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Bureau of Land Management

Environmental Assessment
DOI-BLM-MT-L060-2011-0016-EA
~~May 16, 2011~~ June 22, 2011

Project Title: Lewistown Field Office Oil and Gas Lease Parcel Sale,
October 18, 2011

Location: Central Montana District, Lewistown Field Office (See Appendix A for list of
lease parcels by number and legal description and Map 1)

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United States Department of the Interior



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In Reply Refer To:

3100

July 20, 2011

Dear Reader:

The Bureau of Land Management (BLM) Lewistown Field Office prepared an environmental assessment (EA) to analyze the potential effects from offering 4 nominated lease parcels for competitive oil and gas leasing in a sale tentatively scheduled to occur on October 18, 2011. The EA was available for a 30-day public comment period that ended on June 14, 2011.

Based on our analysis and review of comments received, the EA has been updated (refer to Chapter 5 of the EA for a summary of public comments). A competitive oil and gas lease sale is scheduled to be held on October 18, 2011. It will be my recommendation to offer 4 lease parcels for the competitive oil and gas lease sale, along with stipulations identified in the BLM preferred alternative in the updated EA, see Appendix A.

We anticipate preparing and finalizing our Decision Record after the October oil and gas lease sale, but prior to lease issuance. Upon finalization, the decision record and accompanying finding of no significant impact (FONSI) will be posted at the website listed below.

Please refer to the Montana/Dakotas BLM website at www.blm.gov/mt. From this home page, go to the heading titled "Frequently Requested," where you will find a number of links to information about our oil and gas program. Current and updated information about our EAs can be found on the link titled "Oil and Gas Lease Sale Information" listed under the heading "Frequently Requested". Once there, click on "2011", where you will find the Lewistown Field Office EA and associated documents for the October 18, 2011 lease sale for your review.

If you have any questions or would like more information about lease sale notices or the issuance of the EA, Decision Record and FONSI, please contact Able Guevara at 406-538-1977.

Sincerely,

Todd D. Yeager
Acting Field Manager

**Lewistown Field Office Oil and Gas Lease Sale EA
DOI-BLM-MT-L060-2011-016-EA
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1.0 PURPOSE AND NEED

1.1 Introduction

It is the policy of the Bureau of Land Management (BLM) to make mineral resources available for use and to encourage development of mineral resources to meet national, regional, and local needs. This policy is based on various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 Sec. 5102(a)(b)(1)(A) directs the BLM to conduct quarterly oil and gas lease sales in each state whenever eligible lands are available for leasing. The Montana State Office conducts mineral estate lease auctions for lands managed by the federal government, whether the surface is managed by the Department of the Interior (BLM or Bureau of Reclamation), United States Forest Service, or other departments and agencies. In some cases the BLM holds subsurface mineral rights on split estate lands where the surface estate is owned by another party, other than the federal government. Federal mineral leases can be sold on such lands as well. The Montana State Office has historically conducted five lease sales per year.

Members of the public file Expressions of Interest (EOI) to nominate parcels for leasing by the BLM. From these EOIs, the Montana State Office provides draft parcel lists to the appropriate field offices for review. BLM field offices then review legal descriptions of nominated parcels to determine: if they are in areas open to leasing; if new information has come to light which might change previous analyses conducted during the land use planning process; if there are special resource conditions of which potential bidders should be made aware; and which stipulations should be identified and included as part of a lease. Ultimately, all of the lands in proposed lease sales are nominated by private individuals, companies, or the BLM, and therefore represent areas of high interest.

This environmental assessment (EA) will address 11 nominated lease parcels located in the Lewistown Field Office (LFO), to be included as part of a competitive oil and gas lease sale tentatively scheduled to occur in October 2011. The 11 nominated parcels are located in Fergus, Petroleum, and Pondera counties.

1.2 Purpose and Need for the Proposed Action

The purpose of offering parcels for competitive oil and gas leasing is to provide opportunities for private individuals or companies to explore for and develop federal oil and gas resources after receipt of necessary approvals and to sell the oil and gas in public markets.

This action is needed to help meet the energy needs of the people of the United States. By conducting lease sales, the BLM provides for the potential increase of energy reserves for the U.S., a steady source of income, and at the same time meets the requirement identified in the Energy Policy Act, Sec. 362(2), Federal Oil and Gas Leasing Reform Act of 1987, and the Mineral Leasing Act of 1920, Sec. 17.

The decision to be made is whether to sell and issue oil and gas leases on the lease parcels identified, and, if so, identify stipulations that would be included with specific lease parcels at the time of lease sale.

1.3 Conformance with Land Use Plans

This EA is tiered to the information and analysis; and conforms to the decisions contained in the Fergus Management Framework Plan (MFP) (approved January 1978), the Petroleum Management Framework Plan (approved November 1977), and the Lewistown District Oil & Gas Environmental Assessment of the BLM Leasing Program (approved September 1981) and the Headwaters Resource Management Plan as approved in 1984. A more complete description of activities and impacts related to oil and gas leasing, development, and production, etc... can be found in:

Fergus MFP: M-2.1 The BLM will retain and assure the continued availability of public land and privately owned land having oil and gas reserved to the United States for oil and gas leasing and exploration.

Petroleum MFP: M-1.1 The BLM will retain and assure the continued availability of public land and privately owned land having oil and gas reserved to the United States for oil and gas leasing and exploration.

Lewistown District Oil & Gas Environmental Assessment of BLM Leasing Program, approved September 1981: Leasing federal minerals administered by the Bureau of Land Management, Lewistown Field Office for oil and gas exploration and development is specifically analyzed in the Lewistown District Oil & Gas Environmental Assessment of BLM Leasing Program, approved September 1981.

Pertinent information in the EA: Chapter 1, Proposed Action, pages 1-26.

Headwaters Resource Management Plan: As a general rule, public land outside the Rocky Mountain Front is available for oil and gas leasing. In many areas, oil and gas leases will be issued with only standard stipulations attached (Final RMP/EIS, page 13).

Analysis of the four parcels is documented in this EA and was conducted by LFO resource specialists who relied on professional knowledge of the areas involved, review of current databases, file information, and site visits to ensure that appropriate stipulations had been attached to specific parcels.

At the time of this review it is unknown whether a particular parcel will be sold and a lease issued. It is unknown when, where, or if future well sites, roads, and facilities might be proposed. Assessment of projected activities and impacts was based on potential well densities discerned from the Reasonably Foreseeable Development (RFD) Scenario developed and documented in conjunction with the Judith-Valley-Phillips Resource Management Plan (JVP RMP). Detailed site-specific analysis and mitigation of activities associated with any particular parcel would occur when a lease holder submits an application for permit to drill (APD).

Offering the parcels for sale and issuing leases would not be in conflict with any local, county, or state laws or BLM plans. A more complete description of mitigation measures, best management practices (BMPs), and conditions of approval related to oil and gas lease activities can be found in the the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development-The Gold Book, and online at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html.

1.4 Public Scoping and Identification of Issues

Public scoping for this project was conducted through a 15-day scoping period advertised on the BLM Montana State Office website and posted on the Lewistown Field Office website National Environmental Policy Act (NEPA) notification log. Scoping was initiated March 28, 2011; comments were received through April 12, 2011. No comments were received during the scoping period.

The BLM coordinates with Montana Fish, Wildlife, and Parks (MFWP), and the United States Fish and Wildlife Service (USFWS) to manage wildlife habitat because BLM management decisions can affect wildlife populations which depend on the habitat. The BLM manages habitat on BLM lands, while MFWP is responsible for managing wildlife species populations. The USFWS also manages some wildlife populations but only those federal trust species managed under mandates such as the Endangered Species Act, Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Managing wildlife is factored into project planning at multiple scales and is to be implemented early in the planning process.

Coordination with MFWP was conducted for the 11 lease parcels being reviewed and in the completion of this EA in order to prepare the analysis, identify protective measures, and apply stipulations and lease notices associated with these parcels being analyzed. A letter was sent to the USFWS during the 15-day scoping period requesting comments on the 11 parcels being reviewed.

The BLM consults with Native Americans under Section 106 of the National Historic Preservation Act. The BLM sent letters (March 28, 2011) to tribes in Montana at the beginning of the 15 day scoping period informing them of the potential for the 11 parcels to be leased and inviting them to submit issues and concerns BLM should consider in the environmental analysis. Letters were sent to the Tribal Presidents and THPO or other cultural contacts for the Blackfeet Nation, Rocky Boy (Chippewa Cree), Confederated Salish Kootenai Tribe, Crow Tribe of Montana, Ft. Belknap Indian Community (Assiniboine, Gros Ventre), Ft. Peck Tribes (Sioux and Assiniboine) and Northern Cheyenne Tribe. The BLM ~~will send~~ sent a second letter to the tribes informing them about the 30 day public comment period for the EA and soliciting any information BLM should consider before making a decision whether to offer any or all of the 11 parcels for sale.

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

2.1 Alternative A - No Action

Under the No Action alternative, the 4 lease parcels, 103.99 surveyed federal mineral acres, (73.52 surveyed BLM administered surface and 30.47 surveyed private surface) would not be offered for the October 2011 competitive oil and gas lease sale (Map 1). Under this alternative, the state and private minerals could still be leased in surrounding areas.

2.2 Alternative B - BLM Preferred Alternative

Under the BLM Preferred Alternative, the 4 lease parcels, 103.99 surveyed federal mineral acres, (73.52 surveyed BLM administered surface and 30.47 surveyed private surface) would be offered in whole with lease stipulations and/or lease notices as necessary (Appendix A) for competitive oil and gas lease sale and lease issuance.

2.3 Alternatives Considered but not Analyzed in Detail.

~~The offering of 7 of the 11 oil and gas lease nominated parcels are not being analyzed at this time. There are 3 parcels being deferred based on the not being in conformance with the JVP RMP and 4 parcels are being deferred based on not being able to conduct site visits.~~

~~The JVP RMP was protested over concerns of impacts to wildlife habitat from oil and gas development. The resolution of the protest requires the LFO to defer the leasing of oil and gas parcels, which would require stipulations to protect wildlife habitat. Proposed parcels MTM 97300 TA, MTM 97300 TB, and MTM 97300 M5 (200 federal mineral acres) would require the use of additional stipulations to protect the sage grouse habitat; therefore the leasing of these parcels would not conform to the JVP RMP and would need to be deferred until the revision the JVP RMP.~~

~~The offering of 7 of the 11 oil and gas lease nominated parcels are not being analyzed at this time due to requiring special wildlife stipulations. In 1988, the BLM suspended lease issuance on lands that required special stipulations to protect wildlife resources until a new resource management plan was completed. This was a result of a protest on issuance of oil and gas leases by the BLM in Montana. In the early 1990s, the BLM prepared the Judith-Valley-Phillips RMP to address this protest along with other resource issues. However, a subsequent protest to the 1992 Judith-Valley-Phillips RMP warranted a supplement to address an alternative for oil and gas leasing that would avoid leasing valuable wildlife habitat. Until a new RMP is completed, the BLM will continue to defer leasing federal minerals that would require special wildlife stipulations.~~

Parcels MTM 97300-I6, MTM 97300-I7, MTM 97300-I8, and MTM 97300-K9 (4829.65 federal mineral acres) were not visited due to inclement weather and muddy surface conditions. Resource specialists needed to visit the parcels in order to be able to fully and adequately analyze the impacts of offering the parcels for oil and gas leasing. Therefore, the parcels will be deferred from analysis until after site visits are conducted to determine current resource conditions.

2.4 Additional Considerations for Alternative B

For split-estate lease parcels, the BLM provided courtesy notification to private landowners that the federal oil and gas estate under their surface would be included in this lease sale. In the event of activity on such split-estate lease parcels, the lessee and/or operator would be responsible for adhering to BLM requirements as well as reaching an agreement with the private surface landowners regarding access, surface disturbance and reclamation.

The terms and conditions of the standard federal lease and federal regulations would apply to each parcel offered for sale. Stipulations shown in Appendix A would be included with identified parcels offered for sale. Standard operating procedures for oil and gas operations on federal leases include measures to protect the environment and resources such as groundwater, air, wildlife, historical and prehistorical concerns. Lease stipulations (as required by 43 CFR 3131.3) would be attached to the parcels to address site-specific concerns or new information not previously identified in the land use planning process. Standard operating procedures, best management practices (BMPs), conditions of approval (COAs) and lease stipulations can change over time to meet RMP objectives, resource needs or land use compatibility.

Federal oil and gas leases would be issued for a 10-year period and would remain valid for as long thereafter as oil or gas is produced in paying quantities, required payments are made and lease operations are conducted in compliance with regulations and approved permits. If a lessee fails to produce oil and gas by the end of the initial 10 year period, 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 would revert back to the federal government, and the lease could be resold. Drilling of wells on a lease would not be permitted until the lease owner or operator secures approval of a drilling permit and a surface use plan specified at 43 CFR 3162.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the existing environment (i.e., the physical, biological, social, and economic values and resources) within the analysis area, which includes the 4 nominated parcels in Petroleum County (Map 1), that could be affected by implementation of the alternatives described in Chapter 2.

The existing environment is described by the different resources found throughout the analysis area. Within each resource description, lease parcels containing the resource will be listed and analyzed further in Chapter 4. If the lease parcel does not contain the resource, then the lease parcel will be omitted from the description of that specific resource.

Unless otherwise stated, resource analysis in this chapter, and Chapter 4, will be described in approximate acres due to the scaling and precision parameters associated with the Geographic Information System (GIS), in addition to being referenced to a different land survey.

Only those aspects of the affected environment that are potentially impacted by this project are described in detail. The following aspects of the existing environment were determined to be not present or not potentially impacted by this project include: lands with wilderness characteristics,

cave and karst resources, wild and scenic rivers; wilderness study areas (WSAs); hazardous wastes or solids; areas of critical environmental concern (ACECs). These resources and resource uses will not be discussed further in this EA.

3.2 Air Resources

Air quality and climate are the components of air resources, which include applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years.

3.2.1 Air Quality

Project area air quality is very good. The EPA air quality index (AQI) is an index used for reporting daily air quality (<http://www.epa.gov/oar/data/geosel.html>). It tells how clean or polluted an area's air is and whether associated health effects might be a concern. The AQI focuses on the potential health effects a person may experience within a few hours or days after breathing polluted air. The EPA calculates the AQI for the five major criteria air pollutants regulated by the Clean Air Act (CAA): ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level the EPA has set to protect public health. The following terms help interpret the AQI information:

- **Good** - The AQI value is between 0 and 50. Air quality is considered satisfactory and air pollution poses little or no risk.
- **Moderate** - The AQI is between 51 and 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
- **Unhealthy for Sensitive Groups** - When AQI values are between 101 and 150, members of "sensitive groups" may experience health effects. These groups are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to ozone, while people with either lung disease or heart disease are at greater risk from exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range.

In the context of ozone, all areas throughout Montana and the Dakotas are currently meeting federal standards in all locations. Light and dark blue circles in Figure A indicate standards being met in 2008. Open circles in Figure B indicate static trends.

For haze, trends appear to be improving for the clearest days (Figure C), while there are no apparent trends for the haziest days (Figure D).

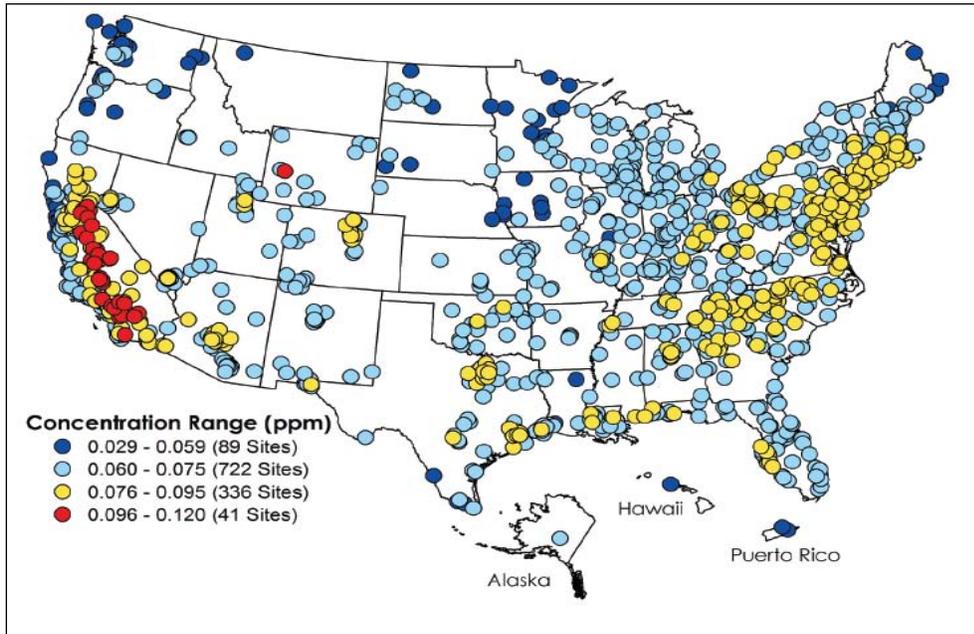


Figure A. Ozone concentrations in ppm, 2008 (fourth highest daily maximum 8-hour concentration).

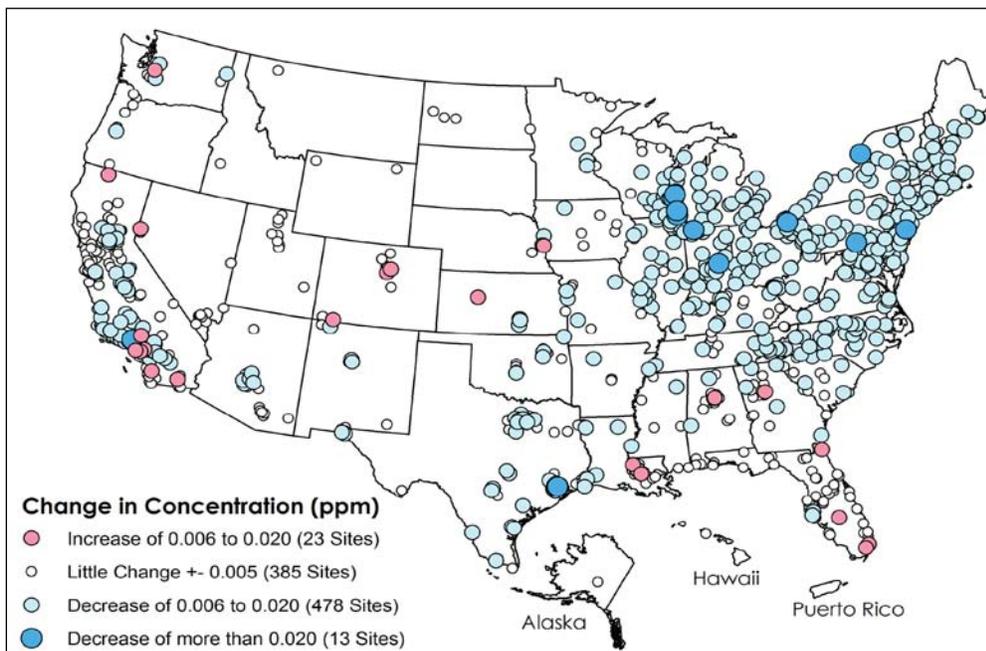


Figure B. Change in ozone concentrations in ppm, 2001-2003 vs. 2006-2008 (three-year average of the annual fourth highest daily maximum 8-hour concentrations).

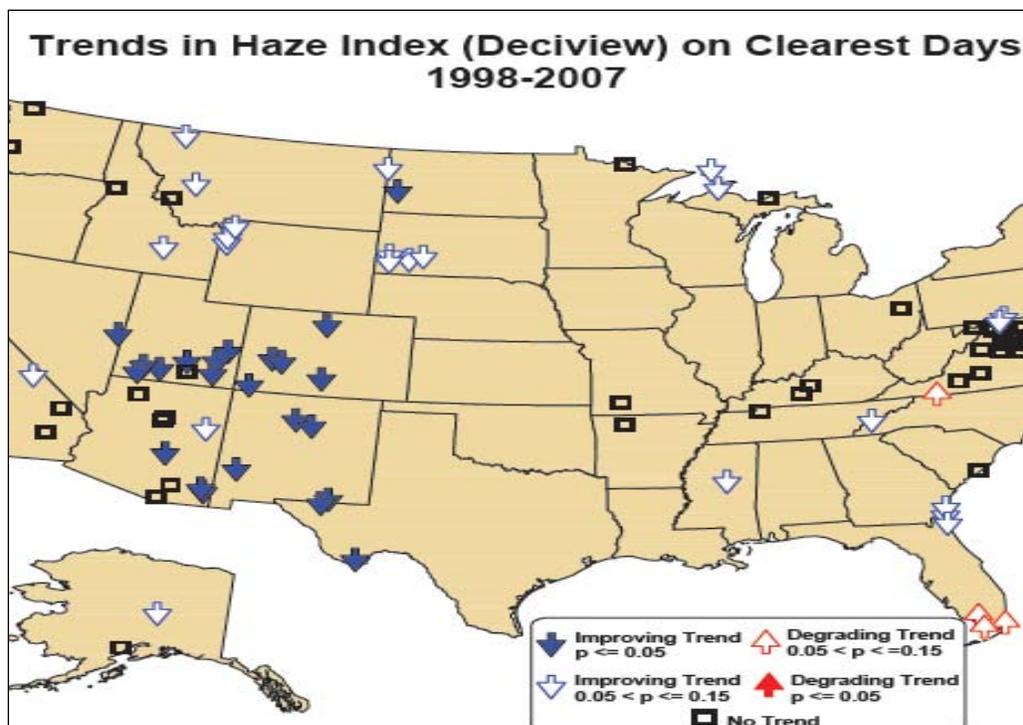


Figure C. Trends in haze index (deciview) on clearest days, 1998-2007.

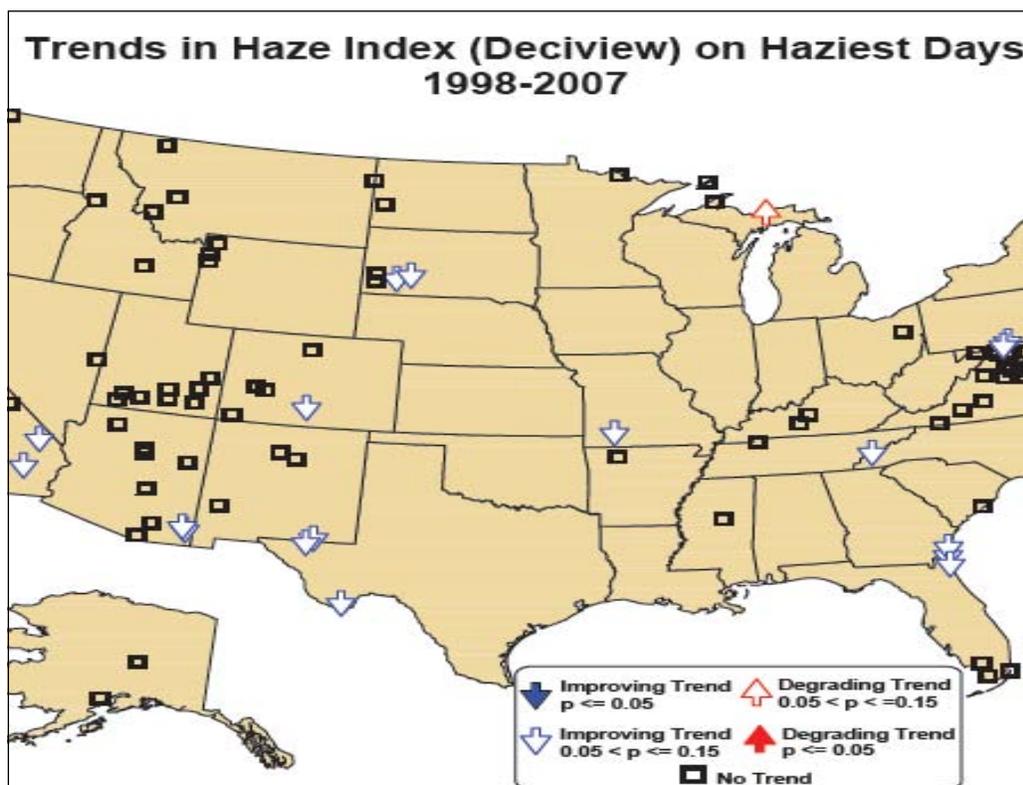


Figure D. Trends in haze index (deciview) on haziest days, 1998-2007.

The AQI data shows that there's little risk to the general public from degraded air quality. The data shown depicts the only data available within the LFO, Cascade, and Fergus Counties. Between 1998 and 2008, 99 percent of the days monitored rated "good" with 1 percent being "moderate." While there were five days that posed a health risk in Cascade County, these are very rare and of short-term occurrence. The three days in 2003 appear to have been related to large wildfires in Glacier National Park and to the Lincoln Complex Fire. Fergus County has not experienced any exceedence; this station was discontinued in 2006.

Table 1 US EPA Air Data Air Quality Index Report – Field Office Summary (1998-2008).

1. US EPA – Air Data Air Quality Index Report – Field Office Summary (1998-2008)							
County	State	# Days with Data	# Days Rated Good	Percent of Days Rated Good	# Days Rated Mod	# Days Rated Unhealthy for Sensitive Groups	# Days Rated Unhealthy
Cascade 2008	MT	320	316	99	4	0	0
Cascade - 2007	MT	365	355	97	8	2	0
Cascade - 2006	MT	365	363	99	2	0	0
Cascade - 2005	MT	365	361	99	4	0	0
Cascade - 2004	MT	366	365	99+	1	0	0
Cascade - 2003	MT	365	354	97	8	3	0
Cascade - 2002	MT	364	356	98	8	0	0
Cascade – 2001	MT	365	358	98	7	0	0
Cascade 2000	MT	366	351	96	15	0	0
Cascade – 1999	MT	365	365	100	0	0	0
Cascade - 1998	MT	365	363	99	2	0	0
Cascade -All	MT	3971	3907	98	59	5	0
Fergus - 2006	MT	120	119	99	1	0	0
Fergus - 2005	MT	122	122	100	0	0	0
Fergus – 2004	MT	119	118	99	1	0	0
Fergus – 2003	MT	106	106	100	0	0	0

Fergus – 2002	MT	107	107	100	0	0	0
Fergus – 2001	MT	104	104	100	0	0	0
Fergus - 2000	MT	89	88	99	1	0	0
Fergus All	MT	767	764	99+	3	0	0
Field Office	MT	4738	4671	98.6	62	5	0
Field Office Percentages	MT	-	-	98.6 percent	1.3 percent	0.1 percent	

In 2008 the lands within the LFO were in compliance with all air quality standards. The following information presents the worst case scenario as they reflect the largest city within the LFO boundary (Great Falls). Carbon monoxide reached 22% (one-hour), while PM_{2.5} reached 48.3% (24-hour) of the standard. This indicates that current air quality is very good, falling well below applicable standards.

