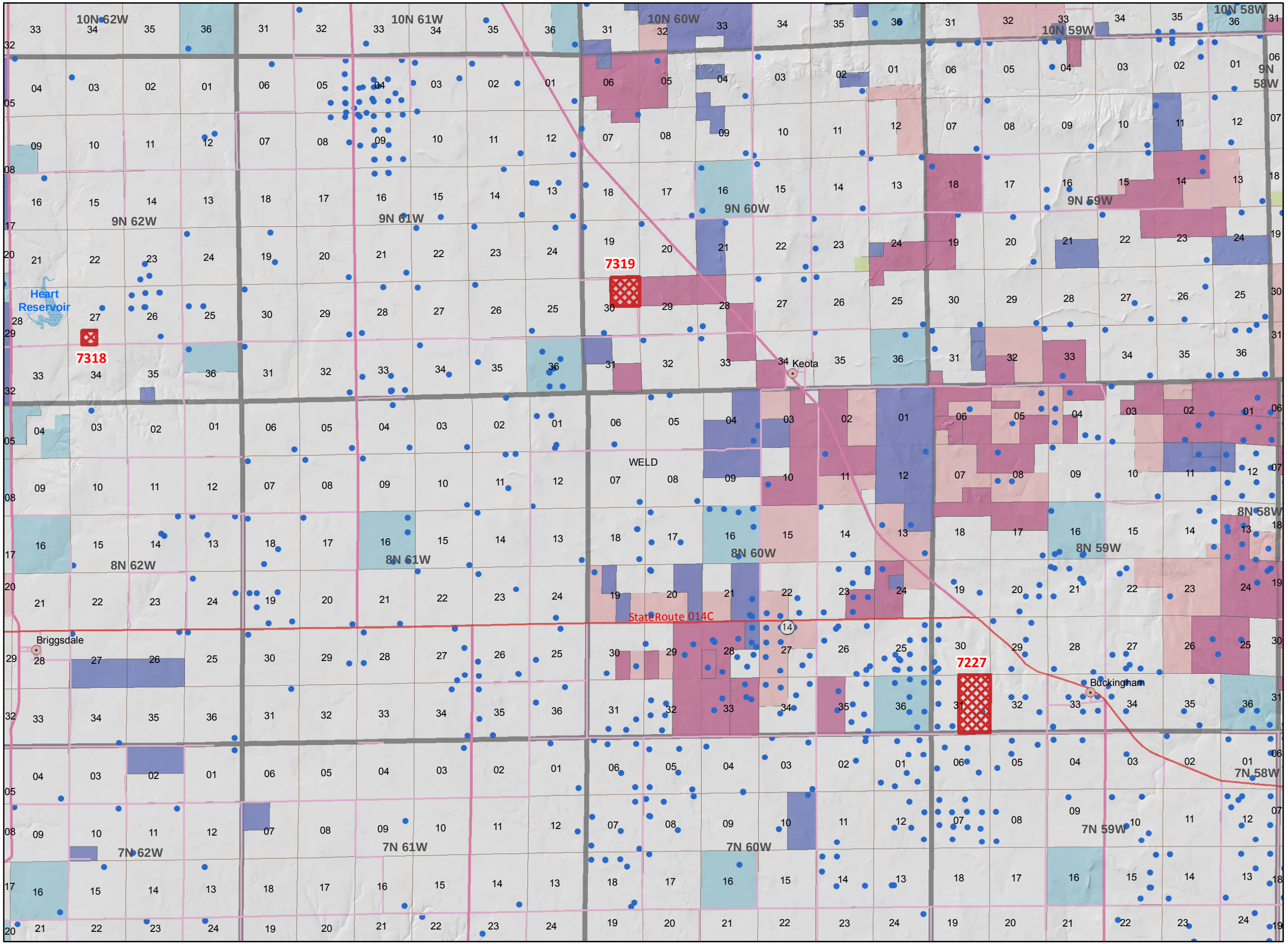


Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

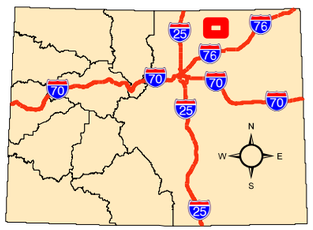
Oil and Gas Leases

- Non-Producing Leases
- Producing Leases
- National Grasslands
- Private
- State
- Bankhead-Jones Land Use Lands
- Township & Range
- Sections
- Lakes and Reservoirs
- Minor Highways
- CDOT Local Roads

