U.S. Department of the Interior
Bureau of Land Management
Little Snake Field Office
455 Emerson Street
Craig, CO 81625-1129

ENVIRONMENTAL ASSESSMENT

EA-NUMBER: DOI-BLM-CO-N010-2011-0104-EA

PROJECT NAME: February 2012 - Colorado Competitive Oil & Gas Lease Sale, Little Snake Field Office

LEGAL DESCRIPTION: See Attachment A for all parcels
See Attachment B for parcels recommended for deferral
See Attachment C for parcels recommended for leasing

LAND USE PLAN (LUP) CONFORMANCE REVIEW: The proposed action was reviewed for conformance (43 CFR 1610.5, BLM 1617.3) with the following plan:

Name of Plans: Little Snake Record of Decision and Resource Management Plan (RMP)

Date(s) Approved: October 2011

Results: The Proposed Action is in conformance with the LUP because it is specifically provided for in the following LUP goals, objectives, and management decisions as follows:

Allow for the availability of the federal oil and gas estate (including coalbed natural gas) for exploration and development. Objectives for achieving these goals include:
- Identify and make available the federal oil and gas estate (including coalbed natural gas) for exploration and development.
- Facilitate reasonable, economical, and environmentally sound exploration and development of oil and gas resources (including coalbed natural gas).

Section/Page: Section 2.13 Energy and Minerals/ page RMP-36

INTRODUCTION: It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976, to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.
The BLM Colorado State Office (BLM CSO) conducts a quarterly competitive lease sale 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 BLM CSO at least 45 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. Surface management of non-BLM administered lands overlaying federal minerals is determined by BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the BLM CSO 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; if appropriate stipulations have been included; if new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted, and if there are special resource conditions of which potential bidders should be made aware. Once the draft parcel review is completed and returned to the BLM CSO, a list of available lease parcels and 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 (http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas/lease_sale_notices.html). On rare occasions, additional information obtained after the publication of the NCLS may result in withdrawal of certain parcels prior to the day of the lease sale.

The following Environmental Assessment (EA) documents the review of the parcels offered in the February 2012 Competitive Oil and Gas Lease Sale that is under the administration of the Little Snake Field Office (LSFO). It serves to verify conformance with the approved land use plan and provides the rationale for deferring or dropping parcels from a lease sale as well as providing rationale for attaching additional lease stipulations to specific parcels.

NEED FOR PROPOSED ACTION: The purpose of offering parcels for competitive oil and gas leasing is to allow private individuals or companies to explore for and develop oil and gas resources for sale on public markets. The sale of oil and gas leases is needed to meet the growing energy needs of the United States public. Production of oil and gas resources on public lands contributes to decreasing the dependence of the United States on foreign energy sources, which is a BLM policy that complies with the Mining and Minerals Policy Act of 1970. Continued leasing is necessary to maintain options for production as oil and gas companies seek new areas for production or attempt to develop previously inaccessible or uneconomical reserves.

PUBLIC SCOPING PROCESS: The preliminary EA was posted in the public room and NEPA register (http://www.blm.gov/co/st/en/BLM_Information/nepa/lsfo.html) of the BLM CSO for a 30-day public review period. The comment period began August 18, 2011. A press release went out on August 22, 2011 and was distributed to the BLM's statewide media list, constituent list, and congressional list. The comment period closed 5:00 PM Mountain time, September 19, 2011.

Three (3) letters of comment were received. One (1) letter of protest was received. Comments & Protests are addressed the Decision Record.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES: The Proposed Action would be to recommend to the BLM CSO the leasing of six (6) parcels, totaling 4957.47 acres of Federal mineral estate within the LSFO, for potential oil and gas exploration and production. These parcels are identified in Attachment C. The BLM and private landowners manage the surface estate. The mineral estate is administered by the BLM.

Seventy-one (71) parcels, totaling 75,080.75 acres, were nominated to be leased and are identified in Attachment A and Map 1. Forty-seven (46) parcels, totaling 48,625.81 acres are in Moffat County. Twenty-five (25) parcels, totaling 26,454.94 acres are in Routt County. Of the nominated parcels in Moffat County, 21,598.85 acres are on BLM managed surface and 27,328 acres are privately owned surface with Federal minerals. Of the nominated parcels in Routt County, 3,225.7 acres are on BLM managed surface and 22,928.2 acres are privately owned surface with Federal minerals. The legal descriptions and applicable land use stipulations for all nominated parcels are identified in Attachment A. Sixty-five (65) parcels, totaling 70,123.29 acres, identified in Attachment B are proposed to be deferred in the upcoming February 2012 competitive lease sale. The six (6) parcels, totaling 4957.47 acres, identified in Attachment C are recommended for leasing.

Once sold, the lease purchaser would have the right to use as much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas resources within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101). Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lease holder fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, ownership of the minerals leased reverts back to the federal government and the lease can be resold. Drilling of wells on a lease would not be permitted until the lease owner or operator meets the site specific requirements specified in 43 CFR 3162. Additional site-specific NEPA analysis will be conducted upon receipt of an Application for Permit to Drill (APD). The site-specific NEPA analysis will determine the potential impacts of the proposed actions and will be used to determine the mitigation measures required to minimize those impacts including those to social and economic impacts.

As part of the LSFO review, parcels are reviewed to make sure the appropriate stipulations will be attached at the time of the lease sale. All of the parcels listed in Attachment C are recommended for leasing and have the correct stipulations identified in Attachment C. All of parcels in Attachment B have been recommended to be deferred from leasing. High and medium priority sagebrush habitats, developed by Colorado Parks and Wildlife (CPW), represent important sagebrush habitat in northwest Colorado. In the Little Snake RMP, LSFO places a 1% disturbance limitation for oil and gas development on new leases in high priority areas and a mandatory 5% disturbance limitation on leases in medium priority areas. Recent research offers strong indications that traditional forms and application of sage-grouse protection measures, formerly endorsed by State and Federal wildlife managers, are ineffective in maintaining local sage-grouse populations in the face of even modest levels of fluid mineral development (e.g., Holloran 2005, Doherty et al. 2008, Walker et al. 2007). These data suggest that reduced lek attendance, avoidance and displacement from areas of energy development, lower survival of

nesting hens, and reduced nest success are attributable to oil and gas development at well densities that exceed one well per section. To ensure new mitigation measures that may be developed during the Colorado Northwest District Greater Sage-grouse EIS are not precluded in priority habitats, all parcels that are within Preliminary Priority Habitat (per WO IM No. 2012-043) would be deferred at this time.

Parcels 5945, 5965, 5983, 6016, 6018 & 6027 are not within Preliminary Priority Habitat and the LSFO has determined that these parcels are appropriate to lease with stipulations developed to protect greater sage-grouse in the LSFO RMP (October 2011). Portions of parcel 6018 are in Medium Priority Sagebrush Habitat and the 5% disturbance threshold stipulation designed to reduce fragmentation of sagebrush habitats has been applied to these portions.

As part of the 2010 oil and gas leasing policy reform, the BLM Washington Office (WO) directed each state to form an Inter-disciplinary Consistency Review Team to ensure lease stipulations are consistent within each state office for the protection of similar resources or resource settings, and stipulations edge-match across administrative boundaries. This process will culminate in new stipulations in BLM Colorado land use plans, which would be integrated during RMP revision processes or as RMP amendments. The LSFO RMP will be amended when the statewide stipulations are approved, which will include the 0.4 mile sharp-tail lek No Surface Occupancy (NSO).

NO ACTION ALTERNATIVE: The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed action would not take place. In the case of a lease sale, this would mean that an expression of interest to lease (parcel nomination) would be denied or rejected.

The No Action alternative would withdraw the lease parcels from the February 2012 lease sale. The parcels would remain available for inclusion in future lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, state, and Indian leases.

No mitigation measures would be required as no new oil and gas development would occur on the unleased lands. No rental or royalty payments would be made to the federal government. If the BLM does not lease these federal minerals, an assumption is that it is not expected that demand would decrease for oil and gas. Demand would likely be addressed through production elsewhere or imports. Due to less stringent environmental regulations in some areas outside of the U.S., it is possible that there would be increased emissions of volatile organic compounds (VOC), air borne dust, and greenhouse gases (GHGs) during exploration and production operations. In addition, it is anticipated that there would be additional emissions of GHGs during transportation of these commodities to US ports.

AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES/MITIGATION

For the following resources and issues, those brought forward for analysis will be addressed below.

