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AIR RESOURCES AND CLIMATE APPENDIX

INTRODUCTION

This appendix contains tables and figures that provide additional air resource and climate information for the planning area. Explanations of the data are provided in Chapter 3, *Affected Environment*. Technical data presented in this appendix address climate, air quality, and air quality related values (AQRVs). The Bureau of Land Management (BLM) *Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources* (ARMP) is also included in this appendix and begins on page ARMP-1.

TABLES AND FIGURES

TABLE 1.
BAKER CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1948 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	31.0	34.4	43.8	60.4	67.7	76.7	90.7	88.2	76.5	59.5	44.6	33.7	**58.9**
Average Min. Temperature	9.4	12.0	21.4	33.4	42.1	51.7	61.0	57.8	46.8	32.6	19.7	11.8	**33.3**
Average Total Precipitation	0.42	0.38	0.56	1.28	1.90	3.03	1.85	1.22	1.34	1.00	0.49	0.40	**13.87**
Average Total Snow Fall	4.8	4.0	4.9	3.1	0.9	0.1	0.0	0.0	0.4	1.0	3.5	4.7	**27.4**
Average Snow Depth	4	4	2	0	0	0	0	0	0	0	1	2	**1**

Source: DRI and NOAA 2010c
Baker: Co-op station 240412
Period of Record: 01 July 1948 through 31 December 2005
Elevation: 2933 feet, 46°22'N / 104°17'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 2.
BROADUS CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1948 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	32.1	38.7	46.5	58.7	68.7	78.3	87.4	86.3	74.5	62.2	45.6	35.6	**59.6**
Average Min. Temperature	6.5	13.1	20.5	31.0	41.2	50.3	56.0	53.5	42.3	31.3	19.4	10.2	**31.3**
Average Total Precipitation	0.47	0.45	0.77	1.45	2.22	2.43	1.52	1.02	1.09	1.01	0.58	0.48	**13.49**
Average Total Snow Fall	6.5	5.7	7.4	4.4	1.2	0.1	0.0	0.0	0.5	2.2	5.6	7.0	**40.6**
Average Snow Depth	3	3	1	0	0	0	0	0	0	0	1	2	**1**

Source: DRI and NOAA 2010d
Broadus: Co-op station 241127
Period of Record: 01 July 1948 through 31 December 2005
Elevation: 3032 feet, 45°27'N / 105°24'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 3.
GLENDIVE CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1905 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	26.1	31.3	43.0	60.0	71.2	80.1	88.9	87.7	75.5	62.2	43.2	31.0	**58.4**
Average Min. Temperature	3.8	7.7	18.9	32.9	43.6	53.0	58.7	55.9	44.7	33.7	20.7	9.6	**31.9**
Average Total Precipitation	0.45	0.37	0.66	1.15	2.03	3.12	1.83	1.37	1.20	0.84	0.46	0.45	**13.93**
Average Total Snow Fall	6.0	4.6	5.7	1.9	0.4	0.0	0.0	0.0	0.1	1.2	3.6	5.3	**28.8**
Average Snow Depth	4	3	1	0	0	0	0	0	0	0	1	2	**1**

Source: DRI and NOAA 2010e
Glendive: Co-op station 243581
Period of Record: 01 January 1893 through 31 December 2005
Elevation: 2076 feet, 47°06'N / 104°43'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 4.
JORDAN CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1905 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	28.8	34.5	45.3	59.7	70.4	79.7	89.6	88.3	76.0	62.9	44.7	33.5	**59.5**
Average Min. Temperature	2.8	7.7	18.4	30.0	40.1	49.4	55.2	52.3	41.4	30.6	17.9	7.9	**29.5**
Average Total Precipitation	0.45	0.32	0.54	1.03	1.81	2.5	1.55	1.09	0.98	0.73	0.34	0.42	**11.74**
Average Total Snow Fall	3.1	3.1	1.3	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.9	1.8	**11.0**
Average Snow Depth	3	2	1	0	0	0	0	0	0	0	0	1	**1**

Source: DRI and NOAA 2010f
Jordan: Co-op station 244522
Period of Record: 01 January 1905 through 31 December 2005
Elevation: 2620 feet, 47°19'N / 106°55'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 5.
LAME DEER CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1948 TO 1998)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	33.7	41.0	48.3	60.6	70.4	79.5	89.2	89.0	77.3	64.5	46.3	36.7	**61.4**
Average Min. Temperature	4.9	11.4	18.9	27.9	37.8	46.0	50.8	48.9	38.6	28.9	18.5	9.0	**28.5**
Average Total Precipitation	0.53	0.59	0.85	1.48	2.69	2.63	1.33	1.06	1.26	1.16	0.77	0.64	**14.98**
Average Total Snow Fall	9.5	7.3	8.0	4.6	0.3	0.3	0.0	0.1	0.4	1.4	6.3	8.2	**46.3**
Average Snow Depth	6	4	1	0	0	0	0	0	0	0	1	3	**1**

Source: DRI and NOAA 2010g
Lame Deer: Co-op station 244839
Period of Record: 01 July 1948 through 31 May 1998
Elevation: 3300 feet, 45°38'N / 106°40'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 6.
MILES CITY FAA AIRPORT TEMPERATURE AND PRECIPITATION DATA (1937 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	27.3	33.7	44.0	58.4	69.3	78.6	88.8	87.2	74.3	61.1	42.8	32.2	**58.1**
Average Min. Temperature	6.8	11.9	21.3	33.6	44.1	53.2	60.1	58.2	46.8	35.5	21.6	11.7	**33.7**
Average Total Precipitation	0.45	0.39	0.62	1.28	2.09	2.89	1.58	1.13	1.14	0.95	0.47	0.43	**13.43**
Average Total Snow Fall	5.8	4.6	4.7	3.3	0.7	0.0	0.0	0.0	0.3	1.2	4.2	5.1	**29.9**
Average Snow Depth	5	6	3	1	0	0	0	0	0	0	1	4	**2**

Source: DRI and NOAA 2010m
Miles City FAA Airport: Co-op station 245690
Period of Record: 16 January 1937 through 31 December 2005
Elevation: 2624 feet, 46°26'N / 105°53'W
Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 7.
SIDNEY CO-OP STATION TEMPERATURE AND PRECIPITATION DATA (1910 TO 2005)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Average Max. Temperature	23.0	30.3	41.4	58.5	69.9	78.1	84.9	84.1	72.3	59.6	40.9	28.7	**56.0**
Average Min. Temperature	1.0	7.7	17.2	30.2	41.4	50.4	54.9	52.7	42.5	32.1	18.8	7.5	**29.7**
Average Total Precipitation	0.40	0.35	0.55	1.09	1.97	2.82	2.11	1.45	1.34	0.95	0.48	0.41	**13.91**
Average Total Snow Fall	6.2	5.2	5.1	2.6	0.7	0.0	0.0	0.0	0.3	1.5	5.1	6.3	**33.0**
Average Snow Depth	5	4	2	0	0	0	0	0	0	0	1	2	**1**

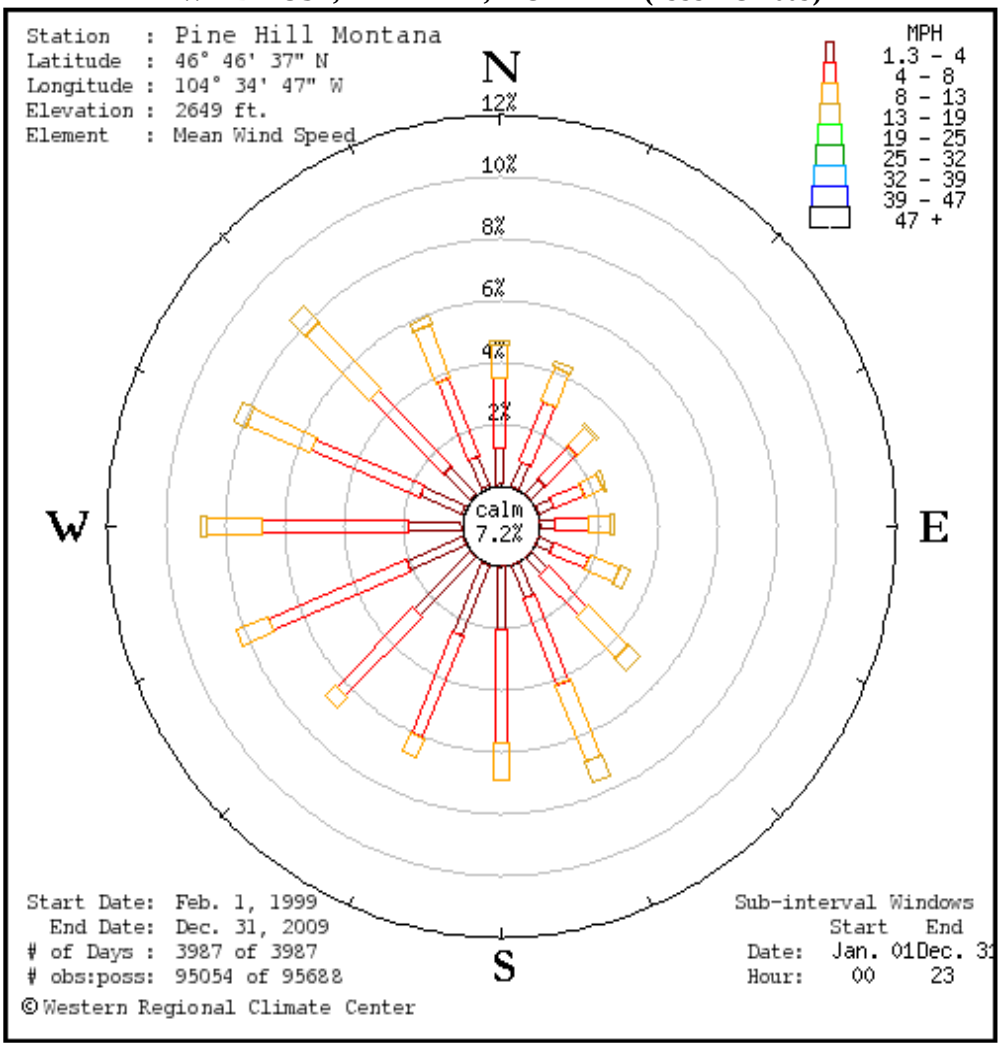
Source: DRI and NOAA 2010p
Sidney: Co-op station 247560
Period of Record: 16 October 1910 through 31 December 2005; Elevation: 1931 feet, 47°44'N / 104°09'W; Temperature: degrees Fahrenheit; precipitation, snowfall, and snow depth: inches

TABLE 8.
HOURLY WIND DATA FROM STATIONS IN THE PLANNING AREA

Month	Station									
	Baker (1998 to 2006)		Glendive (1996 to 2006)		Jordan (1996 to 2006)		Miles City (1996 to 2006)		Sidney (1996 to 2006)	
	Direction[1]	Speed	Direction	Speed	Direction	Speed	Direction	Speed	Direction	Speed
Jan.	W	10.4	S	9.5	W	7.3	S	8.8	SSW	8.9
Feb.	W	10.5	S	9.7	W	7.9	S	9.4	S	9.0
March	SE	12.2	S	10.5	W	9.3	NW	10.6	S	9.5
April	SE	12.5	NW	11.3	W	10.0	NW	11.2	N	10.2
May	W	12.7	NW	11.6	W	10.5	NW	11.3	S	10.4
June	W	11.7	W	10.4	W	9.7	NW	10.5	S	9.0
July	SE	10.7	NW	9.4	W	8.4	NW	9.9	S	7.7
Aug.	SE	10.8	S	9.6	W	8.4	SSE	9.7	S	7.9
Sept.	ESE	10.0	NW	9.6	W	8.2	NW	9.7	S	8.2
Oct	W	10.3	S	10.1	W	8.2	S	9.7	S	8.8
Nov.	W	10.5	S	9.7	W	7.9	S	9.3	SSW	8.7
Dec.	W	10.7	S	10.2	W	8.1	S	9.3	SSW	9.4
Annual	**W**	**11.1**	**S**	**10.1**	**W**	**8.6**	**NW**	**9.9**	**S**	**9.0**

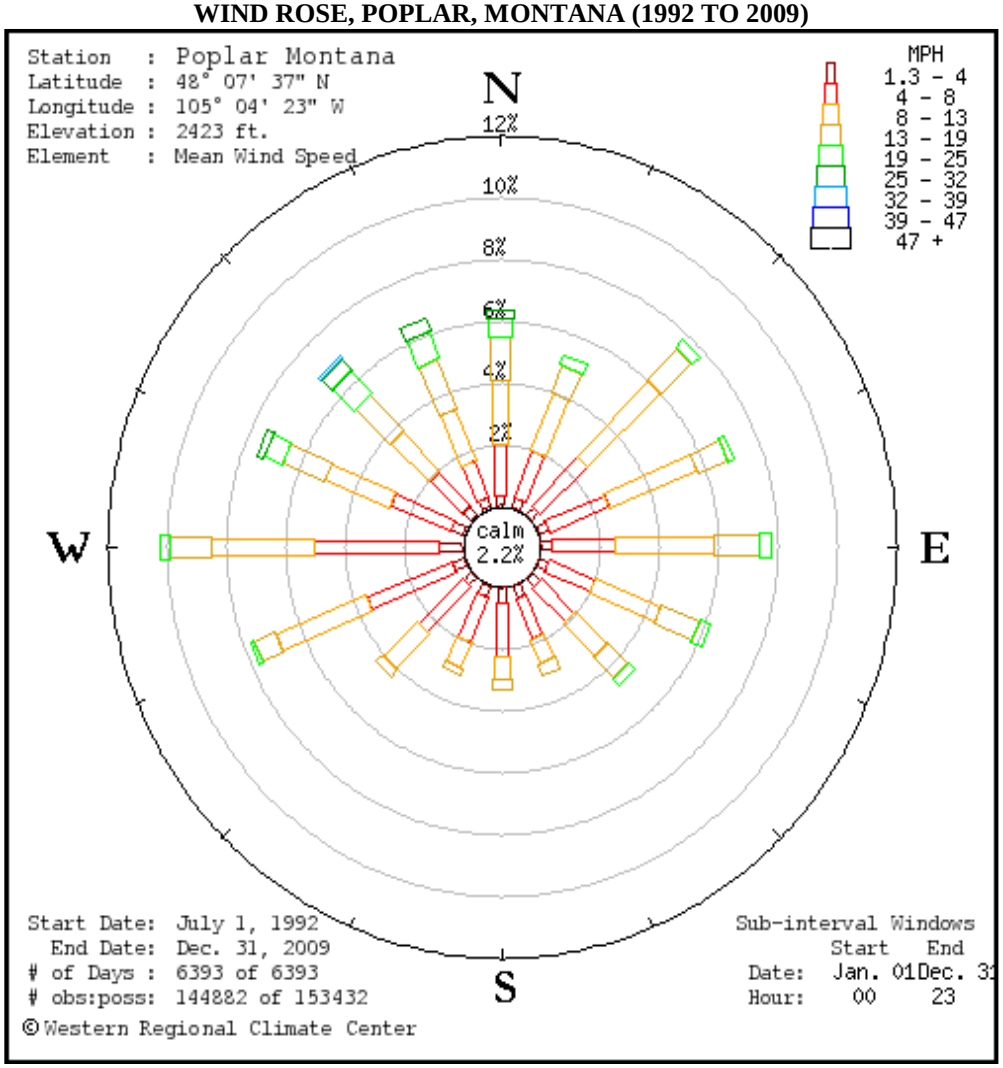
Source: DRI and NOAA 2010a and 2010b
[1]The wind direction was defined as the direction with the highest frequency (percent) from the direction of origin in mph.
The data were derived from hourly measurement during the 1996 to 2006 period, although the measurement periods varied depending on the site as noted. Although some generalities can be considered, since these data were collected at airports with few obstructions for aviation safety, these data may not be representative of a particular region.