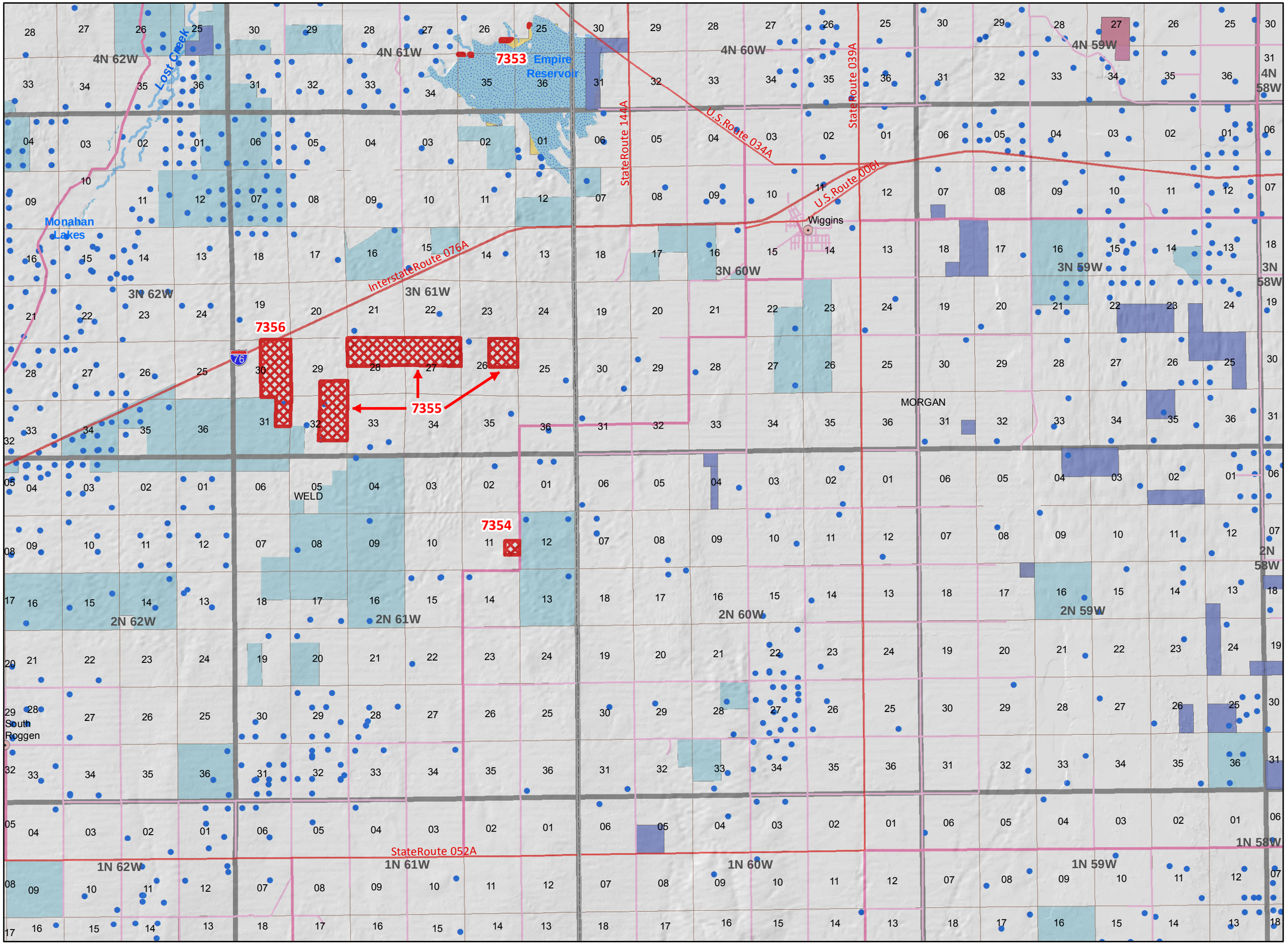
2 Miles

Map Page Location
Page Number 6

ROYAL GORGE FIELD OFFICE



Bureau of Land Management Competitive Oil & Gas Lease Sale November, 2015



NOTE TO MAP USERS
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Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Sale
- COGCC Oil and Gas Well Locations