Monitoring data show that the primary pollutants for this project area vary by county. In Cascade County, the primary pollutants are carbon monoxide (CO), sulfur dioxide (SO₂) and particulate matter (PM_{2.5}). The primary source of CO are light duty gas vehicles and motorcycles (39 percent), light duty gas trucks (29 percent), off-road gas vehicles (19 percent), and residential wood burning (5 percent). The primary sources of SO₂ are industrial gas combustion (64 percent), petroleum refining (8 percent), off-road diesel (7 percent), and industrial oil combustion (7 percent). The primary sources of PM_{2.5} are fugitive dust (54 percent), agriculture and forestry (15 percent), residential wood consumption (12 percent), mineral products (7 percent), and off-road diesel (5 percent). In Fergus County, the primary pollutant is PM_{2.5}, and off-road diesel (6 percent) is the primary source. It is important to note that the presence of a source does not automatically mean that air quality is impaired. As shown above, these emissions do not necessarily lead to impaired air quality. The emissions information is simply intended to identify those sectors which have the greatest likelihood to influence current and future air quality for this project area.

No air quality non-attainment areas are located within Petroleum county or the entire LFO. Only one class 1 areas is found near the project area, UL Bend Wilderness in the Charles M. Russell National Wildlife Refuge. Because of prevailing west winds in central Montana, the only one which would have the potential of being impacted is the UL Bend Wilderness.

3.2.2 Climate Change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as “a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and persist for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.” (IPCC 2007a). Climate change and climate science are discussed in detail in the Climate Change Supplementary Information Report for Montana, North

Dakota, and South Dakota, Bureau of Land Management (Climate Change SIR 2010). This document is incorporated by reference into this EA.

The Intergovernmental Panel on Climate Change (IPCC) (Climate Change SIR, 2010) states that “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” Global average temperature has increased approximately 1.4°F since the early 20th century (Climate Change SIR, 2010). Warming has occurred on land surfaces, oceans and other water bodies, and in the troposphere (lowest layer of earth’s atmosphere, up to 4-12 miles above the earth). Other indications of global climate change described by IPCC 2007b (Climate Change SIR, 2010) include:

- Rates of surface warming increased in the mid-1970s, and the global land surface has been warming at about double the rate of ocean surface warming since then;
- Eleven of the last 12 years rank among the 12 warmest years on record since 1850;
- Lower-tropospheric temperatures have slightly greater warming rates than the earth’s surface from 1958-2005.

As discussed and summarized in the Climate Change SIR, 2010, earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor, CO₂, methane, and N₂O absorb and retain heat. Without the natural greenhouse effect, earth would be approximately 60°F cooler (Climate Change SIR, 2010). Current ongoing global climate change is believed by scientists to be linked to the atmospheric buildup of greenhouse gases (GHGs), which may persist for decades or even centuries. Each GHG has a global warming potential that accounts for the intensity of each GHG’s heat trapping effect and its longevity in the atmosphere (Climate Change SIR, 2010). The buildup of GHGs such as CO₂, methane, N₂O, and halocarbons since the start of the industrial revolution has substantially increased atmospheric concentrations of these compounds compared to background levels. At such elevated concentrations, these compounds absorb more energy from the earth’s surface and re-emit a larger portion of the earth’s heat back to the earth rather than allowing the heat to escape into space than would be the case under more natural conditions of background GHG concentrations.

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere. For example, CO₂ proper may last 50 to 200 years in the atmosphere while methane has an average atmospheric life time of 12 years (Climate Change SIR, 2010).

North Dakota, Montana and South Dakota are all in the lower third of GHG emitting states (by volume). North Dakota ranks 37, Montana ranks 42, and South Dakota ranks 43. Only Hawaii and Idaho have lower emissions than Montana and South Dakota among western states (http://assets.opencrs.com/rpts/RL34272_20071205.pdf, Ramseur 2007). Montana, North Dakota, and South Dakota combine for 1.8 percent of the United States’ (U.S.) greenhouse gas emissions.

Some information and projections of impacts beyond the project scale are becoming increasingly available. Chapter 3 of the Climate Change SIR describes impacts of climate change in detail at various scales, including the state scale when appropriate. The following bullet points summarize potential changes identified by the EPA (EPA, 2008) that are expected to occur at the regional scale, where the proposed action and its alternatives are to take place. The EPA identifies this area as part of the Mountain West and Great Plains region (<http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf>):

- The region is expected to 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 would be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs would be drier.
- More frequent, more severe, and possibly longer-lasting droughts are expected to occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs.
- Drier conditions would reduce the range and health of ponderosa and lodgepole pine forests and increase the susceptibility to fire. Grasslands and rangelands could expand into previously forested areas.
- Ecosystems would be stressed and wildlife such as the mountain lion, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

Other impacts could include:

- Increased particulate matter in the air as drier, less vegetated soils experience wind erosion.
- Shifts in vegetative communities which could threaten plant and wildlife species.
- Changes in the timing and quantity of snowmelt which could affect both aquatic species and agricultural needs.

Projected and documented broad-scale changes within ecosystems of the U.S. are summarized in the Climate Change SIR. Some key aspects include:

- Large-scale shifts have already occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue. Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to two weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.
- Fires, insect epidemics, disease pathogens, and invasive weed species have increased and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
- Insect epidemics and the amount of damage that they may inflict have also been on the rise. The combination of higher temperatures and dry conditions have increases insect populations such as pine beetles, which have killed trees on millions of acres in the western U.S. and Canada. Warmer winters allow beetles to survive the cold season, which would normally limit populations, while concurrently, drought weakens trees, making them more susceptible to mortality due to insect attack.

More specific to Montana, additional projected changes associated with climate change described in Section 3.0 of the Climate Change SIR include:

- Temperature increases in Montana are predicted to be between 3 to 5°F at mid-21st century and between 5 to 9°F at the end of the 21st century. As the mean temperature rises, more heat waves are predicted to occur. In the late 21st century, the number of days per year with temperatures above 100°F is predicted to be between 10 and 45, depending on the level of GHG emissions, with the largest increase in the number days over 100°F occurring in the eastern portion of the state.
- Precipitation increases in winter and spring in Montana may be up to 25 percent in some areas. Precipitation decreases of up to 20 percent may occur during summer, with potential increases or decreases in the fall. In the fall western Montana may see little change in precipitation while the northwestern portion of the state may experience 5 to 10 percent increases.
- For most of Montana, annual median runoff is expected to decrease between 2 and 5 percent, but northwestern Montana may see little change in annual runoff. Mountain snowpack is expected to decline, reducing water availability in localities supplied by meltwater.
- Glaciers are already known to be melting, and all glaciers in Glacier National Park are expected to be completely melted by 2030 or sooner.
- Wind power production potential is predicted to decline in Montana based on modeling focused on the Great Falls area.
- Conditions in Montana wetlands across much of the northern part of the state are predicted to remain relatively stable, although some wetland habitat near Cut Bank is predicted to degrade to less favorable conditions.
- Water temperatures are expected to increase in lakes, reservoirs, rivers, and streams. Fish populations are expected to decline due to warmer temperatures, which could also lead to more fishing closures.
- Wildland fire risk is predicted to continue to increase due to climate change effects on temperature, precipitation, and wind. One study predicted an increase in median annual area burned by wildland fires in Montana based on a 1°C global average temperature increase to be 241 to 515 percent.

While long-range regional changes might occur within this project area, it is impossible to predict precisely when they could occur. The following example summarizing climate data for the West North Central Region (MT, ND, SD, WY) illustrates this point at the regional scale. A potential regional effect of climate change is earlier snowmelt and associated runoff. This is directly related to spring-time temperatures. Over a 112-year record, overall warming is clearly evident with temperatures increasing 0.21 degrees per decade (Figure E). This would suggest that runoff may be occurring earlier than in the past. However, data from 1991-2005 indicates a 0.45 degree per decade cooling trend (Figure F). This example is not an anomaly, because several other 15-year windows can be selected to show either warming or cooling trends. Some of these year-to-year fluctuations in temperature are due to natural processes, such as the effects of El Niños, La Niñas, and the eruption of large volcanoes (Climate Change SIR, 2010). This information illustrates the difficulty of predicting actual regional or site-specific changes or conditions which may be due to climate change during any specific time frame.

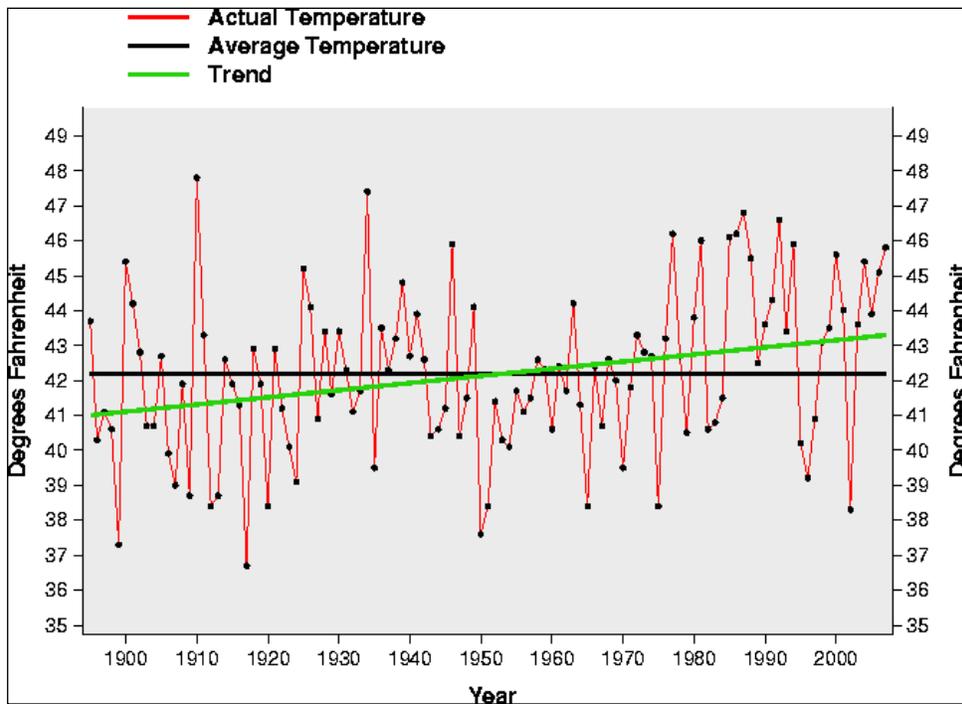


Figure E. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1895-2007. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

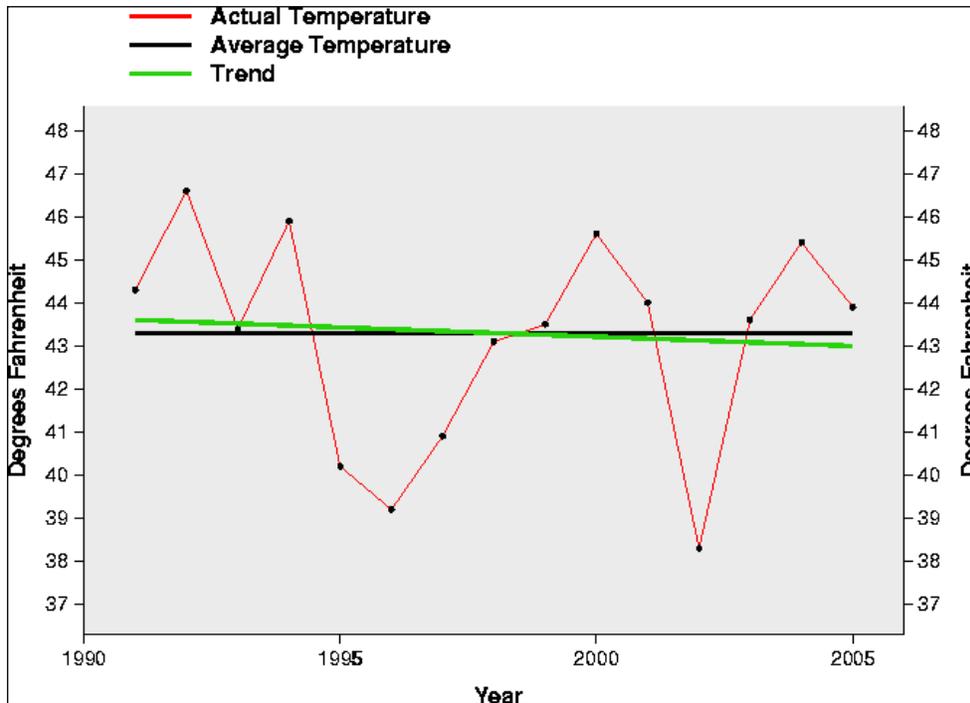


Figure F. Regional climate summary of spring temperatures (March-May) for the West North Central Region (MT, ND, SD, WY), from 1991-2005. (Source: NOAA website – <http://www.ncdc.noaa.gov/oa/climate/research/cag3/wn.html>)

3.3 Soil Resources

Soils were identified from the United States Department of Agriculture’s Natural Resources Conservation Service’s (USDA-NRCS) Soil Survey Geographic (SSURGO) dataset and the Soil Data Mart (SDM) website (<http://soildatamart.nrcs.usda.gov/>). Soil surveys were performed by the USDA-NRCS according to National Cooperative Soil Survey (NCSS) standards. Soils within the lease parcels developed from alluvium from shale and mixed sources; and, residuum and colluviums from sedimentary shale and sandstone. Landforms consist of highly erodible, steep to very steep, hillslopes and escarpments; gently sloping to moderately steep hillslopes; and nearly level to gently sloping alluvial fans, terraces and floodplains. Table 2 breaks out the Soil Map Units within each lease parcel and provides acres, soil ratings, and interpretations. Soil Map Unit descriptions are available from the SDM for the lease parcels.

Table 2. Soil Map Units and associated acres, ratings, and interpretations for Lease Parcels based on dominant condition of each Soil Map Unit. (Source: USDA-NRCS SSURGO dataset (USDA-NRCS, 2011)).

Parcel	Map Unit	Acres ¹	Slope Range (Percent)	Water Erosion Hazard ^{2,5}	Wind Erosion Hazard ^{3,5}	BLM-Reclamation Suitability (MT) ⁴	
						Rating Class	Limiting Feature(s)
MTM97300-NV	25F	5	15-60	Severe	Moderate	Poorly Suited	Water Erosion
MTM97300-NW	9	25	6-60	Severe	Moderate	Poorly Suited	Water Erosion
	64	9	6-60	Severe	Moderate	Poorly Suited	Water Erosion
	70	6	6-60	Severe	Moderate	Poorly Suited	Water Erosion
MTM97300-NX	64	23	6-60	Severe	Moderate	Poorly Suited	Water Erosion
	86	5	0-4	Slight	Moderate	Poorly Suited	Sodium Content
MTM97300-NZ	6	3	0-4	Slight	Slight	Well Suited	-
	7A	3	-	-		Poorly Suited	Vegetation Not Supported
	49	4	0-2	Slight	Slight	Well Suited	-
	61A	4	0-2	Slight	Slight	Well Suited	-
	64	20	6-60	Severe	Moderate	Poorly Suited	Water Erosion
	73	3	-	Not Rated	Not Rated	Poorly Suited	Vegetation Not Supported

1. Approximate acres of each MU ≥ 5 acres in size within the lease parcel with the exception of Lease MTM97300-NZ. Approximate acres based on GIS calculations.
2. The water erosion hazard for bare, non-compacted, soil is estimated by using the formula: Water Erosion Hazard = Kw factor x Representative Value (RV) Slope. The soil erodibility factor (Kw) quantifies soil detachment by runoff and raindrop impact. This erodibility factor is an index used to predict the long-term average soil loss, from sheet and rill erosion. The Kw factor applies to the whole soil, which includes rock fragments. Kw is based primarily on percentage of silt, sand, and organic matter, soil structure, saturated hydraulic conductivity, and rock fragments (USDA-NRCS, 2010). Representative Value (RV) Slope indicates the expected slope value for a given MU.
3. The wind erosion hazard is estimated from the Wind erosion Index (WEI). The WEI is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. This index is divided into three rating classes: slight (0, 38, 48, 56), moderate (86), and severe (134, 160, 180, 220, 250, 310) (USDA-NRCS, 2010).
4. Vulnerability to degradation is a function of resistance to degradation. Resistance to degradation of a rangeland or woodland site is a measure of its ability to function without change throughout a disturbance. The magnitude of decline in the capacity to function determines the degree of resistance to change. Resistance to degradation thus could be described as an areas buffering capacity. This depends upon soil type, vegetation, climate, land use, disturbance regime, temporal and spatial scales. The disturbance regime determines the type of stresses placed upon the soil, vegetation, and wildlife components of the site. Thus, soil

factors of vulnerability to degradation will vary based upon the disturbance regime for a particular site. The Hazard to site degradation ratings represent the soil factors that dominate these processes. Factors for vulnerability to site degradation include relative risk of water and wind erosion, salinization, sodification, organic matter and nutrient depletion and/or redistribution, loss of adequate rooting depth to maintain desired plant communities. Dynamic soil properties which vary with time, e.g. microbial biomass/diversity and carbon/nitrogen ratio, are not used since they are not contained within STATSGO or SSURGO databases. This rating should be used with the objective to protect vulnerable sites from the type of degradation that would result in accelerated erosion, reduction in water and air quality, invasion by annual grasses or noxious weeds, and other large scale potential natural plant community conversions. When degradation of soil and natural plant community characteristics goes beyond the threshold for the ecological site, the ecological site characteristics cannot be restored without intensive inputs of energy (USDA-NRCS, 2010).

5. If a Soil Map Unit (SMU) has a severe or poorly suited rating then the entire SMU is rated severe. However, there may be areas within the SMU that could have a slight, moderate, or well suited rating. For example, SMU 64 has a severe erosion hazard and poorly suited reclamation rating. Slopes 22% and greater would have a severe erosion hazard and poorly suited reclamation rating but slopes less than 22% would have a slight/well or moderate rating. The opposite could be true for an SMU with a slight/well or moderate rating. There could be areas within the SMU with a severe or poorly suited rating.

3.4 Water Resources

3.4.1 Surface Hydrology

All four lease parcels are located within the Musselshell River – Weede School watershed (5th-code HUC 1004020501). The Musselshell River, a perennial stream, flows through parcels MTM97300-NV and NZ. Cat Creek, an intermittent stream, flows through parcel MTM97300-NX. The Musselshell River is only partially supporting its beneficial uses, and is listed as water quality impaired by Montana Department of Environmental Quality. A TMDL has not been required because no pollutant-related impairment has been identified, but it has been included in the Lower Musselshell Water Quality Restoration Plan. The parcels, stream channel distances from the impaired waterbody, and the Musselshell River’s probable causes and sources of impairment are identified in Table 3.

Table 3. Watersheds (5th-code HUC) and impaired streams and associated causes and sources. (Source: Montana Department of Environmental Quality MT-DEQ Clean Water Act Information Center (MT DEQ, 2008).

Parcel #	Watershed (5 th -code HUC)	Impaired Streams within Watershed	Probable Causes	Probable Sources	Stream Channel Distance from Parcel to Impaired Waterbody
MTM97300-NV	Musselshell River – Weede School (1004020501)	Musselshell River (Flatwillow Creek to Fort Peck Reservoir)	Alteration in stream-side or littoral vegetative covers, Low flow alterations	Agriculture, Grazing in riparian or shoreline zones, Streambank modifications/destabilization, Flow alterations from water diversions, Impacts from hydrostructure flow, Regulation/modification,	Immediate
MTM97300-NW	same	same	same	same	1.25 miles
MTM97300-NX	same	same	same	same	0.50 miles
MTM97300-NZ	same	same	same	same	Immediate

3.4.2 Groundwater

The quality and availability of ground water varies greatly across the three-state region (Montana, North Dakota, South Dakota). Residents in eastern Montana and the Dakotas commonly get their ground water from aquifers consisting of unconsolidated, alluvial valley-fill materials, glacial outwash, or consolidated sedimentary rock formations. Aquifers that residents most commonly use in the area covered in this EA include the Fort Union, Hell Creek, Fox Hills,

Judith River, and Eagle consolidated formations. In some areas east of the Rocky Mountains, near-surface thick shale deposits such as those of the Colorado Group and Bearpaw (Pierre) Shale severely limit the economic availability of water to wells, or provide water of quality too poor for most uses. Eastern Montana aquifers typically yield less water and produce more salty, or mineralized, water compared to those in western Montana. The water in some eastern aquifers is suitable only for livestock consumption.

In eastern Petroleum County, which contains the lease parcels, many areas contain rocks that do not have a principal aquifer. Most aquifers are located within Quaternary alluvium, such as the floodplain of the Musselshell River, or in Mesozoic formations such as the Hell Creek-Fox Hills, Judith River, Eagle, Kootenai, and Ellis Group. In the areas of Petroleum County containing the lease parcels, the water quality of the bedrock aquifers is extremely variable; however, the specific conductance (microsiemens/centimeter at 25 degrees C) is often in Class II (1000-2500) or Class III (2500-15000). Total dissolved solids range from 500 to 1,800 milligrams/liter (mg/L) in the Hell Creek Formation to 160 to 27,000 mg/L in the Judith River Formation. Water quality is generally better closer to outcrop areas near the mountains and decreases away from recharge zones.

3.5 Vegetation Resources

Vegetation communities in the analysis area consist of sagebrush grasslands, grasslands, and lightly vegetated badlands. Mixed shrub communities are common in coulees and benches throughout all of these vegetation types. Common grasses and grasslike species include bluebunch wheatgrass, green needlegrass, needle and thread, western wheatgrass, prairie junegrass, blue grama, prairie junegrass, blue grama, prairie sandreed, Sandberg bluegrass and threadleaf sedge. Introduced grasses are found in some areas, either in pure stands or intermingled with native species. Introduced annual invasive species include cheatgrass and Japanese brome. Common shrubs include big sagebrush, silver sagebrush, saltbush, greasewood and rubber rabbitbrush. Other common vegetation includes prickly pear cactus and dense clubmoss.

Parcel NX contains a ponderosa pine vegetative community representative of acid-shale pine forest. Parcel NX and NZ contain bottomlands along the Musselshell River and Lower Cat Creek which contain approximately 20 acres of cottonwood bottomlands and mixed hardwood riparian habitat. Noxious weeds are not known to be present on any of the parcels.

3.6 Special Status Species

3.6.1 Special Status Animal Species

3.6.1.1 Aquatic Wildlife

Fish species that are listed on the BLM Special Status Species list do not occur near any of the project parcels.

3.6.1.2 Threatened, Endangered, Candidate, and Proposed Species

Based on information obtained from the Montana Natural Heritage Program website (MNHP 2011), there are no known occurrences of federally threatened or endangered species. No USFWS critical habitat has been defined in any of the proposed lease parcels.

No formal surveys/inventories for wildlife have been completed in the offered parcels. LFO wildlife biologists attended a site visit to the parcels on April 18, 2011. Potential habitats and species needs were evaluated. Where potential habitat exists species presence is assumed.

It is important to note that the greater sage-grouse (*Centrocercus urophasianus*) is a candidate species and listing is warranted but precluded under the Endangered Species Act. Based on BLM records, there are no known active greater sage-grouse leks within any offered parcel. A known lek occurs approximately 5 miles from the offered parcels. No offered parcels are located within a sage grouse core area.

3.6.1.3 Other Sensitive Species

Several BLM Sensitive Species have been documented in the proposed lease parcel vicinity. These include: Brewer's sparrow (*Spizella breweri*), sage thrasher (*Oreoscoptes montanus*), loggerhead shrike (*Lanius ludovicianus*), Ferruginous hawk (*Buteo regalis*), Northern leopard frogs (*Lithobates pipiens*), Great Plains toad (*Bufo cognatus*), Plains spadefoot (*Spea bombifrons*), and spiny shoftshell (*Apalone spinifera*). Habitat may occur within the offered parcels that may support the species mentioned, as well as other special status species birds that have not been recorded or observed. Appendix D lists parcels containing potential habitat for species identified in Appendix C.

3.6.2 Special Status Plant Species

There are no BLM Sensitive Species known to occur within, or near the affected area. No surveys for special status species have been completed on lease parcels. Double bladderpod, little Indian breadroot, poison suckleya and dwarf woolly heads are Sensitive Species known to occur in Petroleum County. There is no potential habitat for little Indian breadroot, however, potential habitat does exist for double bladderpod, dwarf woolly-heads and poison suckleya.

3.7 Fish and Wildlife

Terrestrial game species expected to occur in and adjacent to the parcels include elk, mule deer, white-tailed deer, pronghorn, sharp-tailed grouse, sage grouse, wild turkey, pheasant and gray partridge. Potential fish species in the Musselshell river include: common carp, flathead chub, sauger, goldeye, plains minnow, Western silvery minnow, Northern pike, yellow perch, Northern redbelly dace, stonecat, smallmouth bass, smallmouth buffalo, blue sucker, black bullhead, emerald shiner, freshwater drum, brassy minnow, channel catfish, sand shiner and walleye.

3.8 Cultural Resources

Cultural resources are discussed in the JVP Final RMP/EIS on page 131. To update and supplement that data in 2010 the BLM completed a Class I Overview of the historic, prehistoric, and paleontological resources present throughout the Central Montana District. That document is on file at the LFO.

The BLM broadly defines cultural resources as any traditional lifeway belief or cultural property. Cultural properties are defined as distinct evidence in areas of past human occupation, activity, and use. Traditional lifeway beliefs are defined as traditional value systems of religious beliefs, cultural practices, or social exchange that are not closely and tangibly defined or identified with definite locations (JVP RMP, 1992).

Early peoples in the study area were mobile hunters and gatherers throughout and up until the historic period. The following brief overview explains changes through time as summarized by other archaeologists (Frison 1978; Ruebelmann 1983).

The Early Prehistoric Period (roughly 10,000 – 5,700 B.C.) is characterized by a tool assemblage consisting of large, lanceolate and/or fluted spear points, and multipurpose tools made of stone or ivory. Subsistence strategies specialized in hunting megafauna but smaller game and plant foods were utilized as well. Typical site types include kill and butchering sites, open air camp sites, and limited activity sites.

The Middle Prehistoric Period (roughly 5,000 B.C. – A.D. 400), is characterized by a shift in tool types from thrusting spears with lanceolate spear heads to spear throwers and darts with diagnostic spear points. Groundstone tools also begin to show up in the assemblages. Subsistence strategies shift from more specialized hunting of megafauna to a broader spectrum strategy which becomes focused on bison by the end of this period. Plant procurement and use also occurs. Evidence of storage in the form of storage pits begins to show up during this period as do large cooking pits. Site types typical of this period include kill and butcher sites, camp sites, and rock shelters.

The Late Prehistoric Period (roughly A.D. 500 – 1800), is characterized by a technological shift from spear throwers and darts to bow and arrows. Tool assemblages consist of small side, corner, or tri-notched points. Some ceramics become evident in the record in limited number on the Northwest Plains at this time. Grooved mauls, bone fleshers, and shell beads are common. Subsistence strategies continue to focus on bison procurement. Large communal bison kill/jump sites, rock shelters, wind breaks, and caves are the site types typically found in this area.

More recently, settlers by the thousands came into the area to live on homesteads. Germans and Scandinavians came from the Midwest, as did eastern European immigrants like Bohemians and Yugoslavs (JVP, 1992).

Cultural sites can be considered significant for several reasons; some because information about the past can be learned through methodical study of the sites, while other sites communicate a sense of a particular time period they represent in history. Finally, sites can be considered to be important because of the current use or values associated with the location.

An important consideration for management actions in this area is preserving the values of the cultural properties contained within. In order to preserve the integrity of a cultural property, it is sometimes necessary to preserve the location in which the cultural property is found. This is an important consideration when the management actions have the potential to affect the location of a cultural property, thus affecting the overall integrity of the cultural property.