Resource/Issue	N/A or Not Present	Applicable or Present, No Impact	Applicable & Present and Brought Forward for Analysis
Air Quality and Climate			X
Areas of Critical Environmental Concern	X		
Cultural Resources			X
Environmental Justice			X
Flood Plains			X
Fluid Minerals			X
Forest Management	X		
Hydrology/Ground			See Water Quality - Ground
Hydrology/Surface			See Water Quality - Surface
Invasive/Non-Native Species			X
Lands with Wilderness Characteristics	X		
Native American Religious Concerns			X
Migratory Birds			X
Paleontology			X
Prime and Unique Farmland		X	
Range Management			X
Realty Authorizations			X
Recreation/Transportation		X	
Socio-Economics			X
Soils			X
Solid Minerals		X	
T&E and Sensitive Animals			X
T&E and Sensitive Plants	X		
Upland Vegetation		X	
Visual Resources		X	
Waste, Hazardous or Solid			X
Water Quality - Ground			X
Water Quality - Surface			X
Wetlands/Riparian Zones			X
Wild and Scenic Rivers	X		
Wild Horse & Burro Mgmt	X		
Wilderness Study Areas (WSAs)	X		
Wildlife - Aquatic			X
Wildlife - Terrestrial			X

AIR QUALITY AND CLIMATE

Affected Environment, Air Quality: The PRMP/FEIS characterized existing air quality conditions as follows: "Because of limited available data, it is only possible to *[quantify or]* trend air quality-related values for a few locations: for those locations, ambient air quality concentrations are below *[cleaner than applicable]* standards, visibility is typical of clear skies associated with remote areas in the Western United States, and there have been improvements in total *[atmospheric]* deposition at Rocky Mountain National Park in recent years." Since none of the available lease parcels are located within EPA designated nonattainment or maintenance areas, Clean Air Act General Conformity regulations do not apply. Data gathered from the nearest representative monitoring stations indicate that current concentrations for criteria pollutants are in compliance with applicable standards.

Background Air Quality Conditions

Pollutant	Averaging Period	Measured Background Concentration ($\mu g/m^3$)	Fraction of National Ambient Air Quality Standard (percent)
carbon monoxide (CO)	1-hour	1,143	3
	8-hour	1,143	11
nitrogen dioxide (NO_2)	Annual	13.2	13
ozone (O_3)	8-hour	131	89
PM_{10}	24-hour	111	74
$PM_{2.5}$	24-hour	17.3	49
	Annual	7.5	50
sulfur dioxide (SO_2)	3-hour	182	14
	24-hour	10.4	3
	Annual	2.6	3

Source: PRMP/FEIS (Page 3-14, Table 3-3)

Affected Environment, Climate Variability and Climate Change: As described in the "Proposed Resource Management Plan and Final Environmental Impact Statement for Public Lands Administered by the Bureau of Land Management, Little Snake Field Office, Craig, Colorado" (PRMP/FEIS) available at <http://www.blm.gov/co/st/en/fo/lsfo/plans/rmp_revision/rmp_docs.html>, climate in the proposed leasing area is characterized as "desert and semiarid steppe with areas of mid-latitude highland or alpine in mountainous areas. Both of these climatic zones have large seasonal variations in temperature and precipitation. The desert and semiarid steppe climate is relatively dry, but precipitation varies annually and is sufficient for the growth of short, sparse grass and shrubs. The mid-latitude highland or alpine climate is characterized by large variations in local climates, depending on elevation and slope exposure, but is generally a similar but cooler version of nearby lowland climate." As presented in the PRMP/FEIS, the U.S. Environmental Protection Agency (EPA) Region 8 has reported "In the coming decades, scientists project that climate change will lead to significant changes in the Mountain West and Great Plains" including several specific impacts. The BLM will continue to evaluate climatic variability and change in the future, and apply appropriate management techniques to address changing conditions.

Proposed Action

Environmental Consequences: While the act of leasing the parcels would produce no significant air quality impacts, potential future development of the lease could lead to surface disturbance from the construction of well pads, access roads, pipelines, and power lines, as well as associated air pollutant emissions from vehicle use, windblown dust, and engine exhausts. Since it is unknown if the parcels would be developed, or the extent of the development, it is not possible to reasonably predict potential air quality impacts at this time. Detailed, site-specific air quality impact analysis would be required at the APD stage once a site-specific proposal is identified, and exploratory drilling activities would be subject to applicable local, state and federal air quality laws and regulations. Potential air quality impacts from various assumed well field construction and production scenarios were analyzed in the PRMP/FEIS, as described in the "Additional Air Quality Impact Assessment to Support the Little Snake Field Office Draft Resource Management Plan and Environmental Impact Statement, Moffat, Routt, And Rio Blanco Counties, Colorado" available at <http://www.blm.gov/co/st/en/fo/lsfo/plans/rmp_revision/rmp_docs.html>. The BLM conducted the additional assessment based on Draft EIS comments provided by EPA, using conservative analysis assumptions and methods, which made the results likely to over-predict potential air quality and air quality-related value impacts. The analysis assumed drilling more than 3,000 new wells, as well as constructing and operating up to 10 new central/pipeline compressors and 90 new well-head engines/compressors. Although the additional assessment predicted a maximum range of 0 to 2 days greater than a 1.0 deciview just noticeable change in visibility at the mandatory federal PSD Class I Mount Zirkel Wilderness Area, given the conservative nature of the analysis, no significant air quality impacts were actually predicted to occur.

Assuming that full-field development could eventually occur, an analysis (Archer 2010) was performed comparing air pollutant and so-called "greenhouse" gas emissions due to assumed oil and gas activities under the four alternatives in the Little Snake RMP. The analysis includes construction emissions (well pad and access road construction, as well as initial drilling), production emissions (vehicle traffic and on-site equipment), and maintenance emissions (periodic pad/road maintenance and well workovers) assumed to occur during the last in last/maximum (20th) year of development. All emissions are reported in tons per year (TPY).

For Alternatives A/B/C, it was assumed 2,140 oil and gas wells would be in production (based on 19 years of development at a 76% success rate), and a final total of 143 wells would be drilled:

Criteria Pollutant Emissions (TPY)

Carbon monoxide (CO): 1,657
Oxides of nitrogen (NOx): 1,251
Particulate matter less than 10 microns in diameter (PM-10): 2,028
Particulate matter less than 2.5 microns in diameter (PM-2.5): 214
Sulfur dioxide (SO2): < 1
Volatile organic compounds (VOC): 12,801

"Greenhouse" Gas Emissions (TPY)
Carbon dioxide (CO2): 954,519
Methane (CH4): 32
Nitrous oxide (N2O): 5

For Alternative D, it was assumed 1,610 oil and gas wells would be in production (based on 19 years of development at a 76% success rate), and a final total of 107 wells would be drilled:

Criteria Pollutant Emissions (TPY)
Carbon monoxide (CO): 1,246
Oxides of nitrogen (NOx): 941
Particulate matter less than 10 microns in diameter (PM-10):1,524
Particulate matter less than 2.5 microns in diameter (PM-2.5): 161
Sulfur dioxide (SO2): < 1
Volatile organic compounds (VOC): 9,626

"Greenhouse" Gas Emissions (TPY)
Carbon dioxide (CO2): 717,706
Methane (CH4): 24
Nitrous oxide (N2O): 4

Mitigation Measures: No additional mitigative measures beyond those required by applicable local, state and federal air quality laws and regulations (including those of the State of Colorado Department of Public Health and Environment, and the Colorado Oil and Gas Conservation Commission) would be required for leasing. However, additional requirements could be imposed based on a detailed, site-specific air quality impact analysis at the APD stage once a site-specific proposal is identified.

No Action Alternative
Environmental Consequences: There would be no impacts to air quality from the No Action Alternative.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACECs)

Affected Environment: Section 202(c)(3) of FLPMA mandates giving priority to the designation and protection of ACECs. These areas are defined in Section 103(a) as areas where special management attention is required to protect, and to prevent irreparable damage to important values, resources, systems, or processes, or to protect life and safety from natural hazards. Further guidance and evaluation criteria are found at 43 CFR Part 1610.7-2.

Proposed Action

Environmental Consequences: The proposed lease area does not meet the criteria for protection as an ACEC. The Irish Canyon ACEC is not in the vicinity of the proposed lease area and would not be affected by the proposed action(s).

Mitigation Measures: None.