FIGURE 1.
WIND ROSE, PINE HILL, MONTANA (1999 TO 2009)



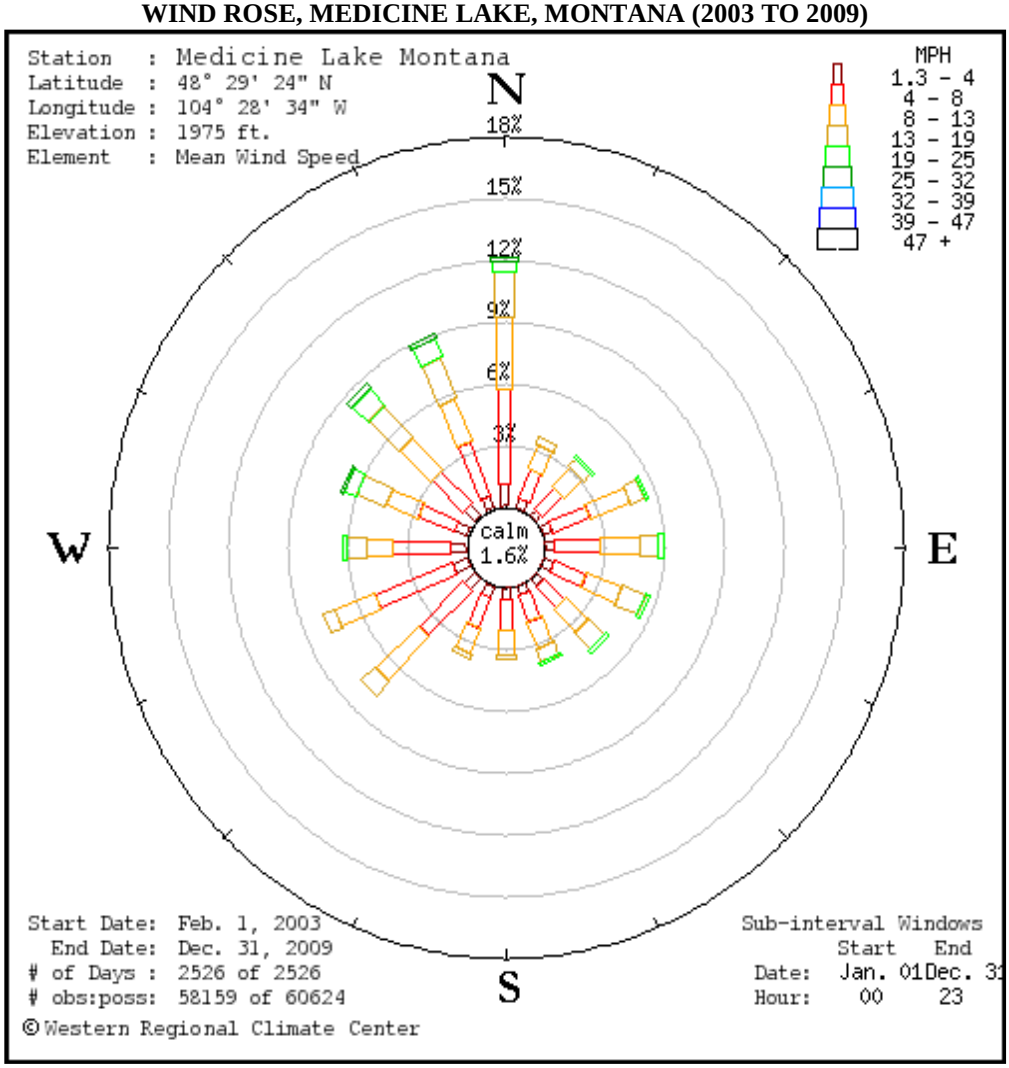
Source: DRI and NOAA 2010n

FIGURE 2.
WIND ROSE, POPLAR, MONTANA (1992 TO 2009)



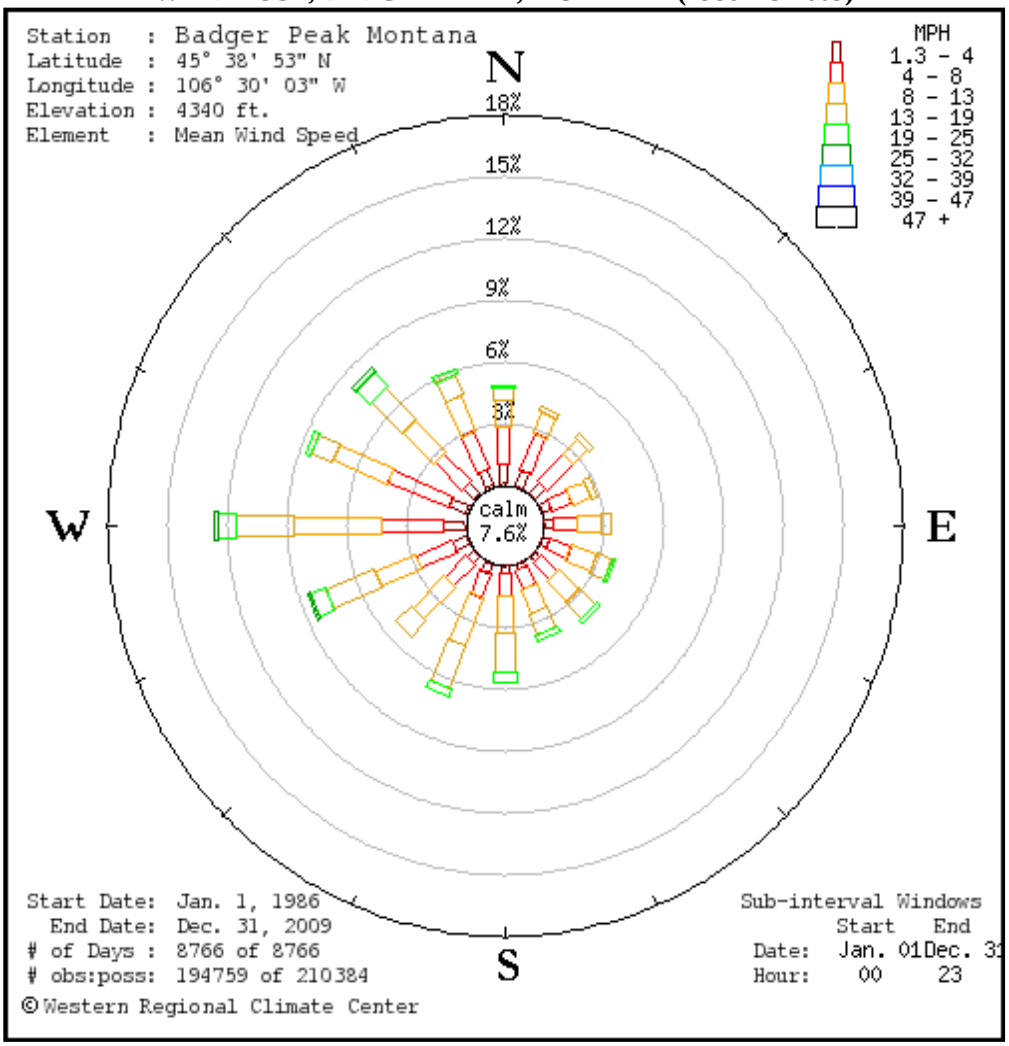
Source: DRI and NOAA 2010o

FIGURE 3.
WIND ROSE, MEDICINE LAKE, MONTANA (2003 TO 2009)



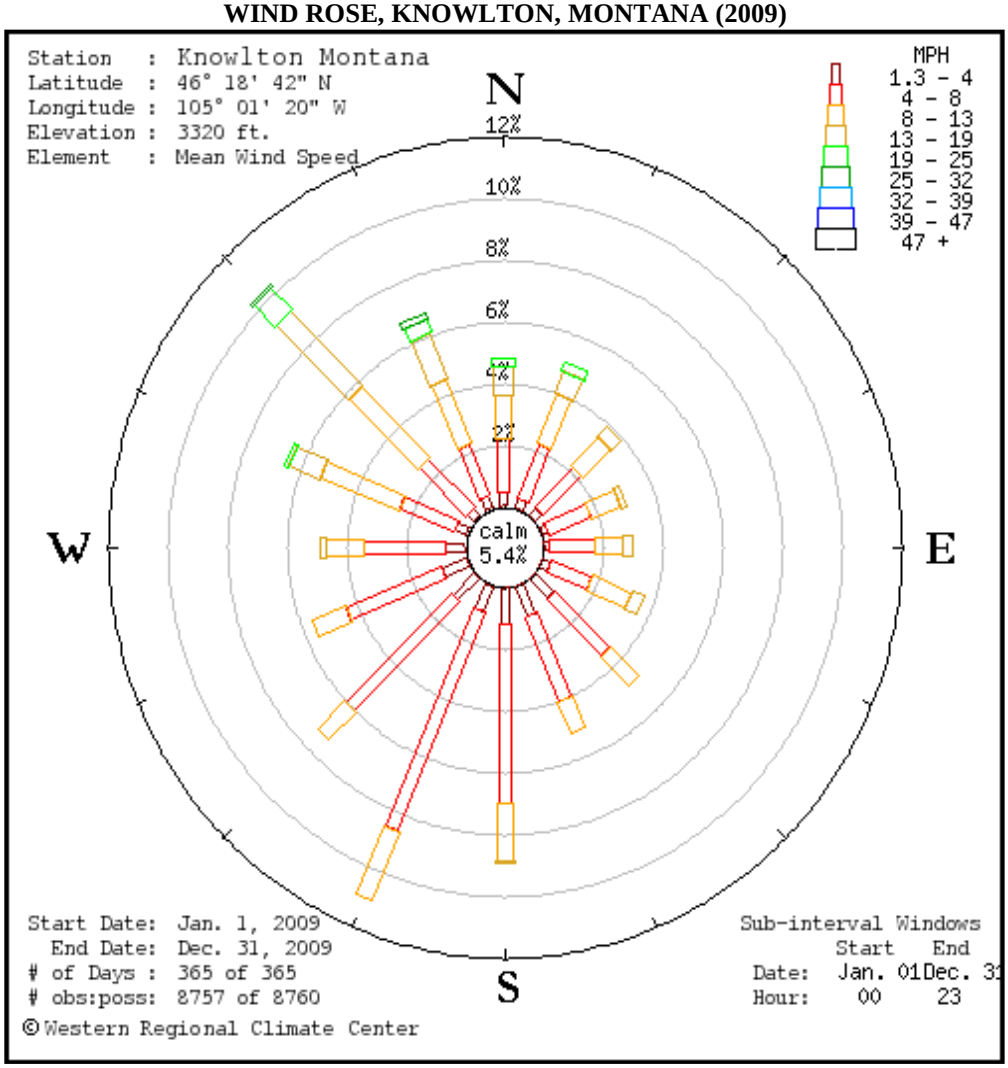
Source: DRI and NOAA 2010l

FIGURE 4.
WIND ROSE, BADGER PEAK, MONTANA (1986 TO 2009)



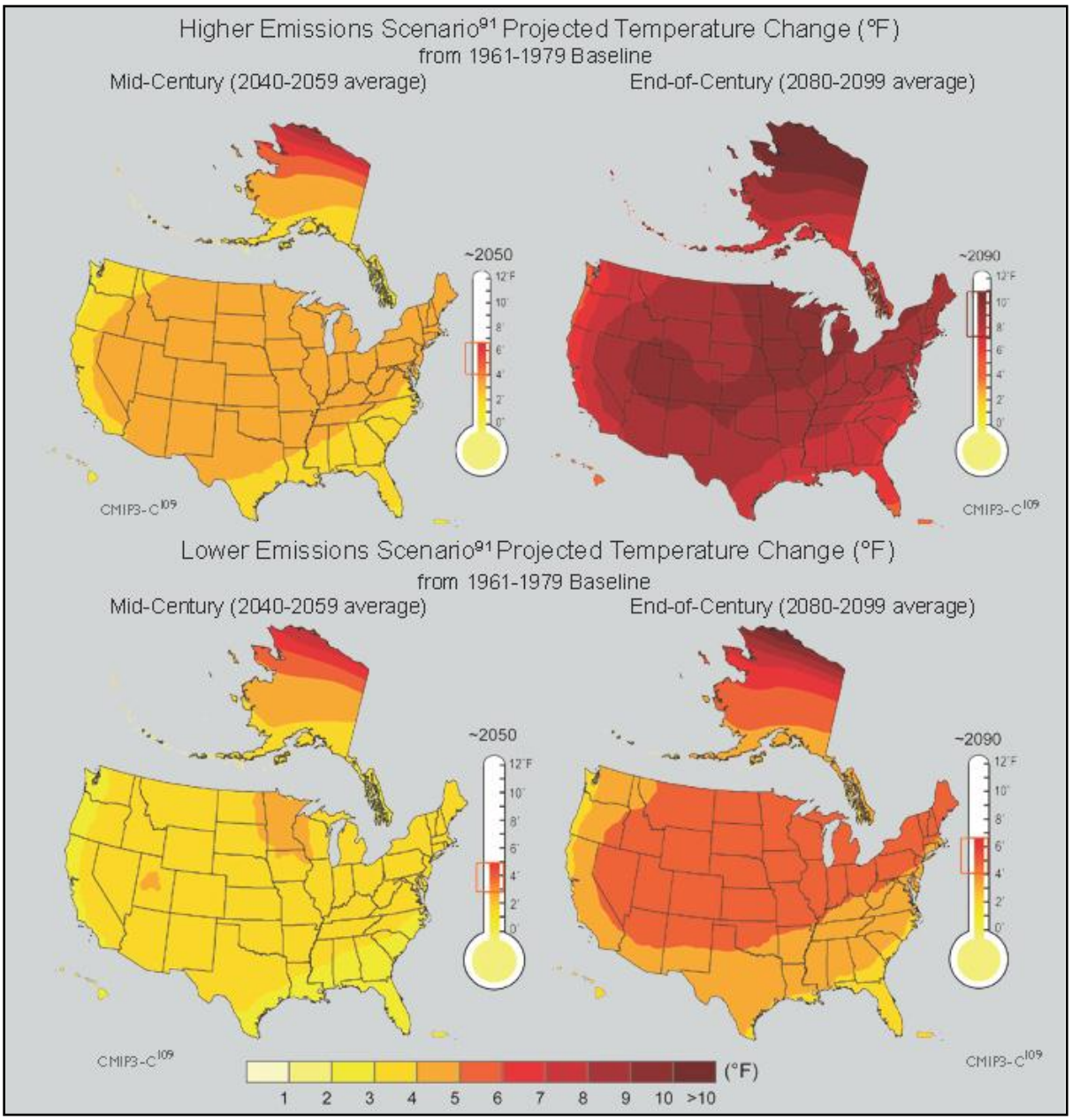
Source: DRI and NOAA 2010i

FIGURE 5.
WIND ROSE, KNOWLTON, MONTANA (2009)