The Montana Historical Society's State Historic Preservation Office, through funding provided by the BLM for a cultural resource data sharing project, maintains the State Antiquities Database. This database maintains records of all sites recorded and all cultural resource inventories completed on federal, state, and private lands. The legal descriptions of the four lease parcels were compared against this database to determine the potential for effects resulting from the leasing of the parcels. One Class III, or intensive, cultural resource inventory has been completed within the affected parcels. None of the private land has been inventoried.

In 2011, the LFO archaeologist visited all four of the parcels to make an initial assessment on site probability and the potential for cultural resources to be present.

MTM 97300-NV has not been inventoried. Initial assessment work identified no cultural sites. This parcel has the potential to contain both historic and prehistoric resources due to its proximity to the Musselshell River.

MTM97300-NW has not been inventoried. Initial assessment work identified remains of two cultural sites (historic and prehistoric). This parcel contains both historic and prehistoric resources. This site is near the Musselshell River, which is a known important resource to multiple cultures. It is also within the historic Cat Creek Oil Field; resources associated with the historic activity may also be present.

MTM97300-NX had one cultural resource inventory conducted within its boundary in 1998, with negative results. Initial assessment work identified remains of two cultural sites. This parcel, on private land, has evidence of historic agricultural use, as well as cultural lithic material present on noncultivated land.

MTM97300-NZ has not been inventoried. This parcel has the potential to contain both historic and prehistoric resources due to its location on the Musselshell River. This parcel is in public ownership but is surrounded by private land.

3.9 Native American Religious Concerns

None of the Indian tribes with whom we consult have identified traditional cultural properties or sacred areas within the analysis area. This area has generally been treated as open territory, or on the margins of many tribal claims. At various times the Blackfeet, Crow, and Gros Ventres have dominated the area, but none have been able to claim it solely as their tribal land. Chippewa and Cree as well as Métis and the Salish and Kootenai have used this area as well. Geographic features near the analysis area of known importance to the various tribes include the Musselshell River. This area has been used as collection sites for plants and minerals, as a sacred area, and for camping and habitation.

BLM's management of Native American Religious concerns is guided through its 8120 Manual: *Tribal Consultation Under Cultural Resources Authorities* and 8120 Handbook: *Guidelines for Conducting Tribal Consultation*. Further guidance for consideration of fluid minerals leasing is contained in BLM Washington Office Instruction Memorandum 2005-003: Cultural Resources, Tribal Consultation, and Fluid Mineral Leasing. The 2005 memo notes leasing is considered an undertaking as defined in the National Historic Preservation Act. Generally areas of concern to Native Americans are referred to as "Traditional Cultural Properties" (TCPs) which are defined as cultural properties eligible for the National Register because of its association with cultural practices or beliefs that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community.

3.10 Paleontology

The subject oil and gas lease parcels are located within areas of varying potential fossil yield classifications (PFCY) assigned from the associated geologic units. The paleontological potentials based on Montana Bureau of Mines and Geology maps and the LFO Class I Overview (Hanna 2009) are evaluated below by parcel.

MTM 97300-NV: Being located within the Musselshell River floodplain, this parcel's surface material consists of modern stream deposits (Quaternary alluvium). The Class I Overview states that there is very low potential for the occurrence of paleontological remains in Quaternary alluvium. In most cases, any faunal, floral, vertebrate, or invertebrate material found is in association with cultural material, considered as archaeological (or historical) rather than paleontological. Quaternary alluvium is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils.

MTM 97300-NW: The higher elevation of the ridges of this parcel area lies within an equivalent to Niobrara Shale, part of the geologic unit designated as the Upper Colorado Shale. Within this unit, the Class I Overview identifies that there are 2 vertebrate and 9 nonvertebrate fossil localities documented in the LFO resource area. The Upper Colorado Shale is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils.

In the area of the stream floodplain that runs west to east through this parcel, surface material consists of Quaternary alluvium. The Class I Overview states that there is very low potential for the occurrence of paleontological remains in Quaternary alluvium. In most cases, any faunal, floral, vertebrate, or invertebrate material found is in association with cultural material, considered as archaeological (or historical) rather than paleontological. Quaternary alluvium is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils.

MTM 97300-NX: This parcel area lies within an equivalent to Carlile Shale, part of the geologic unit designated as the Upper Colorado Shale. Within this unit, the Class I Overview identifies that there are 2 vertebrate and 9 nonvertebrate fossil localities documented in the LFO resource area. The Upper Colorado Shale is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils.

MTM 97300-NZ: Again, much of the parcel is within the floodplain of the Musselshell River, consisting of Quaternary alluvium. The Class I Overview states that there is very low potential for the occurrence of paleontological remains in Quaternary alluvium. In most cases, any faunal, floral, vertebrate, or invertebrate material found is in association with cultural material, considered as archaeological (or historical) rather than paleontological. Quaternary alluvium is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils.

At the higher elevation on the bench above the river is an equivalent to Carlile Shale, part of the geologic unit designated as the Upper Colorado Shale. The Class I Overview identifies that there are 2 vertebrate and 9 nonvertebrate fossil localities documented in the LFO resource area. The Upper Colorado Shale is a Class 2 unit with low potential for yielding vertebrate fossils or scientifically significant nonvertebrate fossils. Much of this bench is overlain by 5 to 10 feet of Quaternary alluvial terrace deposit.

None of the documented fossil localities in any of the geologic units were identified within the subject oil and gas parcels.

3.11 Visual Resources

Public lands have a variety of visual (scenic) values that warrant different levels of management. Visual Resource Management (VRM) classification is only applied to BLM surface and is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. The BLM uses the VRM system to identify and evaluate scenic values to determine the appropriate level of scenery management. These management classes regulate the amount of disturbance that is allowed to occur within a given area – Class I areas are managed to preserve the existing character of the landscape; Class II areas are managed to retain the existing character of the landscape, with a low level of landscape change; Class III areas are managed to partially retain the existing character of the landscape, with only moderate change to the landscape; and Class IV areas are managed to allow major modifications to the existing character of the landscape, and the level of change can be high. The offered parcels contain only VRM Class III (approximately 73 acres) areas.

A Class III VRM area classification means the level of change to the character of the landscape should be moderate. Changes caused by management activities should not dominate the view of the casual observer and should not detract from the existing landscape features. Any changes made should repeat the basic elements found in the natural landscape such as form, line, color and texture.

3.12 Livestock Grazing

The following two allotments are within the affected area for the preferred alternative. Both allotments are in compliance with standards and guidelines for rangeland health and guidelines for livestock management. The specifics for the grazing authorization is:

Fail Allotment, 04846 is authorized to be grazed on a custodial use basis by 4 cattle from March 1 to February 28, with a total permitted use of 45 Animal Unit Months (AUMs).

Long Coulee Allotment, 04839 is authorized to be grazed during two separate seasons. The first season authorizes active use grazing by 119 cattle from May 1 to November 30, with a total permitted use of 528 AUMs. The second season authorizes use on a custodial basis by 5 cattle from March 1 to February 28, with a total permitted use of 63 AUMs.

3.13 Recreation and Travel Management

BLM only manages recreational opportunities and experiences on BLM-administered surface. The affected environment consists of approximately 73 acres of BLM-administered surface. None of the four proposed lease parcels fall within special recreation management areas (SRMAs).

The BLM-administered surface associated with the offered parcels consist of small, isolated, and scattered tracts of land with limited public access (i.e., no public easements or rights-of-way across private property). The lack of public access limits the general public's use of the BLM parcels for recreational purposes. The types of limited public use on these parcels can be characterized as casual dispersed recreational activities including hiking, fishing and hunting.

3.14 Lands and Realty

Parcel 97300-NV, 97300-NW, 97300-NZ – There are currently no rights-of-way (ROWs) for these parcels of land.

Parcel 97300-NX – This parcel is private surface, patented in 1999. Prior to that patent, a ROW was issued to McCone Electric Cooperative initially in 1984, for an overhead power line. There are no other ROWs for this parcel which were issued by the BLM.

3.15 Minerals

3.15.1 Fluid Minerals

It is the policy of the BLM to make mineral resources available for disposal and to encourage development of these resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable prices. At the same time, the BLM strives to assure that mineral development occurs in a manner which minimizes environmental damage and provides for the reclamation of the lands affected.

Currently there are 243 oil and gas leases covering approximately 154,125 acres in the Lewistown Field Office. Existing production activity holds approximately 10 percent of this lease acreage. Information on numbers and status of wells on these leases and well status and numbers of private and state wells within the external boundary of the field office is displayed in Table 4. Numbers of townships, leased acres within those townships, and development activity for all jurisdictions are summarized in Table 5.

If a lease parcel receives leasing interest, and oil and gas lease sales lead to lease issuance, there could be interest in exploration or development activity during the term of the lease. Exploration and development proposals in the future would require a separate environmental document to consider specific proposals and site-specific resource concerns.

Table 4 . Existing Development Activity

	FEDERAL WELLS	PRIVATE AND STATE WELLS
Drilling Well(s)	0	0
Producing Gas Well(s)	9	124
Producing Oil Well(s)	31	348
Water Injection Well(s)	5	45
Shut-in Well(s)	18	371
Temporarily Abandoned Well(s)	20	35

Table 5 . Oil and Gas Leasing and Existing Development within Townships Containing Lease Parcels.

	Petroleum County
Number of Townships Containing Lease Parcels	1 (T15N, R30E)
Total Acres Within Applicable Township(s)	9900.73 acres
Federal Oil and Gas Minerals	6305.45 acres
Percent of Township(s)	63.7
Leased Federal Oil and Gas Minerals	6144.51 acres
Percent of Township(s)	62.1
Leased Federal Oil and Gas Minerals Suspended	0.00 acres
Percent of Township(s)	0
Federal Wells	0 Active Wells
Private and State Wells	POW 3, INJEOR 2, OSI 16, WSW 1, COMP. 5, & WWR 1. Total of 28 Private and State Wells.

POW – Producing Oil Well, INJEOR – Water Injection Well Enhanced Oil Recovery, OSI – Oil Shut-in, WSW- Water Source Well, COMP. – Completed well-unknown current status, WWR – Water Well Released.

3.165.2. Solid Minerals

3.16.2.1. Coal

There is no current coal production in the lease parcel areas. Information was verified utilizing the economic coal deposits GIS layer. No offered parcels are lying over any leased coal deposits.

3.165.2.2. Locatable Minerals

Locatable minerals are subject to provisions of the 1872 Mining Law. These generally include metallic minerals such as gold and silver and other materials not subject to lease or sale. There is currently no locatable mineral production or potential for production in the offered lease parcels.

3.165.2.3. Salable Minerals

Salable minerals (mineral materials) are those common varieties of sand, stone, gravel, cinders, pumice, pumicite, and clay that may be acquired under the Materials Act of 1947. Mineral materials are disposed of by free-use and community/common-use permits granted to municipalities or non-profit entities, respectively. Contracts for sale of mineral materials are offered to private entities on both a competitive and non-competitive basis. Disposal of salable

minerals is a discretionary decision of the BLM authorized officer. Future potential resource development conflicts would be avoidable either by not issuing sales contracts in oil and gas development locations or conditioning the APD or salable mineral contracts in a manner to avoid conflicts between operations.

None of the offered lease parcels conflict with current permits and contracts for salable minerals awarded on federal lands. Therefore, this subject will not be discussed further in this document.

3.176 Special Designations

3.176.1 National Historic/Scenic Trails

There are no National Scenic or Historic trails within the analysis area.

3.176.2 Areas of Critical Environmental Concern (ACECs)

There are no ACECs within the analysis area.

3.187 Social and Economic Conditions

3.187.1 Social and Environmental Justice

The social section focuses on Petroleum County in central Montana where all the lease parcels are located. The county seat for Petroleum County is Winnett with a 2010 population of 182. The county population in 2010 was 494, which was unchanged from 2000. Population density is very low in Petroleum county at .3 persons per square mile, compared to a state figure of 6.8. The areas in the vicinity of the leases are home mostly to large cattle ranches. Approximately one third of the land being considered is split estate (private or state surface with federal mineral estate). Oil leasing and production currently occurs in Petroleum County although not in the vicinity where these offered parcels occur. The oil and gas industry support services for these oil activities come from Havre in Hill County to the northwest.

In 2010, the percent American Indian was 0% in Petroleum County. The Fort Belknap Reservation is located north of Petroleum County. The percent of the population living below the poverty level in 2008 was 17.0% in Petroleum County compared to 14.1% for the state as a whole.

3.187.2 Economics

Certain existing demographic and economic 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, longstanding industries, infrastructure, predominant land and water features, and unique area amenities. The local economic impact area extends beyond the LFO boundaries because of economic linkages to areas outside the LFO boundaries. The affected local economy is made up of nine counties in Montana within the LFO boundaries (Cascade, Chouteau, Fergus, Judith Basin, Lewis and Clark, Meagher, Petroleum, Pondera, and Teton) as well as Hill County which is outside the Lewistown Field Office boundaries. Hill County is included because of the oil and gas related businesses that are based in Havre that work in oil and gas fields within the LFO boundaries. While public revenues from oil and gas leasing, rent, and production addressed in this EA are only distributed to those counties in the LFO area, employment and income effects are spread across the 10 counties. The distribution of these economic effects is based on acres leased and levels of production as well as business patterns.

The ten-county local economy had an estimated 2009 population of 193,428 people. Total employment was estimated to be 130,931 jobs; there were an estimated 78,405 households; and there were 213 NAICS industrial sectors represented in the local economy (IMPLAN, 2009). The local economy includes Great Falls (a major population and business center), Lewistown, and Havre (regional oil and gas business and service centers). There were 1.48 people per job within the local economy and 0.60 households per job.

Nature of the Oil and Gas Industry in the Lewistown Field Office:

In March 2011, BLM had leases in effect covering 154,125 acres within the LFO boundaries. Annual lease rent is paid on 129,918 acres that are not held by production on leases with oil/gas being produced from one or more wells. Estimated annual average (2005-2010) lease bonus and rental revenue to the Federal government was about \$400,000 (ONRR, 2011). Lease rent was not paid on 24,207 acres that were held by production. Instead, royalties are paid on oil and gas production from these leases. More Federal leases and more acres were leased in Petroleum County than any other county in the LFO boundary.

Recently, leasing of Federal minerals occurs in every county within the LFO boundary except Judith Basin. All Federal oil production occurs in Petroleum County. Natural gas production from Federal minerals within the LFO boundary occurs in Fergus and Pondera Counties. While natural gas production from Federal minerals does occur in north Chouteau County, this production comes from the mineral estate managed by the Havre Field Office and is not included in this analysis.

Local oil and gas exploration, development, and production as well as gas pipeline transmission industry all support jobs and income in the local economy.

A portion of the oil and gas-related revenues collected by the Federal government is distributed to the state and counties. The amount that is distributed is determined by the Federal authority under which the Federal minerals are being managed. The leased acres changes daily as some leases expire and other parcels are leased. Generally, within the field office boundary, public domain Federal minerals account for about 69 percent of the acres leased; acquired lands/minerals, mostly Bankhead-Jones lands, account for about 31 percent of acres leased. The leased acres changes daily as leases expire and other parcels are leased.

Forty-nine percent of these Federal leasing revenues from public domain minerals are distributed to the state and the state distributes 25% back to the counties (Title 17-3-240, Montana Code Annotated). Twenty-five percent of the Federal leasing revenues from acquired minerals are distributed to the counties of production.

Leasing:

Federal oil and gas leases generate a one-time lease bonus bid as well as annual rents. The minimum lease bid is \$2.00 per acre. If parcels do not receive the minimum bids they may be leased later as noncompetitive leases that don't generate bonus bids. Within the Lewistown Field Office area, bonus bids averaged \$3.99 per acre on Federal leases issued between 2005 and 2010. Average bonus per leased acre ranged from \$0.00 in Cascade and Judith Basin Counties to \$18.17 per acre in Teton County. Lease rent is \$1.50 per acre per year for the first five years and \$2.00 per acre per year thereafter. Typically, oil and gas leases expire after 10 years unless

held by production. Annual lease rent continues until one or more wells are drilled that result in production and associated royalties. Currently, the Federal government collects an estimated annual average of about \$280,000 in lease bids and rent; of which about \$120,000 is distributed to the state/local governments.

Production:

Federal oil and gas production in Montana is subject to production taxes or royalties. These Federal oil and gas royalties generally equal 12.5 percent of the value of production (43 CFR 3103.3.1). Forty-nine percent of the royalties from public domain Federal minerals are distributed to the state, of which 25 percent is distributed back to the county of production (Title 17-3-240, MCA).

Between 2005 and 2010, an annual average of 16,352 barrels of oil and 64,566 MCF of natural gas was produced from BLM-administered Federal minerals in the LFO area. All Federal oil production occurred in Petroleum County. All of the gas production from BLM-administered Federal minerals occurred in Fergus and Pondera Counties. The average annual royalty value less allowances was \$187,616 (in 2009 dollars) for Federal oil production and \$61,741 (in 2009 dollars) for gas Federal gas production. An estimated \$104,000 was disbursed to the state and counties.

Local Economic Contribution:

The economic contribution to a local economy is measured by estimating the employment and labor income generated by 1) payments to counties associated with the leasing, rent, and production of Federal minerals, 2) local royalty payments associated with production of Federal oil and gas, and 3) economic activity generated from drilling and associated activities. Activities related to oil and gas leasing, exploration, development, and production form a basic industry that brings money into the state and region and creates jobs in other sectors. Extraction of oil and natural gas (NAICS sector 20), drilling oil and gas wells (NAICS sector 28), and support activities for oil and gas operations (NAICS sector 29) supported an estimated 257 total jobs and \$15.1 million in total employee compensation and proprietor income in the local economy (IMPLAN, 2009).

Total average annual Federal revenues from Federal oil and gas leasing, rents, and royalty payments within the LFO boundary are an estimated \$529,000. Federal revenues distributed to the state of Montana amount to an estimated \$220,000 per year. The state redistributes an estimated \$86,000 to the local Montana counties with Federal leases and production within the LFO boundaries per year. These revenues help fund traditional county functions such as enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, and/or keeping records. Other county functions that may be funded include administering primary and secondary education and operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems.

The estimated annual local economic contribution associated with Federal leases, rents, drilling, production, and royalty payments combined to support about 15 total local jobs and \$810,000 in local labor income, respectively. These contributions equal about one-tenth of one percent of the local employment and about two-tenths of one percent of the local income. The NAICS aggregated sectors that experience the most influence from oil and gas related leasing,

exploration, development, and production are mining, retail trade, professional scientific and technical services, and health care and social assistance. Table 6 shows the current contributions of leasing Federal oil and gas minerals and the associated exploration, development, and production of Federal oil and gas minerals to the local economy.

Table 6. Current Contributions of Federal Oil and Gas Leasing, Exploration, Development, and Production to the Local Economy

Industry	Employment (jobs)		Labor Income (Thousands of 2009 dollars)	
	Area Totals	Federal O&G -Related	Area Totals	Federal O&G-Related
Agriculture	8,656	0	\$131,294	\$0
Mining	578	8	\$32,775	\$579
Utilities	485	0	\$45,065	\$5
Construction	7,971	0	\$311,769	\$10
Manufacturing	2,733	0	\$111,719	\$1
Wholesale Trade	3,107	0	\$167,569	\$13
Transportation & Warehousing	3,770	0	\$191,179	\$11
Retail Trade	14,440	1	\$378,995	\$25
Information	2,213	0	\$106,239	\$6
Finance & Insurance	6,440	1	\$301,895	\$23
Real Estate & Rental & Leasing	4,617	0	\$59,998	\$7
Prof, Scientific, & Tech Services	7,135	1	\$312,196	\$37
Mngt of Companies	324	0	\$19,111	\$7
Admin, Waste Mngt & Rem Serv	3,898	0	\$90,164	\$5
Educational Services	1,726	0	\$40,257	\$2
Health Care & Social Assistance	14,416	1	\$647,371	\$37
Arts, Entertainment, and Rec	3,293	0	\$45,720	\$2
Accommodation & Food Services	9,133	1	\$155,494	\$9
Other Services	7,969	0	\$231,845	\$13
Government	28,027	1	\$1,729,930	\$21
Total	130,931	15	\$5,110,587	814
Federal O&G as Percent of Total	---	0.01%	---	0.02%

IMPLAN, 2009 database

4.0 ENVIRONMENTAL IMPACTS

4.1 Assumptions and Reasonably Foreseeable Development Scenario Summary

At this stage of the leasing process, the act of leasing parcels would not result in any activity that might affect various resources. Even if lease parcels are leased, it remains unknown whether development would actually occur, and if so, where specific wells would be drilled and where facilities would be placed. This would not be determined until the BLM receives an APD in which detailed information about proposed wells and facilities would be provided for particular leases. Therefore, this EA discusses potential effects that could occur in the event of development.

Upon receipt of an APD, the BLM would initiate a more site-specific NEPA analysis to more fully analyze and disclose site-specific effects of specifically identified activities. In all potential exploration and development scenarios, the BLM would require the use of BMPs documented in “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development” (USDI and USDA 2007), also known as the “Gold Book.” The BLM could also identify APD COAs, based on site-specific analysis that could include moving the well location, restrict timing of the project, or require other reasonable measures to minimize adverse impacts (43 CFR 3101.1-2 Surface use rights; Lease Form 3100-11, Section 6) to protect sensitive resources, and to ensure compliance with laws, regulations, and land use plans.

This chapter presents the potential environmental, social, and economic effects from the actions described in each alternative in Chapter 2, as well as potential effects from lease exploration and development activities. In addition to describing potential effects, this chapter presents mitigation measures designed to reduce, minimize or avoid potential impacts as per NEPA regulations at 40 CFR 1502.14(f), 40 CFR 1502.16(h), and 40 CFR 1508.20, mitigation measures to reduce, avoid, or minimize potential impacts of the action alternatives are identified by resource below. The duration of the possible effects is analyzed and described as either short-term or long-term. Short-term effects generally last less than five years; long-term effects generally last more than five years. No alternative would affect the demographics, social trends or social organization in the area.

4.1.1 Reasonably Foreseeable Development Scenario Summary

The following assumptions are from the RFD developed for the LFO. The BLM administers approximately 1,329,799 acres of federal minerals (for fluid minerals) available for leasing within the Lewistown LFO. The RFD forecasts the following level of development in the LFO

All parcels within the analysis area are in the portion of the LFO that was included in the Judith Resource Area and the JVP RMP. An RFD scenario was prepared for this RMP. After review, it has been determined that the development potential portrayed within the RMP is still valid. Only six townships in Fergus and Petroleum Counties have high development potential for oil and gas. The rest of the area is moderate potential for oil and gas.

The validation included a review of the drilling and production histories for both counties for the prior 20 years using the Montana Board of Oil and Gas Conservation online database. Between 1990 and 2010, about 19 wells were drilled in Fergus County, with eight completed as shut-in gas wells; the remainder were dry holes. Existing natural gas production is steadily declining; there is no oil production. During the same time frame, the drilling of approximately 15 wells occurred in Petroleum County. One completion is a shut-in oil well in the Cat Creek Field; the others were dry holes. Production in Petroleum County is oil and associated gas. No wells 10,000 feet or greater were drilled in either of the two counties. Historically, approximately 17 wells in Fergus County and 22 wells in Petroleum County were drilled to a depth greater than or equal to 5,000 feet.

4.1.2 Analysis Assumptions for Alternative B

No surface disturbance would occur as a result of issuing leases. The potential number of acres disturbed by exploration and development activities is based upon the 80 acre spacing of wells within the analysis area. The potential acres of disturbance reflect acres typically disturbed by

construction, drilling, and production activities, including infrastructure installation throughout the LFO. Typical exploration and development activities and associated acres of disturbance were used as assumptions for analysis purposes in this EA. (Note: The assumptions were not applied to Alternative A because the lease parcels would not be recommended for lease; therefore, no wells would be drilled or produced on the lease parcel, and no surface disturbance would occur on those lands from exploration and development activities).

There information concening the RFD assumption by parcel is as follows:

Parcel MTM97300 - NV (T15N, R30E, Sec 9, Lot 9) is located 0.7 of a mile off the main Cat Creek Anticline Structure including West Dome Cat Creek, Mosby Dome Cat Creek and the East Dome Cat Creek. Outside of the general structure area, the potential for discovering and developing future oil production is low. This was given a low potential because no wells have been drilled in the S/2 of Sec. 9 or the N/2 of Sec. 16 and because of its location compared to the general Cat Creek Structure Trend.

Parcel MTM97300 - NW (T15N, R30E, Sec 17 SESW) is located 0.3 of a mile off the main Cat Creek Anticline Structure including West Dome Cat Creek, Mosby Dome Cat Creek and the East Dome Cat Creek. Outside of the general structure area, the potential for discovering and developing future oil production is low to moderate. No productive wells have been drilled in the SW of Sec. 17. This was given a low-moderate potential because four dry holes have been drilled in the SESW of Sec. 17 and because of its closer proximity to the general Cat Creek Structure Trend.

Parcel MTM97300 - NX (T15N-R30E Sec 28, Lot 9) is located 0.7 of a mile off the main Cat Creek Anticline Structure including West Dome Cat Creek, Mosby Dome Cat Creek and the East Dome Cat Creek. Outside of the general structure area, the potential for discovering and developing future oil production is low. This was given a low potential because no wells have been drilled in Section 28 and because of its location compared to the general Cat Creek Structure Trend.

MTM97300 - NZ (T15N, R30E, Section 34, Lot 13 & 14) is located 1.5 miles off the main Cat Creek Anticline Structure including West Dome Cat Creek, Mosby Dome Cat Creek and the East Dome Cat Creek. Outside of the general structure area, the potential for discovering and developing future oil production is low. No productive wells have been drilled in the Sec. 34. This was given a low potential because no productive wells have been drilled in Section 34 and because of its location compared to the general Cat Creek Structure Trend.

A number of wells were drilled deeper than the common productive Cat Creek Formation and the wells remained on structure. They did indicate hydrocarbons shows in the Rierdon, Amsden, Tyler, and Charles Formations. This does indicate there is some potential in deeper zones, however they mostly remained on structure, so the potential is limited regarding the four offered parcels.

4.2 Alternative A (No Action Alternative)

4.2.1 Direct Effects Common to All Resources, not including Economics

Under Alternative A, the four parcels would not be offered for competitive oil and gas lease sale. There would be no new impacts from oil and gas production on the parcel lands. Under this alternative, the state and private minerals could still be leased in surrounding areas

There would be no new impacts from oil and gas exploration or production activities on the federal lease parcel lands. No additional natural gas or crude oil would enter the public markets, and no royalties would accrue to the federal or state treasuries from the parcel lands. The No Action Alternative would result in the continuation of the current land and resource uses on the lease parcels.

Except for Economic resources, described below, no further analysis of the No Action Alternative is presented.

4.2.2 Economics

4.2.2.1 Direct and Indirect Effects:

Economic effects are summarized and displayed in comparative form in Tables 15 and 16. Under Alternative A, none of the nominated parcels would be leased. Consequently, no federal, state, or local revenues would be generated from leasing, rents, or royalties associated with production. No additional employment or income would be generated from the nominated parcels if none of the parcels are leased.

4.3 Alternative B (Proposed Action)

Under Alternative B, 4 parcels, 103.99 federal mineral acres (73.52 acres of federal surface and 30.47 acres of private surface), would be offered for competitive oil and gas lease sale.

4.3.1 Direct Effects Common to All Resources

The action of leasing the parcels in Alternative B would, in and of itself, have no direct impact on resources. Any potential effects on resources from the sale of leases would occur during lease exploration and development activities. At the time of this review it is unknown whether a particular lease parcel would be sold and a lease issued.