No Action
Environmental Consequences: There would be no impacts to the Irish Canyon ACEC from the No Action Alternative.

CULTURAL RESOURCES

Affected Environment: This analysis is confined to the 7 parcels recommended for leasing as identified in Attachment C. The leasing of federal mineral rights for potential oil and gas exploration and production is considered an undertaking Section 106 of the National Historic Preservation Act (NHPA).

BLM has the legal responsibility to take into account the effects of its actions on cultural resources located on federal land or affected by federal undertakings. BLM Manual 8100 Series, the Colorado State Protocol and BLM Colorado Handbook of Guidelines and Procedures for Identification, Evaluation, and Mitigation of Cultural Resources provide guidance on how to accomplish Section 106 requirements with the appropriate cultural resource standards. Section 106 of NHPA requires federal agencies to: 1) inventory cultural resources to be affected by federal undertakings, 2) evaluate the importance of cultural resources by determining their eligibility to the National Register of Historic Places (National Register), and 3) consult with the federal and state preservation agencies regarding inventory results, National Register eligibility determinations, and proposed methods to avoid or mitigate impact to eligible sites. Within the state of Colorado, BLM's NHPA obligations are carried out under a Programmatic Agreement between BLM, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer (SHPO). If the undertaking is determined to have "no effect" or "no adverse effect" by the BLM Little Snake Field Office archaeologist then it may proceed under the terms of the Programmatic Agreement. If the undertaking is determined to have "adverse effects" then consultation is initiated with the SHPO.

The prehistoric and historic cultural context for northwestern Colorado has been described in several recent regional contexts. Reed and Metcalf's (1999) context for the Northern Colorado River Basin is applicable for the prehistoric context and historical contexts include overviews compiled by Frederic J. Athearn (1982) and Michael B. Husband (1984). A historical archaeology context has also been prepared for the state of Colorado by Church and others (2007). In addition, significant cultural resources administered by the BLM-LSFO have been discussed in a Class 1 overview (McDonald and Metcalf 2006). A Class I background search specific to each of the seven parcels recommend for leasing was also conducted by the BLM-LSFO.

Parcel 5945-Only one study of less than one acre has been completed within the 640 acres of the parcel. This study did not result in the discovery of any cultural resources. The likelihood of any undiscovered cultural resources within the parcel is relatively low due to rouged terrain. Any newly discovery cultural resources are likely to be identified along the drainage bottoms or on open ridge tops. It is unlikely that any newly discovered resources would be recommended eligible for the National Register.

Parcel 5965-Two studies have been conducted within the lease parcel. The scope of these studies is unknown at the time as the records did not indicate the amount of acreage inventoried. Both of these studies recorded a segment of the historic California Park Road (5RT.119) in the western half of Sections 3 and 10. The historic road alignment follows Route County Route 80 and any historically significant elements have likely been obliterated. The historic road alignment has been officially determined as not eligible for the National Register. Two potential unrecorded historic resources were identified on the 1922 Government Land Office (GLO) Plat. These resources consist of unnamed roads leading to sawmills in Sections 2, 3, 11, and 15. Due to the lack of inventory within the 2,290 acre are the potential of unrecorded cultural resources is unknown. However, there is likely a high probability for historic resources associated with logging in the region during the early 20th century. Any undiscovered cultural resources have the potential to be recommended eligible for the National Register.

Parcel 5983-No cultural resource studies have been conducted over the 575 acres within the parcel. Two potential unrecorded historic resources were identified on the 1914 GLO plat. Both of these resources are located in Section 23 and consist of the "Deckers to Mill" road and a historic fence line. The potential for undiscovered cultural resources is unknown due to the lack of survey in the area. However there are springs and permanent water in the area which typically have associated cultural material. It is likely that some yet to be discovered cultural resources within the parcel would be recommended eligible for the National Register.

Parcel 6016-Three cultural resources studies have been conducted over portions of the parcel resulting in total coverage of the 160 acres of the parcel. These studies did not identify any cultural resources. However, all of these studies were conducted over 20 years ago when inventory and recording standards were different. An unrecorded historic fence line was identified on the 1917 GLO plat in sections 19 and 20. An examination of the GLO plats and topographic maps indicate a strong potential for other undocumented historic resources in the area. The parcel is also situated near a spring and a drainage bottom which are indicators of undiscovered cultural resources. It is likely that some yet to be discovered cultural resources within the parcel would be recommended eligible for the National Register.

Parcel 6018-Two cultural resource studies have inventoried approximately 8 acres within the 1,041 acres of the parcel. These studies did not result in any cultural resources within the lease areas. An examination of the 1878 GLO plat indicated the presence of an

unrecorded historic trail in Section 10. The potential for undiscovered cultural resources is unknown due to the lack of survey in the area. However there are springs and permanent water in the area which typically have associated cultural material. It is likely that some yet to be discovered cultural resources within the parcel would be recommended eligible for the National Register.

Parcel 6027- No cultural resource studies have been conducted over the 247 acres within the parcel. The likelihood of any undiscovered cultural resources within the parcel is relatively low due to rouged terrain. Any newly discovery cultural resources are likely to be identified along the drainage bottoms or on open ridge tops. It is unlikely that any newly discovered resources would be recommended eligible for the National Register.

References

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1982 *An Isolated Empire: A History of Northwest Colorado*. Bureau of Land Management-Colorado. Cultural Resource Series No. 2, Second Edition. Denver.

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1984 *Plateau Country Historic Context*. Office of Archaeology and Historic Preservation, State Historic Preservation Office, Denver.

McDonald Kae and Michael Metcalf
2006 Regional Class I Overview of Cultural Resources for the BLM Little Snake Field Office. Metcalf Archaeological Consultants, Inc. Eagle, Colorado.

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Proposed Action

Environmental Consequences: Site specific surveys, evaluation and mitigation will be completed prior to the issuance of any permit per lease stipulation CO-39. The BLM is required by law and regulation to ensure that Bureau-initiated or Bureau-authorized actions do not inadvertently harm or destroy cultural resource values. Because most cultural resources are unidentified, irreplaceable, and highly sensitive to ground disturbance, it is necessary that the resources are properly identified, evaluated, and reported prior to any proposed action that may affect their integrity or condition. Before any Applications for Permit to Drill (APDs) are issued for exploration or drilling, a Class III cultural resource study would be undertaken to comply with Section 106 of the NHPA.

Mitigation Measures: All lands are subject to Exhibit CO-39 to protect cultural resources. Before any APDs are approved for exploration or drilling, a Class III cultural resource survey would be undertaken to comply with Section 106 of the NHPA. BLM-LSFO

requires a minimum 40-acre inventory block around any proposed well location. Class III cultural resource surveys are also required for associated roads (new or improved) and pipelines. Law and regulation require the BLM to ensure that Bureau-initiated or Bureau-authorized actions do not inadvertently harm or destroy cultural resource values. Coordination with private landowners will ensure consideration of the effect of future federal decisions on cultural resources. Because most cultural resources are unidentified, irreplaceable, and highly sensitive to ground disturbance, it is necessary that the resources are properly identified, evaluated, and reported prior to any future activity that may affect their integrity or condition. Where potential effects to eligible cultural resources are identified, the preferred mitigation is to relocate the proposed well pad(s) or infrastructure to avoid the sites by more than 100 meters, or relocation such that the undertaking's APD does not adversely affect eligible sites. Data recovery of eligible sites may also be initiated in consultation with the Colorado SHPO. Specific mitigation is developed during NEPA review of individual APDs or related undertakings.

No Action Alternative
Environmental Consequences: There would be no impacts to cultural resources.

ENVIRONMENTAL JUSTICE

Affected Environment: Executive Order 12898 (20) requires federal agencies to assess projects to ensure there are no disproportionately high or adverse environmental, health, or safety effects on minority and low-income populations. Minorities comprise a small proportion of the population residing inside the boundaries of the LSFO.

Proposed Action
Environmental Consequences: No minority or low income populations would be directly affected in the vicinity of the proposed action.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: No minority or low income populations would be directly affected by the No Action Alternative.

FLOOD PLAINS

Affected Environment: There are FEMA-identified 100-year floodplains within or adjacent to proposed parcels on public lands in both Moffat and Routt Counties. Flooding is the temporary inundation of an area caused by overflowing streams or by runoff from adjacent slopes (water standing for short periods after rainfall or snowmelt is not considered flooding). Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

Proposed Action
Environmental Consequences: Impacts to floodplains in the proposed project area could include vegetation compression and soil compaction, depending on moisture content of the soils, could degrade form and function of floodplains. Prohibiting surface disturbing activities within the 100-year floodplain boundaries may eliminate a very small amount of area that is proposed for exploration but would also limit or prevent impacts to floodplain soils and vegetation.