Oil and Gas Leases

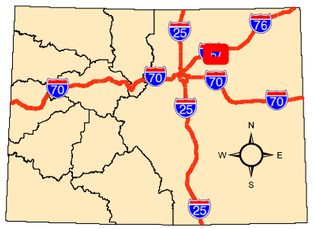
- Non-Producing Leases
- Producing Leases
- Bureau of Land Management
- Private
- State
- Township & Range
- Sections
- Lakes and Reservoirs
- Major Highways
- Minor Highways
- CDOT Local Roads
- Streams

2 Miles

Map Page Location

Page Number 7

ROYAL GORGE FIELD OFFICE



Bureau of Land Management Competitive Oil & Gas Lease Sale November, 2015

NOTE TO MAP USERS
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Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

- Deferral
- COGCC Oil and Gas Well Locations

Oil and Gas Leases

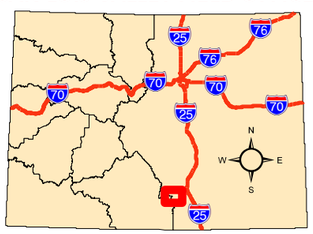
- Non-Producing Leases
- Producing Leases
- Bureau of Land Management
- Private
- State
- US Forest Service
- Township & Range
- Sections
- Lakes and Reservoirs
- Minor Highways
- CDOT Local Roads
- Streams