4.3.2 Indirect Effects Common to All Resources

Oil and gas exploration and development activities such as construction, drilling, production, infrastructure installation, vehicle traffic and reclamation are indirect effects from leasing the parcels in Alternative B. 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. The potential impacts from exploration and development activities would be analyzed after receipt of an APD or sundry notice.

Typical impacts to resources from oil and gas exploration and development activities such as well sites, roads, facilities, and associated infrastructure are described in the Fergus Management Framework Plan (approved January 1978), the Petroleum Management Framework Plan (approved November 1977), and the Lewistown District Oil & Gas Environmental Assessment of the BLM Leasing Program (approved September 1981)

4.3.3 Air Resources

4.3.3.1 Direct and Indirect Effects

4.3.3.1.1 Air Quality

The act of leasing the parcels itself would have no direct impacts on air quality. Any potential effects on air quality from activities on these lease parcels would occur at such time that the leases were developed.

Current monitoring data show that the criteria pollutants fall well below applicable air quality standards indicating very good air quality. The potential level of development and mitigation described below is expected to maintain this level of air quality by limiting emissions. In addition to the limited level of development, pollutants would be regulated through the use of state-issued air quality permits or air quality registration processes developed to maintain air quality below applicable standards.

Potential impacts of development could include increased airborne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHGs and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be precisely quantified at this time since it is not known for certain how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g., compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact would also vary according to the characteristics of the geologic formations from which production occurs and to scope of specific activities proposed in an APD.

4.3.3.1.2 Greenhouse Gas Emissions at the LFO and Project Scales

Sources of GHGs associated with development of lease parcels may include construction activities, operations, and facility maintenance in the course of oil and gas exploration, development, and production. Estimated GHG emissions are discussed for these specific aspects of oil and gas activity because the BLM has direct involvement in these steps. However, the current proposed activity is to offer parcels for lease. No specific development activities are currently proposed or potentially being decided upon for any parcels being considered in this EA. Potential development activities would be analyzed in a separate NEPA analysis effort if the BLM receives an APD on any of the parcels considered here.

Anticipated greenhouse gas emissions presented in this section are taken from the Climate Change Supplementary Report for Montana, North Dakota, and South Dakota (Climate Change SIR 2010). Data are derived from emissions calculators developed by air quality specialists at the BLM National Operations Center in Denver, Colorado, based on methods described in the Climate Change SIR (2010). Based on the assumptions summarized above for the Lewistown

FO RFD, Table 7 discloses projected annual greenhouse gas source emissions from BLM-permitted activities associated with the RFD.

Table 7. BLM RFD projected annual emissions of greenhouse gases associated with oil and gas exploration and development activity in the Lewistown FO RFD.

Source	BLM Projected Greenhouse Gas Emissions in tons/year from Lewistown FO RFD			Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Conventional Natural Gas	593.9	2.1	0.0	580.9
Coal Bed Natural Gas (none forecasted in RFD)	0.0	0.0	0.0	0.0
Oil	727.6	1.4	0.0	696.6
Total	1,321.5	3.5	0.0	1,277.5

Under Alternative A, there would be no greenhouse gas emissions resultant from this project because under this alternative no additional parcels would be leased, and the suspended lease parcel would remain under suspension and would be subject to cancellation.

To estimate potential GHG emissions associated with the Proposed Action (Alternative B), the following approach was used:

1. The proportion of each project level action alternative relative to the total RFD was calculated based on total acreage of parcels under consideration for leasing (and/or lifting of lease suspensions), relative to the total acreage of federal mineral acreage available for leasing in the RFD.
2. This ratio was then used as a multiplier with the total estimated GHG emissions for the entire RFD to estimate GHG emissions for that particular alternative.

Under the Proposed Action, approximately 104 acres of lease parcels with federal minerals would be leased. These acres constitute 0.0078 percent of the total federal mineral estate of approximately 1,329,799 acres identified in the Lewistown FO RFD. Therefore, based on the approach described above to estimate GHG emissions, 0.0078 percent of the Lewistown FO RFD total estimated BLM emissions of 1,277.5 metric tons/year would be approximately 0.1 metric tons/year of CO₂e if the parcels were to be developed.

4.3.3.1.3 Climate Change

The assessment of GHG emissions and climate change is in its formative phase. As summarized in the Climate Change SIR, climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty reliably simulating and attributing observed temperature changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (Climate Change SIR 2010).

It is currently not possible to know with certainty the net impacts from developing lease parcels on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made

at this level. It is therefore beyond the scope of existing science to relate a specific source of greenhouse gas emission or sequestration with the creation or mitigation of any specific climate-related environmental effects. Although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently impossible to determine what specific effect GHG emissions resulting from a particular activity might have on the environment. For additional information on environmental effects typically attributed to climate change, please refer to the cumulative effects discussion below.

While it is not possible to predict effects on climate change of potential GHG emissions discussed above in the event of lease parcel development for alternatives considered in this EA, the act of leasing does not produce any GHG emissions in and of itself. Releases of GHGs would occur at the exploration/development stage.

4.3.3.2 Mitigation

The BLM encourages industry to incorporate and implement BMPs to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Measures may also be required as COAs on permits by either the BLM or the applicable state air quality regulatory agency. The BLM also manages venting and flaring of gas from federal wells as described in the provisions of Notice to Lessees (NTL) 4A, Royalty or Compensation for Oil and Gas Lost.

Some of the following measures could be imposed at the development stage:

- flare or incinerate hydrocarbon gases at high temperatures to reduce emissions of incomplete combustion;
- install emission control equipment of a minimum 95 percent efficiency on all condensate storage batteries;
- install emission control equipment of a minimum 95 percent efficiency on dehydration units, pneumatic pumps, produced water tanks;
- vapor recovery systems where petroleum liquids are stored;
- tier II or greater, natural gas or electric drill rig engines;
- secondary controls on drill rig engines;
- no-bleed pneumatic controllers (most effective and cost effective technologies available for reducing volatile organic compounds (VOCs));
- gas or electric turbines rather than internal combustion engines for compressors;
- nitrogen oxides (NO_x) emission controls for all new and replaced internal combustion oil and gas field engines;
- water dirt and gravel roads during periods of high use and control speed limits to reduce fugitive dust emissions;
- interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.
- co-locate wells and production facilities to reduce new surface disturbance;
- directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores;
- gas-fired or electrified pump jack engines;
- install velocity tubing strings;

- cleaner technologies on completion activities (i.e. green completions), and other ancillary sources;
- centralized tank batteries and multi-phase gathering systems to reduce truck traffic;
- forward looking infrared (FLIR) technology to detect fugitive emissions; and
- air monitoring for NOx and ozone (O₃).

More specific to reducing GHG emissions, Section 6 of the Climate Change SIR identifies and describes in detail commonly used technologies to reduce methane emissions from natural gas, coal bed natural gas, and oil production operations. Technologies discussed in the Climate Change SIR and as summarized below in Table 8 (reproduced from Table 6-2 in Climate Change SIR), display common methane emission technologies reported under the USEPA Natural Gas STAR Program and associated emission reduction, cost, maintenance and payback data.

Table 8. Selected Methane Emission Reductions Reported Under the USEPA Natural Gas STAR Program ¹

Source Type / Technology	Annual Methane Emission Reduction ¹ (Mcf/yr)	Capital Cost Including Installation (\$)	Annual Operating and Maintenance Cost (\$)	Payback (Years or Months)	Payback Gas Price Basis (\$/Mcf)
Wells					
Reduced emission (green) completion	7,000 ²	\$1K – \$10K	>\$1,000	1 – 3 yr	\$3
Plunger lift systems	630	\$2.6K – \$10K	NR	2 – 14 mo	\$7
Gas well smart automation system	1,000	\$1.2K	\$0.1K – \$1K	1 – 3 yr	\$3
Gas well foaming	2,520	>\$10K	\$0.1K – \$1K	3 – 10 yr	NR
Tanks					
Vapor recovery units on crude oil tanks	4,900 – 96,000	\$35K – \$104K	\$7K – \$17K	3 – 19 mo	\$7
Consolidate crude oil production and water storage tanks	4,200	>\$10K	<\$0.1K	1 – 3 yr	NR
Glycol Dehydrators					
Flash tank separators	237 – 10,643	\$5K – \$9.8K	Negligible	4 – 51 mo	\$7
Reducing glycol circulation rate	394 – 39,420	Negligible	Negligible	Immediate	\$7
Zero-emission dehydrators	31,400	>\$10K	>\$1K	0 – 1 yr	NR
Pneumatic Devices and Controls					
Replace high-bleed devices with low-bleed devices					
End-of-life replacement	50 – 200	\$0.2K – \$0.3K	Negligible	3 – 8 mo	\$7
Early replacement	260	\$1.9K	Negligible	13 mo	\$7
Retrofit	230	\$0.7K	Negligible	6 mo	\$7
Maintenance	45 – 260	Negl. to \$0.5K	Negligible	0 – 4 mo	\$7
Convert to instrument air	20,000 (per facility)	\$60K	Negligible	6 mo	\$7
Convert to mechanical control systems	500	<\$1K	<\$0.1K	0 – 1 yr	NR

Table 8. Selected Methane Emission Reductions Reported Under the USEPA Natural Gas STAR Program ¹

Source Type / Technology	Annual Methane Emission Reduction ¹ (Mcf/yr)	Capital Cost Including Installation (\$)	Annual Operating and Maintenance Cost (\$)	Payback (Years or Months)	Payback Gas Price Basis (\$/Mcf)
Valves					
Test and repair pressure safety valves	170	NR	\$0.1K – \$1K	3 – 10 yr	NR
Inspect and repair compressor station blowdown valves	2,000	<\$1K	\$0.1K – \$1K	0 – 1 yr	NR
Compressors					
Install electric compressors	40 – 16,000	>\$10K	>\$1K	>10 yr	NR
Replace centrifugal compressor wet seals with dry seals	45,120	\$324K	Negligible	10 mo	\$7
Flare Installation	2,000	>\$10K	>\$1K	None	NR

Source: Multiple USEPA Natural Gas STAR Program documents. Individual documents are referenced in Climate Change SIR (2010).

¹ Unless otherwise noted, emission reductions are given on a per-device basis (e.g., per well, per dehydrator, per valve, etc).

² Emission reduction is per completion, rather than per year.

K = 1,000

mo = months

Mcf = thousand cubic feet of methane

NR = not reported

yr = year

In the context of the oil sector, additional mitigation measures to reduce GHG emissions include methane reinjection and CO₂ injection. These measures are discussed in more detail in Section 6.0 of the Climate Change SIR (2010).

In an effort to disclose potential future GHG emissions reductions that might be feasible in individual field offices, the BLM estimated GHG emissions reductions based on the RFD for the Miles City Field Office (MCFO). For analysis purposes, the MCFO RFD was selected based on the high potential development scenario. Similar emissions reductions may be possible in other Montana, North Dakota and South Dakota Field Offices. For emissions sources subject to BLM (federal) jurisdiction, the estimated emissions reduction represent approximately 51 percent reduction in total GHG emissions compared to the estimated MCFO federal GHG emissions inventory (Climate Change SIR, as updated October 2010, Section 6.5 and Table 6-3). The emissions reductions technologies and practices are identified as mitigation measures that could be imposed during development. (Note: except for the light-duty vehicle GHG emission standards, no federal or state regulations mandate these GHG emissions reductions).

4.3.4 Soil Resources

4.3.4.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on soil resources. Any potential effects from the sale of leases could occur at the time the leases are developed.

Construction and operation of well pads, access roads, pipelines, powerlines, reserve pits, and other facilities would result in the exposure of mineral soil, soil compaction and rutting, mixing of soil horizons, loss of soil productivity, and increased susceptibility to wind and water erosion. The likelihood and magnitude of these occurrences is dependent upon local site characteristics,

climatic events, and the specific mitigation applied. Effects would be both short-term (well pads and pipelines) and long-term (production areas and access roads). Areas needed for production, access roads, and facilities would require a long-term commitment of the soil resource. These sites remain non-productive and continue to be at risk of erosion and compacted until abandonment and final reclamation.

Generally sites would be revegetated and erosion would return to natural rates within 5 years. Exceptions would be sites poorly suited to reclamation. These areas, once disturbed, are the most difficult and costly to stabilize and reclaim. Production water, when spilled, could contaminate soils and vegetation (depending on properties of the water). This would affect reclamation by altering chemical characteristics of the soils (high electrical conductivity, exchangeable sodium percentage, sodium adsorption ratio, pH, etc.). Potential site-specific effects would be addressed in more detail at the APD stage.

Lease parcels/development would be subject to stipulations that protect soils on slopes over 30 percent, erodible soil on slopes over 20 percent, slumping soils, and/or wet soils. Table 9 shows the approximate acres of soils on slopes over 30 percent and erodible soils on slopes over 20 percent for each lease parcel.

Table 9. Approximate acres of soils on slopes over 30 percent and erodible soils on slopes >20 percent for each Lease Parcel. (Source: USDA-NRCS SSURGO dataset (USDA-NRCS, 2010)).

Parcel #	>30% slope Acres ¹	Erodible soils on slopes >20%	
		Acres ^{2,3}	Percent of Lease Parcel
MTM97300-NV	0	5	100
MTM97300-NW	0	40	100
MTM97300-NX	0	23	77
MTM97300-NZ	0	8	40

1. Approximate acres calculated from MU RV slope where RV slope is >30%. Approximate acres based on GIS calculations. Slopes >30% would be included in the erodible soils on slopes >20% acreage figures.
2. Approximate acres calculated from MU RV slope and Water Erosion Hazard where RV slope > 20% and Water Erosion Hazard is severe. Approximate acres based on GIS calculations.
3. For analysis purposes, if a Soil Map Unit (SMU) has a RV slope >20% and severe Water Erosion Hazard rating then the entire SMU acreage is included. However, there may be areas within the SMU that could have slope values less than 20% and a less than severe Water Erosion Hazard rating. For example, SMU 64 has a RV slope of 33% but the SMU has a slope range from 6 to 60%..

4.3.4.2 Mitigation

Measures would be taken to reduce, avoid, or minimize potential impacts to soil resources from exploration and development activities. Prior to authorization, proposed actions would be evaluated on a case-by-case basis and would be subject to mitigation measures in order to maintain the soil system. Mitigation would include avoiding areas poorly suited to reclamation, limiting the total area of disturbance, rapid reclamation, erosion/sediment control, soil salvage, decompaction, revegetation, weed control, slope stabilization, surface roughening, and fencing. Conducting oil and gas development with BMPs would enhance soil resilience or reduce soil system fragmentation, accelerated wind and water erosion.

4.3.5 Water Resources

4.3.5.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on water resources. Any potential effects on water resources from sale of lease parcels would occur at the time the leases are developed.

The magnitude of the impacts to water resources would be dependent on the specific activity, season, proximity to waterbodies, location in the watershed, upland and riparian vegetation condition, effectiveness of mitigation, and the time until reclamation success. Surface disturbance effects typically are localized, short-term, and occur from implementation through vegetation reestablishment. As acres of surface-disturbance increase within a watershed, so could the effects on water resources.

Lease parcels/development would be subject to stipulations that protect within 500' or the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams and 1,000' or the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies. Table 11 shows the approximate acres within these special areas of each lease parcel. The standard stipulations protecting these special areas would preclude occupancy of parcel MTM97300-NV.

Table 10. Approximate acres within streamside special areas for each lease parcel.

Lease Parcel	Waterbody	Buffer Distance	Acres	Percent of Lease Parcel
MTM97300-NV	Musselshell River	1,000'	5.41	100
MTM97300-NZ	Musselshell River	1,000'	25	89
MTM97300-NX	Cat Creek	500'	15.9	52
MTM97300-NW	Unnamed	500'	32.7	82

Oil and gas exploration and development of a lease parcel could cause the removal of vegetation, soil compaction, and soil disturbance in uplands within the watershed, 100-year floodplains of non-major streams, and non-riparian, ephemeral waterbodies. The potential effects from these activities could be accelerated erosion, increased overland flow, decreased infiltration, increased water temperature, channelization, and water quality degradation associated with increased sedimentation, turbidity, nutrients, metals, and other pollutants. Erosion potential can be further increased in the long term by soil compaction and low permeability surfacing (e.g. roads and well pads) which increases the energy and amount of overland flow and decreases infiltration, which in turn changes flow characteristics, reduces groundwater recharge, and increases sedimentation and erosion (DEQ 2007).

Spills or produced fluids could potentially impact surface and ground water resources in the long term. Oil and gas exploration/development could contaminate aquifers with salts, drilling fluids, fluids and gases from other formations, detergents, solvents, hydrocarbons, metals, and nutrients; change vertical and horizontal aquifer permeability; and increase hydrologic communication with adjacent aquifers (EPA 2004). Groundwater removal could result in a depletion of flow in nearby streams and springs if the aquifer is hydraulically connected to such features.

4.3.5.2 Mitigation

Stipulations addressing steep slopes, waterbodies, streams, 100-year floodplains of major rivers, riparian areas, and wetlands would minimize potential impacts and would be included with the lease when necessary (refer to Appendix A). In the event of exploration or development, measures would be taken to reduce, avoid, or minimize potential impacts to water resources including application of appropriate mitigation. Mitigation measures that minimize the total area of disturbance, control wind and water erosion, reduce soil compaction, maintain vegetative

cover, control nonnative species, and expedite rapid reclamation (including interim reclamation) would maintain water resources.

Methods to reduce erosion and sedimentation could include: reducing surface disturbance acres; installing and maintaining adequate erosion control; proper road design, road surfacing, and culvert design; road/infrastructure maintenance; use of low water crossings; and use of isolated or bore crossing methods for waterbodies and floodplains. In addition, applying mitigation to maintain adequate, undisturbed, vegetated buffer zones around waterbodies and floodplains could reduce sedimentation and maintain water quality. Appropriate well completion, the use of Spill Prevention Plans, and Underground Injection Control regulations would mitigate groundwater impacts. Site-specific mitigation and reclamation measures would be described in the COAs. Given the fore mentioned mitigation measures, no adverse impacts to water quality are expected. Riparian-wetland conditions may be affected but not below proper functioning condition (PFC), which is the minimum standard required for all uses of public lands.

4.3.6 Vegetation Resources

4.3.6.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on vegetation resources. Any potential effects on vegetation resources from sale of lease parcels could occur at the time the leases are developed.

Impacts to vegetation would depend on the vegetation type/community, soil community and the topography of the lease parcels. Disturbance to vegetation is of concern because protection of soil resources, maintenance of water quality, conservation of wildlife habitat, and livestock production capabilities may be diminished or lost over the long-term through direct loss of vegetation (including direct loss of both plant communities and specific plant species).

Other direct impacts, such as invasive species and noxious weed invasion could result in loss of desirable vegetation. Invasive species and noxious weeds may also reduce livestock grazing forage, wildlife habitat quality, and native species diversity. Cheatgrass is an invasive species well known for completely replacing native vegetation and changing fire regimes.

Additionally, surface disturbing activities directly affect vegetation by destroying habitat, churning soils, impacting biological crusts, disrupting seedbanks, burying individual plants, and generating sites for competitive non-native plants including weedy species. In addition, other vegetation impacts could also be caused from soil erosion and result in loss of the supporting substrate for plants, or from soil compaction resulting in reduced germination rates. Impacts to plants occurring after seed germination but prior to seed set could be particularly harmful as both current and future generations would be affected.

Fugitive dust generated by construction activities and travel along dirt roads can affect nearby plants by depressing photosynthesis, disrupting pollination, and reducing reproductive success. Oil, fuel, wastewater or other chemical spills could contaminate soils as to render them temporarily unsuitable for plant growth until cleanup measures were fully implemented. If cleanup measures were less successful, longer term vegetation damage could be expected.

Oil and gas development activity would reduce BLM's ability to manage livestock grazing while meeting or progressing towards meeting the Standards of Rangeland Health. Development and associated disturbances, could reduce available forage or alter livestock distribution leading to overgrazing or other localized excess grazing impacts. Construction of roads, especially in areas of rough topography could cause significant changes in livestock movement and fragment suitable habitat for some plant communities.

If development activity is reducing vegetative resources for livestock grazing and the grazing activity is resulting in the allotment not meeting the standards for rangeland health, then the authorized officer would have to take action prior to the next grazing season to ensure the BLM lands are progressing towards meeting the standards. This could result in the change of livestock grazing activities in order to improve vegetative conditions.

4.3.6.2 Mitigation

Mitigation would be addressed at the site specific APD stage of exploration and development. If needed, COAs would potentially include revegetation with desirable plant species, soil enhancement practices, direct live haul of soil material for seed bank revegetation, reduction of livestock grazing, fencing of reclaimed areas, and the use of seeding strategies consisting of native grasses, forbs, and shrubs.

4.3.7 Riparian-Wetland Habitats

4.3.7.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on riparian-wetland habitats. Any potential effects on riparian-wetland habitats from sale of lease parcels would occur at the time the leases are developed.

The exploration and development of oil and gas within uplands or adjacent to riparian-wetland areas could reduce riparian/wetland functionality by changing native plant productivity, composition, richness, and diversity; accelerating erosion; increasing sedimentation; and changing hydrologic characteristics. Impacts that reduce the functioning condition of riparian and wetland areas could impair the ability of riparian/wetland areas to reduce nonpoint source pollution (MDEQ 2007) and provide other ecosystem benefits. The magnitude of these effects would be dependent on the specific activity, season, proximity to riparian-wetland areas, location in the watershed, upland and riparian-wetland vegetation condition, mitigation applied, and the time until reclamation success. Erosion increases typically are localized, short term, and occur from implementation through vegetation reestablishment. As acres of surface-disturbance increase within a watershed, so would the effects on riparian-wetland resources.

4.3.7.2 Mitigation

Stipulations addressing steep slopes, waterbodies, streams, 100-year floodplains of major rivers, riparian areas, and wetlands would minimize potential impacts and would be included with the lease when necessary (refer to Appendix A). In the event of exploration or development, site-specific mitigation measures would be identified which would avoid or minimize potential impacts to riparian-wetland areas at the APD stage. Mitigation measures that minimize the total area of disturbance, control wind and water erosion, reduce soil compaction, maintain vegetative cover, control nonnative species, maintain biodiversity, maintain vegetated buffer zones, and

expedite rapid reclamation (including interim reclamation) would maintain riparian/wetland resources.

4.3.8 Wildlife

4.3.8.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on wildlife. Any potential effects from the sale of lease parcels could occur at the time the leases are developed.

The use of standard lease terms and stipulations on these lands (Appendix A) would minimize, but not preclude impacts to wildlife. Oil and gas development which results in surface disturbance could directly and indirectly impact aquatic and terrestrial wildlife species. These impacts could include loss or reduction in suitability of habitat, improved habitat for undesirable (non-native) competitors, species or community shift to species or communities more tolerant of disturbances, nest abandonment, mortalities resulting from collisions with vehicles and power lines, electrocutions from power lines, barriers to species migration, habitat fragmentation, increased predation, habitat avoidance, and displacement of wildlife species resulting from human presence. The scale, location, and pace of development, combined with implementation of mitigation measures and the specific tolerance of the species to human disturbance all influence the severity of impacts to wildlife species and habitats, including threatened, endangered, candidate, proposed, and other special status species.

4.3.8.1.1 Threatened, Endangered Proposed, and Candidate Species

The evaluation of habitat based upon occurrence data and field site visits determined the parcels do not contain habitat for threatened, endangered or proposed species (Appendix C); therefore there is no effect to threatened, endangered or proposed species. There is approximately 10 acres of greater-sage grouse habitat within the analysis area, which is a candidate species.

Sage grouse habitat is present in parcels MTM 97300-NZ and NX in limited amounts along the fringe of much larger contiguous habitat. Use would likely shift and decline with development (Taylor et al. 2010; Doherty et al. 2010), but due to having available habitat at a large scale next to the analysis area population impacts are not expected to occur if development occurs.

4.3.8.1.2 Other Special Status Species

Bald eagles, Golden eagles, Ferruginous and Swainson's hawk

Parcels NV and NZ contain mature cottonwood stands that could be used for eagle and Swainson's hawk nesting. Standard stipulations would preclude surface occupancy in these potential nesting areas. Parcels NW and NX contain potential nesting habitat for Ferruginous hawks. Potential foraging habitat covers most non-forested portions of the state and development would not impact use of the area. Other impacts could include raptors' use of buildings for perches. Raptors that may utilize these perches include bald eagles (*Haliaeetus leucocephalus*), golden eagles (*Aquila chrysaetos*), Swainson's hawk, and ferruginous hawk. This may result in increased predation on small mammals and birds since this will provide a perch for raptors in an area that previously did not provide perches. Potential site-specific effects would be addressed in more detail at the APD stage.

Bats

No known roosts occur in the vicinity of the proposed lease parcels. The highest potential for use occurs at standing water bodies located in the parcels. Standard stipulations would preclude surface occupancy proximate to water in all proposed parcels. Potential site-specific effects would be addressed in more detail at the APD stage.

Amphibians

Northern leopard frogs, Great Plains toads and Plains spadefoot all have potential breeding habitat within the proposed lease parcels. Standard stipulations would preclude surface occupancy proximate to water in all proposed parcels. Additional potential site-specific effects would be addressed in more detail at the APD stage.

Reptiles

Greater short-horned lizards are likely to occur at all lease parcels. Little is known about milk snakes and western hog-nosed snakes in Montana, with only a handful of observations. Minimizing ground disturbance associated with development would minimize potential impacts. Standard stipulations would preclude surface occupancy proximate to water in all proposed parcels. Additional potential site-specific effects would be addressed in more detail at the APD stage would mitigate potential impacts.

Sagebrush Associates

Dense sagebrush habitat only occurs in parcels NX and NZ. Brewer's sparrow and sage thrasher could occur in these areas and development would cause additional fragmentation and direct habitat loss. Sagebrush habitats are limited within these parcel and comprise less than 10 acres. Additional potential site-specific effects would be addressed in more detail at the APD stage and would reduce potential impacts.

Migratory Birds

The highest quality bird habitat includes the cottonwood stands adjacent to the Musselshell River. These important areas are used by primary and secondary cavity nesters, as well as all other life stages. Standard stipulations would preclude surface occupancy within these cottonwood stands. The proposed action would be in conformance with the MBTA. Effects to migratory birds from oil and gas development could include direct loss of habitat from roads, well pads and other infrastructure, disturbance, powerline strikes and accidental direct mortality, fragmentation of habitat, change in use of habitats, and potential threats and competition from edge species.

Impacts to BLM sensitive species would be similar to those described above, unless they are afforded protective measures from other regulations such as the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703) or the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c). BLM does not consult with the USFWS on "sensitive" species and likewise would not receive terms and conditions from USFWS requiring additional protections of those species.

Numerous species of birds were identified as inhabitants across the analysis area. With the impacts associated with development, it is reasonable to assume there would be impacts to nesting and migrating bird species. The primary impacts to these species would include

disturbance of preferred nesting habitats, improved habitat for undesirable competitors and/or a species shift to disturbance associated species, and increased vehicle collisions. Research in Sublette County, Wyoming on the effects of natural gas development on sagebrush steppe passerines documented negative impacts to sagebrush obligates such as Brewer's sparrows, sage sparrows, and sage thrashers. (Ingelfinger, 2001) The impacts were reported greatest along roads where traffic volumes are high and within 100 meters of these roads. Sagebrush obligates were reduced within these areas by as much as 60%. Sagebrush obligate density was reduced by 50% within 100 meters of a road even when traffic volumes were less than 12 vehicles /day. It would be expected that similar population declines would occur to this guild of species from similar development proposals within sagebrush habitats.