Mitigation Measures: No surface occupancy within FEMA-identified 100-year floodplains.

No Action Alternative
Environmental Consequences: There would be no impacts to the flood plains from the No Action Alternative.

Source: USDA-NRCS Soil Data Viewer version 5.2.0016: http://soildataviewer.nrcs.usda.gov/

FLUID MINERALS

Affected Environment: The nominated parcels are within favorability zone 4 (highest for oil and gas potential). Geologic formations would be analyzed during the APD NEPA process.

Proposed Action
Environmental Consequences: The LSFO ensures the APD submitted casing and cementing program would be adequate to protect all of the resources, minerals and fresh water zones. The blowout prevention system will be analyzed to ensure Onshore Order No. 2 standards are adequately met.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts from the No Action Alternative.

INVASIVE/NON-NATIVE SPEICES

Affected Environment: Invasive species and noxious weeds occur within the affected area. Downy brome (cheatgrass), yellow alyssum, blue mustard and other annual weeds are common along roadsides and in other disturbed areas. Perennial species in the affected area include hoary cress (white top), leafy spurge, Russian knapweed, hound's tongue, Canada thistle and several species of biennial thistles. Other species of noxious weeds can be introduced by vehicle traffic, livestock and wildlife. The LSFO, Moffat County, livestock operators, and oil and gas companies collaborate to control weeds and find the best

integrated approaches to achieve these results. For all actions on public lands that involve surface disturbance or rehabilitation, reasonable steps are required to prevent the introduction or spread of noxious weeds. These steps may include power washing or air blasting of construction equipment to remove soil and vegetative parts and requirements for using certified weed-free seed and weed-free hay, mulch, and straw. In addition, any actions that result in the introduction or spread of invasive non-native or noxious weeds would be mitigated by standard weed management guidelines under the direction of LSFO.

Proposed Action

Environmental Consequences: If drilling were to occur on these parcels, subsequent activities would create an environment 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. The annual invasive weed species (downy brome, yellow alyssum, and other annual weeds) that occur on adjacent rangelands would occupy the 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 is expected to provide the necessary control of invasive annual weeds within 2 or 3 years.

The perennial and biennial noxious weeds in the area less frequently establish on the uplands, but some potential exists for their establishment in draws and swales or areas that would collect additional water. The largest concern in the project area would be for these species to become established and not be detected, providing seed which can move onto adjacent rangelands. At the APD stage the operator would be required to control any invasive and/or noxious weeds that become established within the disturbed areas involved with drilling and operating the well.

Mitigation Measures: Mitigation attached to the APD as Conditions of Approval (COA) to minimize disturbance and obtain successful reclamation of the disturbed areas, as well as weed control utilizing integrated practices, including herbicide applications would help to control the noxious weed species. A Pesticide Use Proposal (PUP) is required prior to application of herbicide on BLM land. All principles of Integrated Pest Management should be employed to control noxious and invasive weeds on public lands.

No Action Alternative

Environmental Consequences: There would be no new impacts to invasive species under the No Action Alternative.

LANDS WITH WILDERNESS CHARACTERISTICS

Affected Environment: The proposed parcels were analyzed for lands with wilderness characteristics under WO-IM 2011-154, *Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans.* Based on this analysis, no proposed parcels are subject to WO-IM 2011-154. All proposed parcels are either on split estate in, where BLM does not control the surface, or because GIS analysis for the areas where BLM controls the surface demonstrates that no parcels are in areas that meet the minimum size requirements for an inventory finding of the presence of characteristics. Size requirements are based on whether parcels are within roadless areas greater than 5,000 acres or are directly adjacent to designated wilderness or Wilderness Study Areas.

Proposed Action
Environmental Consequences: There would be no adverse impacts as none of these parcels meet the qualifications for lands with wilderness characteristics.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts to lands with wilderness characteristics associated with this alternative.

MIGRATORY BIRDS

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

Proposed Action
Migratory bird habitats on the proposed lease parcels are comprised primarily of sagebrush stands, mixed mountain shrublands, oakbrush and mixed conifer/aspen stands. A variety of migratory birds may utilize these vegetation communities during the nesting period (May through July) or during spring and fall migrations. The proposed lease parcels provide potential habitat for several species on the US Fish and Wildlife Service's Birds of Conservation Concern (BCC) List. Those species associated with the Southern Rockies/Colorado Plateau region and the proposed lease parcels are presented by habitat affiliation below.

BCC species associated with shrubland habitats include Brewer's sparrow and golden eagles. Brewer's sparrows are a summer resident in Colorado and nest in sagebrush stands. Nests are constructed in sagebrush and other shrubs in denser patches of shrubs. This species would likely be nesting in the LSFO from mid-May through mid-July. Rocky

outcrops associated with Parcel 6018 provide nesting habitat for golden eagles. Golden eagles also utilize sagebrush habitats on several other parcels for hunting or winter scavenging.

BCC species that utilize mixed conifer and aspen stands include Cassin's finch and flammulated owl. Cassin's finches are a year round resident of Colorado. This species nest in higher elevation forests and move to lower elevations for the winter. Flammulated owls nest in tree cavities and inhabit higher elevation aspen and conifer forests during the summer months. Parcels 5965 and 6027 likely provide habitat for these two species.

Environmental Consequences: The actual lease sale would not impact any migratory bird species or their habitat, however, potential future development of the proposed lease parcels may impact migratory birds. Potential impacts include decreased habitat patch size and habitat degradation. Indirectly, habitat effectiveness adjacent to potential development would be reduced as a result of noise and human activity during construction, drilling and completion activities. Inglefinger and Anderson (2004) documented 40-60% declines in Brewer's sparrow abundance within 100 meters of well access roads in Wyoming, and it is likely that this effect is similar within the LSFO. Indirect habitat loss attributable to this behavioral response adds substantially to the effects of habitat loss due to long term facility occupation and sagebrush modification.

If drilling activities occur during the nesting season, there could be negative impacts to migratory bird species through nest destruction or increased stress leading to nest abandonment. Combined No Surface Occupancy (NSO) and Timing Limitation (TL) lease stipulations for nesting raptors are used to prevent reproductive failures and maintain the integrity of nest substrates for subsequent years' nesting activities. Encouraging the use of BMPs that reduce vehicle traffic, reducing public use of well access roads and promoting clustered development would help reduce impacts to migratory birds. Impacts to specific species would be addressed at the APD level and appropriate mitigation or COAs would be developed.

Mitigation Measures: Potential mitigative measures would include NSO and TL stipulations (See Attachment C).

No Action Alternative

Environmental Consequences: There would be no impacts to migratory bird species or their habitat from the No Action Alternative.

Ingelfinger, H. and S. Anderson (2004). Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. Western North American Naturalist 64(3): 385-395.

NATIVE AMERICAN RELIGIOUS CONCERNS

Letters were sent to the Uinta and Ouray Tribal Council, Southern Ute Tribal Council, Ute Mountain Utes Tribal Council, Shoshoni Tribal Historic Preservation Officer, and the Colorado Commission of Indian Affairs in the spring of 2011 discussing upcoming projects the BLM would be working on in FY10 and FY11. Letters were followed up with phone calls. No comments were received (Letters on file at the LSFO, Craig, Colorado). The LSFO consults semi-annually regarding undertakings. No comments specific to lease sales were brought to our attention. No Native American Religious Concerns or Traditional Cultural Properties (TCPs) are known in the area. What we have learned through past consultation is that Native American groups have a generalized concept of spiritual significance that is not easily transferred to Western models or definitions. As such the BLM recognizes that they have identified sites that are of concern because of their association with ancestral occupation of the area as part of their traditional lands. These parcels are in an area used by these Native American groups into historical times. Tribal representatives have consulted with the LSFO on previous projects in this general area and provided instructions for the protection of culturally sensitive sites, should any be discovered during inventory or proposed actions. In addition to the stipulations for the protection of Cultural Resources if new information is brought forward any site-specific Native American mitigation measures suggested during previous notification/ consultation would be considered during analysis of any future APDs or related undertakings. If new information is provided by Native Americans during the EA process, additional or edited terms and conditions for mitigation may have to be negotiated or enforced to protect resource values.