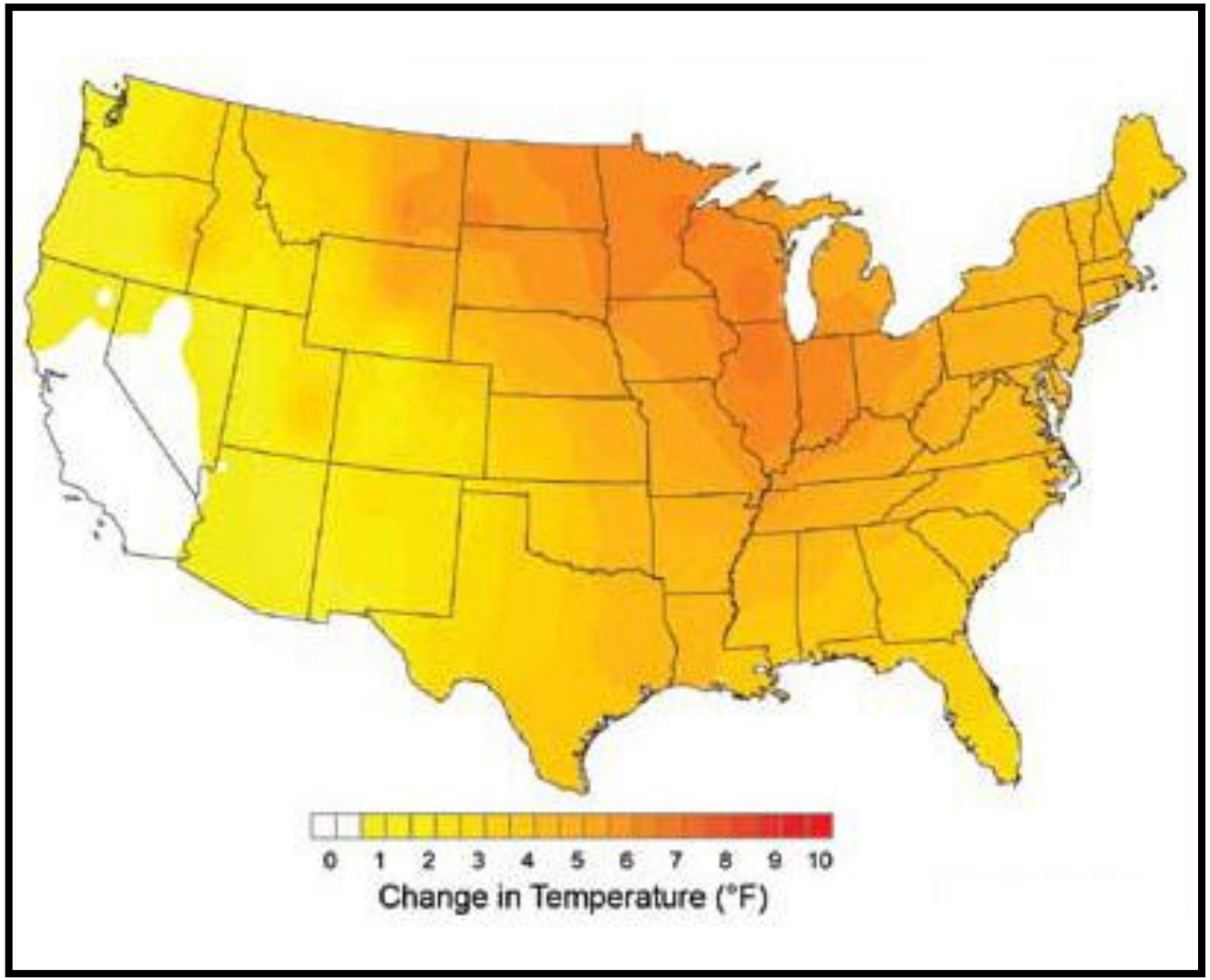
Source: DRI and NOAA 2010k

FIGURE 6.
PROJECTED UNITED STATES TEMPERATURE CHANGES FROM 1961 TO 1979 BASELINE



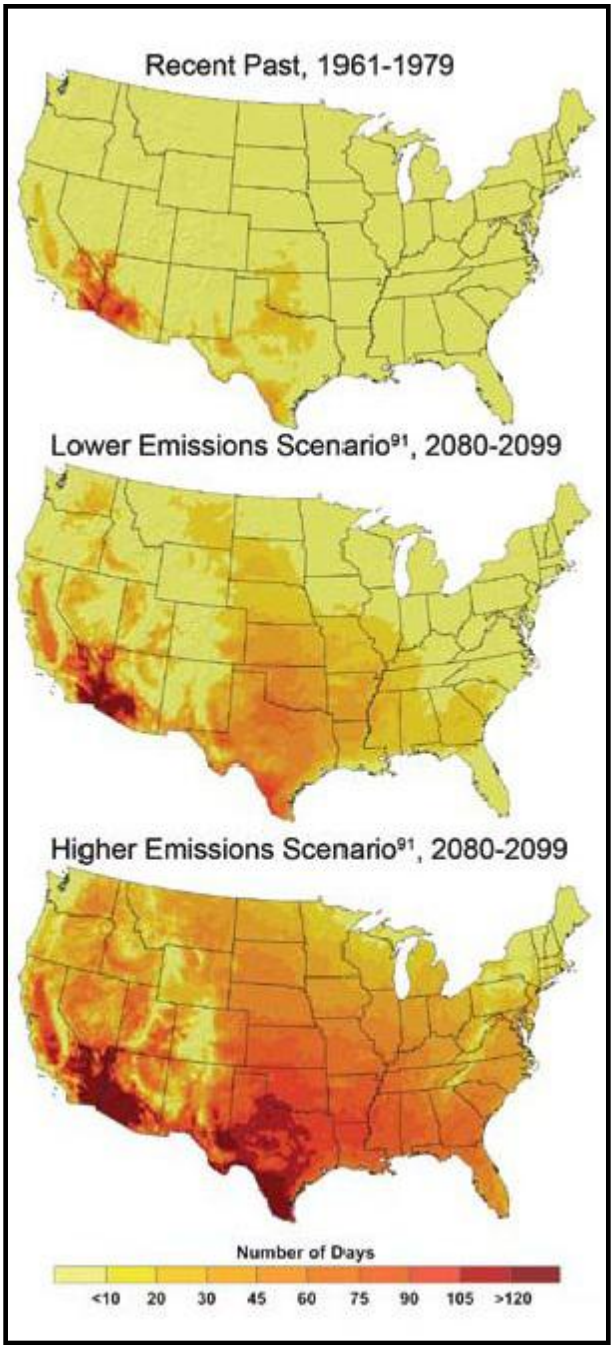
Source: USGCRP 2009
This figure is based on projections of future temperature by 16 of the Coupled Model Intercomparison Project Three (CMIP3) climate models using two emissions scenarios from the Intergovernmental Panel on Climate Change (IPCC), Special Report on Emission Scenarios. The higher emission scenario is shown in the top half of the figure, while the lower emission scenario is shown in the bottom half. Temperature predictions for the middle of the 21st century are shown on the left, with end-of-century predictions shown on the right. The brackets on the thermometers represent the likely range of model projections, though lower or higher outcomes are possible.