Stipulations do not exist specifically for the protection of BLM sensitive songbirds. The MBTA prohibits the take, capture or kill of any migratory bird, any part, nest or eggs of any such bird (16 U.S.C 703 (a)). NEPA analysis pursuant to Executive Order 13186 (January 2001) requires BLM to ensure that MBTA compliance and the effects of Bureau actions and agency plans on migratory birds are evaluated, should reduce take of migratory birds and contribute to their conservation.

Effects to migratory birds from oil and gas development at the APD stage could include direct loss of habitat from roads, well pads and other infrastructure, disturbance, powerline strikes and accidental direct mortality, fragmentation of habitat, change in use of habitats, and potential threats and competition from edge species. Field surveys for nesting birds at proposed development sites would be conducted for activities planned between May 1 and August 30. Mitigation measures would be assigned at the APD stage to ensure there would be no measurable negative effect on migratory bird populations, in compliance with Executive Order 13186 and MBTA. These mitigation measures would be required as Conditions of Approval. An NSO stipulation for oil and gas surface disturbing activities in riparian and wetland areas would prohibit any potential oil and gas development in those habitats unless approval was granted through the "Waivers, Exceptions, and Modifications" (WEM) process. BLM would coordinate WEMs with USFWS to assure MBTA compliance.

All raptor species known to exist within the analysis area are considered migratory under MBTA. There are no known raptor nests within any proposed leases.

Take of bald and golden eagles and any other migratory raptors is not anticipated through this action; however, take may occur indirectly as a result of vehicle collisions and other related actions associated with development. Field surveys for raptors at proposed development sites would be conducted. Mitigation measures would be assigned at the APD stage to ensure there would be no measurable negative effect on raptor populations, including bald and golden eagles. These mitigation measures would be required as Conditions of Approval. The application of stipulations and COA's at the project level is expected to comply with MBTA and BGEPA

Sauger

Sauger could occur in the Musselshell River. Standard stipulations would preclude surface occupancy proximate to water in all proposed parcels. Additional potential site-specific effects would be addressed in more detail at the APD stage.

4.3.8.1.3 Other Fish and Wildlife

The types and extent of impacts to other wildlife species and habitats from development are similar to those described above for other species. Based on the RFD scenarios, direct habitat loss is possible. Initial disturbance could change the occupation of those areas to disturbance-oriented species (e.g., horned larks), or species with more tolerance for disturbances. These changes could also be expected to decrease the diversity of wildlife. Although bladed corridors would be reclaimed after the facilities are constructed, some changes in vegetation could occur along the reclaimed areas. The goal of reclamation is to restore disturbed areas to pre-disturbed conditions. The outcome of reclamation, unlike site restoration, will therefore not always mimic pre-disturbance conditions and offer the same habitat values to wildlife species. Sagebrush obligates, including some species of songbirds and sage grouse, could be most affected by this change.

It is anticipated that some development could occur adjacent to existing disturbances of some type. Depending on proximity and species tolerance, wildlife species within these areas could either have acclimated to the surrounding conditions, previously been displaced by construction activities, or could be caused to be displaced to other areas with or without preferred habitat.

Potential impacts to aquatic wildlife from development could include: overland oil spills, underground spills from activities associated with horizontal drilling or other practices, spills from drilling mud or other extraction and processing chemicals, and surface disturbance activities that create a localized erosion zone. Oil spills and other pollutants from the oil extraction process could harm the aquatic wildlife species in two different ways if the spill substances enter the habitat. First, toxicological impacts from direct contact could have immediate lethal effects to eggs, larvae, juveniles, and adults. Second, toxic effects to lower food web levels (e.g. aquatic macro-invertebrates) could indirectly affect fish, amphibian, and reptile species by degrading water quality and degrading or eliminating food resources.

Additional mitigation could occur as COAs at the APD stage. These conditions could include the placement of earthen berms and oil skimmers (in ephemeral drainages where fish passage will not be blocked) to help protect aquatic wildlife habitat in case of oil spills.

4.3.8.2 Mitigation

Measures would be taken to prevent, minimize, or mitigate impacts to fish and wildlife animal species from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could include rapid revegetation, project relocation, or pre-disturbance wildlife species surveying.

4.3.9 Special Status Plant Species

4.3.9.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on special status plant species. Any potential effects from the sale of leases would occur at the time the leases are developed.

4.3.9.2 Mitigation

Stipulations applied to wildlife resources, steep slopes, waterbodies, streams, 100-year floodplains of major rivers, riparian areas, and wetlands would likely also provide protections for special status plant species. Proposed development would be analyzed on a site-specific basis prior to approval of oil and gas exploration or development activities at the APD stage. Mitigation would also be addressed at the site-specific APD stage. Surveys to determine the existence of federally listed species could occur on BLM-administered surface or minerals prior to approval of exploration and development activities at the APD stage.

4.3.10 Cultural Resources

4.3.10.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on cultural resources. It is only when the lease is developed that there is a potential for cultural resources to be affected by the proposed action. That is when the drilling location is known and cultural resource investigations can be centered on that location and other related developments such as roads, transmission lines, and pipelines.

Direct and Indirect impacts are not anticipated from leasing nominated parcels. It is at the APD stage of development that specific impacts can be correctly assessed. Potential impacts to cultural resources at the APD stage include damage to archaeological sites through construction activities and the possibility of removal of, or damage to, archaeological materials by increased human activity in the area. Conversely, cultural resource investigations associated with development potentially adds to our understanding of the prehistory and history of the area under investigation.

Based on existing information there are no recorded cultural resource sites located on the nominated parcels. Two parcels contain cultural resources that have been noted but not evaluated for National Register eligibility. Based on the geography (Musselshell River/Breaks) and the sites that have been documented in Petroleum County, historic and prehistoric resources could be expected on most of the parcels.

4.3.10.2 Mitigation

Each nominated lease parcel would have the standard lease notice attached and the special cultural resource stipulation as written in IM 2005-030. Refer to Appendix A of this document for pertinent parcel-specific lease stips as needed.

Specific mitigation measures, including, but not limited to possible site avoidance or excavation and data recovery would be determined when site specific development proposals are received. If a conflict were to exist between the proposed action and the presence of cultural resources, mitigation measures would be factored into the project's design. Such measures could include complete documentation of the site to exhaust its information potential, evaluating the site and making a determination that the site is not eligible for inclusion on the National Register of Historic Places, avoiding the site through project redesign or implementing protective measures to prevent impacts to the characteristics of the site that make the site eligible.

4.3.11 Native American Religious Concerns

4.3.11.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on Native American religious concerns. Any potential effects from the sale of leases would occur at the time the leases are developed.

Leasing would not have an impact on TCPs and/or areas of religious or cultural importance to tribes. A lease sale would not interfere with the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act (AIRFA) or EO 13007. It would not prevent tribes from visiting sacred sites or prevent possession of sacred objects. Indirect effects from site specific development proposals could have an impact to Native American religious practices and TCPs.

4.3.12 Paleontology

4.3.12.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on paleontological resources. Any potential effects from the sale of leases would occur at the time the leases are developed.

The surface disturbances associated with oil and gas exploration and development activities could have indirect effects to paleontological resources primarily in areas classified as Potential Fossil Yield Classification (PFYC) 4 or 5 areas. Surface-disturbing activities could potentially alter the characteristics of paleontological resources through damage, fossil destruction, or disturbance of the stratigraphic context in which paleontological resources are located, resulting in the loss of important scientific data. However, in most surface-disturbing situations, paleontological resources would be avoided by project redesign or relocation before project approval which would negate the need for the implementation of mitigation measures.

Conversely, surface-disturbing activities can also potentially lead to the discovery of paleontological localities that would otherwise remain undiscovered due to burial or omission during review inventories. The scientific study to retrieve and interpret important paleontological resource information provides a better understanding of the nature and distribution of those resources. The retrieval and interpretation of information is most successful and meaningful when a site is left intact.

Once a parcel is leased, the application of standard lease terms (movement of activities by 200 meters or delay of up to 60 days) would protect vulnerable significant paleontological resource values on these lease parcels. In most instances this may be sufficient to provide the necessary protection to paleontological values. However, the application of standard lease terms may not always adequately protect paleontological values. In order to protect paleontological values, paleontological resources management relies on the application of Lease Notice MT-14-12, applied at the leasing phase to provide protection to paleontological resources or at least notification to the lessee that potentially significant paleontological resources are or are likely to be present on the lease parcels should the lease parcel fall within one of the designated PFYC Class 4 or 5 significant geologic formations which have a record of producing significant fossils.

The paleontological lease notice would be applied to those lease parcels that fall within the PFYC 4 or 5 areas, requiring a field survey prior to surface disturbance. Paleontological resource surveys conducted prior to surface-disturbing activities could locate additional paleontological resources and would result in a better understanding of the nature and distribution of those resources.

4.3.12.2 Mitigation

The use of standard lease terms, ~~the NSO stipulation~~ and the lease notice protect paleontological resource values on these lease parcels (refer to Appendix A). The application of these requirements at the leasing phase provides protection to paleontological values. The paleontological lease notice would be applied to those lease parcels that fall within the PFYC 4 or 5 areas, requiring a field survey prior to surface disturbance. These inventory requirements should result in the identification of paleontological resources and avoidance or mitigation of significant localities before permit approval and prior to surface disturbance. However, the application of standard lease terms only allows the relocation of activities up to 200 meters, unless documented in the NEPA document, and cannot result in moving the activity off lease.

Specific mitigation measures could include, but are not limited to, site avoidance or excavation. Avoidance of paleontological properties would be a best management practice. However, should a paleontological locality be unavoidable, significant properties would be mitigated prior to implementation of a project. These measures would be determined when site specific development proposals are received.

Based on the above analysis, in order to protect potential paleontological values the following Leases are recommended to have the Paleontological Lease Notice, (MT-14-12) applied per guidance identified in Instructional Memorandums 2009-011 and 2008-009. Leases recommended for paleontological lease notice are listed by county: Petroleum County MTM97300-NV, NW, NX, and NZ. See Appendix A for specific legal description.

4.3.13 Visual Resources

4.3.13.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on visual resources. Any potential effects from the sale of leases would occur at the time the leases are developed.

All of the lease parcels fall into VRM class III. While the act of leasing federal minerals produces no visual impacts, subsequent development (indirect effects) of a lease parcel would result in some level of modification to the existing landscape.

4.3.13.2 Mitigation

All new oil and gas development would implement, as appropriate for the site, BLM Best Management Practices for VRM, regardless of the VRM class. This includes, but would not be limited to, proper site selection, reduction of visibility, minimizing disturbance, selecting color(s)/color schemes that blend with the background and reclaiming areas that are not in active use. Repetition of form, line, color and texture when designing projects would reduce contrasts between landscape and development. Wherever practical, no new development would be allowed on ridges or mountain tops. Overall, the goal would be to not reduce the visual qualities or scenic value that currently exists.

4.3.14 Livestock Grazing

4.3.14.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on livestock grazing. Any potential effects from the sale of leases would occur at the time the leases are developed.

Oil and gas development could result in a loss of vegetation for livestock grazing (e.g., direct removal, introduction of unpalatable plant species, etc.), decrease the palatability of vegetation due to fugitive dust, disrupt livestock management practices, involve vehicle collisions, and decrease grazing capacity. Direct losses of forage could also result from construction of roads, well pads and associated infrastructure and would vary depending on the extent of development. These impacts could vary from short-term impacts to long-term impacts depending on the type of exploration or development, the success of reclamation, and the type of vegetation removed for the oil and gas activities.

4.3.14.2 Mitigation

Measures would be taken to prevent, minimize, or mitigate impacts to livestock grazing from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could potentially include controlling livestock movement by maintaining fence line integrity, fencing of facilities, revegetation of disturbed sites, and fugitive dust control.

4.3.15 Recreation and Travel Management

4.3.15.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on recreation and travel management. Any potential effects from the sale of leases would occur at the time the leases are developed.

Recreation impacts may exist where oil and gas development and recreational user conflicts may occur. In areas where a high level of oil and gas development is likely, there may be user conflicts between motorized recreationists (OHV activities), hunting, target shooting, camping, fishing, river use, picnicking, and winter activities such as snowmobiling and the oil and gas/industrial activities. The intensity of these impacts is moderate and could exist in both the short-term (exploration and construction phases of oil and gas development) and in the long-term (producing wells, maintenance of facilities, etc.). Recreationists would lose some beneficial outcomes such as the loss of importance sense of place, solitude and possible increase of stress.

Where there are other land use activities occurring, including oil and gas development, in areas frequented by recreationists, the public may perceive these areas as inaccessible or unavailable because of the facilities or recreationists may use lease roads to access areas for recreational activities.

As oil and gas development occurs, new routes are created which often attract recreationists seeking additional or new areas to explore for motorized recreational opportunities. Motorized recreational opportunities could be enhanced through the additional opportunities to explore; however, user conflicts and public safety issues could result from the use of the new travel routes. The creation of routes from oil and gas activities could lead to a proliferation of user-created motorized routes, resulting in adverse impacts to the scenic qualities of the area and increased level of surface disturbance.

For those areas with isolated tracks of BLM public lands that generally do not have existing public access, recreation opportunities that occur in these areas are limited to use with adjacent

land owner permission or hunting by an outfitter; therefore, oil and gas activities would have little or no impact on recreational experiences in this area.

Foreseeable changes in recreation use levels include demand for recreational use of public land to increase. Increases could be expected in, but not limited to, hunting, fishing, hiking, camping, wildlife viewing, and dispersed recreational uses. This could increase the incidence of conflict between recreationists involved in motorized activities and non-motorized activities.

4.3.15.2 Mitigation

Measures would be taken to minimize, avoid, or mitigate impacts to recreation from oil and gas exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation measures could potentially include, but are not limited to, reclamation of industrial routes/areas when no longer needed, fencing of facilities, and installing signs along roads.

4.3.16 Lands and Realty

4.3.16.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on lands and realty. Any potential effects from the sale of leases would occur at the time the leases are developed.

Facilities associated with oil and gas development could cause disturbance to the existing rights-of-way on private surface on one of the tracts (Parcel MTM-97300-NX). Additional rights-of-way could be required across federal surface for “off-lease” or third party facilities required for potential development of the parcel.

4.3.16.2 Mitigation

In the event of any exploration and development activities on the leased parcels, measures would need to be taken to avoid disturbance to or impacting the existing rights-of-way whether on federal or private surface. Any new “off-lease” or third party rights-of-way required across federal surface for future exploration and/or development of the parcels (97300-NV,NW,NX, and NZ) would be subject to stipulations to protect other resources as determined by environmental analyses which would be completed on a case-by-case basis.

4.3.17 Minerals

4.3.17.1 Fluid Minerals

4.3.17.1.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts on fluid minerals. Any potential effects from the sale of leases would occur at the time the leases are developed.

Issuing a lease provides opportunities to explore for and develop oil and gas. Additional natural gas or crude oil produced from any or all of the 4 parcels would enter the public markets. The production of oil and gas results in the irreversible and irretrievable loss of these resources. Royalties and taxes would accrue to the federal and state treasuries from the lease parcel lands. There would be a reduction in the known amount of oil and gas resources.

Stipulations applied to various areas with respect to occupancy, timing limitation, and control of surface use could affect oil and gas exploration and development, both on and off the federal parcel. Leases issued with major constraints (NSO stipulations) may decrease some lease values, increase operating costs, and require relocation of well sites, and modification of field development. Leases issued with moderate constraints (timing limitation and controlled surface Use (CSU) stipulations) may result in similar but reduced impacts, and delays in operations and uncertainty on the part of operators regarding restrictions.

Under Alternative B, all of the lease parcels would be offered for lease subject to major (NSO) or moderate (CSU) constraints and/or standard lease terms and conditions.

4.3.18.2 Solid Minerals

4.3.18.2.1 Direct and Indirect Effects

Leasing the parcels would have no direct impacts solid minerals. As described in Chapter 3, none of the parcels proposed to be leased for oil and gas in the analysis area conflict with currently active or existing claims, patents, permits or leases for all solid materials issued on federal lands within the analysis area.

4.3.19 Social and Economic Conditions

4.3.19.1 Social

4.3.19.1.1 Direct and Indirect Effects

The No Action alternative would result in the continuation of the current land and resource uses and would cause no social impacts. There would be no disproportionate effects to low income or minority populations under this alternative.

While the act of leasing Federal minerals itself would result in no social impact, subsequent exploration and development may generate impacts to people living near or using the area in the vicinity of the lease. Exploration, drilling or production could create an inconvenience to people living adjacent to leases due to increased traffic and traffic delays, and light, noise and visual impacts. This could be especially noticeable in rural areas where oil and gas development has not occurred previously. The amount of inconvenience would depend of the activity affected, traffic patterns within the area, noise and light levels, length of time and season these activities occur, etc.

There would be no disproportionate effects to low income or minority populations, from leasing. Consultation with potentially affected Tribes would occur at the APD stage.

4.3.19.2 Economics

4.3.19.2.1 Direct and Indirect Impacts

The basis for economic impacts is the number of acres leased, rents paid, and level of production by alternative. This is displayed in Table 11. The economic contribution to a local economy is measured by estimating the employment and labor income generated by 1) payments to counties associated with the leasing and rent of Federal minerals, 2) royalty payments associated with production of Federal oil and gas, and 3) economic activity generated from drilling and associated activities. Activities related to oil and gas leasing, exploration, development, and production form a basic industry that brings money into the state and region and creates jobs in

other sectors. Table 12 is a summary of local revenues, employment, income, population, and household impacts of each alternative.

Table 11 Summary of Anticipated Average Annual Oil and Gas Activity by Alternative

Activity	Alternative	
	A	B
<i>Additional acres that would be leased based on this EA</i>	0	104
Lease rental first 5 years (\$1.50/acre)	0	\$78
Lease rental second 5 years (\$2.00/acre)	0	\$104
Bonus bids (avg. \$12.54/acre)	0	\$41
Total annual Federal lease and rental revenue	0	\$223
Distribution to State/local government	0	\$93
Average annual oil production (bbl)	0	11
Average annual gas production (MCF)	0	44
Average annual Federal Oil Royalty (bblx\$91.76x0.125)	0	\$127
Average annual Federal gas Royalty (MCFx\$7.65x0.125)	0	\$42
Total average annual Federal O&G royalties	0	\$168
Average annual distribution to state/local government	0	\$70
Total average annual Federal revenues	0	\$392
Total average annual state/local revenues	0	\$163
Total average annual revenue distributed to counties	0	\$63
Average annual total local employment (jobs)	0	0
Average annual total local income (\$1,000)	0	\$0

Table 12. Summary Comparison of Estimated Average Annual Economic Impacts

Alternative	Acres Recommended for Lease	Local Revenue to Counties (\$)	Total Employment (full and part-time jobs)	Total Labor Income (\$1,000)	Change in Population Change	Change in Change in Number of Households
A	0	0	0	0	0	0
B	104	\$85,702	0	\$0	0	0

Economic effects are summarized and displayed in comparative form in Table 12 (Summary of Anticipated Average Annual Oil and Gas Activity by Alternative), Table 13 (Summary Comparison of Estimated Average Annual Economic Impacts), Table 15 (Summary Comparison of Cumulative Annual Economic Impacts by Alternative), and Table 16 (Summary Comparison of Cumulative Employment and Income by Major Industry by Alternative). With Alternative A none of the parcels considered would be leased. Consequently, no Federal, state, or local revenues would be generated from leasing, rents, or royalties associated with production. No employment or income would be generated if none of the parcels are leased.

4.3.20 Cumulative Impacts- Alternative B

Public Revenues:

Leasing an additional 104 acres of Federal minerals (Alternative B) would increase average annual oil and gas leasing and rent revenues to the Federal government by an estimated \$200

(Table 12). Average annual leasing and rent revenues that would be distributed to state/local governments would increase by about \$100. Estimated average annual Federal oil and gas royalties would increase by less than \$200 with Alternative B compared to current levels. Estimated average annual royalties distributed to the state/counties would increase by less than \$100 compared to current levels.

Total average annual Federal revenues related to leasing an additional 104 acres of Federal minerals and associated annual rent and royalty revenues related to average annual production of Federal minerals would amount to about \$400. Estimated total average annual revenues from leasing, rent, and royalties distributed to the state and counties would be less than \$200. Total estimated revenues distributed to the counties would be less than \$100.

Local Economic Contribution:

The estimated combined total average annual employment and income supported by Federal oil and gas leasing, distributions of royalties to local governments, drilling wells, and production would not change from current levels (IMPLAN, 2009). Nor would there be a change in population and number of households.

Conclusion:

Total Federal contribution of Alternative B (leasing an additional 104 acres of Federal minerals) and anticipated related exploration, development, and production of oil and gas would have little effect on local population, total local employment, number of households, average income per household, and total personal income. The economic effects would be spread unevenly among the counties. Leasing the additional 104 acres and anticipated exploration, development, and production under alternative B would provide very little additional funds for county functions such as enforcing laws, administering justice, collecting and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, keeping records, administering primary and secondary education and operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems. Demand for these services would change very little since the population and number of households would change little. Leasing the additional 104 acres and anticipated exploration, development, and production would not change local economic diversity (as indicated by the number of economic sectors), economic dependency (where one or a few industries dominate the economy), or economic stability (as indicated by seasonal unemployment, sporadic population changes and fluctuating income rates) across the entire 10-county area.

4.3.20.1 Past, Present and Reasonably Foreseeable Future Actions

Past, present, or reasonably foreseeable future actions that affect the same components of the environment as the Proposed Action are: grazing, roads, wildfire and prescribed fire, range improvement projects, and utility right-of-ways.

4.3.20.2 Cumulative Impacts by Resource

Cumulative effects for all resources in the Lewistown Field Office are described in the JVP RMP (USDI-BLM 1992). The Final JVP RMP discloses environmental consequences of a broad range of resource management activities, including the fluid minerals RFD scenario upon which assumptions in this EA are based (pages 157-242). While the JVP RMP did not make decisions for fluid minerals,

alternatives for fluid minerals management were described and analyzed in that EIS. The RFD scenario for fluid minerals developed for that planning effort was used to identify assumptions related to fluid minerals management described in this EA. Pages 226-242 of the RMP/EIS (1992) discussed cumulative effects of management activities considered in the RMP at the entire RMP planning area scale which includes the southern portion of Choteau County as well as Fergus, Judith Basin, Petroleum, Phillips, and Valley counties. This document is hereby incorporated by reference into this EA. Anticipated exploration and development activities associated with the lease parcels considered in this EA are within the range of assumptions used and effects described in this cumulative effects analysis for resources other than air, climate, and socio-economics resources. This previous analysis is hereby incorporated by reference for resources other than for air, climate, and socio-economics resources.

4.3.20.2.1 Greenhouse Gas Emissions and Cumulative Impacts on Air Quality/Climate Change

The cumulative effects analysis area is the Lewistown Field Office, with additional discussion at state-wide, national, and global scales for GHG emissions and climate change.

This section incorporates an analysis of the potential contributions to GHG emissions in the event that Alternative B lease parcels are ever developed, followed by a general discussion of potential impacts to climate change. Potential emissions relate to those derived from potential exploration and development of fluid minerals. Additional emissions beyond the control of the BLM, and outside the scope of this analysis, would also occur during any needed refining processes, as well as end uses of final products.

Projected GHG emissions for this project and the Lewistown RFD are compared below with recent, available inventory data at the state, national, and global scales. Greenhouse gas emissions inventories can vary greatly in their scope and comprehensiveness. State, national, and global inventories are not necessarily consistent in their methods or in the variety of GHG sources that are inventoried (Climate Change SIR, 2010). However, comparisons of emissions projected by the BLM for its oil and gas production activities are made with those from inventories at other scales to provide a context for the potential contributions of GHGs associated with this project.

As discussed in the Air Quality section of Chapter 4, total projected BLM GHG emissions from the RFD are 1,277.5 metric tons/year CO₂e. Potential emissions under Alternative B would be approximately 0.0078 percent of this total. Table 14 displays projected GHG emissions from non-BLM activities included in the Lewistown RFD. Total projected emissions of non-BLM activities in the RFD are 4,120.9 metric tons/year of CO₂e. When combined with projected annual BLM emissions, this totals 5,398.4 metric tons/year CO₂e. Potential GHG emissions under Alternative B would be 0.0018 percent of the estimated emissions for the entire RFD. Potential incremental emissions of GHGs from exploration and development of fluid minerals on parcels within Alternative B would be minor in the context of projected GHG contributions from the entire RFD for the Lewistown FO.

Table 13. Projected non-BLM GHG emissions associated with the Lewistown FO Reasonably Foreseeable Development Scenario for fluid mineral exploration and development.

Source	Non-BLM Projected Greenhouse Gas Emissions in tons/year for Lewistown FO RFD			Emissions (metric tons/yr)
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Conventional Natural Gas	939.3	6.2	0.0	973.2
Coal Bed Natural Gas (none forecasted in RFD)	0.0	0.0	0.0	0.0
Oil	3,116.0	12.6	0.3	3,147.7
Total	4,055.3	18.8	0.3	4,120.9

Montana’s Contribution to U.S. and Global Greenhouse Gases (GHGs)

Montana’s GHG inventory (<http://www.eia.doe.gov/oiaf/1605/archive/gg04rpt/emission.html>, Center for Climate Strategies 2007) shows that activities within the state contribute 0.6 percent of U.S and 0.076 percent of global GHG emissions (based on 2004 global GHG emission data from the IPCC, summarized in Climate Change SIR, 2010). Based on 2005 data in the state-wide inventory, the most pronounced source of Montana’s emissions is combustion of fossil fuels to generate electricity, which accounts for about 27 percent of Montana’s emissions. The next largest contributors are the agriculture and transportation sectors (each at approximately 22 percent) and fossil fuel production (13.6 percent).

Greenhouse emissions from all major sectors in Montana in 2005 added up to a total of approximately 36.8 million metric tons of CO₂e (Center for Climate Strategies (CCS) 2007). Potential emissions from development of lease parcels in Alternative B of this project represent approximately 0.000000027 percent of the state-wide total of GHG emissions based on the 2005 state-wide inventory (CCS 2007).

The EPA (USEPA 2010, as summarized in the Climate Change SIR 2010) published an inventory of U.S. GHG emissions, indicating gross U.S. emissions of 6,957 million metric tons, and net emissions of 6,016 million metric tons (when CO₂ sinks were considered) of CO₂e in 2008. Potential annual emissions under Alternative B of this project would amount to approximately 0.0000000017 percent of gross U.S. total emissions. Global GHG emissions for 2004 (IPCC 2007, summarized by the Climate Change SIR 2010) indicated approximately 49 gigatonnes (10⁹ metric tons) of CO₂e emitted. Potential annual emissions under Alternative B would amount to approximately 0.00000000002 percent of this global total.

As indicated above, although the effects of greenhouse gas emissions in the global aggregate are well-documented, it is currently not credibly possible to determine what specific effect GHG emissions resulting from a particular activity might have on climate or the environment. If exploration and development occur on the lease parcels considered under Alternative B, potential GHG emissions described above would incrementally contribute to the total volume of GHGs emitted to the atmosphere, and ultimately to climate change.