PALEONTOLOGY

Affected Environment: Rocks at or near the surface in the area of the nominated parcels consist of Tertiary Age formations: Wasatch (Tw) Class Ia PFYC 4-5, Browns Park (Tbp) Class Ia, PFYC 4-5; and, Cretaceous Age formations: Iles (Ki) Class II PFYC 3, Lewis shale (Kls) Class II, PFYC 3, Williams Fork (Kw) Class Ia PFYC 4-5, Fort Union (Tf) Class II PFYC 3 and Mancos Shale (Km) Class II PFYC 3. Class Ia PFYC 4-5 formations have a high potential for occurrence of scientifically significant fossils. The potential for discovery of significant fossils within Class II PFYC 3 formations is considered to be moderate.

Proposed Action

Environmental Consequences: If any such fossils are located, construction activities could damage the fossils and the information that could have been gained from them would be lost. The significance of this impact would depend upon the significance of the fossil. The proposed action could also constitute a beneficial impact to paleontological resources by increasing the chances for discovery of scientifically significant fossils.

Mitigation Measures: Ceasing operations and notifying the Field Office Manager immediately upon discovery of a fossil during construction activities will effectively mitigate the potential impact to paleontological resources. An assessment of the

significance is made and a plan to retrieve the fossil or the information from the fossil is developed.

No Action Alternative
Environmental Consequences: There would be no impacts to paleontological resources from the No Action Alternative.

References
Armstrong, Harley J. and Wolney, David G., 1989, Paleontological Resources of Northwest Colorado: A Regional Analysis, Museum of Western Colorado, Grand Junction, CO, prepared for Bur. Land Management, Vol. I of V.

Miller, A.E., 1977, Geology of Moffat County, Colorado, Colo. Geol. Surv. Map Series 3, 1:126,720.

PRIME AND UNIQUE FARMLANDS

Affected Environment: There are federal lands designated as prime and unique farmlands as well as farmland of statewide importance within the proposed leasing areas in Moffat and Routt Counties. However, to conditionally qualify as prime farmland, soils in these areas must be irrigated and/or reclaimed of excess salts and sodium. Generally, farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.

Proposed Action and No Action Alternative
Environmental Consequences, Both Alternatives: There would be no adverse impacts as none of these soils on public lands are or would become irrigated or otherwise manipulated so as to create conditions favorable to create prime farmland within the proposed leasing areas.

Mitigation Measures: None

Source: USDA-NRCS Soil Data Viewer version 5.2.0016: http://soildataviewer.nrcs.usda.gov/

RANGE MANAGEMENT

Affected Environment: Some acreage within the nominated parcels is within grazing allotments administered by the LSFO. Of those acres, a small percentage is LSFO administered surface. There are fences, water developments, and other range improvements within these grazing allotments. Any range improvements on private surface are not administered by LSFO.

Proposed Action

Environmental Consequences: The amount and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. The range improvements can be impacted by road and pad development. Placement of facilities in close proximity to range improvements compromises their usefulness, particularly during the development stage. In addition closeness to water can increase potential for stock to use the pad areas for resting, rubbing, and potential exposure to ethylene glycol storage and spills.

Mitigation Measures: Cattle guards would be installed on fence lines. LSFO notifies grazing permittees on a site-by-site basis as part of the APD process. Best Management Practices would be incorporated as COAs.

No Action Alternative
Environmental Consequences: There would be no impacts to the range management from the No Action Alternative.

REALTY AUTHORIZATIONS

Affected Environment: Right-of-way (ROW) grants across BLM-administered land provide for uses of public lands in accordance with regulations to help ensure that public lands are managed to benefit the public. A ROW is required for all uses off the oil and gas lease for the purpose of on the lease development, regardless of who owns or controls the development.

Proposed Action
Environmental Consequences: The level and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. Existing ROWs can be impacted by road and pad development. To avoid impacts to existing uses, oil and gas lessees would contact the ROW holders and notify them of the site-specific APD stage of development. As a result of the environmental analysis of the proposed site-specific APDs, location and materials used for pads may be adjusted to minimize effects.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts from the No Action Alternative.

RECREATION/TRANSPORTATION

Affected Environment: FLPMA provides for recreational use of public land as part of multiple use management. Dispersed, unstructured activities typify the recreational uses occurring on most public land. Recreational activities include motorized touring, big and

small game hunting, backpacking, horseback riding, hiking, mountain bike use, sightseeing, pleasure driving, and OHV use.

Proposed Action
Environmental Consequences: Use and proliferation of roads could contribute to impacts to environmental values, wildlife, cultural and paleontological resources, and other values, and contribute to user conflicts over those values.

Mitigation Measures: None. The goal of the travel management program is to provide appropriate access for BLM permittees, to provide for administrative access for management of public lands, and to provide a balanced mix of motorized and non-motorized opportunities across BLM-administered lands.

No Action Alternative
Environmental Consequences: There would be no impacts from the No Action Alternative.

SOCIOECONOMICS

Affected Environment: The LSFO encompasses all or portions of Moffat, Rio Blanco and Routt Counties. Although bordering each other, they exhibit different social and economic characteristics. Moffat and Rio Blanco Counties are traditional rural counties with high dependence on agriculture, resource extraction industries, and essential services. Routt County is associated with a relatively large influx of "amenity" migrants interested in recreation and lifestyle opportunities in the area.

Proposed Action
Environmental Consequences: Indirect effects could include effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: It is an assumption that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced federal and state royalty income, and the potential for federal lands to be drained by wells on adjacent private or state lands. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. If the BLM were to forego its leasing decisions and potential development of those minerals, the assumption is that the public's demand for the resource would not be expected to change. Instead, the resource foregone would be replaced by other sources that may include a combination of imports, fuel switching, and other domestic production. This displacement of supply would

offset any reductions in emissions achieved by not leasing the subject tracts. No rental or royalty payments would be made to the federal government.

SOILS

Affected Environment: The magnitude and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development. Soils vary in their suitability for use as road fill and road beds. Road design to BLM standards and use of suitable fill would foster road stability and mitigate erosion and sedimentation. Maintenance standards for constructed roads would also be specified in the APD stage.

Proposed Action

Environmental Consequences: While the act of leasing a parcel would produce no impacts, subsequent development of the lease would physically disturb the topsoil and would expose the substratum soil on subsequent project areas. Direct impacts resulting from the construction of well pads, access roads, and reserve pits include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of topsoil productivity, and susceptibility to wind and water erosion. Wind erosion would be expected to be a minor contributor to soil erosion, with the possible exception of dust from vehicle traffic. These impacts could result in increased indirect impacts such as runoff, erosion, and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation of well sites, access roads, gas pipelines, and facilities. Increased traffic in the area with development could cause increased deterioration that could make travel by various road users difficult and worsen the loss of soil due to erosion by wind and/or water.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these direct impacts can be reduced or avoided through proper design, construction and maintenance and implementation of Best Management Practices.

Additional soil impacts associated with lease development could occur when heavy precipitation causes water erosion damage. When water saturated segment(s) of the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of access roads.

Mitigation Measures: As described in COAs 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 COAs 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. For the purpose of protecting slopes or fragile soils, surface disturbance will not be allowed on slopes over 35 percent.

No Action Alternative
Environmental Consequences: There would be no impacts to the soils from the No Action Alternative, as there would be no surface disturbing activity.

T&E AND SENSITIVE ANIMALS

Affected Environment: There are no Endangered Species Act (ESA) listed or proposed species that inhabit or derive important benefit from any of the lease parcels. Critical habitat for the razorback sucker, Colorado pikeminnow, bonytail chub and humpback chub is located downstream of all parcels.

A number of BLM sensitive animal species are known to inhabit or may be directly influenced from development of the proposed lease parcels, including Columbian sharp-tailed grouse, Brewer's sparrow, northern leopard frog, roundtail chub, mountain sucker and flannelmouth sucker.

Columbian sharp-tailed grouse inhabit sagebrush stands and mixed mountain shrublands in the eastern portion of the LSFO. Conservation Reserve Program (CRP) lands are also utilized, except during the winter. There are no leks located within the boundary of any of the proposed lease parcels; however, several parcels provide both nesting and winter habitat for this species. Brewer's sparrows are common in sagebrush stands and mixed brush communities throughout the LSFO.