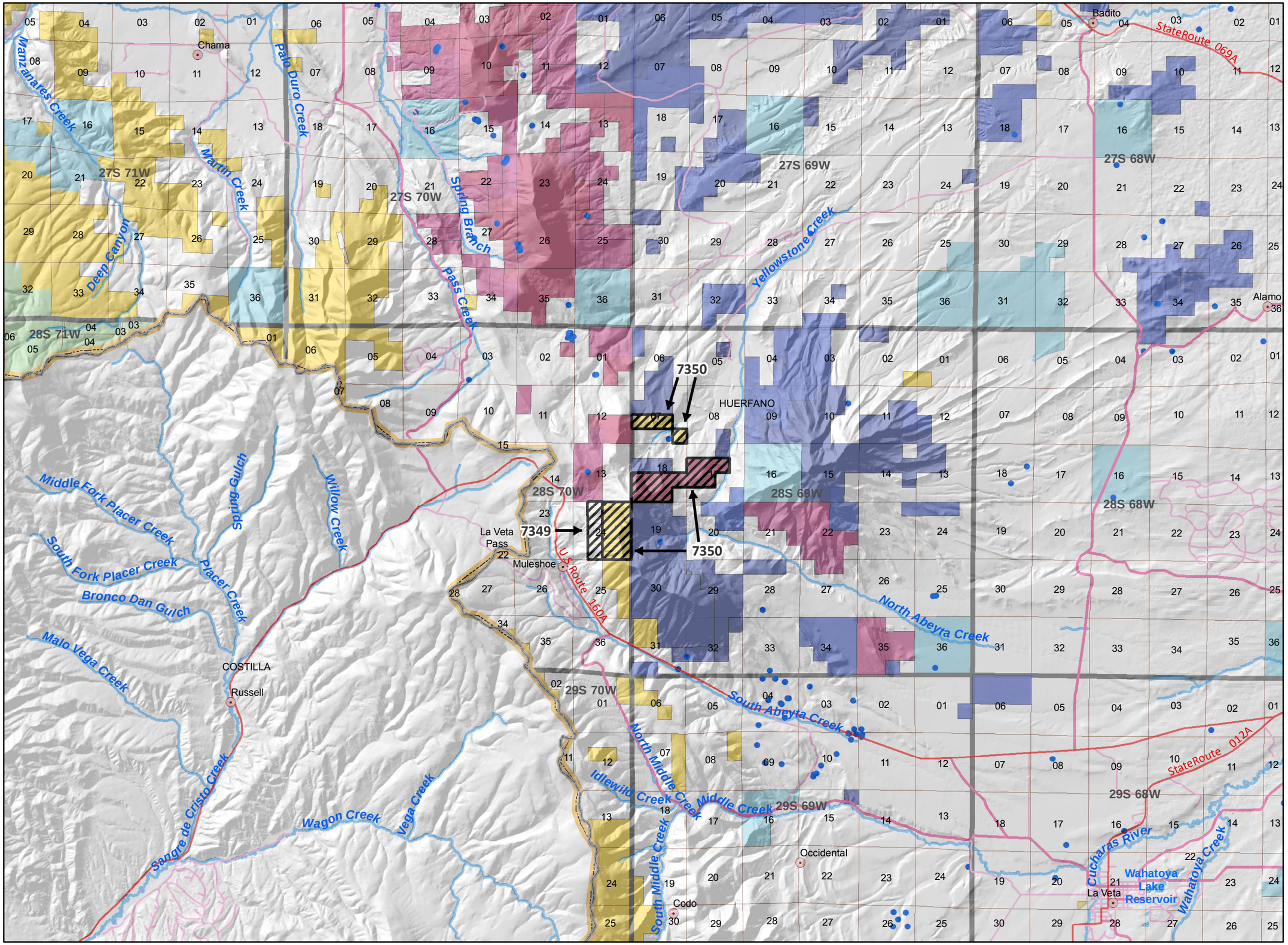
2 Miles

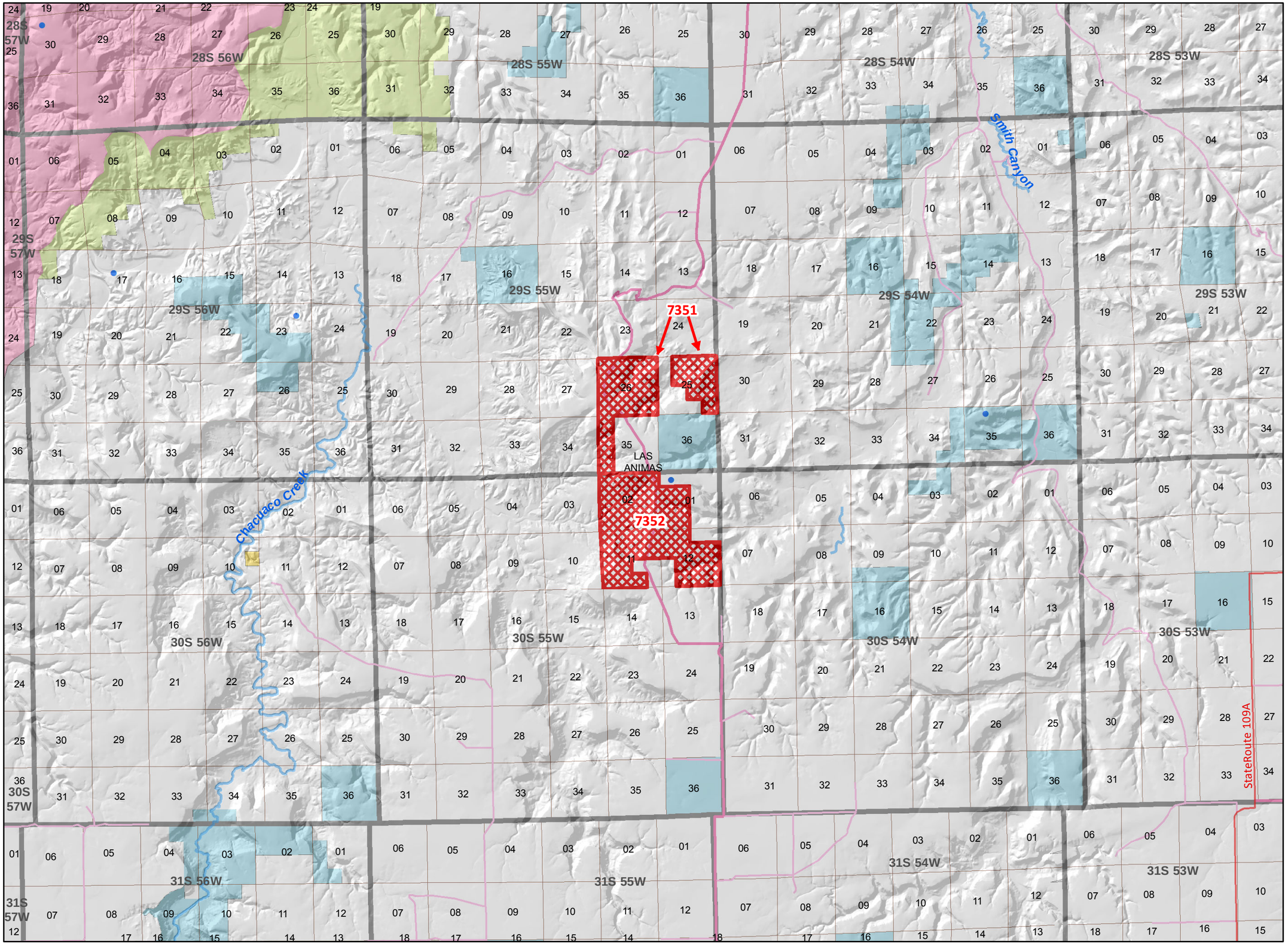
Map Page Location

Page Number 8

SAN LUIS VALLEY FIELD OFFICE







Bureau of Land Management Competitive Oil & Gas Lease Sale November, 2015

NOTE TO MAP USERS
No warrantee 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 records should be checked for the current status on any specific tract of land.