Mitigation measures identified in the Chapter 4 Air Quality section above may be in place at the APD stage to reduce GHG emissions from potential oil and gas development on lease parcels within Alternative B. This is likely because many operators working in Montana, South Dakota and North Dakota are currently USEPA Natural Gas STAR Program Partners and future

regulations may require GHG emission controls for a variety of industries, including the oil and gas industry (Climate Change SIR 2010).

4.3.20.2.2 Cumulative Impacts of Climate Change

As previously discussed in the Air Quality section of Chapter 4, it is difficult to impossible to identify specific impacts of climate change on specific resources within the project area. As summarized in the Climate Change SIR (2010), climate change impacts can be predicted with much more certainty over global or continental scales. Existing models have difficulty reliably simulating and attributing observed temperature changes at small scales. On smaller scales, natural climate variability is relatively larger, making it harder to distinguish changes expected due to external forcings (such as contributions from local activities to GHGs). Uncertainties in local forcings and feedbacks also make it difficult to estimate the contribution of GHG increases to observed small-scale temperature changes (IPCC 2007b, as cited in the Climate Change SIR 2010). Effects of climate change on resources are described in Chapter 3 of this EA and in the Climate Change SIR (2010).

4.3.20.2.3 Cumulative Impacts to Soils

In general, the aforementioned actions would have cumulative impacts on soil resources by causing surface disturbances contributing to soil compaction, erosion, and subsequent sedimentation. It is not expected that the surface disturbance associated with the proposed action and, past, present and future foreseeable actions would have consequential cumulative effects due to the implementation of stipulations, mitigation measures, BMPs, and adherence to standards and guidelines.

4.3.20.2.4 Cumulative Impacts to Visual Resources

Non-federal actions could have cumulative impacts on the scenic quality of the landscape with the development of more roads, structures and facilities.

4.3.20.2.5 Cumulative Impacts to Water Resources

The fore mentioned past, present, and reasonably foreseeable future actions have the potential to increase runoff and erosion, deliver sediment to streams, and destabilize streambanks. These consequences result in the potential cumulative effects of increased sediment loading, increased water temperature, decreased dissolved oxygen concentrations, and less bank storage of water among many other non-point source pollutants. The flow alterations and diversion on the Musselshell River have the potential to increase water temperatures, salinity, total dissolved solids concentrations, and decreases in water availability.

Although the Musselshell River is not listed as water quality impaired because of pollutant related sources and causes, development of the lease parcels has the potential to cumulatively affect the probable causes, which include alteration in stream-side covers and low flow alterations. For example, increased sedimentation and runoff can lead to channel widening and erosion that could lead to further stream-side alteration. However, the lease parcel stipulations, and implementation of BMPs in the Gold Book would preclude the likelihood of that occurring or being measurable. **With a 1000' buffer distance on the Musselshell River, potential oil or gas development would not be the cause for the alteration of streamside vegetation.** The lease stipulations that control or exclude use on sensitive, erosive soils or within the floodplains of

rivers and streams would prevent erosion from disturbed surfaces from reaching rivers and streams. Also, in the context of a watershed, the amount of surface disturbance would not change the runoff coefficient enough to create measurable increases in water yield that can cause channel erosion. Based upon the analysis in the direct and indirect effects sections, the effect of non-point source pollutants on water resources would be immeasurable. Therefore, if the direct and indirect effects are immeasurable, the cumulative effects as a result of the Proposed Action on water resources would be immeasurable.

4.3.20.2.6 Cumulative Impacts to Wildlife

Cumulative impacts are those impacts on the environment which result “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.” (40 CFR 1508.7). In this case, past and presently on-going actions and activities in the project vicinity include oil and gas development, fire, farming, livestock grazing, traffic, and any other form of human and natural disturbances.

Construction of roads, production well pads, and other facilities would result in long term (>5 years) loss of habitat and forage in the analysis area. This would be in addition to acres disturbed, or habitats fragmented from various other adjacent activities. As new development occurs, direct and indirect impacts would continue to stress wildlife populations, most likely displacing the larger, mobile animals into adjacent habitat, and increasing competition with existing local populations. Non-mobile animals would be affected by increased habitat fragmentation and interruptions to preferred nesting habitats.

Certain species are localized to some areas and rely on very key habitats during critical times of the year. Disturbance or human activities that would occur in winter range for big game, nesting and brood-rearing habitat for grouse and raptors could displace some or all of the species using a particular area or disrupt the normal life cycles of species. Wildlife and habitat in and around the project would be influenced to different degrees by various human activities. Some species and/or a few individuals from a species group may be able to adapt to these human influences over time.

With the addition of various forms of stipulations, mitigation, and terms and conditions applied during the development stage, the assessed resources of concern are not expected to approach conditions where additional stresses associated with the proposed action and, past, present and future foreseeable actions will have consequential cumulative effects.

4.3.20.2.7 Cumulative Impacts to Economic Conditions

Cumulative economic impacts associated with Alternative A would be similar to those described in the economic section of the Affected Environment. The cumulative effects of Federal mineral leasing, exploration, development and production within the local economy are summarized in Table 14 and Table 15. The cumulative demographic and economic characteristics of the local economy would not change if the parcels being considered are not leased.

Table 14 Summary Comparison of Cumulative Annual Economic Impacts by Alternative

Activity	Alternative	
	A	B
Existing Acres leased*	154,125	154,125
<i>Acres that would be leased based on this EA **</i>	0	104
Total acres leased	154,125	154,229
Acres held by production*	24,207	24,207
Total acres leased for which lease rents would be paid	129,918	130,022
Lease rental first 5 years (\$1.50/acre)	\$97,439	\$97,517
Lease rental second 5 years (\$2.00/acre)	\$129,918	\$130,022
Bonus bids (average \$3.99/acre)	\$51,837	\$51,879
Total average annual Federal lease and rental revenue	\$279,195	\$279,418
Average annual distribution to State/local government	\$116,033	\$116,126
Average annual oil production (bbl)***	16,352	16,363
Average annual gas production (MCF)***	64,566	64,610
Federal Oil Royalty (bblx\$91.79x0.125)	\$187,616	\$187,742
Federal gas Royalty (MCFx\$7.65x0.125)	\$61,741	\$61,783
Total Average annual Federal O&G royalties	\$249,357	\$249,525
Average annual distribution to State/local government	\$103,633	\$103,703
Total average annual Federal Revenues	\$528,552	\$528,943
Total average annual State/Local Revenues	\$219,666	\$219,829
Total average annual revenue distributed to counties	\$85,639	\$85,702

Table 15 Summary Comparison of Cumulative Employment and Income by Major Industry by Alternative

Industry	Total Jobs Contributed			Total Income Contributed (\$1000)		
	Alt. A	Alt. B		Alt. A	Alt. B	
Total Federal Contribution	15	15		\$814	\$814	
Percent Change from Current	0.0%	0.1%		0.0%	0.0%	

IMPLAN, 2009 database

The cumulative effects of Federal mineral leasing within the local economy as well as the specific effects of leasing an additional 104 acres under Alternative B are summarized in Tables 14 (Summary Comparison of Cumulative Annual Economic Impacts by Alternative) and 15 (Summary Comparison of Cumulative Employment and Income by Major Industry by Alternative). These tables also display, in comparative form, the cumulative effects of alternatives A. The total demographic and economic characteristics of the local economy would not change from current levels.

5.0 CONSULTATION AND COORDINATION:

5.1 Persons, Agencies, and Organizations Consulted

Coordination with MFWP and USFWS was conducted for the 11 lease parcels being reviewed. The BLM coordinated with MFWP and USFWS in the completion of this EA in order to prepare analysis, identify protective measures, and apply stipulations associated with these parcels being analyzed.

The BLM consults with Native Americans under Section 106 of the National Historic Preservation Act. The BLM sent letters (March 28, 2011) to tribes in Montana at the beginning of the 15 day scoping period informing them of the potential for the 11 parcels to be leased and inviting them to submit issues and concerns BLM should consider in the environmental analysis. Letters were sent to the Tribal Presidents and THPO or other cultural contacts for the Blackfeet Nation, Rocky Boy (Chippewa Cree), Confederated Salish Kootenai Tribe, Crow Tribe of Montana, Ft. Belknap Indian Community (Assiniboine, Gros Ventre), Ft. Peck Tribes (Sioux and Assiniboine) and Northern Cheyenne Tribe. The BLM will ~~sent~~ send a second letter to the tribes informing them about the 30 day public comment period for the EA and soliciting any information BLM should consider before making a decision whether to offer any or all of the 11 parcels for sale.

5.2 Summary of Public Participation

Scoping

Public scoping for this project was conducted through a 15-day scoping period advertised on the BLM Montana State Office website and posting on the field office website NEPA notification log. Scoping was initiated March 28, 2011; scoping comments were received through April 12, 2011. Surface owner notification letters were also distributed briefly explaining the oil and gas leasing process and planning process. The surface owner notification letter (March 28, 2011) requested written comments regarding any issues or concerns that should be addressed in the environmental analysis.

A total of 12 surface owner notification letters were distributed for the oil and gas leasing analysis process in the Lewistown Field Office. No written or verbal comments were received during the 15-day scoping period.

30-day Public Comment Period

On May 16, 2011, the EA, along with an unsigned FONSI, was made available for a 30-day public comment period. Notification letters were also distributed to external entities, local agencies, and tribes to explain that an EA and the unsigned FONSI were available for review and comment.

No substantive comments were received after the 30-day comment period from the public; however, after an internal review of the EA, some modifications have been made to the EA. Changes made to the analysis are noted with gray-scale shading and/or strikeout so the modifications to the EA can easily be identified.

After the 30-day protest period, but before lease issuance, the BLM will issue the Decision Record and signed Finding of No Significant Impact for this EA. This information, along with other updates and Lease Sale Notice information can be found on the Montana/Dakotas BLM website at www.blm.gov/mt. From this home page, go to the heading titled “Frequently Requested,” where you will find a number of links to information about our oil and gas program. Current and updated information about our environmental assessments and lease sale notices can be found on the link titled “Oil and Gas Lease Sale Information.”

Table 16. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Abel Guevara	Wildlife Biologist	Team Lead
Todd Yeager	Acting LFO Field Manager	Review, Concurrence and Signature
Adam Carr	Supervisory NRS	Oversight, Review
Zane Fulbright	Archeologist	Cultural Resources, Native American Religions Concerns
Josh Sorlie	Soil Scientist	Soils
Dan Brunkhorst	Rangeland Management Specialist	Livestock/Vegetation/ BLM Sensitive Plants
Chad Krause	Hydrologist	Water Resources, Air Resources, Climate
Mike Barrick	Range Technician	Noxious Weeds
Jerry Majerus	Environmental Coordinator	Review
Chris Rye	Geologist	Paleontology, Solid Minerals
Gail Plovanic	Outdoor Recreation Planner	Recreation/Travel Management/VRM
Deb Tucek	Realty Specialist	Lands and Realty
Matt Comer	Wildlife Biologist	Wildlife Resources, Special Status Wildlife Species
Joan Trent	Social Scientist	Social Analysis
John Thompson	Planning & Environmental Specialist	Economic Analysis

6.0 REFERENCES

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7.0 DEFINITIONS

The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. NAICS was developed under the auspices of the Office of Management and Budget (OMB), and adopted in 1997 to replace the Standard Industrial Classification (SIC) system and to allow for a high level of comparability in business statistics among the North American countries.

IMPLAN: The IMPLAN Model is the most flexible, detailed and widely used input-output impact model system in the U.S. It provides users with the ability to define industries, economic relationships and projects to be analyzed. It can be customized for any county, region or state, and used to assess "multiplier effects" caused by increasing or decreasing spending in various parts of the economy. This can be used to assess the economic impacts of resource management decisions, facilities, industries, or changes in their level of activity in a given area. The current IMPLAN input-output database and model is maintained and sold by MIG, Inc. (Minnesota IMPLAN Group). The 2007 data set was used in this analysis is.

APPENDIX A

Changes made to this appendix are noted with bold for additions and strikeout for deletions.

PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/ NO LEASING ALTERNATIVE C
MTM 97300-I6	T. 22 N, R. 18 E, PMM, MT SEC. 6 S2SE; SEC. 17 SW,NWSE,S2SE; SEC. 18 W2NE,E2NW; SEC. 19 LOTS 1,2,3,4; SEC. 19 NE,NESW,NWSE; SEC. 20 N2,E2SW,N2SE,SWSE; SEC. 21 N2NE,NW,N2SW; SEC. 28 NWNE; SEC. 29 NW,NESW; SEC. 30 LOTS 1,2; SEC. 30 E2NE; SEC. 31 LOTS 1,2; SEC. 31 E2NW; FERGUS COUNTY 2347.35 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		T. 22 N, R. 18 E, PMM, MT SEC. 6 S2SE; SEC. 17 SW,NWSE,S2SE; SEC. 18 W2NE,E2NW; SEC. 19 LOTS 1,2,3,4; SEC. 19 NE,NESW,NWSE; SEC. 20 N2,E2SW,N2SE,SWSE; SEC. 21 N2NE,NW,N2SW; SEC. 28 NWNE; SEC. 30 LOTS 1,2; SEC. 30 E2NE; FERGUS COUNTY (Bighorn Sheep Winter Use and Distribution) All other lands deferred under "Alternatives Considered but Not Analyzed" and will be analyzed in next lease sale.
MTM 97300-I7	T. 22 N, R. 18 E, PMM, MT SEC. 12 S2N2,NWNW,N2SW; SEC. 22 NENE,NWNW,S2NW; SEC. 25 N2NE,SENE,NENW; SEC. 26 N2N2,S2NW,NESW, S2SW,W2SE; SEC. 27 NENE,NENW; SEC. 33 E2NE,SENW,N2SE; SEC. 34 S2NE,N2NW,NWSE; SEC. 35 LOTS 3,4; SEC. 35 NW,NWSE; FERGUS COUNTY	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		T. 22 N, R. 18 E, PMM, MT SEC. 12 S2N2,NWNW,N2SW; SEC. 22 NENE,NWNW,S2NW; FERGUS COUNTY (Bighorn Sheep Winter Use and Distribution) All other lands deferred under "Alternatives Considered but Not Analyzed" and will be analyzed in next lease sale.

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PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/ NO LEASING ALTERNATIVE C
MTM 97300-I8	T. 22 N, R. 18 E, PMM, MT SEC. 17 W2NW; SEC. 18 E2E2; SEC. 20 SESE; SEC. 21 S2SW,W2SE; SEC. 28 N2NW; SEC. 29 NENE; FERGUS COUNTY 560.00 AC ACQ	Cultural Resources 16-1 (All Lands) Standard 16-2 (All Lands) TES 16-2 (All Lands)		T. 22 N, R. 18 E, PMM, MT SEC. 17 W2NW; SEC. 18 E2E2; SEC. 20 SESE; SEC. 21 S2SW,W2SE; SEC. 28 N2NW; FERGUS COUNTY (Bighorn Sheep Winter Use and Distribution) All other lands deferred under "Alternatives Considered but Not Analyzed" and will be analyzed in next lease sale.
MTM 97300-TA	T. 14 N, R. 26 E, PMM, MT SEC. 25 SWNE,S2NW; PETROLEUM COUNTY 120.00 AC ACQ	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		All Lands (Sage Grouse Core Area)
MTM 97300-TB	T. 13 N, R. 27 E, PMM, MT SEC. 24 SENW; PETROLEUM COUNTY 40.00 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		All Lands (Sage Grouse Core Area)
MTM 97300-M5	T. 15 N, R. 29 E, PMM, MT SEC. 11 NENE; PETROLEUM COUNTY 40.00 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		All Lands (Sage Grouse Core Area)
MTM 97300-NV	T. 15 N, R. 30 E, PMM, MT SEC. 9 POR LOT 18; PETROLEUM COUNTY 5.41 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands) LN 14-12 (ALL LANDS)		
MTM 97300-NW	T. 15 N, R. 30 E, PMM, MT SEC. 17 SESW; PETROLEUM COUNTY 40.00 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands) LN 14-12 (ALL LANDS)		

APPENDIX A

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PARCEL NUMBER	PARCEL DESCRIPTION	PROPOSED FOR LEASING ALTERNATIVE B	PROPOSED FOR LEASING ALTERNATIVE C	PROPOSED FOR DEFERRAL/ NO LEASING ALTERNATIVE C
MTM 97300-NX	T. 15 N, R. 30 E, PMM, MT SEC. 28 LOT 8; PETROLEUM COUNTY 30.47 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands) LN 14-12 (ALL LANDS)		
MTM 97300-NZ	T. 15 N, R. 30 E, PMM, MT SEC. 34 POR LOT 13 (11.58 AC); SEC. 34 POR LOT 14 (16.53 AC); PETROLEUM COUNTY 28.11 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands) LN 14-12 (ALL LANDS)		
MTM 97300-K9	T. 28 N, R. 5 W, PMM, MT SEC. 19 SESE; SEC. 20 NESW,SWSW; PONDERA COUNTY 120.00 AC PD	Cultural Resources 16-1 (All Lands) Standard 16-2 3 (All Lands) TES 16-2 (All Lands)		All lands deferred under "Alternatives Considered but Not Analyzed" and will analyzed in next lease sale.

Appendix B: Lease Stipulation Key

Stipulation Number	Stipulation Name/Brief Description
Bureau of Land Management	
CSU 12-1	CONTROLLED SURFACE USE STIPULATION Prior to surface disturbance on slopes over 30 percent, an engineering/reclamation plan must be approved by the authorized officer.
CSU 12-2	CONTROLLED SURFACE USE STIPULATION Prior to surface disturbance, a surface use plan of operations (SUPO) for oil and gas activities must be approved for black-footed ferret reintroduction areas by the authorized officer in consultation with the U.S. Fish and Wildlife Service (USFWS).
CSU 12-3	CONTROLLED SURFACE USE STIPULATION Prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the absence or presence of black-footed ferrets. the findings of this examination may result in some restrictions to the operator's plans or may even preclude use and occupancy that would be in violation of the endangered species act (ESA) of 1973.
CSU 12-4	CONTROLLED SURFACE USE STIPULATION Prior to surface disturbance, a surface use plan of operations (SUPO) for oil and gas activities must be approved for black-footed ferret reintroduction areas by the authorized officer in consultation with the U.S. Fish and Wildlife Service (USFWS).
CSU 12-5	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use would be subject to the following special operating constraint: No disturbance of Riparian areas of wetlands, intermittent, ephemeral, or perennial streams and rivers would be allowed except for essential road and utility crossings.
CSU 12-6	CONTROLLED SURFACE USE STIPULATION Operations within Special Recreation Management Areas (SRMAs) must be conducted in a manner that minimizes encounters and conflicts with recreation users. Proposed activities may not alter or depreciate important recreational values located outside of developed areas but within the SRMA boundary.
CSU 12-7	CONTROLLED SURFACE USE STIPULATION Oil and gas activities will comply with all motorized vehicle use and travel plan restrictions, including seasonal restrictions and areas closed to motorized travel.
CSU 12-8	CONTROLLED SURFACE USE STIPULATION An inventory of the leased lands may be required prior to surface disturbance to determine if cultural resources or paleontological localities are present and to identify needed mitigation measures.
CSU 12-9	CONTROLLED SURFACE USE STIPULATION In areas known to have a high potential for containing significant paleontological resources, the lessee may be required to conduct a paleontological inventory prior to any surface disturbance. If inventory is required, the lessee must engage the services of a qualified paleontologist, acceptable to the Surface Managing Agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.
CSU 12-10	CONTROLLED SURFACE USE STIPULATION All surface disturbing activities and construction of semi-permanent and permanent facilities in VRM Class II, III, and IV areas may require special design including location, painting, and camouflage to blend with the natural surroundings and meet the visual quality objectives for each respective class.
CSU 12-11	CONTROLLED SURFACE USE STIPULATION

Stipulation Number	Stipulation Name/Brief Description
	A field inspection will be conducted for special status plant species by the lessee prior to any surface disturbance. A list of special status plant species and any known populations or suitable habitat will be provided after the issuance of the lease. Plant species on the list are subject to change over time as new information becomes available. Plant inventories must be conducted at the time of year when the target species are actively growing and flowering. An acceptable report must be provided to the BLM documenting the presence or absence of special status plants in the area proposed for surface disturbing activities. The findings of this report may result in restrictions to the operator's plans or may preclude use and occupancy.
CSU 12-12	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints. The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. 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. BLM will not approve any ground-disturbing activity that may affect any such species or requirements of the Endangered Species Act as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.
CSU 12-13	CONTROLLED SURFACE USE STIPULATION Activities within one-half mile of streams containing 90% up to 99% genetically pure Westslope Cutthroat Trout may be relocated, require special design, or require on and off site mitigation measures to prevent impacts to sensitive trout populations.
CSU 12-18	CONTROLLED SURFACE USE STIPULATION Prior to surface disturbance on areas of active mass wasting, unstable land areas, or slopes greater than 30 on non-Boulder Batholith soils or 20 percent on Boulder Batholith soils, an engineering/reclamation plan must be approved by the authorized officer. Such plan must demonstrate how the following will be accomplished: <ul style="list-style-type: none"> •site productivity will be restored. •surface runoff will be adequately controlled. •off-site areas will be protected from accelerated soil erosion. •surface disturbing activities will not be conducted during wet periods.
CSU 12-19	CONTROLLED SURFACE USE STIPULATION Operations within Special Recreation Management Areas (SRMAs) must be conducted within a manner that minimizes encounters and conflicts with recreation users. Proposed activities may not alter or depreciate important recreational values located within the SRMA boundary. This would apply to the following SRMAs for this alternative: Holter Lake/Missouri River, Sleeping Giant, Hauser Lake/Lower Missouri River, Toston Reservoir/Missouri River, Scratchgravel Hills, Sheep Mountain, Pipestone, Upper Big Hole River, and Humbug Spires.
Cultural Resources 16-1	CULTURAL RESOURCES LEASE 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

Stipulation Number	Stipulation Name/Brief Description
	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."
LN 14-1	LEASE NOTICE Land Use Authorizations incorporate specific surface land uses allowed on Bureau of Land Management (BLM) administered lands by authorized officers and those surface uses acquired by BLM on lands administered by other entities. These BLM authorizations include rights-of-way, leases, permits, conservation easements, and Recreation and Public Purpose leases and patents.
LN 14-2	LEASE NOTICE CULTURAL RESOURCES The Surface Management Agency is responsible for assuring that the leased Lands are examined to determine if cultural resources are present and to specify mitigation measures.
LN 14-3	LEASE NOTICE The lessee or operator shall immediately bring to the attention of the Surface Management Agency (SMA) any paleontological resources or any other objects of scientific interest discovered as a result of approved operations under this lease, and shall leave such discoveries intact and undisturbed until directed to proceed by the SMA.
LN 14-4	LEASE NOTICE Portions of the lands in this parcel are occupied by a cemetery. As per the Standard Stipulation (May 2001) attached to this lease, occupancy will be excluded from the cemetery and a 300 foot buffer zone around the cemetery.
LN 14-5	LEASE NOTICE CULTURAL RESOURCES An inventory of the lease lands may be required prior to surface disturbance to determine if cultural resources are present and to identify needed mitigation measures.
LN 14-7	LEASE NOTICE This parcel contains the following occupancy exclusions: 1. Exploration and development activity must be conducted with roads constructed to an appropriate standard no higher than necessary to accommodate the intended use. 2. Anti-raptor perch devices are required on all aboveground structures. 3. U.S. Fish and Wildlife (USFWS) staff responsible for the management of the Creedman Coulee National Wildlife Refuge will be notified of any exploration and development proposals by the Bureau of Land Management. This notice is necessary to provide the USFWS an opportunity to participate in the evaluation of any proposed activity on the lease, including on-site inspections before site preparation occurs.
LN 14-8	LEASE NOTICE Cultural sites are located in the _____, Sec. __ T. ., R. . This parcel is located adjacent to the Lake Mason National Wildlife Refuge. In accordance with 43 CFR 3101.1-2, additional mitigation may be required in regard to exploration and development.
LN 14-9	LEASE NOTICE CULTURAL RESOURCES Lease is located adjacent to known sacred sites and historic properties, and contains high potential for National Register eligible historic and cultural properties. Lessees are notified that archaeological resource inventory and mitigation costs may be high within this area. A cultural plan of operations will be developed in consultation with the Billings Field Office and must be approved before field development takes place. All surface use plans will be presented to the Billings

Stipulation Number	Stipulation Name/Brief Description
	Field Office archaeologist for approval.
LN 14-11	<p>LEASE NOTICE GREATER SAGE-GROUSE HABITAT</p> <p>The lease may in part, or in total contain important Greater Sage-Grouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Greater Sage-Grouse populations and habitat quality. Such measures shall be developed during the application for permit to drill on-site and environmental review process and will be consistent with the lease rights granted.</p>
LN 14-12	<p>LEASE NOTICE PALEONTOLOGICAL RESOURCE INVENTORY REQUIREMENT</p> <p>Surface occupancy or use is subject to the following special operating constraints: The lessee/operator is given notice that this lease has been identified as being located within geologic units rated as being moderate to very high potential for containing significant paleontological resources. The locations identified meet the conditions 1 and/or 2 as set forth in the Potential Fossil Yield Classification System, IM 2008-009, Attachment 2-2. The BLM is responsible for assuring that the leased lands are examined to determine if paleontological resources are present and to specify mitigation measures. Guidance for application of this requirement can be found in IM 2008-009, 10/15/2007 and IM 2009-011, 10/10/2008. The project proponent may be required to conduct a paleontological inventory prior to any surface disturbance. If inventory is required, the project proponent must engage the services of a qualified paleontologist, acceptable to the BLM, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or project proponent shall contact the BLM to determine if a paleontological resource inventory is required. If an inventory is required then;</p> <ul style="list-style-type: none"> •The lessee or project proponent will complete the required inventory. The lessee or project proponent may engage the services of a paleontological resource consultant acceptable to the BLM to conduct a paleontological resource inventory of the area of proposed surface disturbance. The project proponent will, at a minimum, inventory a 10-acre area or larger to incorporate possible project relocation which may result from environmental or other resource considerations. •Paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by IM 2009-011, 10/10/2008.
LN 14-13	<p>LEASE NOTICE GRASSLAND / WETLAND EASEMENT</p> <p>The lease parcel is encumbered with a US Fish and Wildlife wetland and/or grassland easement to restrict draining, burning, filling, or leveling of wetlands and/or protection of grassland depending on the specific easement. The operator may be required to implement specific measures to reduce the impacts of oil and gas operations on wetlands or grasslands on easements. Additional measures may be developed during the application for permit to drill during the on-site inspection as well as the environmental review process, consistent with the lease rights granted and in accordance with 43 CFR 3101.1-2.</p>
LN 14-15	<p>LEASE NOTICE SPRAGUE'S PIPIT</p> <p>The lease area may contain habitat for the federal candidate Sprague's pipit. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on Sprague's pipits, their habitat, and overall population. Such measures would be developed during the application for permit to drill and environmental review processes, consistent with lease rights.</p> <p>If the USFWS lists the Sprague's pipit as threatened or endangered under ESA, BLM would enter into formal consultation on proposed permits that may affect the Sprague's pipit and its habitat. Restrictions, modifications, or denial of permits</p>

Stipulation Number	Stipulation Name/Brief Description
	could result from the consultation process.
NSO 11-1	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and directional drilling are prohibited within the boundaries of existing coal leases.
NSO 11-2	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within riparian areas, 100-year flood plains of major rivers, and on water bodies and streams.
NSO 11-3	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited in the designated Bighorn Sheep Range.
NSO 11-4	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-quarter mile of grouse leks.
NSO 11-5	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within 1/4 mile of designated reservoirs with fisheries.
NSO 11-6	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of known bald eagle nest sites which have been active within the past 7 years and within bald eagle nesting habitat in riparian areas.
NSO 11-7	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within 1 mile of identified peregrine falcon nesting sites.
NSO 11-8	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of known ferruginous hawk nest sites which have been active within the past 2 years.
NSO 11-9	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-quarter mile of wetlands identified as piping plover habitat.
NSO 11-10	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-quarter mile of wetlands identified as interior least tern habitat.
NSO 11-11	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within sites or areas designated for conservation use, public use, or sociocultural use.
NSO 11-12	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within designated or known paleontological sites.
NSO 11-13	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use.
NSO 11-14	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited in VRM Class I areas (i.e., wilderness, wild and scenic rivers, etc.).
NSO 11-15	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within the boundary of State Game Ranges administered by the Fish Wildlife and Parks.
NSO 11-16	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of North American Wetland Conservation Act/Intermountain Joint Venture (NAWCA/IMWJV) wetland projects.
NSO 11-17	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of Ferruginous Hawk nest sites.
NSO 11-18	NO SURFACE OCCUPANCY STIPULATION

Stipulation Number	Stipulation Name/Brief Description
	Surface occupancy and use is prohibited within one-half mile from centerline of stream containing known populations of 99 to 100% genetically pure Westslope Cutthroat Trout.
NSO 11-19	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile from centerline of occupied or influencing habitat for fluvial and adfluvial Artic Grayling, including the North Fork of the Big Hole River, the Big Hole, the Beaverhead and Ruby Rivers, and tributaries to Upper Red Rock Lake are prohibited.
NSO 11-20	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile from the centerline of Class 1 fishery streams (Blue Ribbon trout streams).
NSO 11-21	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of developed recreation sites. Currently developed recreation sites include: Axolotl Lakes Cabin and Fishing Access, Deadwood Gulch Campground, Big Sheep Creek Back Country Byway, Maiden Rock Boat Launch, East Fork Blacktail Deer Creek Campground, Ney Ranch Recreation Site, Palisades Recreation Site, Red Mountain Day Use, Red Mountain Campground, Warm Springs Day Use, Bear Trap Wilderness Trailhead, Bear Trap Boat Launch, Fall Creek Campground, Klutes Landing, and Shoshone Ridge.
NSO 11-22	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within, and for a distance of 300 feet from the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible to the national register of historic places. This includes cultural properties designated for conservation use, scientific use, traditional use, public use, and experimental use. Defined archaeological districts include: Everson Creek/Black Canyon Quarry Complex; Muddy Creek Archaeological District; Lower Beartrap Canyon Archaeological District; and Beaverhead Rock.
NSO 11-23	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of the boundaries of cultural properties determined to be of particular importance to Native American groups, determined to be traditional cultural properties, and/or designated for traditional use. Such properties include (but are not limited to) burial locations, plant gathering locations, and areas considered sacred or used for religious purposes.
NSO 11-24	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-quarter mile of special status plants or populations.
NSO 11-25	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited on areas of active mass movement (landslides).
NSO 11-26	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce (Nee Me Poo) Trail.
NSO 11-27	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of the Continental Divide National Scenic Trail.
NSO 11-28	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited on recreation and public purposes leases and patents and on leases and permits authorized under regulations found at 43 CFR 2920.