The William's Fork River provides habitat for roundtail chub, mountain sucker and flannelmouth sucker. One parcel, 6018 is in close proximity to habitat for these three fish. Northern leopard frogs are found throughout the LSFO and are associated with riparian communities. There are no know occurrences of this species on any of the proposed lease parcels, however, potential habitat does exist.

Proposed Action
Environmental Consequences: Leasing the proposed parcels for development would not impact any listed or BLM sensitive species. However, potential future development of the parcels may impact special status species.

Colorado River Fish - Cumulative water depletions from the Colorado River Basin are considered likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail and razorback sucker and result in the destruction or adverse modification of their critical habitat. In 2008, BLM prepared a Programmatic Biological Assessment (PBA) that addressed water depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado, including water used for well drilling, hydrostatic testing of pipelines and dust abatement on roads. In response, the US Fish and Wildlife Service (FWS) prepared a Programmatic Biological Opinion (PBO) that addressed water depletions associated with fluid minerals development on BLM lands. The PBO included reasonable and prudent alternatives which allowed BLM to authorize oil and gas wells that result in water depletions while avoiding the likelihood of jeopardy to the endangered fishes and avoiding destruction or adverse modification of their critical habitat. The reasonable and prudent alternative authorized BLM to solicit a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in an amount based on the average annual acre-feet depleted by fluid minerals activities on BLM lands. Development associated with this lease sale would be covered by this agreement and water use would be entered into the LSFO water depletion log that is summited to the BLM CSO at the end of each fiscal year.

Columbian sharp-tailed grouse – Impacts to sharp-tailed grouse from oil and gas development include: loss of habitat, habitat fragmentation, disturbance and displacement, increased stress, facilitation of predation and direct mortality from vehicles (Hoffman and Thomas 2007). Most oil and gas research has focused on greater sage-grouse; however, it is likely that these impacts would be similar to sharp-tailed grouse. Recent research on sage-grouse suggest that reduced lek attendance, avoidance and displacement from areas of energy development, lower survival of nesting hens and reduced nest success can occur even under moderate levels of fluid minerals development (Holloran 2005, Doherty et al. 2008, Walker et al. 2007). Although Timing Limitation stipulations can limit disturbances to birds during the lekking season from drilling activities, impacts from long term disturbances (e.g. roads and facilities) are more difficult to minimize. BMPs and COAs at the APD stage that limit traffic, encourage clustered development and reduce habitat fragmentation would be needed to minimize impacts to Columbian sharp-tailed grouse if development exceeds one disturbance per section.

Brewer's Sparrow – Impacts to Brewer's sparrow are discussed in the Migratory Bird section.

Sensitive fish and northern leopard frogs – Considering RMP-derived management emphasis on protecting riparian habitats, it is unlikely that lease development would have any substantive consequence on the condition or function of aquatic habitats occupied by special status species. However, it is likely that populations of fish and amphibians would be subject to water depletion-related effects, to which the development of proposed lease parcels would incrementally contribute.

Mitigation Measures: Potential mitigation includes No Surface Occupancy buffers around leks and nest sites. Timing limitations would also be used to protect sensitive species during critical time periods (See Attachment C). All parcels are also subject to Exhibit CO-34 to alert lessee of potential habitat for a threatened, endangered, candidate or other special status plants or animals.

No Action Alternative
Environmental Consequences: There would be no impacts to special status species or their habitat from the No Action Alternative.

Doherty, K.E. (2008). Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. PhD Dissertation, University of Montana, Missoua.

Holloran, M.J. (2005). Greater sage-grouse (*Centrocercus urophasianus*) population response to natural gas field development in western Wyoming. PhD Dissertation, University of Wyoming, Laramie.

Hoffman, R.W. and A.E. Thomas. (2007, August 17). Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/columbiansharptailedgrouse.pdf Accessed 8/3/11.

Walker, B.L. D.E. Naugle and K.E. Doherty. (2007). Greater sage-grouse population response to energy development and habitat loss. Journal of Wildlife Management 71: 2644-2654.

UPLAND VEGETATION

Affected Environment: The parcels would be in sagebrush grassland, aspen woodland and mountain shrub plant communities.

Proposed Action
Environmental Consequences: The amount and location of direct and indirect effects cannot be predicted until the site-specific APD stage of development.

Mitigation Measures: Evaluation of mitigation measures for the effect on vegetation is deferred to the site specific APD stage of development. Best Management Practices would be incorporated into the Conditions of Approval.

No Action Alternative
Environmental Consequences: There would be no impacts to the upland vegetation from the No Action Alternative.

VISUAL RESOURCES

Affected Environment: The lease areas are located in a Visual Resource Management (VRM) Class III area where moderate change to the characteristic landscape would be allowed as long as the existing characteristics of the landscape are partially retained.

Proposed Action
Environmental Consequences: The amount and location of direct and indirect effects to visual quality cannot be predicted until the site-specific APD stage of development. Designation and management of VRM classes allows BLM to establish objectives that set visual standards to be met during surface disturbing activities.

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts to the visual quality from the No Action Alternative.

WASTES, HAZARDOUS OR SOLID

Affected Environment: The Resource Conservation and Recovery Act (RCRA) of 1976 established a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. U.S. Environmental Protection Agency (EPA) regulations define solid wastes as any "discarded materials" subject to a number of exclusions. On July 6, 1988, EPA determined that oil and gas exploration, development and production wastes would not be regulated as hazardous wastes under RCRA. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 regulates the mitigation of the release of hazardous substances (spillage, leaking, dumping, accumulation, etc.) or threat of a release of hazardous substances into the environment. Despite many oil and gas constituent wastes being exempt from hazardous waste regulations, certain RCRA-exempt contaminants could be subject to regulations as hazardous substances under CERCLA. Civil and criminal penalties may be imposed if the hazardous waste is not managed in a safe manner and according to regulations. The Colorado Department of Public Health & Environment (CDPHE) administers hazardous waste regulations for oil and gas activities in Colorado. No hazardous or solid waste materials are known to be present on the proposed lease parcels.

Proposed Action
Environmental Consequences: The lease parcels fall under environmental regulations that impact exploration and production waste management and disposal practices and impose responsibility and liability for protection of human health and the environment from harmful waste management practices or discharges. While the act of leasing the parcels would produce no impacts, subsequent development of the leases would lead to surface disturbance (from below). The direct impact would follow a lease sale project when solid waste is discarded and contaminates the land surface either by solid, semi-solid, liquid, or contained gaseous material. The indirect impact would be that the EPA definition of solid

wastes that have been designated as exempt and nonexempt and if it is hazardous, civil and criminal penalties may be imposed if the waste is not managed in a safe manner, and according to regulations.

Mitigation Measures: The lease sale parcels would be regulated under the RCRA Subtitle C regulations, which are extremely stringent, as well as the CERCLA that provides for the exclusion of petroleum, including crude oil or any fraction thereof from the definition of hazardous substance, pollutant, or contaminant. The mitigation would include the stringent regulation of waste containment within the project areas.

No Action Alternative
Environmental Consequences: There would be no impacts from the No Action Alternative, as there would be no action authorizing the use or storage of hazardous materials.

WATER QUALITY – GROUND

Affected Environment: Rocks at or near the surface in the area of the nominated parcels consist of Tertiary Age formations: Wasatch (Tw), Browns Park (Tbp); and, Cretaceous Age formations: Iles (Ki), Lewis shale (Kls), Williams Fork (Kw), Fort Union (Tf) and Mancos Shale (Km). These rocks can and do contain potable, useable water.

Proposed Action
Environmental Consequences: If drilling were to occur on these parcels, the potential of encountering useable groundwater while drilling the surface holes exists. Fresh to moderately saline groundwater (TDS < 10,000 ppm) could be found within the formations listed above.

Mitigation Measures: Federal onshore orders require lessees to submit an Application to Drill (APD) prior to the commencement of a drilling operation. Specific casing and cement designs must be included in each APD for the purpose of isolating and protecting useable groundwater from other water, hydrocarbons and minerals. The lessee would be required to submit a report showing the depth and analysis of groundwater encountered during the drilling operation.

No Action Alternative
Environmental Consequences: There would be no impacts to the ground water from the No Action Alternative.

WATER QUALITY – SURFACE

Affected Environment: Any surface runoff from the proposed parcels would drain into the nearest perennial or ephemeral drainage. Water quality standards and any impairments that

are relevant to the application would be determined at the site-specific APD stage of development.