Legend

- BLM Field Office Boundaries

Recommended Oil & Gas Sale Status

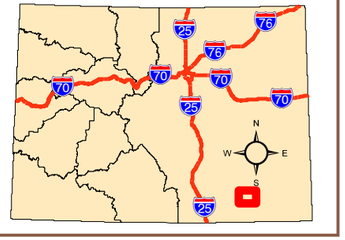
- Sale
- COGCC Oil and Gas Well Locations
- Bureau of Land Management
- Military Reservation
- National Grasslands
- Private
- State
- Township & Range
- Sections
- Minor Highways
- CDOT Local Roads
- Streams

2 Miles

Map Page Location

Page Number 9

ROYAL GORGE FIELD OFFICE



Attachment F

Response to Draft Comments

Comments submitted by Wild Earth Guardians

Air Related Comments

Summary: Wild Earth Guardians commented that the social cost of carbon has been ignored, and must be considered for all proposed land management projects.

Response: The social cost of carbon protocol (SCC) was developed by an Interagency Working Group (IWG), including the Environmental Protection Agency (EPA) and others, for use in cost-benefit analyses of proposed regulations that could impact cumulative global emissions (Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, available at: http://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf).

Executive Order 13514 required Federal agencies to submit a 2020 greenhouse gas pollution reduction target within 90 days, and to increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage Federal purchasing power to promote environmentally-responsible products and technologies. This EO does not apply to land management decisions.

The Social Cost of Carbon (SCC) protocol was developed by the Office of Management and Budget using an interagency working group in response to Executive Order 12866, which requires federal agencies, to the extent permitted by law, "to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs." SCC estimates the monetary cost incurred by the emission of one additional metric ton of carbon dioxide (CO2), and is not applicable to non-CO2 GHG emissions, such as methane. It includes (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change. The SCC was developed to assist agencies in meeting Executive Order (EO) 12866's requirement to assess costs and benefits during the development of regulations, and to support agencies in responding to EO 13514; not for use in making land management decisions.

Estimating SCC is challenging because it is intended to model effects on the welfare of future generations at a global scale caused by additional carbon emissions occurring in the present and does not account for the complexity of multiple stressors and indicators. Uncertainty of production rates, volumes, and end uses from the proposed action and alternatives would seriously limit application of the SCC protocol. The BLM does not know how quickly those resources would be developed; whether the fuel would be used in vehicles, power plants, or other consumptive use with varying emission rates; or what

changes in technology or climate affecting end-uses may occur. The speculative nature and high variability of such an analysis would be of little use in making a leasing availability decision and subsequent determination of whether specific parcels of federal minerals should be leased for oil and gas development. It is BLM's determination that in this particular instance, calculating the SCC from CO2 emissions from the combustion of an unknown quantity of produced oil and gas would be highly speculative but likely would be negligible in relation to the impacts from oil and gas burned on a nationwide or global basis.

EO 12866 requires cost-benefit analyses when developing regulations and the IWG encourages the use of the SCC protocol in those cases. The November 2015 Oil and Gas Lease Sale is not a regulatory action but rather a leasing action. The act of leasing land for oil and gas development in itself does not emit any carbon or greenhouse gases. The EA was prepared in accordance with NEPA to inform the BLM's decisions as to whether or not to make specific land available for oil and gas leasing, and the terms and conditions under which those lands may be leased.

Unlike EO 12866, NEPA does not require a quantitative cost-benefit analysis, although CEQ NEPA regulations allow agencies to use it in NEPA analyses in certain circumstances. (40 CFR 1502.23) As contemplated in the CEQ regulations, the EA recognizes that there are environmental costs associated with the development and use of fossil fuels, and also identifies benefits that oil and gas development provide to the local economy and tax base, and in helping to meet the energy needs of the country. The analysis appropriately weighs the merits and the drawbacks of the proposed action and alternatives.