Stipulation Number	Stipulation Name/Brief Description
NSO 11-29	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within the Beaverhead Rock, Muddy-Big Sheep Creek and Everson Creek ACECs.
NSO 11-30	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within the Centennial Sandhills ACEC and within one mile of special status plants that are contained within the Centennial Sandhills ACEC.
NSO 11-31	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within the Bighorn Sheep core areas in the Hidden Pasture Area and the Greenhorn Mountains reintroduction area.
NSO 11-32	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and directional drilling are prohibited within the boundaries of the Medicine Land Sandhills Ecological Preserve.
NSO 11-33	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within 200 feet of wetlands, lakes, and ponds.
NSO 11-34	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within one-half mile of Prairie Falcon nests known to have been occupied at least once within the seven previous years.
NSO 11-35	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) would be allowed within one-fourth mile of one-fourth mile of active Sage Grouse strutting grounds.
NSO 11-36	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) would be allowed in the floodplain of the Yellowstone River.
NSO 11-37	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within 200 feet of wetlands, lakes, or ponds.
NSO 11-38	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within one-half mile of Golden Eagle nests known to have been occupied at least once within the seven previous years.
NSO 11-39	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) of those lands within the floodplain of the Missouri River.
NSO 11-40	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within a visible area within a 3.5 mile radius of the Fort Union Historic Site.
NSO 11-41	NO SURFACE OCCUPANCY STIPULATION No surface occupancy (NSO) or use would be allowed within 1,000 feet of wetlands, lakes, or ponds.
NSO 11-42	NO SURFACE OCCUPANCY STIPULATION No surface occupancy. Activity is prohibited within the bighorn sheep core areas.
NSO 11-43	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within ¼ mile of developed recreation sites, regardless of administering agency. Currently there are 49 developed BLM recreation sites: Beartooth Landing Rec Site, Bryant Creek Rec Site, Buffalo Hump Rec Site, Carbella Rec Site, Clark’s Bay Rec Site, Crimson Bluff Rec Site, Crow Creek Rec Site, Departure Point Rec Site, Devil’s Elbow Rec Site, Dickie Bridge Rec Site, Divide Bridge Campground, Divide Bridge Day Use, East Bank Rec Site, Four Corners OHV Trailhead, French Bar Rec Site, Galena Gulch Rec Site, Headlane Trailhead, Holter Lake Dam Rec Site, Holter Lake

Stipulation Number	Stipulation Name/Brief Description
	Rec Site, Jerry Creek BR Fishing Access, John G Mine Trailhead, Log Gulch Rec Site, Lombard Historical, Lower Toston Rec Site, Maiden Rock East, McMaster Hill East Trailhead, McMaster Hill West Trailhead, Moose Creek Trailhead, Ohio Gulch OHV Trailhead, Pintlar Creek Rec Site, Pipestone OHV Rec Site, Radersburg OHV Trailhead, Ringing Rocks Rec Site, Sawlog Creek Rec Site, Sawmill Gulch Trailhead, Sheep Camp Rec Site, Sheep Mountain Trailhead, Sleeping Giant Trailhead, Spokane Bay Rec Site, Spokane Bay Trailhead, Spokane Hills South, Titan Gulch Rec Site, Toston Dam Rec Site, Tumbleweed Lane Trailhead, Two Camps Vista, Ward Ranch Historical Site, Whiskey Gulch Trailhead, White Sandy Campground, Woodsiding Trailhead.
NSO 11-44	NO SURFACE OCCUPANCY STIPULATION Activity is prohibited within 1/2 mile of bald eagle nest sites and within bald eagle nesting habitat in riparian areas.
NSO 11-45	NO SURFACE OCCUPANCY STIPULATION Activity is prohibited within the boundary of the Recovery Zone for Grizzly Bears.
NSO 11-46	NO SURFACE OCCUPANCY STIPULATION Activity is prohibited within the boundary of any prairie dog town.
NSO 11-47	NO SURFACE OCCUPANCY STIPULATION No activity allowed within 1/2 mile from centerline of streams containing known populations of bull trout.
NSO 11-48	NO SURFACE OCCUPANCY STIPULATION No activity allowed within 1/2 mile from centerline of streams containing known populations of 90-100% genetically pure Yellowstone Cutthroat Trout.
NSO 11-49	NO SURFACE OCCUPANCY STIPULATION No activity allowed within 1/2 mile from centerline of streams that are identified by the BLM as having high restoration potential for westslope cutthroat trout, Yellowstone cutthroat trout, arctic grayling and/or bull trout.
NSO 11-50	NO SURFACE OCCUPANCY STIPULATION Surface occupancy would be prohibited in the following municipal watersheds: Missouri River Siphon, Tenmile Creek Drainage, Big Hole River Intake, and Moulton Reservoir.
NSO 11-51	NO SURFACE OCCUPANCY STIPULATION No activity allowed within 1/2 mile from centerline of stream containing known populations of 90-99% genetically pure westslope cutthroat trout.
NSO 11-52	NO SURFACE OCCUPANCY STIPULATION Activity is prohibited within 300 ft. of site boundaries and/or districts eligible for, or listed on the National Register of Historic Places. There is one known district, the Indian Creek Historic Mining District (134 acres).
NSO 11-53	NO SURFACE OCCUPANCY STIPULATION Surface occupancy would be prohibited within 1/2 mile either side of the active river channel. This would apply to the following river segment lengths: 3.1 miles of the Upper Missouri River and 2.6 miles of Muskrat Creek.
NSO 11-54	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within one-half mile of ferruginous hawk nest sites which have been active within the past 5 years.
NSO 11-55	NO SURFACE OCCUPANCY STIPULATION Surface occupancy would be prohibited on lands acquired with Land and Water Conservation Funds.
NSO 11-56	NO SURFACE OCCUPANCY STIPULATION Surface use is prohibited within Makoshika State Park and surrounding area of management concern except on designated sites identified in the 1999 Decision

Stipulation Number	Stipulation Name/Brief Description
	Record for Oil and Gas Leasing in the Makoshika State Park Area of Management Concern.
NSO 11-57	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited within the Terry Badlands limber pine areas.
NSO 11-59	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited on lands administered by the U.S. Fish and Wildlife Service (FWS) within the Solberg Waterfowl Production Area.
Standard 16-3	<p>STANDARD LEASE STIPULATION</p> <p>ESTHETICS--To maintain esthetic values, all surface-disturbing activities, semipermanent and permanent facilities may require special design including location, painting and camouflage to blend with the natural surroundings and meet the intent of the visual quality objectives of the Federal Surface Managing Agency (SMA).</p> <p>EROSION CONTROL--Surface-disturbing activities may be prohibited during muddy and/or wet soil periods.</p> <p>CONTROLLED OR LIMITED SURFACE USE STIPULATION --This stipulation may be modified, consistent with land use documents, when specifically approved in writing by the Bureau of Land Management (BLM) with concurrence of the SMA. Distances and/or time periods may be made less restrictive depending on the actual onground conditions. The prospective lessee should contact the SMA for more specific locations and information regarding the restrictive nature of this stipulation.</p> <p>The lessee/operator is given notice that the lands within this lease may include special areas and that such areas may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled, or if absolutely necessary, excluded. Use or occupancy will be restricted only when the BLM and/or the SMA demonstrates the restriction necessary for the protection of such special areas and existing or planned uses. Appropriate modifications to imposed restrictions will be made for the maintenance and operations of producing oil and gas wells.</p> <p>After the SMA has been advised of specific proposed surface use or occupancy on the leased lands, and on request of the lessee/operator, the Agency will furnish further data on any special areas which may include:</p> <ul style="list-style-type: none"> • 100 feet from the edge of the rights-of-way from highways, designated county roads and appropriate federally-owned or controlled roads and recreation trails. • 500 feet, or when necessary, within the 25-year flood plain from reservoirs, lakes, and ponds and intermittent, ephemeral or small perennial streams: 1,000 feet, or when necessary, within the 100-year flood plain from larger perennial streams, rivers, and domestic water supplies. • 500 feet from grouse strutting grounds. Special care to avoid nesting areas associated with strutting grounds will be necessary during the period from March 1, to June 30. One-fourth mile from identified essential habitat of state and federal sensitive species. Crucial wildlife winter ranges during the period from December 1 to May 15, and in elk calving areas during the period from May 1 to June 30. • 300 feet from occupied buildings, developed recreational areas, undeveloped recreational areas receiving concentrated public use and sites eligible for or designated as National Register sites. • Seasonal road closures, roads for special uses, specified roads during

Stipulation Number	Stipulation Name/Brief Description
	<p>heavy traffic periods and on areas having restrictive off-road vehicle designations.</p> <ul style="list-style-type: none"> • On slopes over 30 percent or 20 percent on extremely erodible or slumping soils. <p>APPLICATIONS FOR PERMIT TO DRILL (APDs)--The appropriate BLM field offices are responsible for the receipt, processing, and approval of APDs. The APDs are to be submitted by oil and gas operators pursuant to the requirements found in Onshore Oil and Gas Order No. 1 -- Approval of Operations on Onshore Federal and Indian Oil and Gas Leases (Circular No. 2538). Additional requirements for the conduct of oil and gas operations can be found in the Code of Federal Regulations Title 43, Part 3160. Copies of Onshore Oil and Gas Order No. 1, and pertinent regulations, can be obtained from the BLM field offices in which the operations are proposed. Early coordination with these offices on proposals is encouraged.</p> <p>CULTURAL AND PALEONTOLOGICAL RESOURCES--The SMA is responsible for assuring that the leased lands are examined to determine if cultural resources are present and to specify mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator, unless notified to the contrary by the SMA, shall:</p> <ul style="list-style-type: none"> • Contact the appropriate SMA to determine if a site-specific cultural resource inventory is required. If an inventory is required, then: • Engage the services of a cultural resource specialist acceptable to the SMA to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the area of proposed disturbance to cover possible site relocation which may result from environmental or other considerations. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted. • Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as testing salvage and recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. <p>The operator shall immediately bring to the attention of the SMA any cultural or paleontological resources discovered as a result of approved operations under this lease, and not disturb such discoveries until directed to proceed by the SMA.</p> <p>ENDANGERED OR THREATENED SPECIES--The SMA is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species, listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats.</p> <p>The lessee/operator may, unless notified by the authorized officer of the SMA that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resources specialist approved by the SMA. An acceptable report must be provided to the SMA identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.</p>
TES 16-2	ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

Stipulation Number	Stipulation Name/Brief Description
	<p>STIPULATION The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development, and require modifications to or disapprove proposed activity that is likely to result in jeopardy to proposed or listed threatened or endangered species or designated or proposed critical habitat.</p>
TL 13-1	<p>TIMING LIMITATION STIPULATION Surface use is prohibited within crucial winter range for wildlife for the time period December 1 to March 31 to protect crucial White-Tailed Deer, Mule Deer, Elk, Antelope, Moose, Bighorn Sheep, and Sage Grouse winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.</p>
TL 13-2	<p>TIMING LIMITATION STIPULATION Surface use is prohibited within established spring calving range for Elk for the following time period April 1 to June 15 to protect Elk spring calving range from disturbance during the spring use season, and to facilitate long-term maintenance of wildlife populations.</p>
TL 13-3	<p>TIMING LIMITATION STIPULATION Surface use is prohibited within established spring calving range for Elk for the time period April 1 to June 15 to protect Elk spring calving range from disturbance during the spring use season, and to facilitate long-term maintenance of wildlife populations.</p>
TL 13-4	<p>TIMING LIMITATION STIPULATION Surface use is prohibited within one-half mile of Raptor nest sites which have been active within the past 2 years during the time period March 1 - August 1 to protect nest sites of Raptors which have been identified as species of special concern.</p>
TL 13-5	<p>TIMING LIMITATION STIPULATION No surface use would be allowed within one-half mile of occupied Ferruginous Hawk nests known to be occupied at least once within the seven previous years from March 15 to July 15 to protect Ferruginous Hawk nesting</p>
TL 13-6	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from March 1 through June 30 in nesting and early brood-rearing habitat (defined as within three miles of leks).</p>
TL 13-7	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from December 1 through May 15 within big game winter/spring range for wildlife.</p>
TL 13-8	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from April 1 through June 30 in Elk calving/big game birthing areas to protect Mule Deer, Elk, Antelope, and Moose birthing areas from disturbance and facilitate long-term maintenance of wildlife populations.</p>
TL 13-9	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from November 1 through June 30 in Bighorn rutting, winter and lambing habitat to protect Bighorn rutting, winter and lambing habitat from disturbance and facilitate long-term maintenance of Bighorn Sheep populations.</p>
TL 13-10	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from February 1 through August 31 in a one mile radius around Bald Eagle nest sites/breeding habitat to protect Bald Eagle nesting site and/or breeding habitat in accordance with the Endangered Species Act and the Montana Bald Eagle Management Plan.</p>
TL 13-11	<p>TIMING LIMITATION STIPULATION Surface use is prohibited from March 1 through July 31 within one-half mile of</p>

Stipulation Number	Stipulation Name/Brief Description
	raptor nest sites which have been active within the past five years.
TL 13-12	TIMING LIMITATION STIPULATION Surface use is prohibited from April 1 through August 31 within one-half mile of waterfowl production and molting areas to protect waterfowl production and molting areas from disturbance and facilitate long-term maintenance of waterfowl populations.
TL 13-13	TIMING LIMITATION STIPULATION Surface use is prohibited from March 1 through August 31 within one mile of Ferruginous Hawk nest sites that have been active within the past five years.
TL 13-14	TIMING LIMITATION STIPULATION Surface use is prohibited from December 1 through May 15 within winter and spring range for sage grouse.
TL 13-15	TIMING LIMITATION STIPULATION No seismic exploration would be allowed within 500 feet of waterfowl nesting habitat from March 1 through July 1 to protect nesting waterfowl.
TL 13-16	TIMING LIMITATION STIPULATION No surface use would be allowed within one-half mile of occupied Prairie Falcon nests from March 15 through July 15 to protect Prairie Falcon nesting.
TL 13-17	TIMING LIMITATION STIPULATION No surface use would be allowed within two miles of active strutting grounds from March 1 to June 15 to protect Sage Grouse strutting activities.
TL 13-18	TIMING LIMITATION STIPULATION No surface use would be allowed on Bighorn Sheep lambing range from April 1 to June 15 to protect Bighorn Sheep lambing activities.
TL 13-19	TIMING LIMITATION STIPULATION No surface use would be allowed on Bighorn Sheep winter range from December 1 to April 1 to protect Bighorn Sheep winter range activities.
TL 13-20	TIMING LIMITATION STIPULATION Surface use for drilling and construction activity is prohibited from April 1 through August 15 to protect Creedman Coulee National Wildlife Refuge wildlife populations and habitats.
TL 13-21	TIMING LIMITATION STIPULATION No surface use would be allowed within one-half mile of occupied Golden Eagle nests from February 15 to July 15 to protect Golden Eagle nesting.
TL 13-22	TIMING LIMITATION STIPULATION No surface use would be allowed for Elk calving from June 1 to July 1 to protect Elk calving.
TL 13-23	TIMING LIMITATION STIPULATION No surface use would be allowed on Elk winter range from November 30 to May 1 to protect wintering Elk.
TL 13-24	TIMING LIMITATION STIPULATION Surface use is prohibited within one-half mile of occupied Golden Eagle nests known to be occupied at least once within the seven previous years from February 15 to July 15 to protect Golden Eagle nesting.
TL 13-25	TIMING LIMITATION STIPULATION No activity from March 1 through July 31, within 1/2 mile of raptor nest sites which have been active within the past five years. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.
TL 13-26	TIMING LIMITATION STIPULATION No activity is allowed from February 1 through August 31 in a one mile radius

Stipulation Number	Stipulation Name/Brief Description
	around bald eagle nest sites. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.
TL 13-27	TIMING LIMITATION STIPULATION Activity is prohibited from November 1 through June 30 in bighorn rutting, winter and lambing habitat. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures would be insufficient.
TL 13-28	TIMING LIMITATION STIPULATION No activity from December 1 through May 15 within winter range for wildlife.
TL 13-29	TIMING LIMITATION STIPULATION Activity is prohibited from April 1 through June 30 in big game birthing areas.
TL 13-30	TIMING LIMITATION STIPULATION Activity is restricted from March 1 through June 30 in nesting and early brood rearing habitat (defined as within three miles of leks).
TL 13-31	TIMING LIMITATION STIPULATION Activity is prohibited from April 1 to June 30 and from September 15 – October 15 in the grizzly bear distribution zone.
TL 13-32	TIMING LIMITATION STIPULATION Activity is prohibited within a 1 mile buffer around wolf dens or rendezvous sites from April 15 to June 30 in the Northwest Montana Recovery Area. This stipulation would be applied to the Northwest Montana Recovery Area (94,700 acres), but there are no known den or rendezvous sites currently mapped in this area.
Region 1 Forest Service	
DPG 13d (McKenzie RD)	FOREST SERVICE - Agency lease stipulations.
DPG 13d (Medora RD)	FOREST SERVICE - Agency lease stipulations.
DPG NSO 14-1	NO SURFACE OCCUPANCY STIPULATION Surface occupancy and use is prohibited on slopes greater than 40 percent to protect soil resources from loss of productivity, prevent erosion on steep slopes, soil mass movement, and resultant sedimentation.
DPG NSO 14-4	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within 0.25 mile (line of sight) of prairie falcon and burrowing owl nests to prevent reduced reproductive success and adverse habitat loss.
DPG NSO 14-5	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within 0.5 mile (line of sight) of golden eagle, merlin, and ferruginous hawk nests; to prevent reduced reproductive success and adverse habitat loss.
DPG NSO 14-6	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within bighorn sheep habitat MA 3.51 to achieve optimum habitat suitability for bighorn sheep.
DPG NSO 14-7	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within 0.25 mile (line of sight) of a sharp-tailed grouse and sage grouse display ground to prevent abandonment of display grounds, reduced reproductive success, and adverse habitat loss
DPG NSO 14-9	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within the established boundaries of Bear Den-Bur Oak, Cottonwood Creek Badlands, Little Missouri River, Mike's Creek,

Stipulation Number	Stipulation Name/Brief Description
	Ponderosa Pines, Limber Pine, and Two Top/Big Top Research Natural Areas; to maintain natural conditions for research purposes and protect against activities, which directly or indirectly modify the natural occurring ecological processes within the RNA.
DPG NSO 14-11	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within the boundaries of Battle of the Badlands, Custer Trail/Davis Creek, and Square Buttes Special Interest Areas to protect the heritage resources.
DPG NSO 14-13	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within developed recreation sites to maintain the recreation opportunities and settings within developed recreation sites.
DPG NSO 14-14	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within boundaries of backcountry non-motorized management areas to retain recreation opportunities in a natural-appearing landscape.
DPG NSO 14-15	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within ¼ mile each side of the Little Missouri River, to maintain the recreation opportunities and settings within the river corridor.
DPG NSO 14-16	NO SURFACE OCCUPANCY STIPULATION No surface occupancy or use is allowed within National Register eligible heritage sites to protect the immediate environment of the site.
DPG TL 15-1	TIMING LIMITATION STIPULATION No surface use is allowed during the following time period(s) March 1 – June 15 within 1 mile (line of sight) of active sharp-tailed grouse display grounds. This stipulation applies to drilling, testing, new construction projects, and does not apply to operation and maintenance of production facilities.
DPG TL 15-2	TIMING LIMITATION STIPULATION No surface use is allowed during the time period(s) March 1 through June 15 within 2 miles (line of sight) of a sage grouse display ground. This stipulation applies to drilling, testing, new construction projects, and does not apply to operation and maintenance of production facilities.
DPG TL 15-4	TIMING LIMITATION STIPULATION No surface use is allowed during the time period(s) January 1 through March 31 to maintain the health, vigor, and physical condition of wintering pronghorn by minimizing disturbance on winter range during the critical period.. This stipulation applies to drilling and testing and new construction projects, and does not apply to operation and maintenance of production facilities.
DPG TL 15-6	TIMING LIMITATION STIPULATION No surface use is allowed during the time period(s) May 1 through December 1 within 0.25 miles of the established boundaries of Burning Coal Vein, Buffalo Gap, Sather Lake, CCC, Campgrounds and Summit, Whitetail Picnic Areas, and the 6 Maa Daa Hey Trail overnight camps; Wannagan, Roosevelt, Elkhorn, Magpie, Beicegel, and Bennett to maintain the recreation opportunities and settings within the area surrounding campgrounds, picnic areas, and recreation trail overnights... This stipulation does not apply to operation and maintenance of production facilities.
DPG TL 15-7	TIMING LIMITATION STIPULATION No surface use is allowed during the time period(s) April 1 through June 15 within 1 mile (line-of-sight) of lambing areas to safeguard lamb survival and prevent bighorn sheep displacement from lambing areas.. This stipulation applies to drilling and testing and new construction projects, and does not apply to operation or maintenance of production facilities.

Stipulation Number	Stipulation Name/Brief Description
DPG TL 15-8	TIMING LIMITATION STIPULATION No surface use is allowed during the time period(s)October 16 – June 14 to provide quality forage, cover, escape terrain and solitude for bighorn sheep. This stipulation applies to drilling and testing of wells and new construction projects, and does not apply to operation and maintenance of production facilities. Limit on-lease activities (operation and maintenance of facilities) to the period from 10 am to 4 pm except in emergency situations.
DPG CSU 16-1	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to special operating constraints. to protect key paleontological resources from disturbance, or mitigate the effects of disturbance to conserve scientific and interpretive values, and the interests of the surface owner.
DPG CSU 16-2	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints: Try to locate activities and facilities away from the water’s edge and outside the riparian areas, woody draws, wetlands, and floodplains.
DPG CSU 16-5	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints: Operations may be moved or modified to preserve certain geologic type sections for future scientific research, education, and interpretation.
DPG CSU 16-6	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints. Surface occupancy and use is subject to operational constraints to maintain the Scenic Integrity Objective (SIO) for areas identified as high.
DPG CSU 16-7	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints: Surface occupancy and use is subject to operational constraints to maintain the Scenic Integrity Objective (SIO) for areas identified as moderate.
DPG CSU 16-8	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to special operating constraints: New developments, including new facilities, roads, and concentrations of humans, within 1 mile of bighorn sheep lambing areas may be moved or modified to be out of view of the lambing areas. This stipulation applies to drilling and testing and new construction projects, not to operation or maintenance of production.
DPG TES 18a	FOREST SERVICE - Agency lease stipulations.
DPG 22b	LEASE NOTICE - ROADLESS AREA CONSERVATION RULE Operations such as road construction or reconstruction may be prohibited by the Roadless Area Conservation Rule or subsequent modifications thereof.
DPG 22c	LEASE NOTICE - ROADLESS AREA CONSERVATION RULE Operations such as road construction or reconstruction may be prohibited by the Roadless Area Conservation Rule or subsequent modifications thereof.
DPG 23	LEASE NOTICE - LITTLE MISSOURI BADLANDS MILITARY COMPLEX/DAVIS CREEK AND SQUARE BUTTE AREAS Each proposed well, both inside and outside the critical area, will be evaluated individually, and allowed if they can be mitigated to the level of no adverse effect.
Region 2 Forest Service	
R2-FS-2820-13	FOREST SERVICE - Agency Lease Stipulation
R2-FS-2820-16	CONTROLLED SURFACE USE STIPULATION Surface occupancy or use is subject to the following special operating constraints: Surface occupancy and use is subject to operational constraints to maintain the Scenic Integrity Objective (SIO) for areas identified as moderate.
Bureau of Reclamation	
BOR 17-1	BUREAU OF RECLAMATION - Agency lease stipulations.
BOR 17-2	BUREAU OF RECLAMATION - Agency special stipulations.

Stipulation Number	Stipulation Name/Brief Description
Corps of Engineers	
COE 18-1	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-2	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-3	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-4	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-5	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-6	CORPS OF ENGINEERS - Agency lease stipulations.
COE 18-7	CORPS OF ENGINEERS - Agency lease stipulations.
Federal Energy Regulatory Commission	
FERC 19-1	Federal Energy Regulatory Commission - Agency lease stipulations.
International Boundary Commission	
IBC 18-8	International Boundary Commission - Agency lease stipulations.