Proposed Action

Environmental Consequences: While the act of leasing the parcels would produce no impacts, subsequent development of the lease would lead to surface disturbance from the construction of well pads, access roads, pipelines, and powerlines and could result in degradation of surface water quality and groundwater quality from non-point source pollution, especially from potentially increased soil erosion and sedimentation.

Potential direct impacts would chiefly be brought about by soil disturbance due to construction of well pads, access roads, pipelines, and power lines, and would include increased surface water runoff, erosion, off-site sedimentation and dissolved constituents (salt loading) to downstream waters. Such hydrologic effects may cause changes in downstream channel morphology such as bed and bank erosion or accretion. The magnitude of these potential impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts would likely be greatest shortly after the start of construction activities and would decrease in time due to proper implementation of Best Management Practices (BMPs) that would include proper design of facilities along with effective temporary stabilization measures that would promote permanent natural vegetative stabilization and reclamation of disturbed areas. Construction activities would occur over a relatively short period, and therefore the majority of the disturbance would be evident but short lived. Impacts to surface water quality would be managed (minimized) through the implementation, monitoring, and necessary adjustment of BMPs prescribed. However, short-term and minor impacts may occur during storm flow events.

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality. Authorization of development projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

Mitigation Measures: Potential effects would depend on site-specific location of future development and cannot be predicted or quantified at the leasing stage. General conditions of approval at the APD stage will specify BMPs that will include reclamation of plant communities and water control measures to prevent and limit erosion and sedimentation, such as road and pad location and design, culverts, and silt traps. Existing regulations require operators ensure an adequate casing program is designed to protect ground water from contamination.

The use of lined reserve pits, or the elimination of reserve pits, would reduce or eliminate seepage of drilling fluid into the soil and prevent it from eventually reaching groundwater. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breech, overflow, or spill from storage tanks) could result in contamination of the soils onsite, or offsite, and could potentially impact surface and groundwater resources in the long term. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling mud and other surface sources.

No Action Alternative
Environmental Consequences: There would be no new impacts to water quality or surface hydrology from oil and gas development/production on the proposed parcel lands.

Reference: Colorado Department of Public Health and Environment Water Quality Control Commission. 2010. Regulations #33, 37, and 93. http://www.cdphe.state.co.us/regulations/wqccregs/index.html

WETLANDS/RIPARIAN ZONES

Affected Environment: There are multiple perennial and ephemeral riparian resources (including streams, wetlands, seeps, and springs) and associated habitats on both federal and private lands within the proposed leasing area. The character and condition of each resource would be determined at the site-specific APD stage of development and evaluated individually.

Proposed Action
Environmental Consequences: The amount and location of direct and indirect effects cannot be predicted until the site specific APD stage of development.

Mitigation Measures: LSFO- RMP (October 2011) Riparian Stipulation. No surface occupancy for up to 0.25 mile from perennial water sources, if necessary, depending on type and use of the water source, soil type, and slope steepness.

No Action Alternative
Environmental Consequences: Riparian zones and wetlands would not be affected.

WILD AND SCENIC RIVERS

Affected Environment: The National Wild and Scenic Rivers (NWSR) Act (PL 90-542 and amendments) Section 1(b) states that "certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." Section 5(d) requires federal

agencies to consider potential wild, scenic, and recreational river areas in all planning for the use and development of water and related land resources. Section 10(a) describes the basic management requirement of protecting and enhancing the values that were the reasons for originally including the river in the NWSR System.

Proposed Action
Environmental Consequences: There are no eligible rivers in the vicinity of the proposed lease area and, therefore, would not be affected by the proposed action(s).

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts to Wild and Scenic Rivers from the No Action Alternative.

WILDERNESS STUDY AREAS (WSAs)

Affected Environment: BLM designated WSAs under the authority of the FLPMA Section 603(a) and Section 202. BLM manages WSAs under the Interim Management Policy for Lands Under Wilderness Review (H-8550-1). This management is referred to as the Interim Management Policy (IMP). The IMP provides detailed direction on management activities within WSAs including that project actions result in no irreversible or irretrievable harm to wilderness values. All proposed lease areas are either on split estate in which BLM does not control the surface, or because GIS analysis for the areas where BLM controls the surface demonstrates that no leases are in areas designated as WSAs.

Proposed Action
Environmental Consequences: The proposed leases are not in the vicinity of WSAs and, therefore, would not be affected by the proposed action(s).

Mitigation Measures: None.

No Action Alternative
Environmental Consequences: There would be no impacts to WSAs from the No Action Alternative.

WILDLIFE – AQUATIC

Affected Environment: There are multiple perennial and ephemeral riparian resources (including streams, wetlands, seeps, and springs) and associated habitats that provide habitat for aquatic wildlife species. The William's Fork River and Slater Creek both support populations of native fish. Riparian habitats provide potential habitat for amphibians (western chorus and northern leopard frogs).

Proposed Action
Environmental Consequences: RMP-derived management emphasis on protecting riparian habitats effectively avoids impacts to aquatic wildlife. Implementation of state and federally-imposed design measures to control erosion and spills also work to limit the risk of contaminants migrating off-site and degrading water quality in these systems.

Mitigation Measures: Mitigation designed to protect riparian habitats would be adequate to protect aquatic wildlife.

No Action Alternative
Environmental Consequences: There would be no impacts to aquatic wildlife or associated habitats from this alternative.

WILDLIFE – TERRESTRIAL

Affected Environment: A variety of wildlife habitats and their associated species occur within proposed leasing areas. Each habitat type provides food, cover and shelter for a variety of mammal, bird, and reptile species common to northwest Colorado. The lease area provides nesting and staging habitat for greater sandhill cranes. Large ungulates in the area include mule deer and elk, with some parcels providing important winter range for these species. Parcel 5965 also provides habitat for elk calving. Large predators include mountain lion and black bear. Coyotes, bobcats, jackrabbits, cottontail rabbits and a variety of small rodents, reptiles and birds likely inhabit the general area. Although all of the species are important members of native communities and ecosystems, most are common and have wide distributions within the state, region and field office.

Proposed Action
Environmental Consequences: Although the lease sale itself has no direct effects on wildlife in the area, future potential drilling would impact wildlife species and their habitat. Impacts to wildlife species from oil and gas development are discussed in the LSFO RMP EIS. Impacts include, but are not limited to, displacement into less suitable habitat, increased stress and loss of habitat. These impacts are more significant during critical seasons, such as winter or reproduction. Big game species are often restricted to smaller areas during the winter months and may expend high amounts of energy to move through snow, locate food and maintain body temperature. Disturbances during the winter can displace big game, depleting much needed energy reserves and may lead to decreased over winter survival. Timing Limitation stipulations would help protect wildlife during critical time periods, however direct and indirect habitat loss is more difficult to minimize. BMPs and site specific COAs developed at the APD stage (e.g. clustering of wells, limiting traffic) would potentially help mitigate impacts from habitat losses.

Lease development's influence on small mammal populations, at least in the short team, is likely confined to on-site mortality and direct habitat loss attributable to facility occupation

and vegetation clearing. Due to relatively small extent of actual surface occupation and large areas of undisturbed lands, development of the proposed lease parcels would have limited impacts to small mammal populations. Impacts to specific species would be addressed at the APD level and appropriate mitigation or COA would be developed.

Recent research offers strong indications that traditional forms and application of sage-grouse protection measures, formerly endorsed by State and Federal wildlife managers, are ineffective in maintaining local sage-grouse populations in the face of even modest levels of fluid mineral development (e.g., Holloran 2005, Doherty et al. 2008, Walker et al. 2007). These data suggest that reduced lek attendance, avoidance and displacement from areas of energy development, lower survival of nesting hens, and reduced nest success are attributable to oil and gas development at well densities that exceed one well per section.

Mitigation Measures: Potential mitigation includes NSO stipulations to protect raptor nest sites and Timing Limitations to protect wildlife during critical time period, such as winter and reproduction (See Attachment C). To ensure new mitigation measures that may be developed during the Colorado Northwest District Greater Sage-grouse EIS are not precluded in priority habitats, all parcels that are within Preliminary Priority Habitat (per WO IM No. 2012-043) are being deferred at this time. Parcels 5945, 5965, 5983, 6016, 6018, & 6027 are not within Preliminary Priority Habitat and the LSFO has determined that these parcels are appropriate to lease with stipulations developed to protect greater sage-grouse in the LSFO RMP (October 2011). All six parcels have either a 1% or 5% disturbance threshold stipulation designed to reduce fragmentation of sagebrush habitats.