FIGURE 7.
UNITED STATES WINTER TEMPERATURE TRENDS FROM 1975 TO 2007



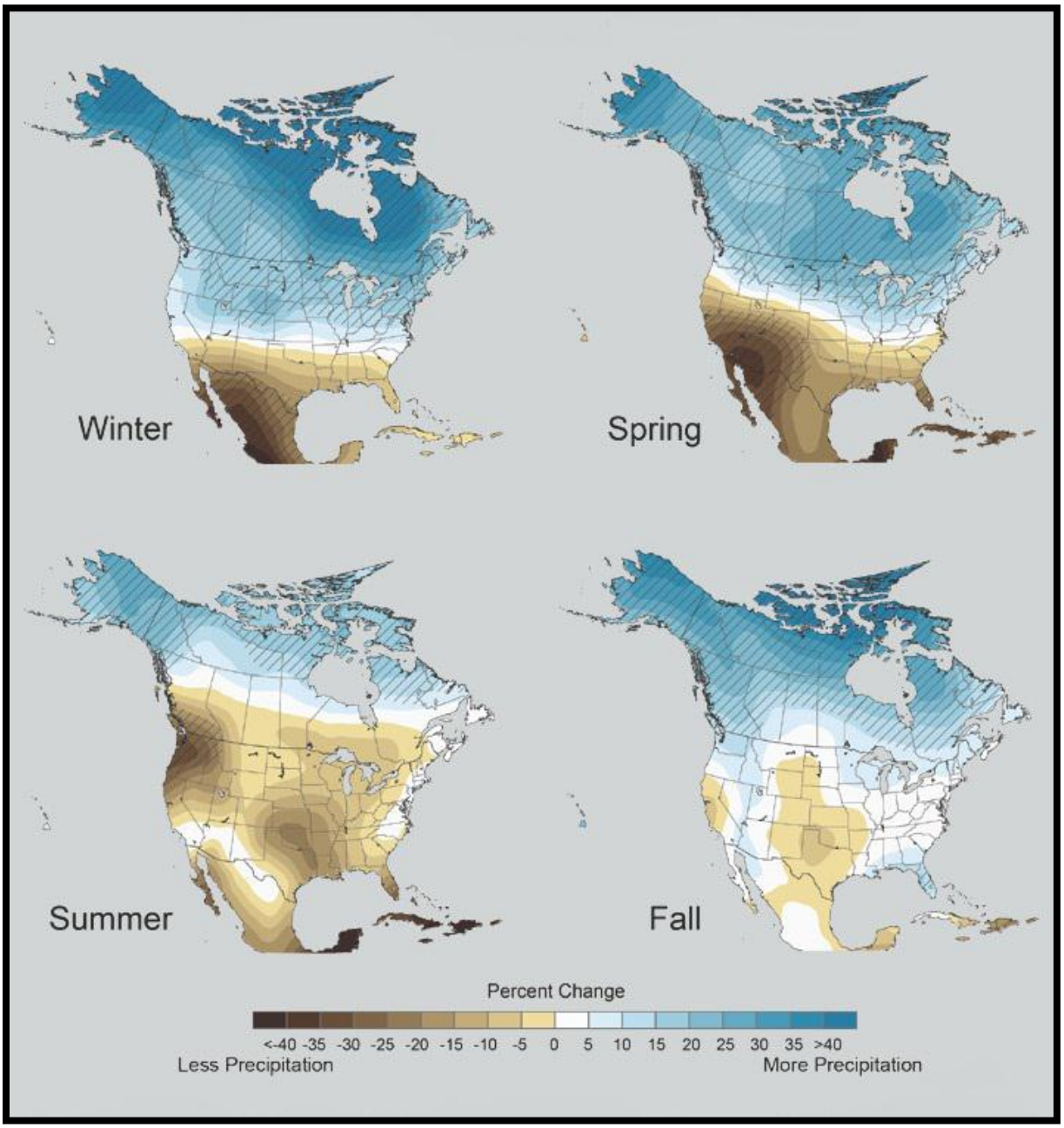
Source: USGCRP 2009

FIGURE 8.
PREDICTED NUMBER OF DAYS OVER 100 DEGREES FAHRENHEIT IN THE UNITED STATES



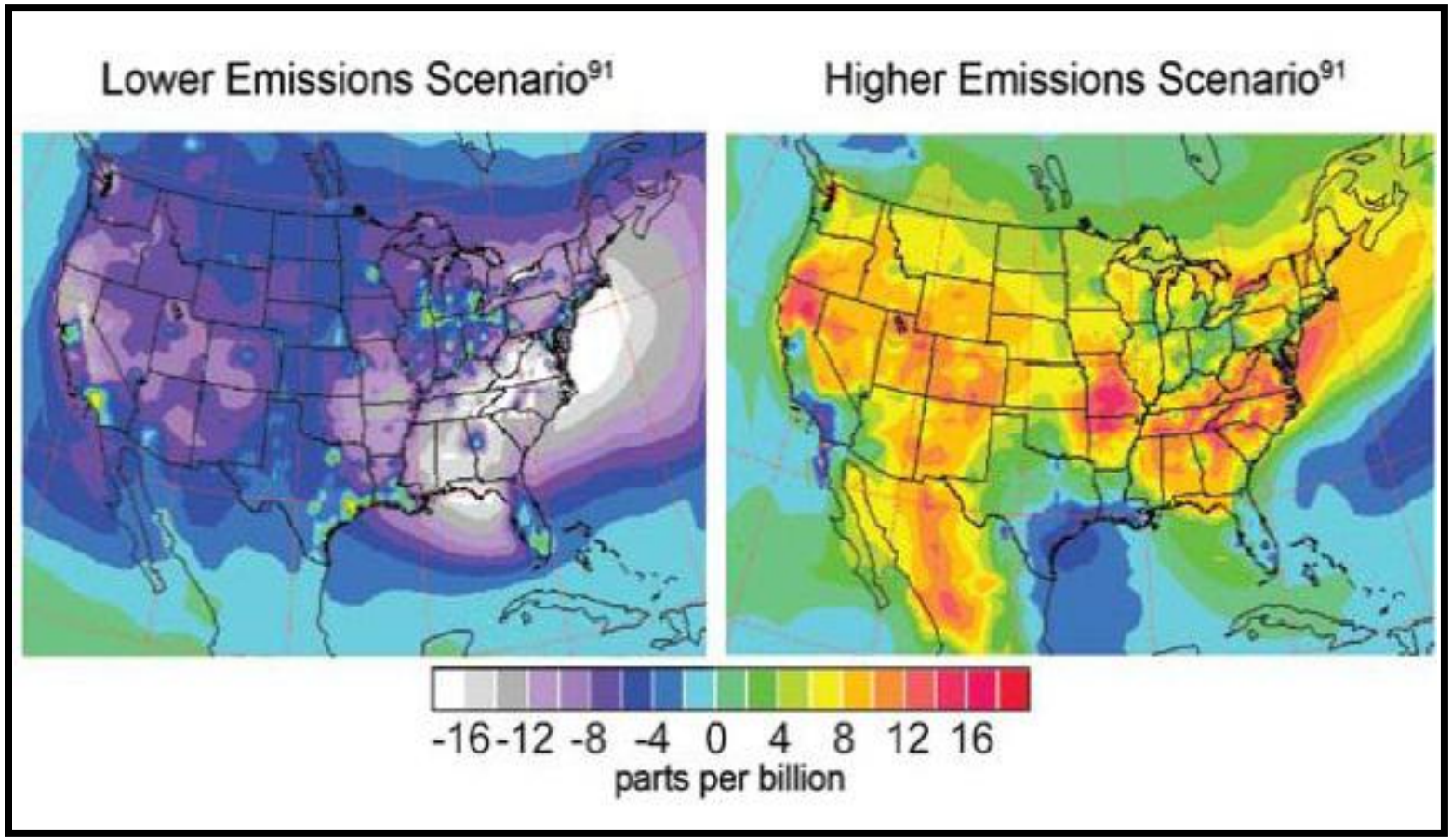
Source: USGCRP 2009

FIGURE 9.
PREDICTED SEASONAL CHANGES IN NORTH AMERICAN PRECIPITATION FROM 2080 TO 2099



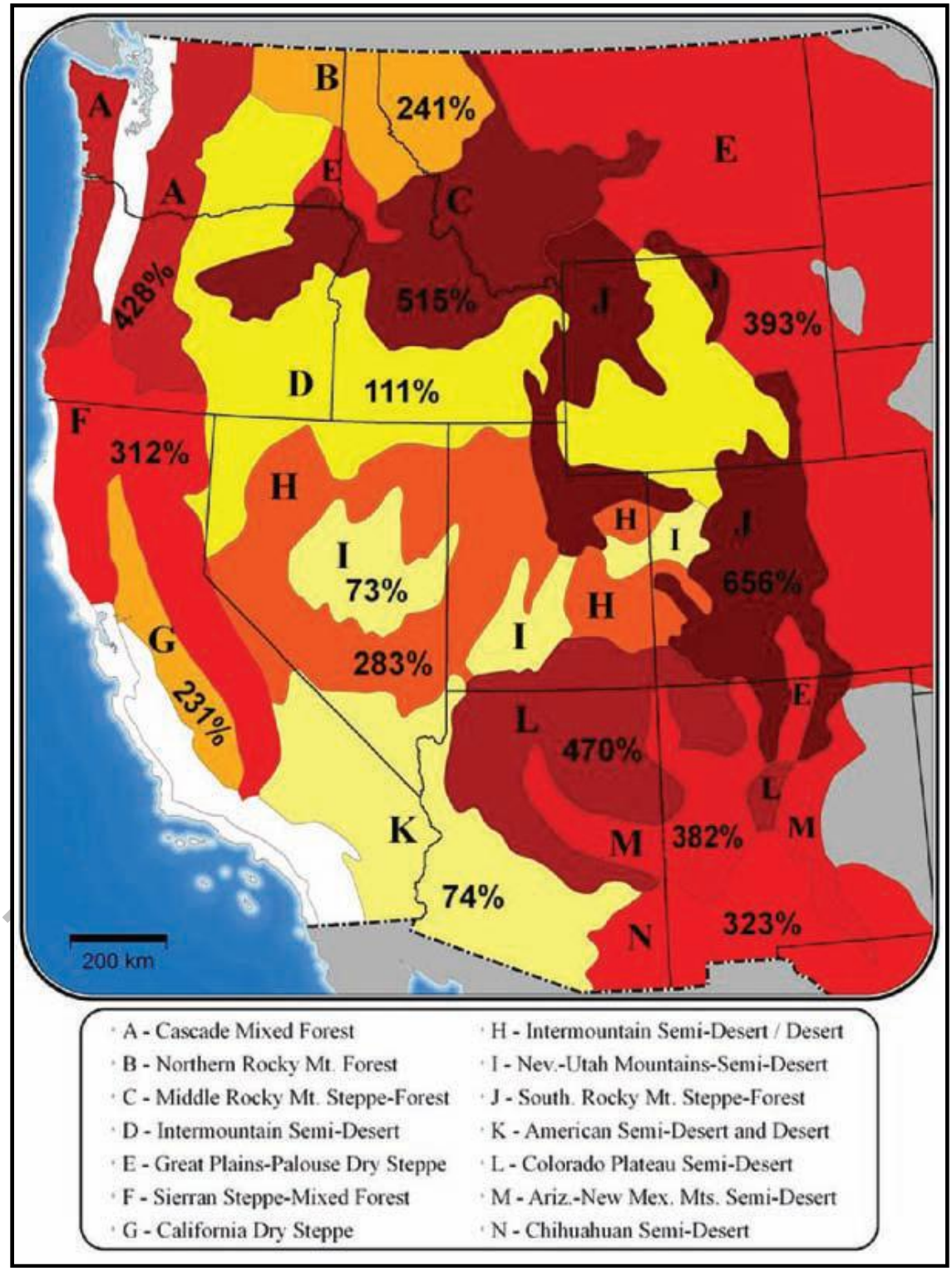
Source: USGCRP 2009

FIGURE 10.
PROJECTED CHANGE IN UNITED STATES GROUND-LEVEL OZONE IN THE 2090s



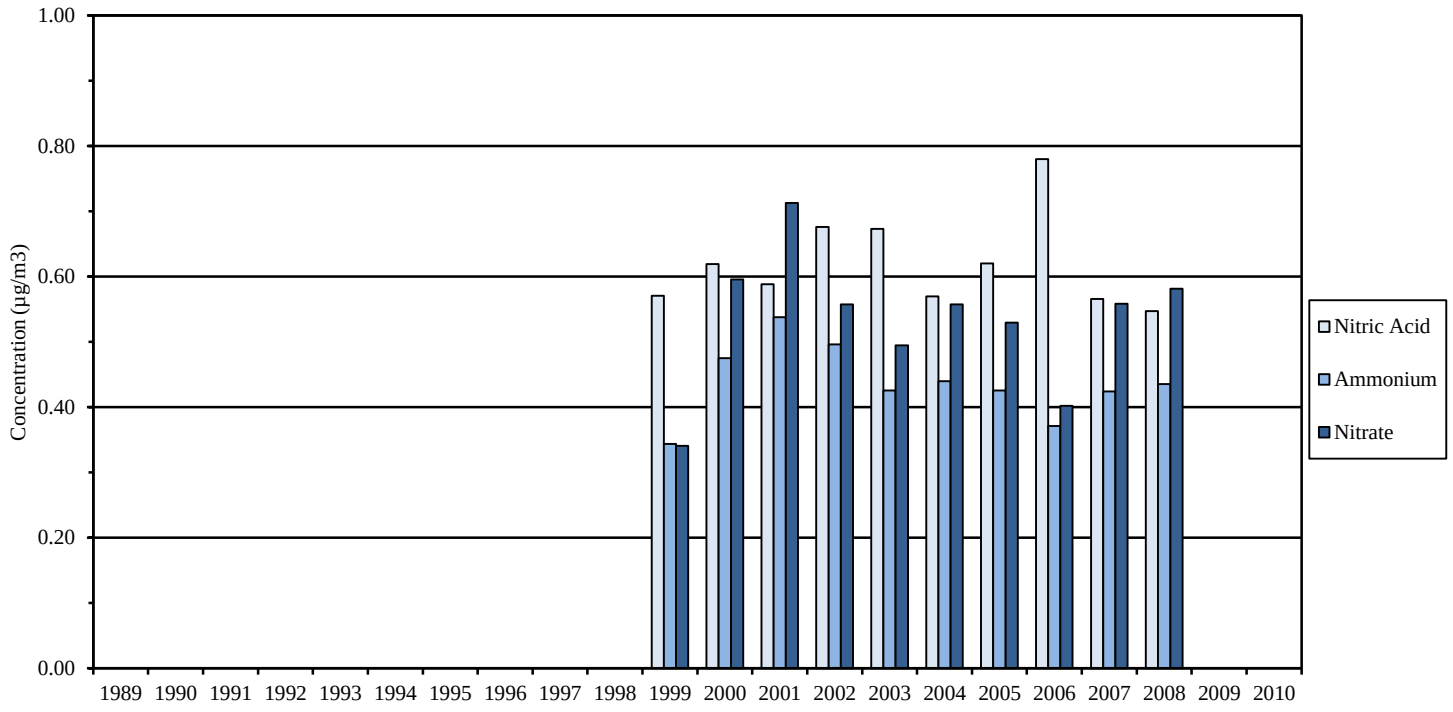
Source: USGCRP 2009

FIGURE 11.
PREDICTED CHANGES IN WILDFIRE AREA BURNED IN THE WESTERN UNITED STATES



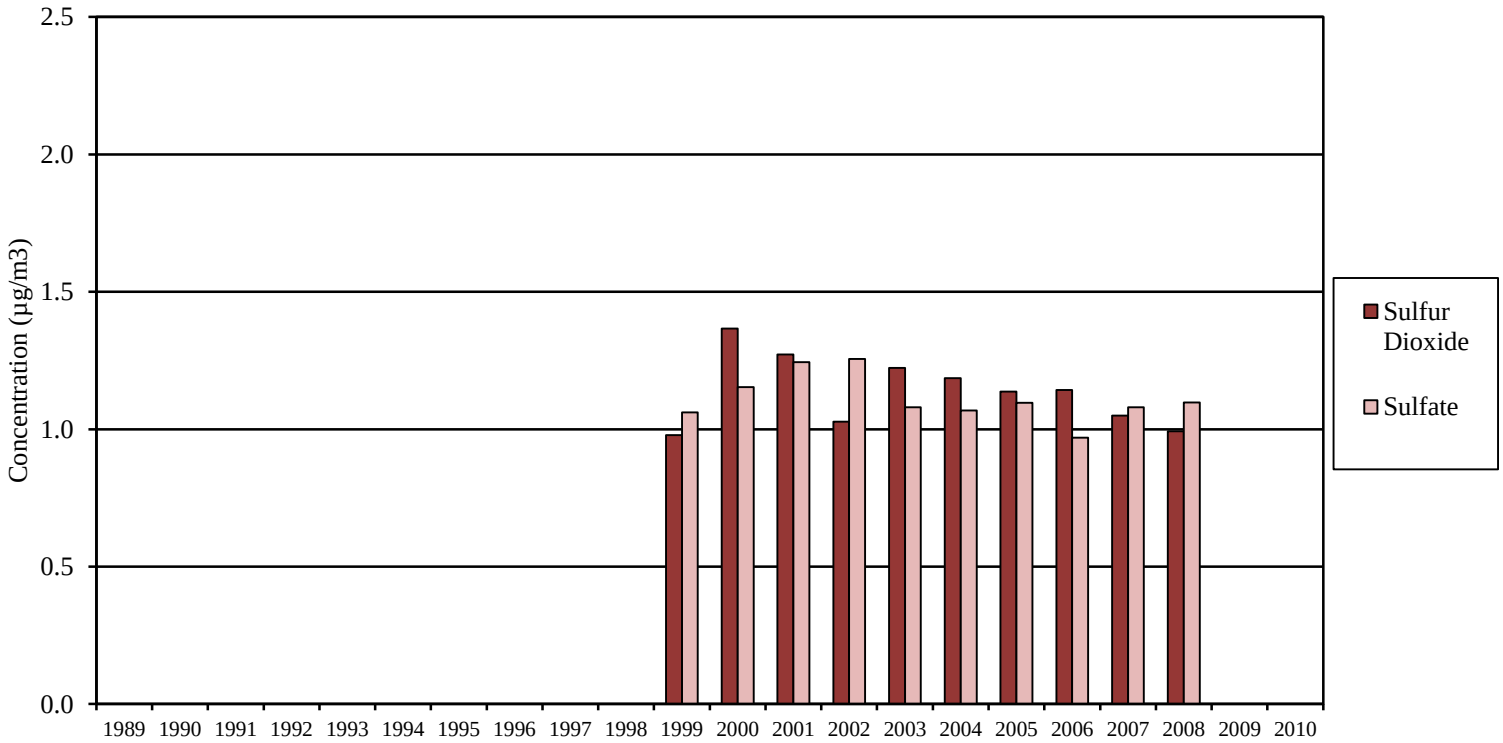
Source: NRC 2011

FIGURE 12.
MEAN ANNUAL CONCENTRATIONS OF NITROGEN COMPOUNDS IN THE MILES CITY STUDY AREA (THEODORE ROOSEVELT NATIONAL PARK)