Appendix C. Threatened, endangered, candidate/proposed, and BLM sensitive wildlife and fish species with the potential to occur within the Analysis Area on the Lewistown Field Office (FO). **NOTE:** The U.S. Fish and Wildlife Service species list (US Fish and Wildlife Service 2011), Montana and Dakotas sensitive species list (BLM 2009) were reviewed.

¹**Status Codes:** E=federally listed endangered; T=federally listed threatened; C=federally proposed/candidate for listing; and S=BLM sensitive

²**Exclusion Rationale Codes:** ODR=outside known distributional range of the species; HAB=no habitat present in Analysis Area; SEA=species not present/affected during season.

SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
INVERTEBRATES				
Dakota skipper <i>Hesperia dacotae</i>	S		ODR	Native tallgrass prairie in Eastern Dakotas
FISH				
Arctic grayling <i>Thymallus arcticus montananus</i>	S		ODR	small, cold, clear lakes with tributaries suitable for spawning. They do not coexist well with other fishes except cutthroat trout and others with which they evolved. Sun River along Rocky Mtn. Front.
Bull trout <i>Salvelinus confluentus</i>	T		ODR	Sub-adult and adult fluvial bull trout reside in larger streams and rivers and spawn in smaller tributary streams, whereas adfluvial bull trout reside in lakes and spawn in tributaries. They spawn in headwater streams with clear gravel or rubble bottom
Northern redbelly dace x Finescale dace <i>Phoxinus eos x</i> <i>Phoxinus neogaeus</i>	S		HAB	Northern redbelly dace prefer quiet waters from beaver ponds, bogs and clear streams. The finescale dace likes similar habitat but is also found in larger lakes. Known in Big Coulee Ck in Judith Basin Co.
Paddlefish <i>Polyodon spathula</i>	S		HAB	slow or quiet waters of large rivers or impoundments. They spawn on the gravel bars of large rivers during spring high water. Paddlefish tolerate, or perhaps seek, turbid water
Pallid Sturgeon <i>Scaphirhynchus albus</i>	E		HAB	large turbid streams including the Missouri and Yellowstone rivers. They use all channel types, primarily straight reaches with islands. They primarily use areas with substrates containing sand (especially bottom sand dune formations) and fines (93% of observations)
Pearl dace <i>Margariscus margarita</i>	S		ODR	small cool streams, either clear or turbid (Brown 1971). They spawn in clear water at depths of 1 to 2 feet over a gravel or sand bottom. N/E MT.
Sauger <i>Stizostedion canadense</i>	S	✓		larger turbid rivers and the muddy shallows of lakes and reservoirs. They spawn in gravelly or rocky areas in shallow water and seem to prefer turbid water.
Sturgeon chub <i>Macrhybopsis gelida</i>	S		ODR	turbid water with moderate to strong current over bottoms ranging from rocks and gravel to coarse sand
Westslope cutthroat trout <i>Oncorhynchus clarki lewisi</i>	S		ODR	gravel substrate in riffles and pool crests for spawning habitat. Cutthroat trout have long been regarded as sensitive to fine sediment
Yellowstone cutthroat trout <i>Oncorhynchus clarki bouvieri</i>	S		ODR	relatively clear, cold streams, rivers, and lakes. Optimal temperatures have been reported to be from 4 to 15 degrees C., with occupied waters ranging from 0 to 27 degrees C.
AMPHIBIANS AND REPTILES				
Coeur d'Alene salamander	S		ODR	primary habitats are seepages and streamside talus; W. MT near Libby, MT

<i>Plethodon idahoensis</i>				
Great Plains toad <i>Bufo cognatus</i>	S	✓		sagebrush-grassland, rainwater pools in road ruts, in stream valleys, at small reservoirs and stock ponds, and around rural farms; breeding has been documented in small reservoirs and backwater sites along streams appears to prefer stock tanks and roadside ponds rather than floodplains. Eggs and larvae develop in shallow water, usually clear or slightly turbid, but not muddy.
Northern leopard frog <i>Lithobates pipiens</i>	S	✓		wetland habitats of relatively fresh water with moderate salinity, including springs, slow streams, marshes, bogs, ponds, canals, flood plains, beaver ponds, reservoirs, and lakes, usually in permanent water with rooted aquatic vegetation.
SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
Plains spadefoot <i>Spea bombifrons</i>	S	✓		soft sandy/gravelly soils near permanent or temporary bodies of water. lives largely inactive in burrows of its own construction or occupies rodent burrows, and enters water only to breed. Following heavy rains, adults have been reported in water up to 30 centimeters deep in flooded wagon wheel ruts, temporary rain pools formed in wide flat-bottom coulees, water tanks, and badland seep ponds, and tadpoles and toadlets have been observed in stock ponds and small ephemeral reservoirs, usually in sagebrush-grassland habitats
Western toad <i>Anaxyrus boreas boreas</i>	S		ODR	utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms
REPTILES				
Greater short-horned lizard <i>Phrynosoma hernandesi</i>	S	✓		ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil. limestone outcrops in canyon bottoms of sandy soil with an open canopy of limber pine-Utah juniper, and are also present on flats of relatively pebbly or stony soil with sparse grass and sagebrush cover
Milksnake <i>Lampropeltis triangulum</i>	S	✓		open sagebrush-grassland habitat and ponderosa pine savannah with sandy soils, most often in or near areas of rocky outcrops and hillsides or badland scarps, sometimes within city limits.
Snapping turtle <i>Chelydra serpentina</i>	S	✓		backwaters along major rivers, at smaller reservoirs, and in smaller streams and creeks with permanent flowing water and sandy or muddy bottoms
Spiny softshell <i>Apalone spinifera</i>	S	✓		primarily a riverine species, occupying large rivers and river impoundments, but also occurs in lakes, ponds along rivers, pools along intermittent streams, bayous, irrigation canals, and oxbows. open sandy or mud banks, a soft bottom, and submerged brush and other debris. Spiny Softshells bask on shores or on partially submerged logs. They burrow into the bottoms of permanent water bodies, either shallow or relatively deep (0.5 to 7.0 meters), where they spend winter. Eggs are laid in nests dug in open areas in sand, gravel, or soft soil near water
Western hog-nosed snake <i>Heterodon nasicus</i>	S	✓		apparent preference for arid areas, farmlands, and floodplains, particularly those with gravelly or sandy soil, has been noted. They occupy burrows or dig into soil, and less often are found under rocks or debris, during periods of inactivity
BIRDS				

Baird's sparrow <i>Ammodramus bairdii</i>	S		HAB	nest in native prairie, but structure may ultimately be more important than plant species composition. (nesting has been observed in crested wheat, while smooth brome is avoided) areas with little to no grazing activity are required.
Bald eagle <i>Haliaeetus leucocephalus</i>	S	✓		near open water including rivers, streams & lakes, nesting & roosting in large ponderosa pine, Douglas-fir, or cottonwood trees in proximity to open water and rivers.
Black tern <i>Chilodoniast niger</i>	S		HAB	wetlands, marshes, prairie potholes, and small ponds. 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., reed spp., grass spp., <i>Polygonum</i> spp., <i>Juncus</i> spp. and <i>Potamogeton</i> spp., indicating a wide variety of potential habitats are usable by Black Terns. Water levels range from about 0.5 m to greater than 2.0 m with most having depths between 0.5 m and 1.0 m (MTNHP 2003).
Black-backed woodpecker <i>Picoides arcticus</i>	S		HAB	early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir, although they are more numerous in lower elevation Douglas-fir and pine forest habitats than in higher elevation subalpine spruce forest habitats
Black-crowned night heron <i>Nycticorax nycticorax</i>	S		HAB	shallow bulrush or cattail marshes, most often within a grassland landscape. also nest in cottonwoods, willows, or other wetland vegetation that allows them to nest over water or on islands that may afford them protection from mammalian Most colonies are located in large wetland complexes, typically with a one-to-one ratio of open water and emergent vegetation
SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
Blue-gray gnatcatcher <i>Poliophtilia caerulea</i>	S		ODR	brush, scrub, or chaparral are intermixed with taller vegetation (e.g., forest edge, riparian corridors); nesting often occurs near water. Nests are built on branches or forks of trees or shrubs, usually 1 to 25 meters above ground—S. Central MT
Bobolink <i>Dolichonyx orysivorus</i>	S		HAB	Nests built in tall grass and mixed-grass prairies. Prefers "old" hay fields with high grass-to-legume ratios.
Brewer's sparrow <i>Spizella breweri</i>	S	✓		Sagebrush, mountain meadows, and mountain shrub habitats. nested in sagebrush averaging 16-inches high. The cover (concealment) for the nest provided by sagebrush is very important
Burrowing owl <i>Athene cucicularia</i>	S		HAB	open grasslands, where abandoned burrows dug by mammals such as ground squirrels, prairie dogs and badgers are available. Black-tailed Prairie Dog and Richardson's Ground Squirrel colonies provide the primary and secondary habitat for Burrowing Owls in the state
Chestnut-collared longspur <i>Calcarius ornatus</i>	S	✓		Species prefers short-to-medium grasses that have been recently grazed or mowed. Prefers native pastures.
Common loon <i>Gavia immer</i>	S		HAB	13+ acre lake <5000 feet in elevation. Small islands preferred for nesting, but herbaceous shoreline areas, also selected. Nursery areas are very often sheltered, shallow coves with abundant small fish and insects. relatively oligotrophic and have not experienced significant siltation or other hydrological changes.
Dickcissel <i>Spiza americana</i>	S	✓		grasslands, meadows, savanna, cultivated lands, and brushy fields. nest on ground in grass or rank herbage, or raised a little above ground, in grass tufts or tall weeds, or in low shrubs or trees, up to about 2 meters above the ground but usually low. prefer habitat with dense, moderate to tall vegetation (particularly with some forbs) and moderately deep litter. moderately grazed and idle prairie. A high abundance of forbs provides perches, nesting cover, nest support, and possibly increased invertebrate

				abundance.
Ferruginous hawk <i>Buteo regalis</i>	S	✓		mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe.
Flammulated owl <i>Otus flammeolus</i>	S		HAB	old-growth or mature ponderosa pine, ponderosa pine, & Douglas-fir forests, often mixed with mature aspen, nesting in cavities, feeding on insects.
Franklin's gull <i>Larus pipixcan</i>	S		HAB	Preferring large, relatively permanent prairie marsh complexes, the Franklin's Gull builds its nests over water on a supporting structure of emergent vegetation. Nesting is noted to occur in cattails and bulrushes
Golden eagle <i>Aquila chrysaetos</i>	S	✓		nest on cliffs and in large trees (occasionally on power poles), and hunt over prairie and open woodlands. Cliff nests selected for south or east aspect, less than 200 in. snowfall, low elevation, availability of sagebrush/grassland hunting areas
Great gray owl <i>Strix nebulosa</i>	S		HAB	dense coniferous and hardwood forest, especially pine, spruce, paper birch, poplar, and second-growth, especially near water. forage in wet meadows, boreal forests and spruce-tamarack bogs in the far north, and coniferous forest and meadows in mountainous areas. nest in the tops of large broken-off tree trunks in old nests of other large birds, or in debris platforms from dwarf mistletoe, frequently near bogs or clearings. Nests are frequently reused and the same pair often nests in the same area in successive years.
Greater sage-grouse <i>Centrocercus urophasianus</i>	S/C	✓		tall dense stands of sagebrush; 6 to 18 inch high sagebrush covered benches in June to July (average 213 acres); move to alfalfa fields (144 acres) or greasewood bottoms (91 acres) when forbs on the benches dry out; and move back to sagebrush (average 128 acres) in late August to early September (Peterson 1970).
Harlequin duck <i>Histrionicus histrionicus</i>	S		HAB	fast moving, low gradient, clear mountain streams. birds in streams on the Rocky Mountain Front were seen in pole-sized timber.
Least tern <i>Sternula antillarum</i>	E		HAB	nest on unvegetated sand-pebble beaches and islands of large reservoirs and rivers in northeastern and southeastern Montana, specifically the Yellowstone and Missouri river systems.
LeConte's sparrow <i>Ammodramus leconteii</i>	S		HAB	wet meadows within peatlands, often with a strong sedge (<i>Carex</i>) component
SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
Loggerhead shrike <i>Lanius ludovicianus</i>	S	✓		open riparian areas, montane meadows, agricultural areas, grasslands, shrublands, & piñon/juniper woodlands
Long-billed curlew <i>Numenius americanus</i>	S	✓		Nests primarily in short-grass or mixed-prairie habitat with flat to rolling topography Habitats with trees, high density of shrubs (e.g., sagebrush [<i>Artemisia</i> spp.]), and tall, dense grass generally. Taller, denser grass used during brood-rearing when shade and camouflage from predators are presumably more important for chicks, but may also reflect decline in availability of shorter habitats with season.
Marbled godwit <i>Limosa fedoa</i>	S	✓		Breeds in short, sparsely to moderately vegetated landscapes that include native grassland and wetlands. ephemeral ponds, as well as temporary ponds and alkali wetland. Semi permanent ponds used as well. Upland habitat during breeding season primarily idle grassland and pastures

McCown's longspur <i>Calcarius mccownii</i>	S	✓		breeding habitat is a matrix of perennial shortgrass species (e.g., <i>Bouteloua gracilis</i> , <i>Buchloe dactyloides</i>) interspersed with cactus, and limited cover of midgrasses (e.g., <i>Aristida longiseta</i> , <i>Agropyron smithii</i> , <i>Stipa comata</i>) and shrubs (e.g., <i>Gutierrezia sarothrae</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemisia frigida</i>).
Mountain plover <i>Charadrius montanus</i>	S/P		HAB	prairie dog colonies and other shortgrass prairie sites are confirmed as preferred breeding habitat. Strong preference was also given to sites with slopes less than 5% and grass height of less than 6 cm (3 inches)
Nelson's sharp-tailed sparrow <i>Ammodramus nelson</i>	S		HAB	freshwater wetlands with dense, emergent vegetation or damp areas with dense grasses
Northern goshawk <i>Accipiter gentilis</i>	S		HAB	primarily forest habitat, especially in mountains, nesting in lower portions of mature Douglas-fir, ponderosa pine, lodgepole pine, or aspen canopies; prefers mature or old-growth forest structure.
Peregrine falcon <i>Falco peregrinus anatum</i>	S		HAB	wide variety of habitats, selects cliff ledges or rock outcroppings for nesting, preferring high, open cliff faces that dominate the surrounding area.
Red-headed woodpecker <i>Melanerpes erythrocephalus</i>	S	✓		along major rivers having riparian forest. open savannah country w/ ground cover, snags and canopy cover. Large burns also utilized. nest in holes excavated 2 to 25 meters above ground by both sexes in live trees, dead stubs, utility poles, or fence posts. Individuals nest in the same cavity in successive years.
Sage sparrow <i>Amphispiza belli</i>	S		ODR	Prefers semiopen habitats with evenly spaced shrubs 1–2 m high. Vertical structure, habitat patchiness, and vegetation density may be more important in habitat selection than specific shrub species, but this sparrow is closely associated with big sagebrush throughout most of its range. Historical records w/i FO 20+ years old. Extreme S. Central MT
Sage thrasher <i>Oreoscoptes montanus</i>	S	✓		sagebrush obligate in Montana. abundance is generally positively correlated with the amount of sage cover and negatively correlated with grass cover.
Sedge wren <i>Cistothorus platensis</i>	S		ODR	areas that are highly susceptible to flooding and drying caused by annual and seasonal variation in rainfall.
Sprague's pipit <i>Anthus spragueii</i>	S		HAB	native, medium to intermediate height prairie and in a short grass prairie landscape, can often be found in areas with taller grasses. more abundant in native prairie than in exotic vegetation; area sensitive, requiring relatively large areas of appropriate habitat; the minimum area requirement in a Saskatchewan study was 470 acres. known to utilize and breed in alkaline meadows and around the edges of alkaline lakes
Swainson's hawk <i>Buteo swainsoni</i>	S	✓		nest in river bottom forests, brushy coulees, and shelterbelts. hunt in grasslands and agricultural land, especially along river bottoms.
Three-toed woodpecker <i>Picoides dorsalis</i>	S		HAB	mature or old-growth spruce-fir forest, but also occurs in ponderosa pine, Douglas-fir, & lodgepole pine forests with abundant snags and insect populations are present due to outbreaks from disease or fire.
Trumpeter swan <i>Cygnus buccinator</i>	S		ODR	Along the Rocky Mountain Front the breeding habitat is small pothole lakes, generally with sufficient water to maintain emergent vegetation through the breeding season. Habitat requirements for breeding include room to take off (~100 m), shallow, unpolluted water with sufficient emergent vegetation and invertebrates, appropriate nest sites (i.e. Muskrat lodges), and areas with little human disturbance

SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
White-faced ibis <i>Plegadis chihi</i>	S	✓		freshwater wetlands, including ponds, swamps and marshes with pockets of emergent vegetation. also use flooded hay meadows and agricultural fields as feeding locations. nest in areas where water surrounds emergent vegetation, bushes, shrubs, or low trees. use old stems in cattails (<i>Typha</i> spp.), hardstem bulrush (<i>Scirpus acutus</i>) or alkali bulrush (<i>S. paludosus</i>) over shallow water as their nesting habitat
Yellow rail <i>Coturnicops noveboracensis</i>	S		HAB	Breeding habitat consists of wet sedge meadows and other wetlands containing grasses, rushes and bulrushes. Presence of the Yellow Rail is most commonly dictated by water depth, specifically one that fluctuates throughout the breeding season, i.e. wet in the early part of the breeding season and relatively dry (no standing water) by July or September. NE MT and Flathead Valley.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	S		HAB	tall cottonwood and willow riparian woodlands. Nests are found in trees, shrubs or vines, an average of 1 to 3 meters above ground. Western subspecies require patches of at least 10 hectares (25 acres) of dense, riparian forest with a canopy cover of at least 50 percent in both the understory and overstory. Nests are typically found in mature willows
MAMMALS				
Black-footed ferret <i>Mustela nigripes</i>	E		HAB	intimately tied to prairie dogs and only found in association with prairie dogs. limited to habitat used by prairie dogs: grasslands, steppe, and shrub steppe. rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population. estimated that 40 to 60 hectares of prairie dog colony is needed to support one Black-footed Ferret, and females with litters have never been found on colonies less than 49 hectares
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	S		HAB	colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama and big sagebrush. Colonies are associated with silty clay loams, sandy clay loams, and loams and fine to medium textured soils are preferred, presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils.
Canada lynx <i>Lynx canadensis</i>	T		HAB	dense spruce-fir, Douglas-fir, early seral lodgepole pine, mature lodgepole pine with developing understory of spruce-fir & aspen in subalpine zone & timberline, using caves, rock crevices, banks, logs for denning, closely associated with snowshoe hare.
Fisher <i>Martes pennanti</i>	S		ODR	When inactive, they occupy dens in tree hollows, under logs, or in ground or rocky crevices, or they rest in branches of conifers (in the warmer months). Fishers occur primarily in dense coniferous or mixed forests, including early successional forests with dense overhead cover. Optimal conditions for Fishers are forest tracts of 245 acres or more, interconnected with other large areas of suitable habitat.
Fringed myotis <i>Myotis thysanodes</i>	S	✓		rocky outcroppings in mid-elevation ponderosa pine, piñon/juniper, oak, & mixed conifer woodlands, grasslands, deserts, & shrublands;
Fringe-tailed myotis <i>Myotis thysanodes pahasapensis</i>	S		ODR	occurs primarily in caves in the Black Hills and Badlands. occurs only in certain montane (mountainous) areas of South Dakota and Wyoming

Gray wolf <i>Canis lupis</i>	S		ODR	no particular habitat preference except for the presence of native ungulates within its territory on a year-round basis. Gray Wolves establishing new packs in Montana have demonstrated greater tolerance of human presence and disturbance than previously thought characteristic of this species.
Great Basin pocket mouse <i>Perognathus parvus</i>	S		ODR	arid and sometimes sparsely vegetated. They include grassland-shrubland with less than 40% cover, stabilized sandhills, and landscapes with sandy soils, more than 28% sagebrush cover, and 0.3 to 2.0 meters shrub height. Extreme SW MT.
Grizzly bear <i>Ursus arctos horribilis</i>	T		ODR	primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, sidehill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals. Historically, the Grizzly Bear was primarily a plains species occurring in higher densities throughout most of eastern Montana.
SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR?	RATIONALE FOR EXCLUSION ²	BRIEF HABITAT DESCRIPTION AND RANGE IN MONTANA
Long-eared myotis <i>Myotis evotis</i>	S	✓		found in wooded and rocky areas. It has been located hibernating in a mine in riverbreaks habitat in northeastern Montana
Long-legged myotis <i>Myotis volans</i>	S	✓		typically occupy mountainous or relatively rugged areas. They often live in coniferous forest, although they are sometimes found in oak or streamside woodlands, and even deserts. They feed mostly on moths, but are opportunistic, eating whatever soft-bodied insects are most abundant.
Meadow jumping mouse <i>Zapus hudsonius</i>	S		HAB ODR	dense, tall and lush grass and forbs in marshy areas (sometimes with standing water), riparian areas, woody draws, and grassy upland slopes, sometimes within or near forested sites of ponderosa pine. E/SE MT.
Northern myotis <i>Myotis septentrionalis</i>	S		ODR	located hibernating in an abandoned mine in riverbreaks habitat in Richland County. prefers cooler hibernacula than <i>Myotis lucifugus</i> and selects narrow crevices in which to hibernate. NE MT.
Pallid bat <i>Antrozous pallidus</i>	S		ODR	arid deserts, juniper woodlands, sagebrush shrub-steppe, and grasslands, often with rocky outcrops and water nearby. arid and semi-arid regions throughout northern Mexico and the western United States. Pallid bats eat beetles, grasshoppers, and moths, and they forage for slow-moving prey, such as scorpions, flightless arthropods, and sometimes lizards, at and near ground level. visit flowers in their hunt for insects, and are natural pollinators of several species of cactus. S. Central MT.
Pygmy rabbit <i>Brachylagus idahoensis</i>	S		ODR	shrub-grasslands on alluvial fans, floodplains, plateaus, high mountain valleys, and mountain slopes, where suitable sagebrush cover and soils for burrowing are available. Some occupied sites may support a relatively sparse cover of sagebrush and shallow soils, but these usually support patches of dense sagebrush and deeper soils. Big sagebrush was the dominant shrub at all occupied sites, averaging 21.3 to 22.6% coverage; bare ground averaged 33% and forbs 5.8%. SW MT.
Swift fox <i>Vulpes velox</i>	S	✓		open prairie and arid plains, including areas intermixed with winter wheat fields in north-central Montana. They use burrows when they are inactive; either dug by themselves or made by other mammals (marmot, prairie dog, badger). The burrows are usually located in sandy soil on high ground such as hill tops in open prairies, along fencerows, or occasionally in a plowed field. Suitable habitat generally extensive in size (preferably over 100,000 acres), with relatively level topography, and with greater than 50% of the area undisturbed by agriculture. A total of 8,000,000 suitable acres were identified in Montana

Townsend's big-eared bat <i>Plecotus townsendii</i>	S	✓		associated with caves & abandoned mines for day roosts & hibernacula, will also use abandoned buildings in western shrubland, piñon/juniper woodlands, & open montane forests in elevations up to 9,500 ft.
White-tailed prairie dog <i>Cynomys leucurus</i>	S		ODR	xeric sites with mixed stands of shrubs and grasses. habitats dominated by two types of vegetation: areas with Nuttall saltbrush with lesser amounts of big sage, and areas with poverty sumpweed and winter fat. Extreme S. Central MT
Wolverine <i>Gulo gulo</i>	S/C		HAB	alpine & subalpine mature/intermediate timbered areas around natural openings, including cliffs, slides, basins, & meadows, dependant on ungulates, range extending the length of the Rocky Mts.

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U.S. Fish and Wildlife Service (FWS). 2011. Endangered, Threatened, Proposed and Candidate Species Montana Counties. Ecological Services Montana Field Office (May, 2011). http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species.html accessed 5/10/11.

Appendix D. Potential species within each of the proposed lease parcels.

Species	NV	NW	NX	NZ
Sauger	✓			✓
Great Plains toad		✓	✓	
Northern leopard frog	✓	✓	✓	✓
Plains spadefoot	✓	✓	✓	✓
Greater short-horned lizard	✓	✓	✓	✓
Milk snake		✓	✓	✓
Spiny softshell turtle	✓			✓
Western hog-nosed snake	✓	✓	✓	✓
Bald eagle	✓			✓
Brewer's sparrow			✓	✓
Chestnut-collared longspur			✓	✓
Dickcissel		✓	✓	✓
Ferruginous hawk		✓	✓	
Golden eagle	✓	✓	✓	✓
Greater sage-grouse			✓	✓
Loggerhead shrike		✓	✓	
Long-billed curlew			✓	✓
Marbled godwit	✓	✓	✓	✓
McCown's longspur			✓	
Red-headed woodpecker	✓			✓
Sage thrasher			✓	✓
Swainson's hawk	✓			✓
White-faced ibis			✓	
Fringed myotis		✓	✓	
Long-eared myotis	✓	✓	✓	✓
Long-legged myotis	✓	✓	✓	✓
Swift fox			✓	✓
Townsend's big-eared bat		✓	✓	

Appendix E. Determination Summary for the LFO Oil and Gas Leasing Project.

Species	No Action	Proposed Action
Sauger	NI	NI
Great Plains toad	NI	NI
Northern leopard frog	NI	NI
Plains spadefoot	NI	NI
Greater short-horned lizard	NI	MIIH
Milk snake	NI	MIIH
Spiny softshell turtle	NI	NI
Western hog-nosed snake	NI	MIIH
Bald eagle	NI	MIIH
Brewer's sparrow	NI	MIIH
Chestnut-collared longspur	NI	MIIH
Dickcissel	NI	MIIH
Ferruginous hawk	NI	MIIH
Golden eagle	NI	MIIH
Greater sage-grouse	NI	MIIH
Loggerhead shrike	NI	MIIH
Long-billed curlew	NI	MIIH
Marbled godwit	NI	MIIH
McCown's longspur	NI	MIIH
Red-headed woodpecker	NI	NI
Sage thrasher	NI	MIIH
Swainson's hawk	NI	NI
White-faced ibis	NI	NI
Fringed myotis	NI	MIIH
Long-eared myotis	NI	MIIH
Long-legged myotis	NI	MIIH
Swift fox	NI	MIIH
Townsend's big-eared bat	NI	MIIH

Federally Listed Species

NE – No Effect

*LAA – May Effect, Likely to Adversely Affect (formal USFWS consultation required)

NLAA – May Effect, Not Likely to Adversely Affect (informal USFWS consultation required)

BE – Beneficial Effect (informal USFWS consultation required)

Species Proposed For Listing

NE – No Effect

NLJ – Not likely to Jeopardize the continued existence of the species or result in adverse modification of proposed critical habitat

*LJ – Likely to Jeopardize the continued existence of the species or result in or adverse modification of proposed critical habitat

Sensitive Species

NI – No Impact

MIIH – May Impact Individuals or Habitat, but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species

*WIFV – Will Impact Individuals or habitat that is likely contribute to a trend toward federal listing or cause a loss of viability to the population or species

BI – Beneficial Impact