No Action Alternative
Environmental Consequences: There would be no impacts to wildlife species or their habitat from the No Action Alternative.

CUMULATIVE IMPACTS SUMMARY:

Cumulative impacts may result from the development of the proposed leases when added to non-project impacts that result from past, present, and reasonably foreseeable future actions. The potential exists for future oil and gas development throughout the Little Snake Field Office. Other past or existing actions near the project area that have influence on the landscape are wildfire, recreation, hunting, grazing, and ranching activities.

As of August 2008, approximately 70 percent of BLM-administered surface, and more than 50 percent of federal mineral estate within the LSFO is leased. As of August 2008, there were 1,171 oil and gas authorized or pending leases administered by BLM within the LSFO. During the past 20 years, 594 wells have been drilled in the LSFO, of which 226 are on BLM-administered lands. On average, 30 wells have been drilled annually over the last 20 years. Most of this has been infill drilling within known oil and gas fields. About 30 percent of the 881 producing wells are oil producers, and about 70 percent are gas producers (RMP-FEIS).

Based on historical oil and gas development and production activities, leasing, and economic factors, about 3,031 wells are anticipated to be drilled over the next 20 years within the LSFO. About 96 percent of the projected 3,031 wells would be drilled in areas of high oil and gas occurrence potential. Of the 3,031 wells that are projected, about 54 percent would be gas wells (both conventional oil and gas and CBNG), 20 percent oil wells, 20 percent dry holes, and 6 percent other types of wells (e.g., injection wells). Potential development of all available minerals in the field office, including those in the proposed lease parcels, was included as part of the analysis (RMP-FEIS).

Surface disturbance associated with oil and gas activity would increase the potential for erosion and sedimentation. Displacement of hunters and recreationists during the short-term construction and drilling periods would occur. Contrasts in line, form, color, and texture from development would impact the visual qualities on the landscape.

Cumulative impacts to the plant communities within the oil & gas leases and adjacent areas include an incremental reduction of continuity in the plant communities in terms of acreages that remain undisturbed. Loss of continuity results in smaller and smaller areas of undisturbed native vegetation and the potential for loss of integrity within the larger plant community. Fragmented plant communities can lose resilience to natural and man-made disturbance due to isolation of areas from seed sources necessary for proper age class distribution of plants, and subsequently, a greater opportunity for stressors such as drought to have a more severe impact on the plant community as a whole. The increased disturbance also makes native plant communities more susceptible to invasion by annual weeds as vectors for increasing weeds. Even with weed control measures applied, the potential for weeds to move further into undisturbed remnant areas increases as these remnants become smaller and more isolated from larger undisturbed areas.

Cumulative impacts to the livestock grazing operations in the area may be increased through the development of the proposed action. If development occurs, the growth in wells, roads, and human activity has the potential to reduce the availability of forage in this area far beyond direct impacts caused by construction. The potential impact to grazing activities permitted in the LSFO would be a loss of available Animal Unit Months (AUMs), i.e. a loss of the amount of livestock that allotments can reasonably carry.

Habitat fragmentation from the development of the proposed leases would likely decrease the nesting suitability for migratory birds in the resource area. In *The Effects of Natural Gas Development on Sagebrush Steppe Paserines in Sublette County, Wyoming* by F. Ingelfinger (2001) it was found that roads associated with oil and gas development have a negative impact on passerines bird species. Bird densities were reduced within 100m of each road. Due to the amount of new road construction and an increase in traffic on these roads, passerine populations in the area are likely decreasing.

The cumulative impacts of the development of oil and gas leases in the LSFO would continue to degrade habitat for the greater sage-grouse and Columbian sharp-tailed grouse. Fragmentation, mostly due to road construction, is an important factor contributing to a decrease in habitat quality. Disturbances such as higher traffic volume and other human activities also contribute to

degradation of habitat quality. Continued oil and gas development would lead to decreased sage grouse use of the habitat.

Although big game species are able to adapt to disturbances better than other wildlife, increased development would still have impacts to mule deer, elk, and antelope. Timing Limitation stipulations adequately protect big game species during critical times of the year; however, continued oil and gas development would lead to decreased use of the habitat due to increased human activity. A significant amount of vehicle traffic could occur with oil and gas development. Impacts to big game may be vehicle-animal collisions, as these would be a major cause of mortality for big game species.

References:
Little Snake Proposed Resource Management Plan and Final Environmental Impact Statement (RMP-FEIS) August 2010, Department of the Interior, Bureau of Land Management

Ingelfinger, F. 2001. The Effects of Natural Gas Development on Sagebrush Steppe Passerines in Sublette County, Wyoming. University of Wyoming, Laramie, WY.

Description of Mitigating Measures and Residual Impacts

The issuance of those leases identified under the proposed action would be mitigated by attaching appropriate conditions of approval to any subsequent requests for lease development either on a case by case basis or upon receipt of a multi-well project proposal. An Environmental Analysis would be prepared on a case-by-case basis upon receipt of future subsequent actions. The LSFO, Surface Use and Occupancy Requirements, COAs, and the Special Leasing Stipulations, which are in place at the CSO, would provide adequate mitigation for issuance of all lease parcels under the Proposed Action. Direct, indirect, cumulative and residual impacts of leasing and lease development are generally described in the LSFO RMP, approved in October 2011; and the Colorado Oil and Gas Leasing & Development Environmental Impact Statement (EIS) and the ROD signed on November 5, 1991.

STANDARDS:

PLANT AND ANIMAL COMMUNITY (animal) STANDARD: Leasing the proposed parcels for oil and gas development would have no bearing on this standard. Potential future development resulting from the lease sale may influence the ability of the landscape to meet standards. Since the amount of development is unknown at this time, additional standard assessments would be conducted at the APD stage.

SPECIAL STATUS, THREATENED AND ENDANGERED SPECIES (animal) STANDARD: Leasing the proposed parcels for oil and gas development would have no bearing on this standard. Potential future development resulting from the lease sale may influence the ability of the landscape to meet standards. Since the amount of development is unknown at this time, additional standard assessments would be conducted at the APD stage.

PLANT AND ANIMAL COMMUNITY (plant) STANDARD:
There would be no influence to this standard under the proposed action. As sites are individually developed impacts may occur that could cause this standard not to be met. This will be assessed and mitigated at the APD stage.

SPECIAL STATUS, THREATENED AND ENDANGERED SPECIES (plant) STANDARD: There are no federally listed threatened or endangered or BLM sensitive plant species present on any of the proposed leases within the Little Snake Field Office. Within the Little Snake Field Office this standard does not apply.

RIPARIAN SYSTEMS STANDARD: The proposed action would meet the public land health standard for riparian systems. All parcels on federal lands would be subject to No Surface Occupation and Controlled Surface Use stipulations to protect all perennial and ephemeral riparian resources.

WATER QUALITY STANDARD: The proposed action would meet the public land health standard for water quality. Interim reclamation of the unused area on the well pads would be completed to minimize sheet and rill erosion from the well site. When the well pad is no longer needed for production operations, the disturbed well pad and access roads would be reclaimed to approximate original contours, topsoil would be redistributed, and adapted plant species would be reseeded. These Best Management Practices would help to reduce accelerated erosion of the sites. Water quality impairments or suspected water quality issues for waters influenced by the project area would be determined and any necessary mitigation would be applied at the APD stage.

UPLAND SOILS STANDARD: The proposed action would meet the public land health standard for soils, as there would be no surface disturbing activities at the leasing stage. Potential future development resulting from the lease sale may influence the ability of the landscape to meet standards. Since the amount of development is unknown at this time, additional standard assessments would be conducted at the APD stage. Best Management Practices applied at the Application for Permit to Drill would help to reduce accelerated erosion of the sites.

PERSONS/AGENCIES CONSULTED: Colorado Department of Wildlife, Uintah and Ouray Tribal Council, Colorado Native American Commission, Colorado State Historic Preservation Office.

SIGNATURE OF PREPARER: /s/ Shawn Wiser

DATE SIGNED: 10/26/11

SIGNATURE OF ENVIRONMENTAL REVIEWER: /s/ Barbara Sterling

DATE SIGNED: 10/26/11

Attachments:

Map 1 of all parcels
Attachment A: All Parcels
Attachment B: Parcels Recommended for Deferral
Attachment C: Parcels Recommended for Leasing
Decision Record: Comments, Protests, & Responses