The EA includes an analysis of socioeconomic impact that acknowledges the monies received from leasing the parcels. The socioeconomic impact analysis estimates the distributional effects of the proposed action on sectors of the regional economy, primarily by measuring the changes in employment and income within Huerfano, Las Animas, and Weld County, Colorado. Because of the speculative nature of development, however, the analysis does not attempt to quantify costs and benefits associated with drilling, possible production or eventual combustion of fluid minerals from the lease parcel.

A cost-benefit analysis, by contrast, would examine the economic efficiency of a proposed action—the net change in social welfare resulting from the costs and benefits of a proposal, including consideration of market and non-market values. The economic impact analysis for this project is not the "benefit" side of a SCC cost-benefit analysis.

Rather, SCC provides one element of a benefit-cost analysis: the monetization of all meaningful economic benefits and costs. Monetizing only certain effects on social welfare can lead to an unbalanced assessment. Reporting the SCC in isolation could be misleading. As a federal District Court in Oregon recently held in *League of Wilderness Defenders/Blue Mts. Biodiversity Project v. Connaughton*, 2014 U.S. Dist. LEXIS 170072 (D. Or. Dec. 9, 2014), a SCC analysis is not required to comply with NEPA where there is no clear way to quantify costs and benefits. Because anticipated

production from a particular lease parcel is speculative, and the resulting CO2 emissions from eventual combustion of that production is even more speculative, a qualitative evaluation of climate change, as presented in the EA, is appropriate.

The EA estimated cumulative GHG emissions as it relates to RGFO projected RFD oil and gas wells in the Air Quality section. The EA qualitatively describes the potential impacts of climate change projections specific to Colorado in response to global increases in GHG emissions which would include any future development on the offered for sale leases. This information is at a scale that is relevant and useful to the decision-maker and meets the requirements of NEPA.

The BLM also has acknowledged that climate science does not allow a precise connection between project-specific GHG emissions and specific environmental effects of climate change. This approach is consistent with the approach that federal courts have upheld when considering NEPA challenges to BLM federal coal leasing decisions. *WildEarth Guardians v. Jewell*, 738 F.3d 298, 309 n.5 (D.C. Cir. 2013); *WildEarth Guardians v. BLM*, 8 F. Supp. 3d 17, 34 (D.D.C. 2014).

Hydraulic Fracturing

Summary: The EA fails to consider the impacts of hydraulically fracturing oil and gas wells. There is incomplete analysis of water usage, seismic activity, health impacts, or any of the other known impacts of hydraulic fracturing. BLM must evaluate the cumulative impacts of hydraulic fracturing.

Response: While the applicable RMP/EISs and the Oil and Gas EIS do not specifically analyze hydraulic fracturing, they likewise do not preclude such technologies being analyzed in leasing and APD EAs.

The Hydrology/Water Quality section of the EA discusses potential impacts to natural resources and regulations associated with hydraulic fracturing, which are designed and implemented to protect natural resources and the human environment.

At the leasing stage, it is not known how many potential wells may be hydraulically fractured, and what the water usage requirements may be for those wells. Water usage for hydraulic fracturing of oil and gas wells is considered at the APD stage.

Resources such as water are protected during hydraulic fracturing activities per 43 CFR 3162.3-1, in which the well is approved only after appropriate environmental and technical reviews by the authorized officer (AO) of the BLM, at the APD stage, which is a site-specific process. A thorough review of submitted materials for each individual well by BLM resource specialists is completed. The geologist performs independent review utilizing Colorado Division of Water Resources data, Colorado Geological Survey maps and publications and Colorado Oil & Gas Conservation Commission records to generate a geological report. The geologist identifies usable ground water and mineral-bearing zones that require protection. The petroleum engineer reviews the casing and cementing

portions of the drilling plan to ensure the protection of those zones identified by the geologic report. Conditions of approval (COAs) to protect usable water zones are attached to the APD as necessary.

Usable ground water resources are protected during drilling in accordance with BLM Onshore Oil and Gas Order No. 2, Drilling Operations. Onshore Order No. 2 requires that all formations containing usable quality water (≤10,000 mg/L total dissolved solids) be isolated and protected utilizing proper casing and cementing. "If encountered while drilling, usable quality water requires protection by bringing the cement at least +/- 200' above the usable water quality zone". BLM geologists and petroleum engineers review the drilling and completion data to insure that oil/gas zones and usable water zones are protected by wellbore. BLM natural resource specialists and petroleum engineering technicians (PETs) conduct inspections to ensure that the operator's plans have successfully avoided environmental impacts. PETs inspect well sites during drilling, completion and production for technical and safety compliance.