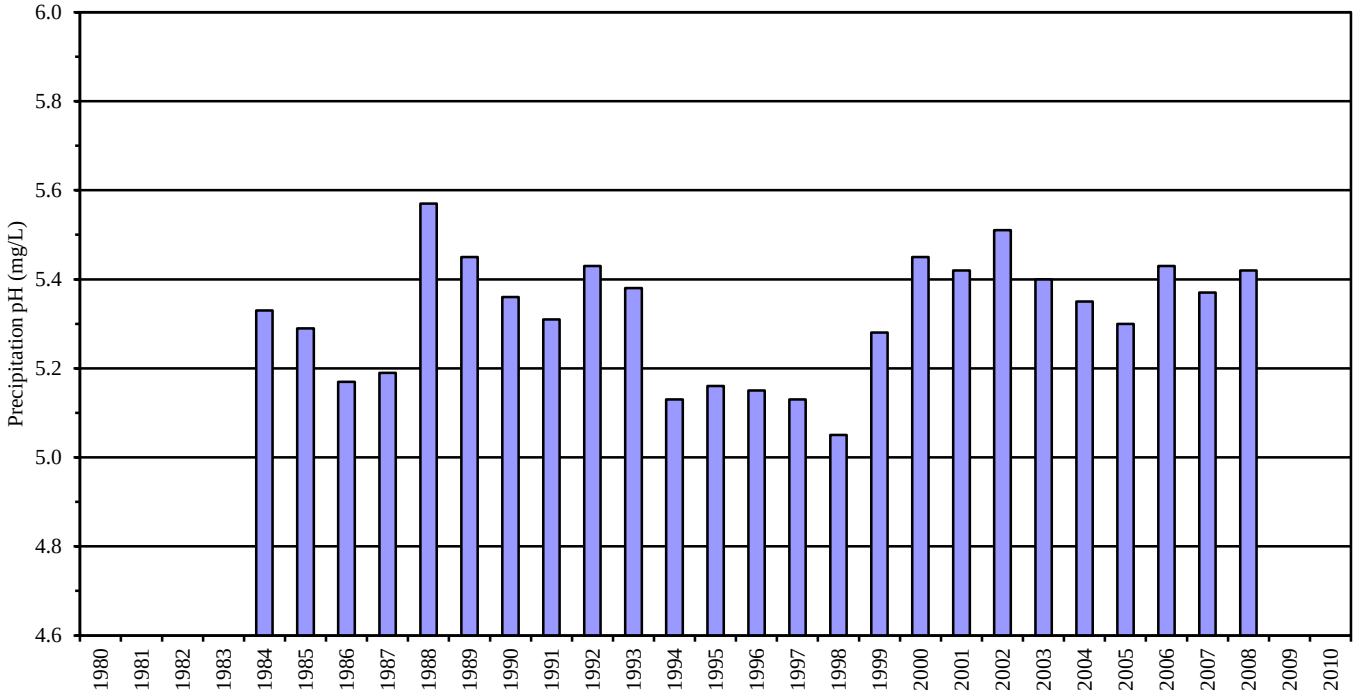
Clean Air Status and Trends Network (CASTNet)
CASTNet Theodore Roosevelt National Park station THR422
Typical concentrations for remote areas:
Nitric Acid (HNO3): 0.05 - 0.80 µg/m3
Ammmonium (NH4+): 0.20 µg/m3
Nitrate (NO3-): 0.50 µg/m3

FIGURE 13.
MEAN ANNUAL CONCENTRATIONS OF SULFUR COMPOUNDS IN THE MILES CITY STUDY AREA (THEODORE ROOSEVELT NATIONAL PARK)



Clean Air Status and Trends (CASTNet)
CASTNet Theodore Roosevelt National Park station: THR422
Typical concentrations for remote areas:
Sulfur Dioxide (SO_2): 2.6 - 26 µg/m3
Sulfate (SO_4^{-2}): 2.5 µg/m3

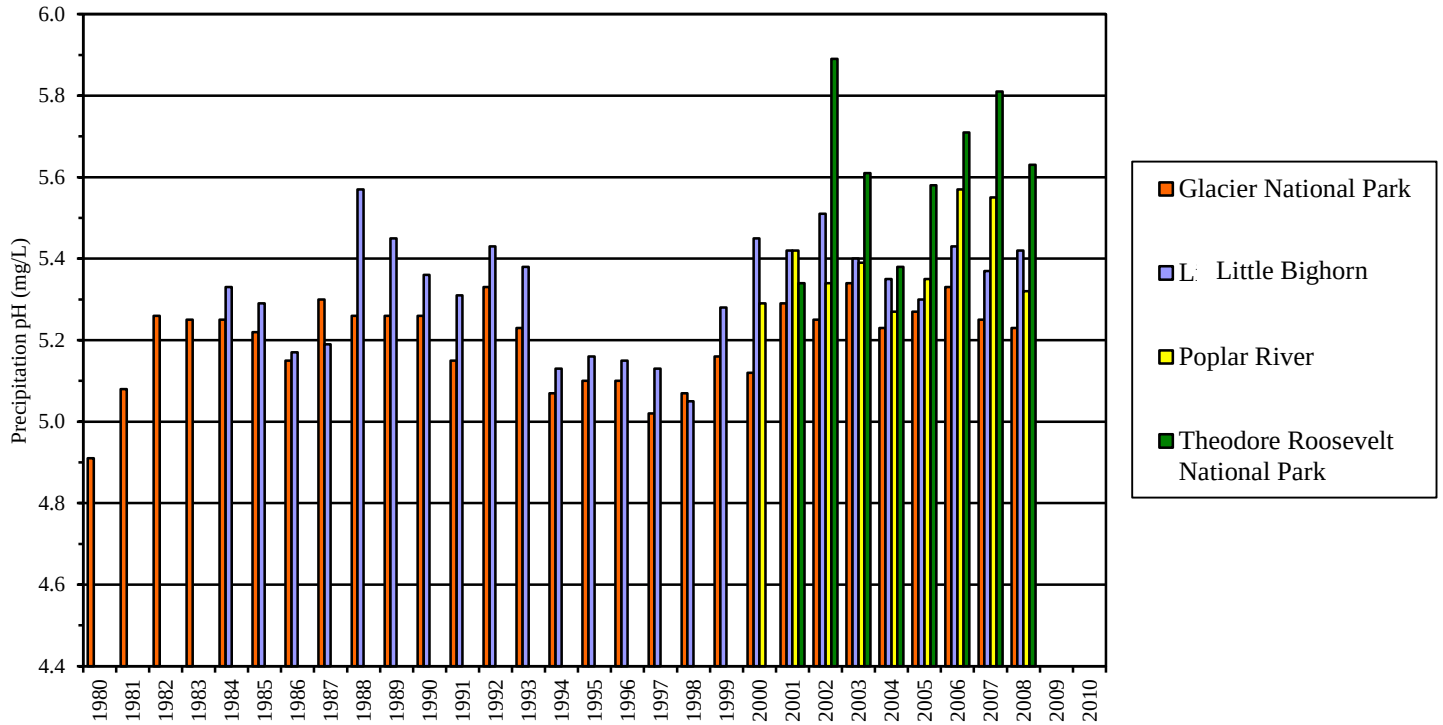
FIGURE 14.
MEAN ANNUAL PRECIPITATION PH REPRESENTING THE PLANNING AREA, LITTLE BIGHORN BATTLEFIELD



National Atmospheric Deposition Program (NADP)
Little Bighorn Battlefield National Monument NADP station MT00

Normal range of precipitation pH (mg/L): 5.0 - 5.6 (Seinfeld 1986)

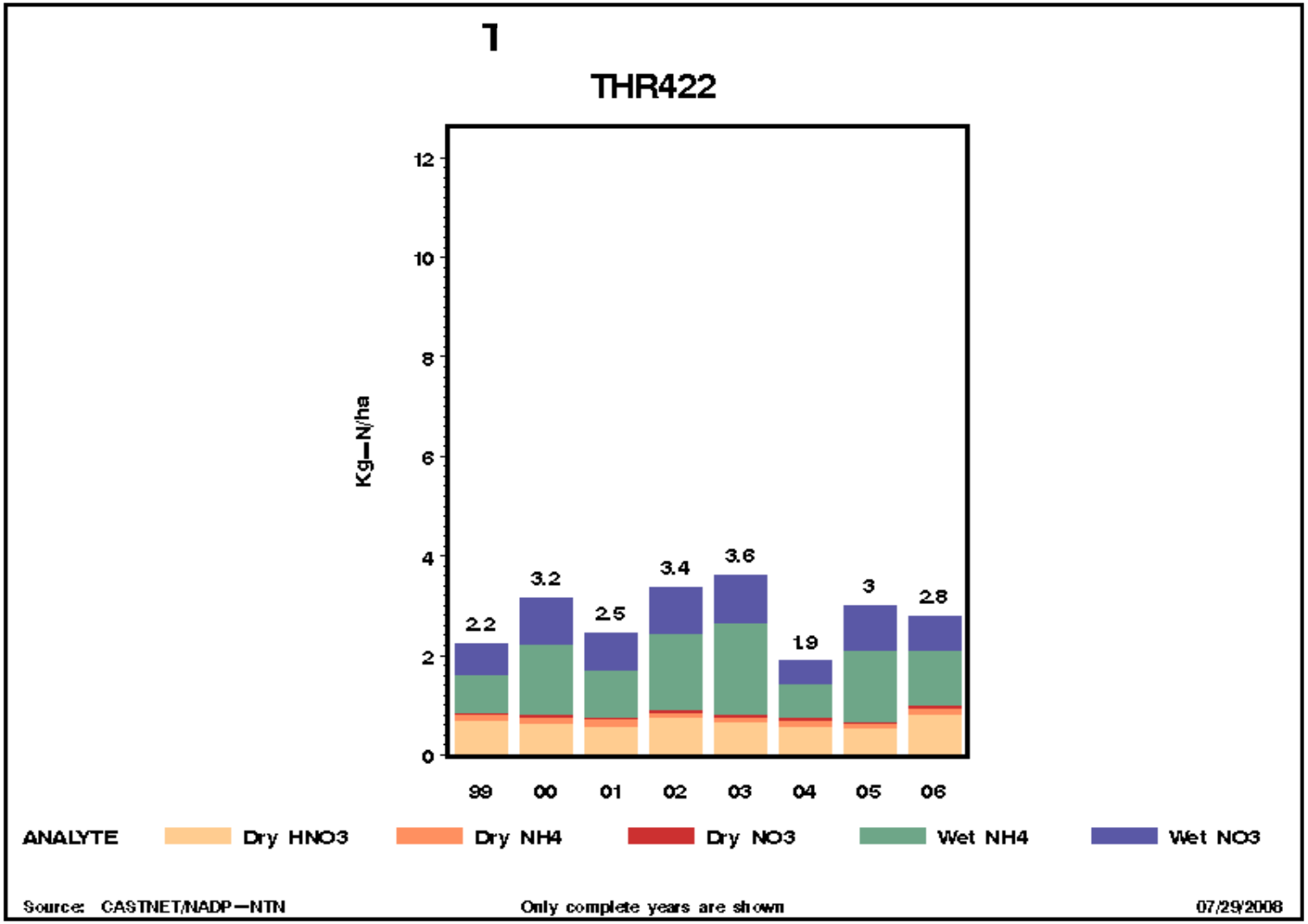
FIGURE 15.
MEAN ANNUAL PRECIPITATION PH REPRESENTING THE PLANNING AREA



National Atmospheric Deposition Program (NADP)
Glacier National Park NADP station MT05
Little Bighorn Battlefield National Monument NADP station MT00
Poplar River NADP station MT96
Theodore Roosevelt NADP station ND00

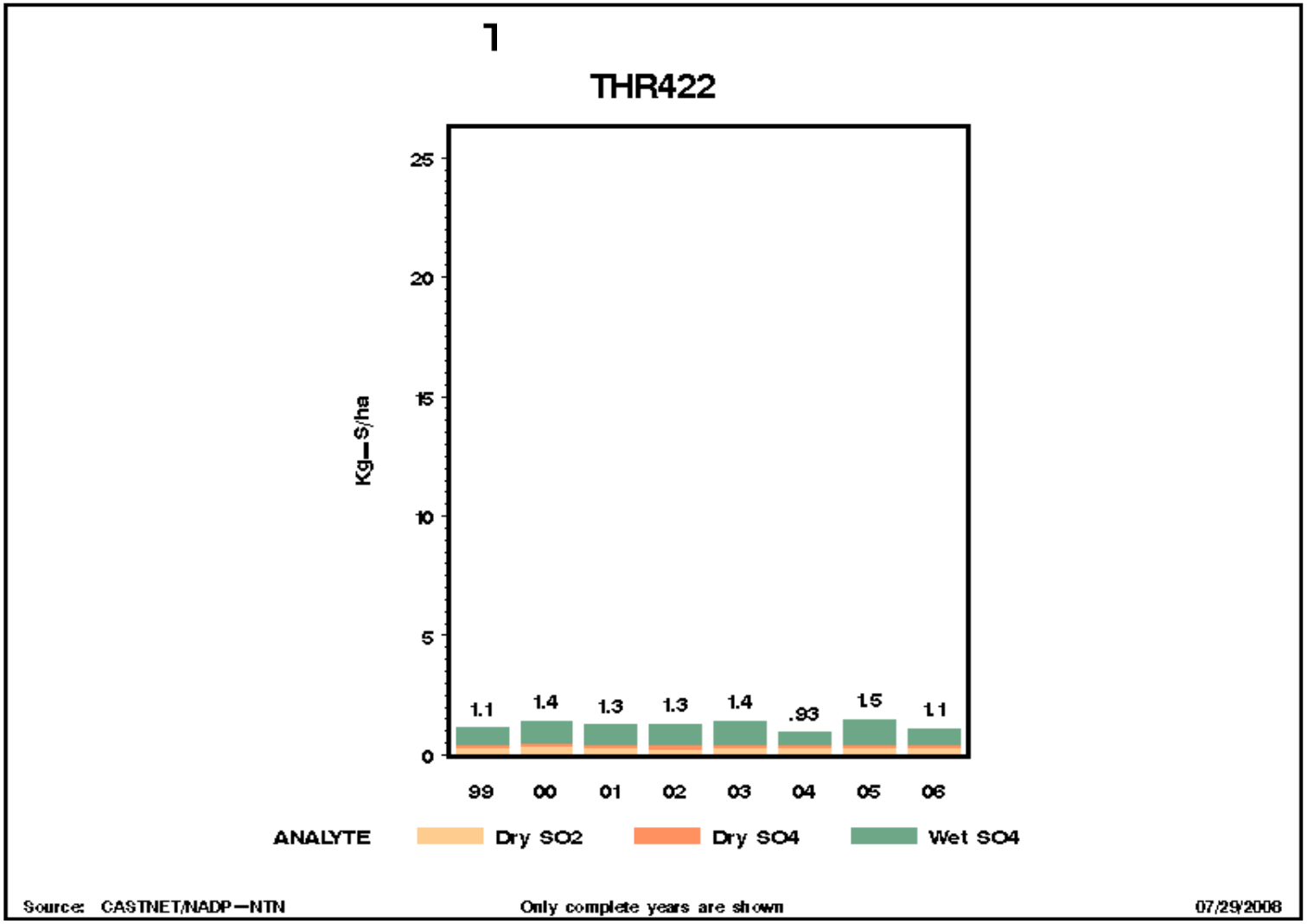
Normal range of precipitation pH (mg/L): 5.0 to 5.6 (Seinfeld 1986)

FIGURE 16.
TOTAL NITROGEN DEPOSITION IN THEODORE ROOSEVELT NATIONAL PARK



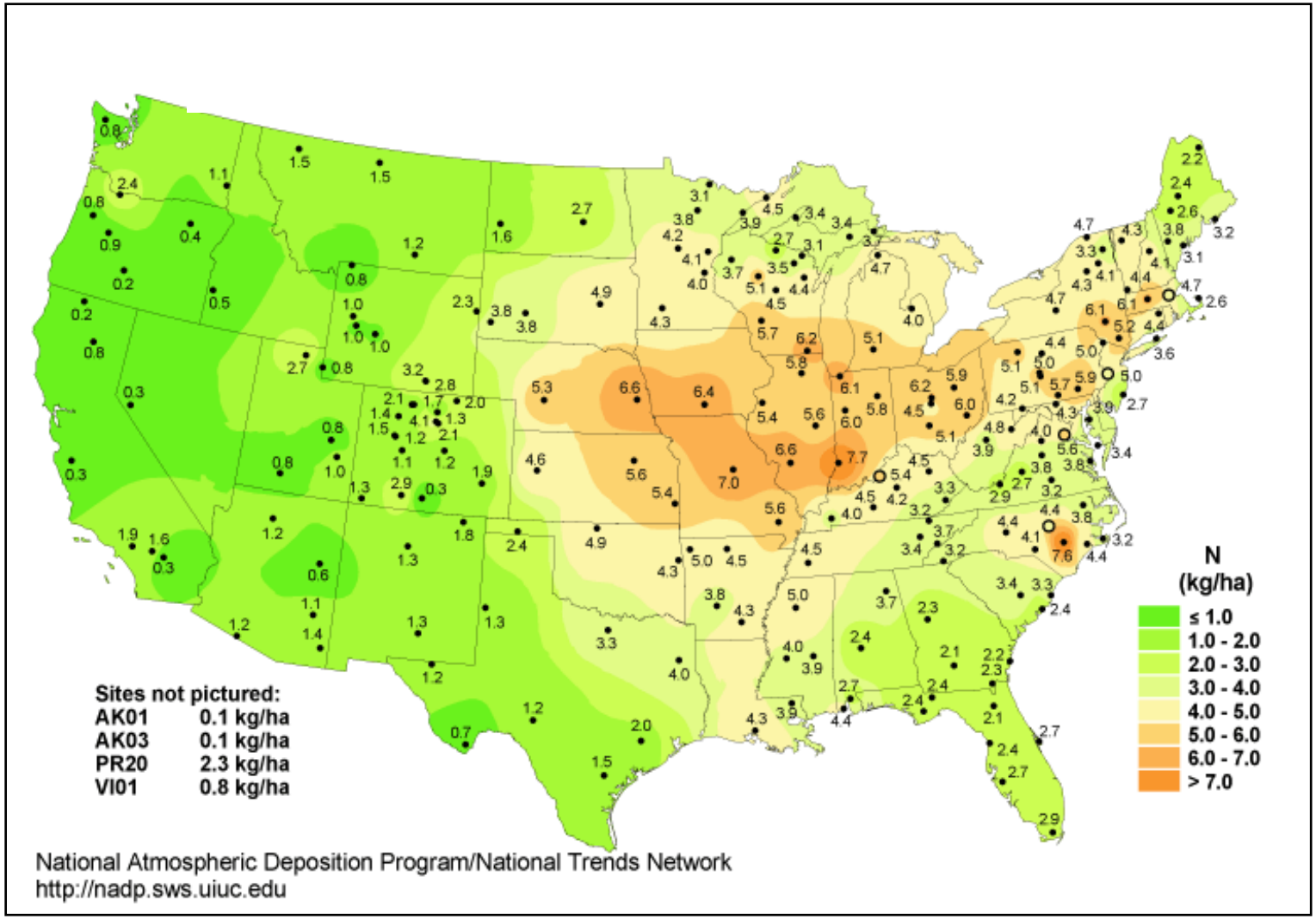
Source: USEPA 2010h

FIGURE 17.
TOTAL SULFUR DEPOSITION IN THEODORE ROOSEVELT NATIONAL PARK



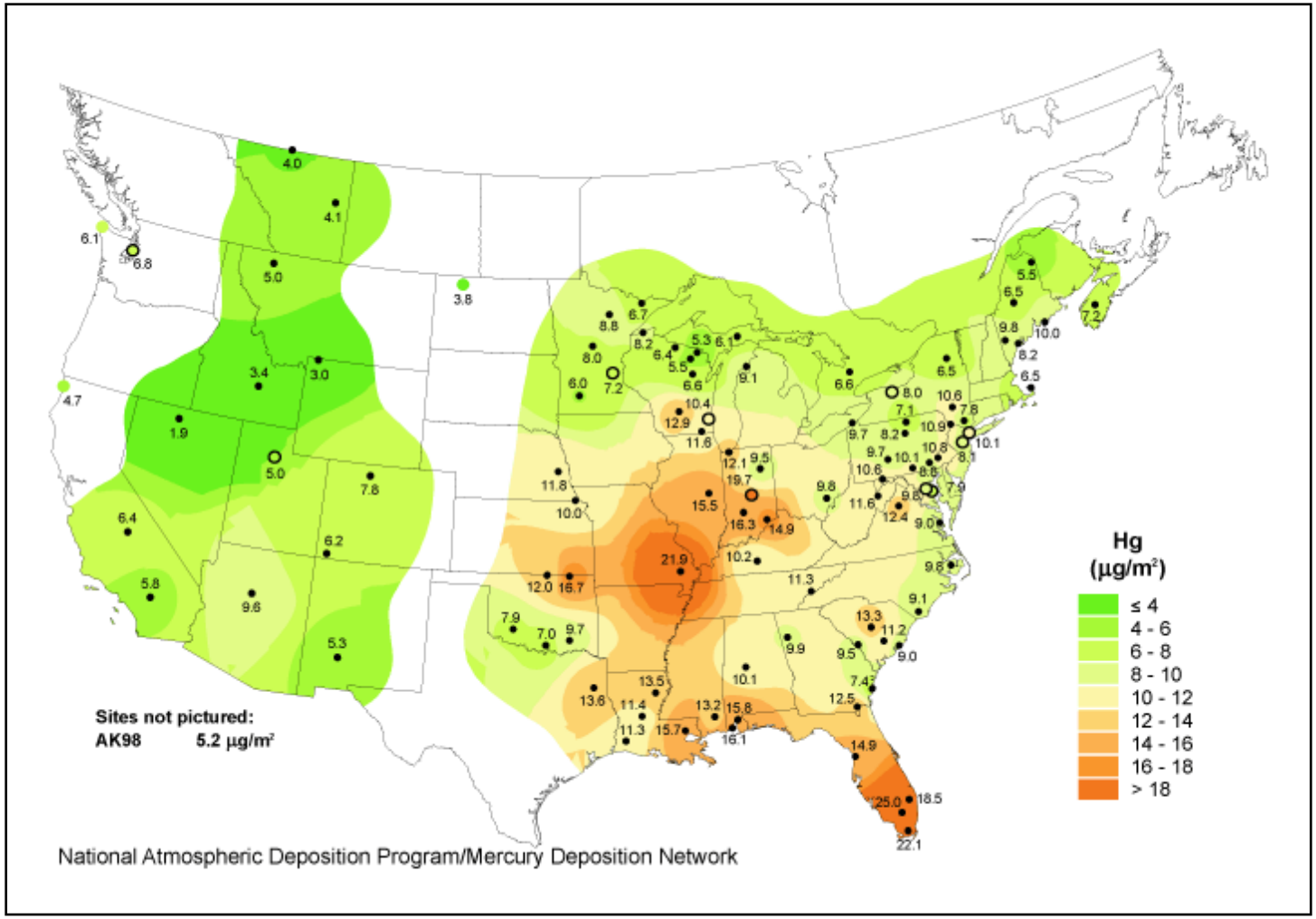
Source: USEPA 2010g

FIGURE 18.
INORGANIC NITROGEN WET DEPOSITION FROM NITRATE AND AMMONIUM IN 2008



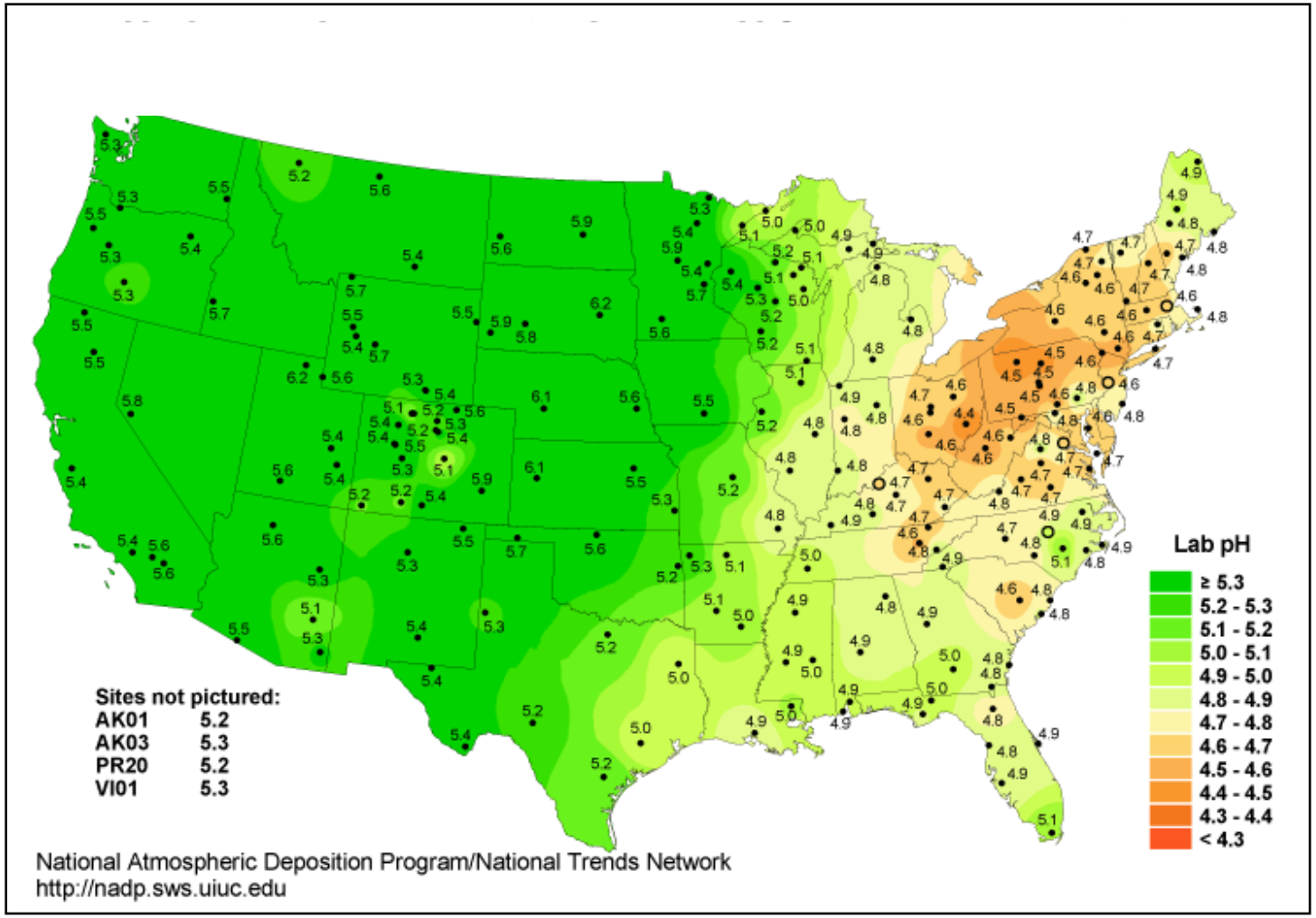
Source: NADP 2010b

FIGURE 19.
TOTAL MERCURY WET DEPOSITION IN 2008



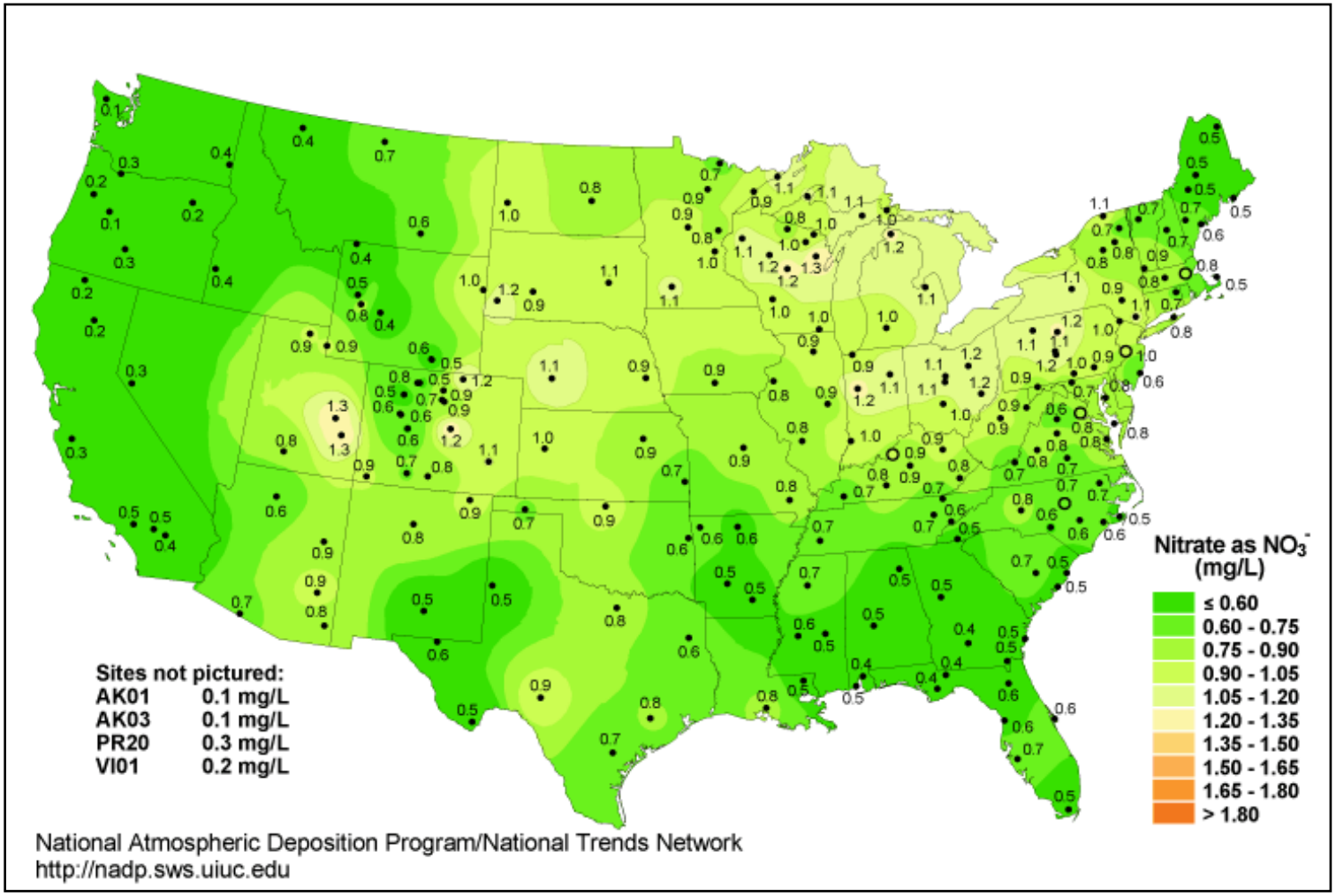
Source: NADP 2010c

FIGURE 20.
HYDROGEN ION CONCENTRATION AS PH FROM
MEASUREMENTS MADE AT THE CENTRAL ANALYTICAL LABORATORY IN 2008



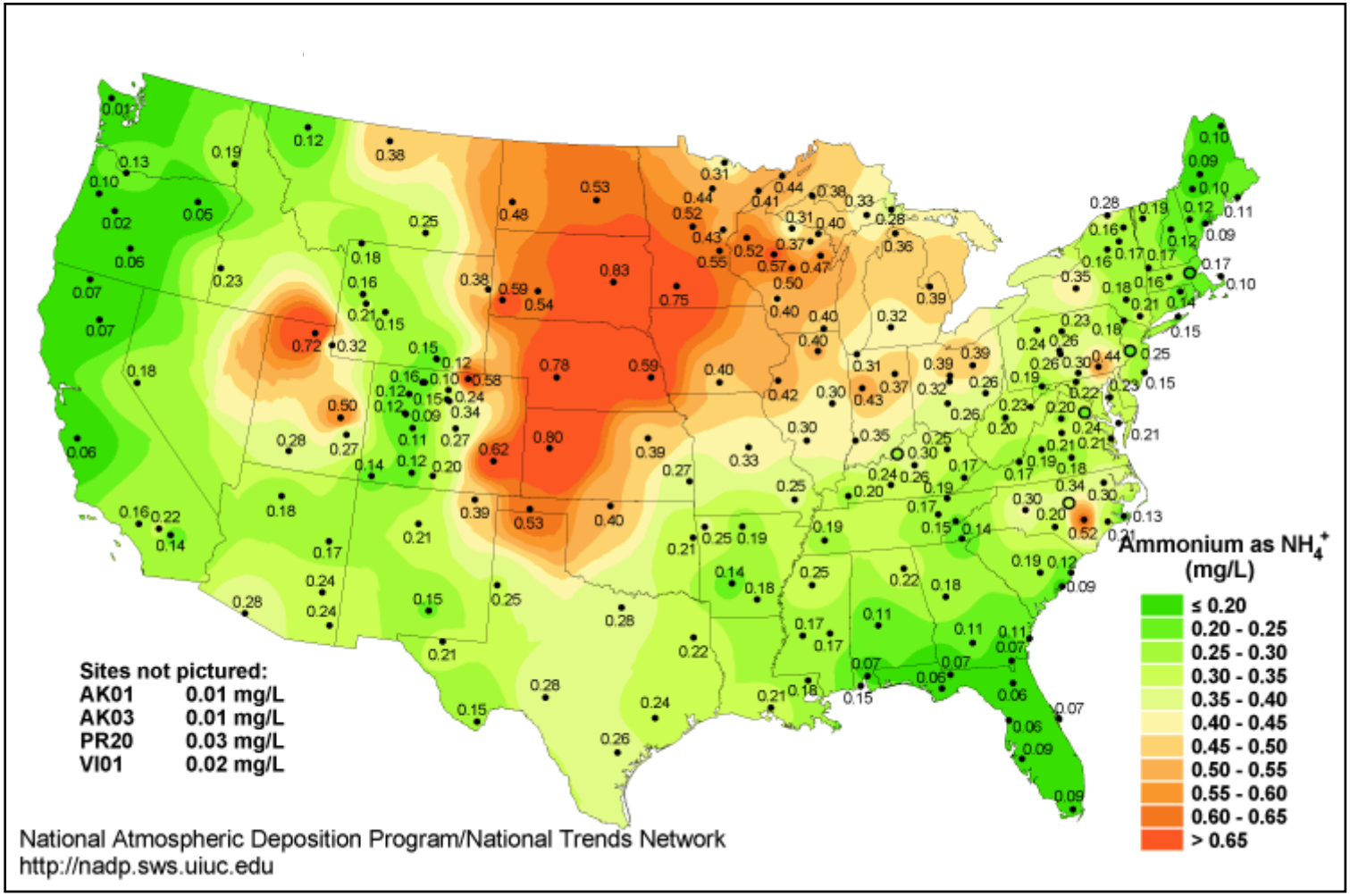
Source: NADP 2010d

FIGURE 21.
NITRATE ION CONCENTRATION IN 2008



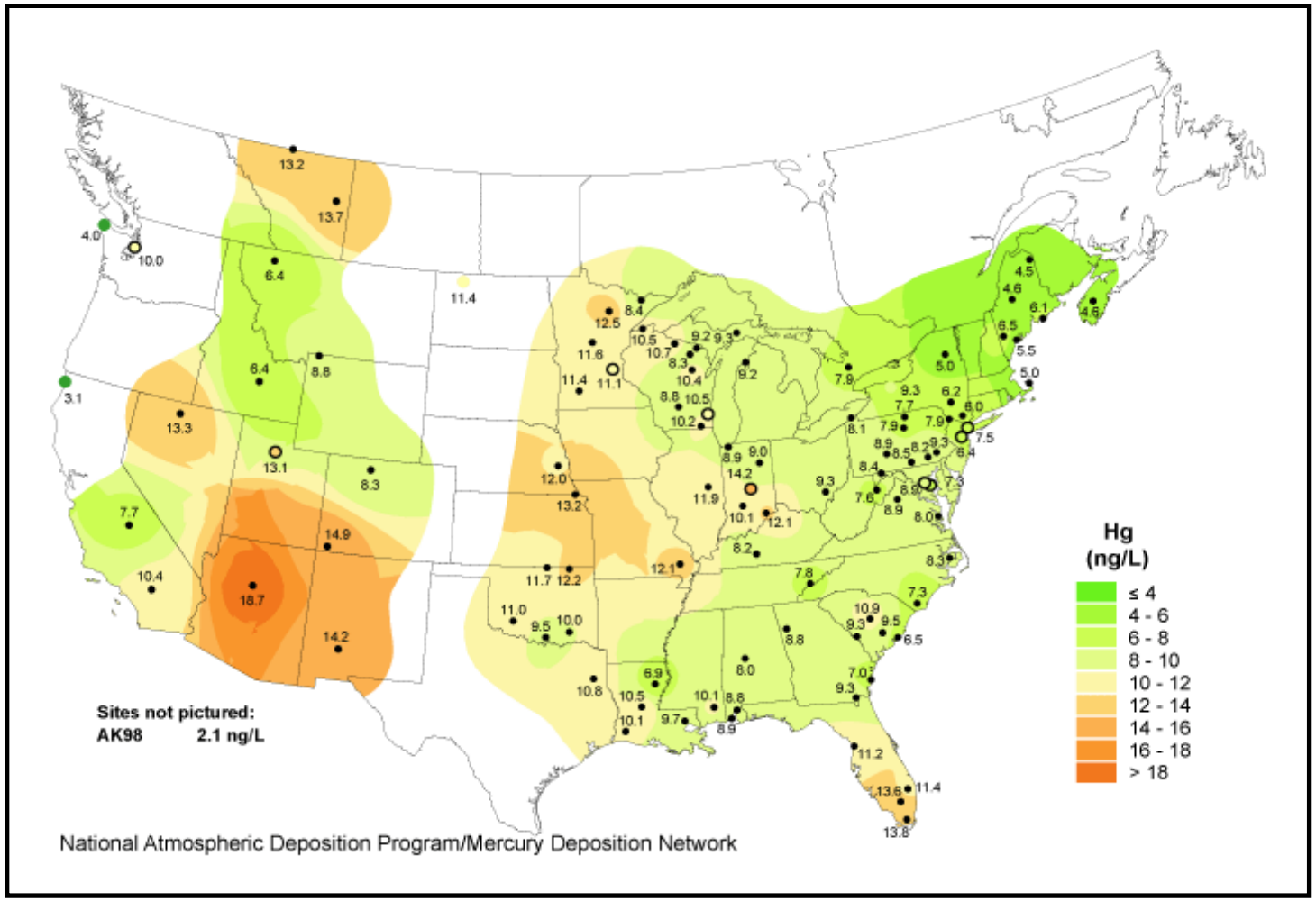
Source: NADP 2010e

FIGURE 22.
AMMONIUM ION CONCENTRATION IN 2008



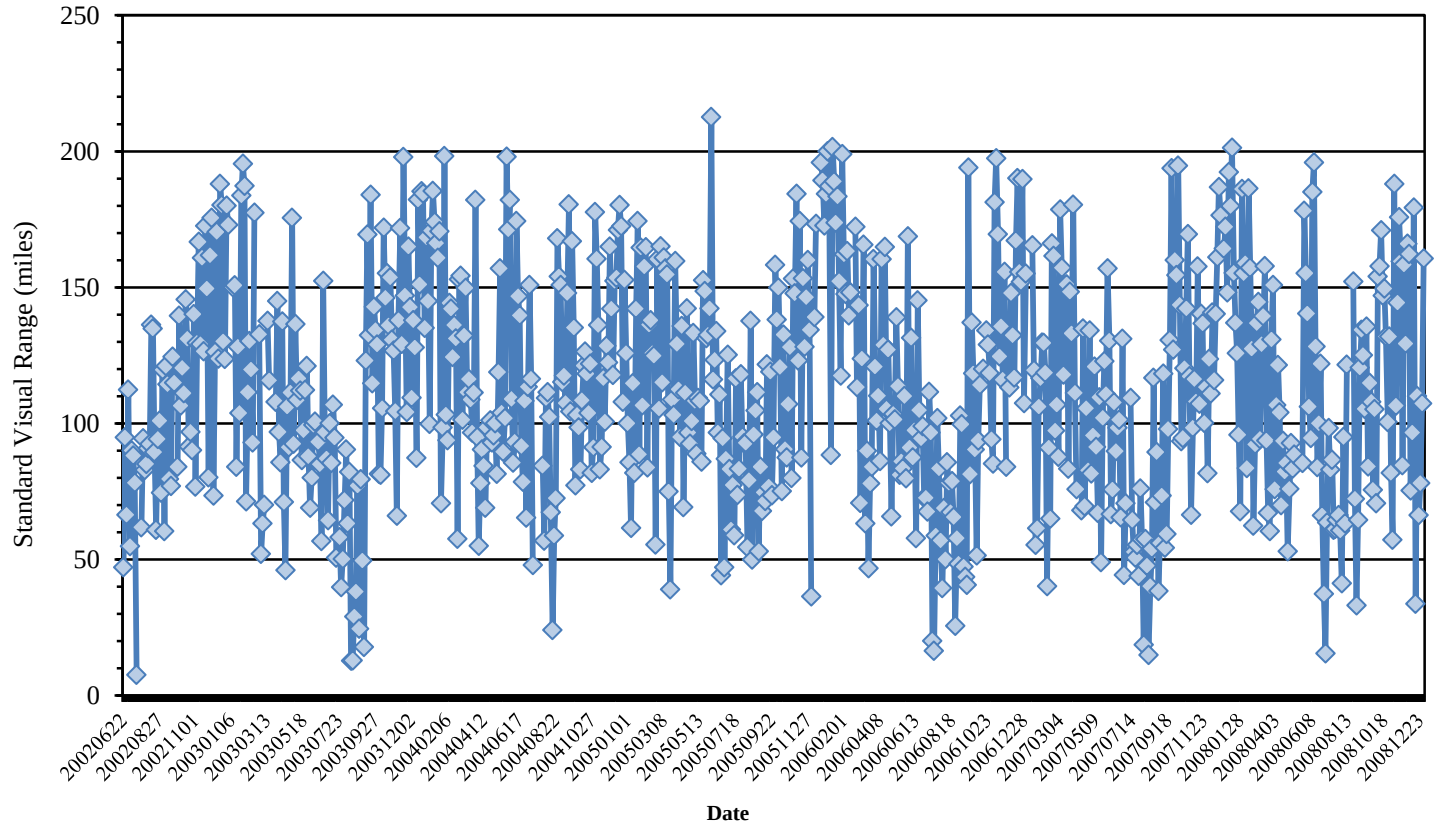
Source: NADP 2010f

FIGURE 23.
TOTAL MERCURY CONCENTRATION IN 2008



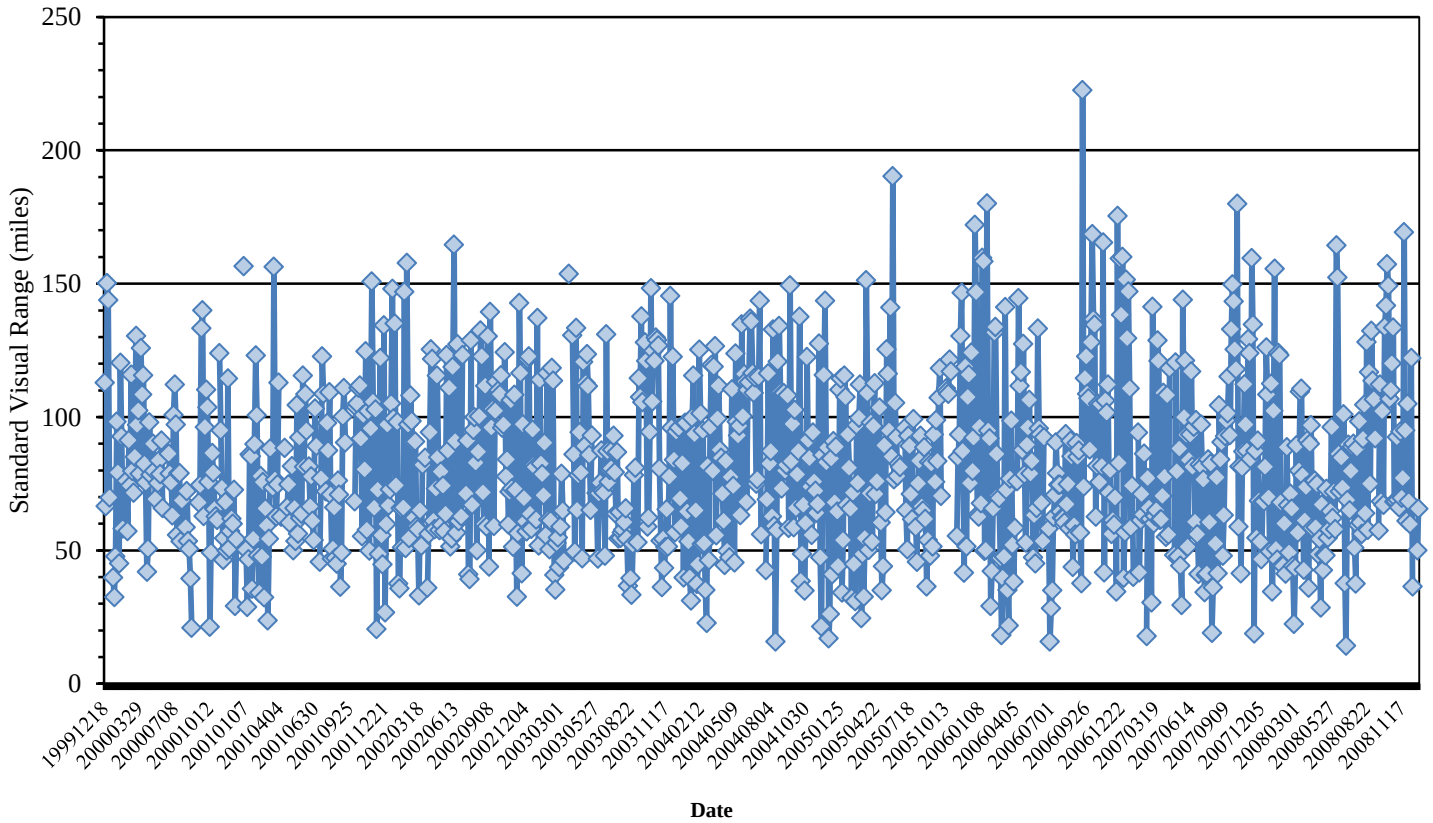
Source: NADP 2010g

FIGURE 24.
DAILY VISIBILITY REPRESENTING THE MILES CITY STUDY AREA, NORTHERN CHEYENNE INDIAN RESERVATION



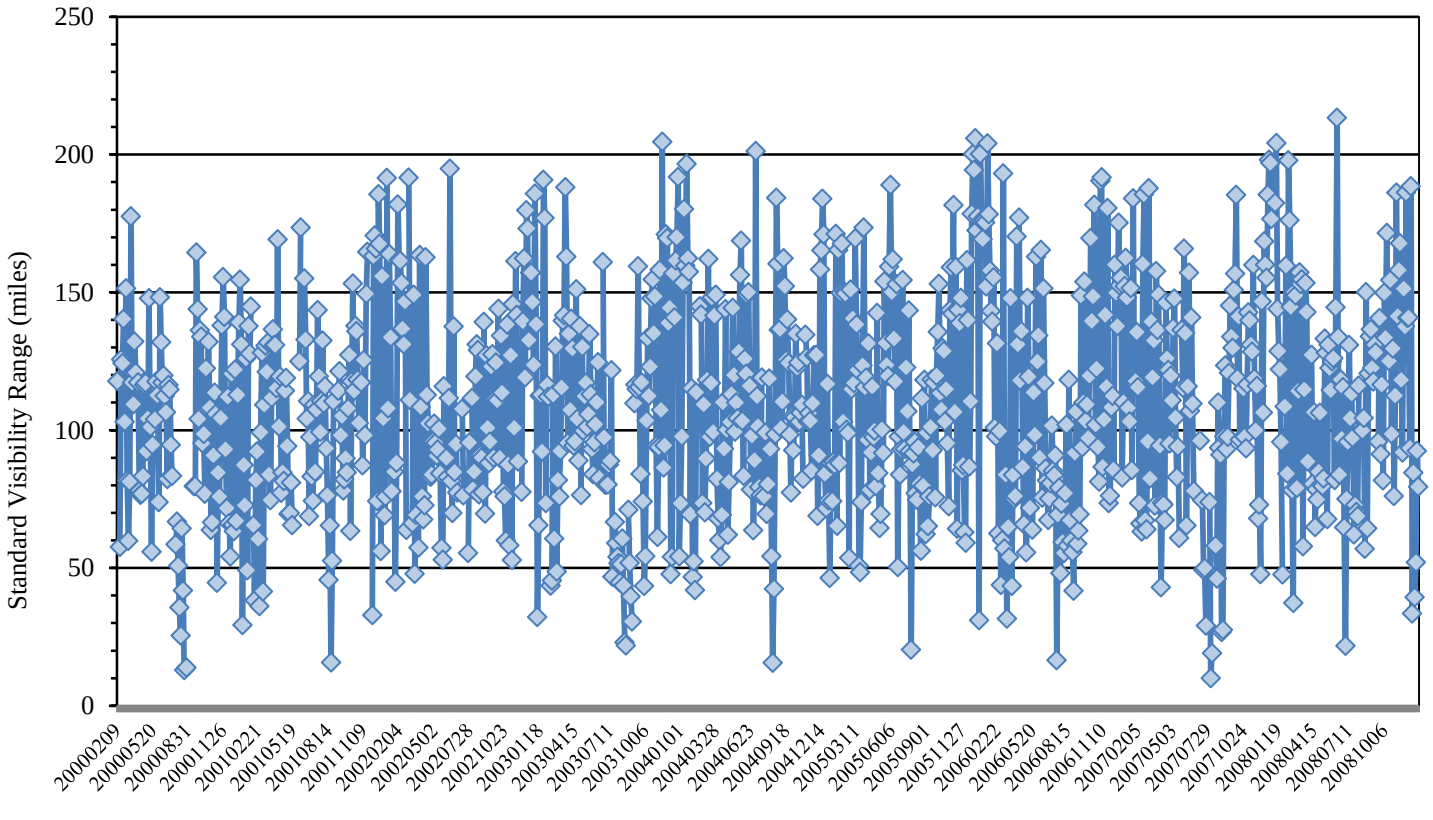
IMPROVE Northern Cheyenne Indian Reservation station: NOCH1
Visibility measured every 3 days from 6/2002 through 2008

FIGURE 25.
DAILY VISIBILITY REPRESENTING THE MILES CITY STUDY AREA, MEDICINE LAKE



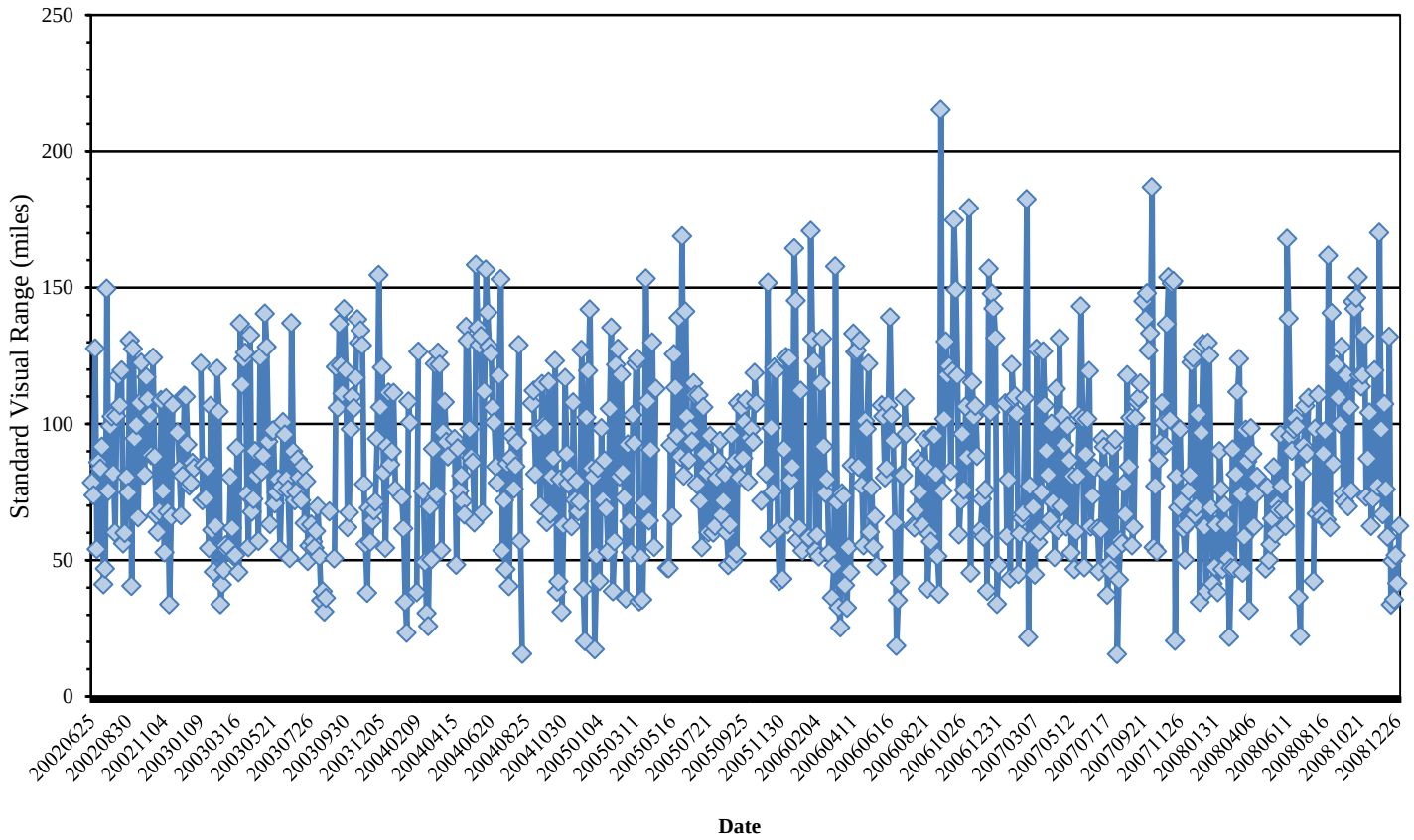
IMPROVE Medicine Lake station: MELA1
Visibility measured every 3 days from 1999 through 2008

FIGURE 26.
DAILY VISIBILITY REPRESENTING THE MILES CITY STUDY AREA, UL BEND



IMPROVE UL Bend station: ULBE1
Visibility measured every 3 days from 2000 through 2008

FIGURE 27.
DAILY VISIBILITY REPRESENTING THE MILES CITY STUDY AREA, FORT PECK INDIAN RESERVATION



IMPROVE Fort Peck station: FOPE1
Visibility measured every 3 days from 2002 through 2008

MILES CITY FIELD OFFICE AIR RESOURCE MANAGEMENT PLAN: ADAPTIVE MANAGEMENT STRATEGY FOR OIL AND GAS RESOURCES