In accordance with 43 CFR 3162.4-2, Samples, Tests and Surveys, "during the completion of a well, the operator shall, when required by the authorized officer (AO), conduct, test, run logs and make other surveys reasonably necessary to determine the presence, quantity, and quality of oil, gas, other minerals, or the presence or quality of water." These tests and logs are reviewed and correlated with geologic and hydrologic data. In order to protect fresh water and other minerals, "tests and surveys of the effectiveness of such measures (to isolate and protect usable water) shall be conducted by the operator using such procedures and practices approved or prescribed by the AO". The BLM has the authority to require companies to do reasonable testing if deemed necessary. The BLM AO may require an operator to conduct cement bond log surveys to verify cement adequacy.

The State of Colorado also regulates hydraulic fracturing under its regulations: http://cogcc.state.co.us/reg.html#/rules.

Cumulative effects of oil and gas development are analyzed in the EA and include the potential effects all known oil and gas development on both private and federal minerals as well as any other known actions that might cause an impact to the human or natural environment.

Climate Emissions and Impacts

Summary: The EA fails to include an estimate of climate change emissions and fails to provide for quantitative or qualitative analytical methods or analysis of proposed action or alternative related climate impacts.

Response: The EA provided and disclosed typical per well emissions for development and production activities (criteria and greenhouse gases) in table 3.5, on page 22. As stated in the text above the table, the BLM has no way of knowing how many wells will be developed on any of the individual lease parcels or cumulatively among all the parcels nominated for leasing in the November 2015 sale. Further the EA states that the BLM

cannot predict when or if any future development will be proposed within the ten year initial lease timeframe. For these reasons, we developed and disclosed the per well emissions estimates.

For planning purposes, the BLM has made emissions projections for cumulative field office development out to year 2021 (CARMMS High Development Scenario). These emissions were also discussed in the EA (page 25, table 3.7). BLM assumes that any future project level emissions (where lease holders would propose actual exploration or development) would fit within the levels of emissions analyzed by one of the CARMMS cumulative scenarios. The cumulative emissions were contrasted to state level GHG emissions and a hypothetical source of GHG emissions that was analyzed by the EPA (see EA page 34). The conclusion in the EA, based on EPA's findings for the hypothetical source, was that the cumulative GHG projections (which are expected to account for any future lease development) would have no *measurable* impact on the climate and are not significant.

As of present, no tools exist to allow for meaningful climate change assessment from individual project level activities. As CEQ states in their draft guidance (pgs. 13, 26 & 27), it is appropriate to provide context and intensity metrics, and then disclose the projected impacts from the global models or other studies, and any regional level changes that can be distilled from those results (i.e. tier). Additional text was added to describe these predicted regional impacts (see EA page 34).

To be clear, the predicted impacts from the global climate models would be the same regardless of the alternative chosen, given that the cumulative emissions scenario (inclusive of all projected development, not just this lease sale) is exceptionally small when compared to the global GHG emissions burden. These cumulative global emissions are ultimately responsible for driving the climate change model responses. It is entirely plausible that the global models would produce predictions indiscernible from one another should the alternatives considered in the EA be tested within the global model framework. This is true regardless of the fact that the no action alternative would have zero future GHG emissions.

General Conformity

Summary: The EA fails to ensure Conformity under the clean air act, and relies on a number of incorrect arguments to claim no conformity determination is required.

Response: As explained in the EA on page 23, the BLM has considered the information available and has determined that potential future emissions generating activities (i.e. indirect emissions in relation to the proposed action) are not reasonably foreseeable with sufficient accuracy at the leasing stage for purposes of conformity analysis. As also discussed in the EA on page 23, many of the sources of emissions the BLM would consider are likely to be permitted by the State of Colorado under their SIP approved New Source Review program, and would thus be exempt from the general conformity analysis requirements, see 40 CFR 93.153(d). For example, some of the largest sources of

ozone precursor emissions (compressor engines – NOx, and tank batteries – VOCs) are permitted by the state of Colorado's Air Pollution Control Division on a regular routine basis, however the BLM cannot know this for certain until an actual development or exploration plan is proposed.