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Abbreviations and Acronyms

AQRV	Air Quality Related Value
AQTW	Air Quality Technical Workgroup
ARMP	Air Resource Management Plan
BLM	Bureau of Land Management
CO	Carbon Monoxide
CBNG	Coal Bed Natural Gas
CFR	Code of Federal Regulations
FLPMA	Federal Land Policy and Management Act
IWG	Interagency Working Group
MAAQS	Montana Ambient Air Quality Standards
MCFO	Miles City Field Office, Bureau of Land Management
MDEQ	Montana Department of Environmental Quality
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPS	National Park Service
O_3	Ozone
PGM	Photochemical Grid Modeling
$PM_{2.5}$	Particulate Matter with a Diameter Less than or Equal to 2.5 Microns
PM_{10}	Particulate Matter with a Diameter Less than or Equal to 10 Microns
POD	Plan of Development
ppb	Parts per Billion
ppm	Parts per Million
PRB	Powder River Basin
RMP	Resource Management Plan
ROD	Record of Decision
SO_2	Sulfur Dioxide
µg/m3	Micrograms per Cubic Meter
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
WRF	Weather Research and Forecasting

1.0 INTRODUCTION

1.1 PURPOSE OF THE AIR RESOURCE MANAGEMENT PLAN

The Bureau of Land Management (BLM) *Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources* (ARMP) for oil and gas activities describes the air resource adaptive management strategy that would be used to assess future air quality and air quality related values (AQRVs) and identify mitigation measures to address unacceptable impacts that may be associated with future oil and gas development. The adaptive management strategy focuses on oil and gas activity because aggregated emissions from multiple small sources at well sites can potentially cause air quality and AQRV impacts under certain circumstances. The oil and gas adaptive management strategy was prepared in collaboration or with the review of the United States Environmental Protection Agency (USEPA) and three federal land management agencies under the *Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process* (USDA, USDI, and USEPA 2011). This agreement is described in more detail in Section 4.