The BLM has addressed general conformity at length in the EA. Contrary to the commenter's position, the BLM does not find that emissions are reasonably foreseeable at the leasing stage of oil and gas development. And thus the proposed action is exempted from the requirement for a conformity analysis under 40 CFR § 93.153(c)(3). The emissions from any potential future development are highly uncertain because: 1) We do not know and will not speculate on the timing or overall pace of development for any particular parcel such that we can estimate tons per year for any pollutant(s); 2) We do not know and will not speculate about what equipment sets might be proposed (for both mobile and stationary sources, e.g., a Tier II or Tier IV rig, flare or vapor recovery unit) or how proposed wells will be developed (i.e. will they be hydraulically fractured or not, will they be vertical or horizontal bores), or what equipment might be explicitly exempted under the general conformity rules; 3) We do not know and will not speculate as to what resources a well might target (oil vs. gas) and what the production rates might be for the various resources that might be recovered, all of which will affect the inventory in ways that makes a conformity analysis impractical and unforeseeable at the leasing stage. For the purposes of a NEPA cumulative impacts analysis, the BLM has made some broad and reasonable assumptions to provide for an appropriate analysis such as was done for the CARMMS analysis. But a conformity analysis requires project specific information and cannot simply rely on broad 161 assumptions, or speculation concerning development timing, pace, or overall project design features.

We further state in the EA that leasing does not authorize development, and that the specific impacts of development will be analyzed later when the Bureau has information about project specifics. Since leasing does not authorize development there are no specific emissions to analyze, and thus the proposed federal action, i.e. offering parcels for lease, is exempt from further analysis under the General Conformity requirements. BLM routinely analyzes the CAA conformity of development stage project proposals in the NAA.

Comments submitted by Huerfano County Federal Mineral Lease District:

Summary: Parcel 7349 and portions of parcel 7350 should not be deferred under the preferred alternative because deferral of the entire parcels would have a disproportionally high and adverse impact on the social and economic conditions within Huerfano County.

Response: In the Environmental Assessment for the Royal Gorge Field Office November 2015 Competitive Oil & Gas Lease Sale the BLM, in accordance with Executive Order 12898, assessed the project to ensure there would be no disproportionately high or adverse environmental, health, or safety impacts on minority and low income populations. This analysis identified populations in Huerfano and Las

Animas County meet the criteria for environmental justice consideration. Further, the BLM disclosed that "[w]hile the lease sale is not expected to result in any disproportionately high or adverse impacts on minority and low-income populations, it is possible that development of the lease may have disproportionately high or adverse impacts on minority and low-income populations." The Huerfano County Federal Mineral Lease District has commented that the deferral of Parcels 7349 and 7350 is contrary to environmental justice considerations.

CEQ provides guidance on factors to consider when determining whether there may be disproportionately high and adverse effects. One of the factors is to determine whether the adverse effect on minority populations, low-income populations, or Indian tribes "appreciably exceeds or is likely to appreciably exceed those on the general population…" (CEQ 1997, p. 27, http://www.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf). The deferral of Parcels 7349 and 7350 is not anticipated to have a disproportionate impact on minority populations, low-income populations, or Indian tribes since the impact will be distributed across all residents and members of the County. As detailed in the EA 3.4.3.4 Social and Economic conditions the lease sale solely assesses the impacts of offering parcels for lease. If a parcel is sold during a lease sale, the economic impact is the bonus bid payment and rent of which a portion is returned to the county in which the parcel resides as fiscal revenue. The effect of fiscal revenue is to be distributed across all residents of the county. Unleased parcels do not provide bonus bids nor rents therefore a deferral of unleased parcels will not significantly redistribute economic activity in the county nor disproportionately impact minority or low-income populations. Further, this EA does not assess the impacts of development due to the uncertainty of parcels being leased, leases being explored, and exploration resulting in production. Such impacts of development will be analyzed upon receiving an Application for Permit to Drill or Notice of Sundry.

Summary: The EA's selection of deferral of the entire portions of parcel 7349 and 7350 based on steep slopes and fragile soils and wildlife concerns is not supported by the evidence. Most of Huerfano County contains big game young rearing habitat, and much of parcel 4349 and portions of parcel 4350 are not very steep or rough.

Response: As the comment pointed out, not all of the land in parcels 7349 and 7350 contain slopes up to 80%, however more time is needed for the BLM to determine which portions of these parcels may be suitable for oil and gas development. Deferral of the parcels does not exclude them from leasing in the future. The preferred alternative of the EA would defer the entirety of parcel 7349 and parcel 7350 at this time, to allow time for sufficient detailed analysis of the soils and slopes, and wildlife issues of these two parcels do determine what portions, if any, of these parcels may be leased in a future sale.