The ARMP includes both near-term actions and long-term actions. In the near-term, the ARMP sets forth initial actions to maintain good air quality until regional modeling can be performed to further assess potential impacts to air quality and AQRVs. In the long-term, the ARMP provides ongoing management strategies to assess and adapt to new air quality and AQRV ambient monitoring and modeling data during the life of this resource management plan (RMP).

The ARMP includes a multifaceted approach involving the following activities:

- oil and gas activity assessment,
- ambient air quality monitoring support,
- air quality and AQRV assessment,
- future air quality and AQRV modeling, and
- initial and enhanced mitigation.

Pollutant emissions addressed by the ARMP include the criteria air pollutants listed below:

- carbon monoxide (CO),
- nitrogen dioxide (NO_2),
- ozone (O_3),
- particulate matter with a diameter less than or equal to 10 microns (PM_{10}),
- particulate matter with a diameter less than or equal to 2.5 microns ($PM_{2.5}$), and
- sulfur dioxide (SO_2).

The ARMP also addresses modeling and mitigation for the following AQRVs:

- deposition of sulfur and nitrogen,
- lake acid neutralizing capacity, and
- visibility.

The adaptive management strategy for oil and gas resources provides the flexibility to respond to changing conditions that could not have been predicted during RMP development and allows for the use of new technology and methods that may minimize or reduce impacts.

1.2 REVISION OF THE AIR RESOURCE MANAGEMENT PLAN

This ARMP may be modified as necessary to comply with law, regulation, and policy and to address new information and changing circumstances. Changes to the goals or objectives set forth in the Miles City Field Office (MCFO) RMP would require maintenance or amendment of the RMP while changes to the implementation, including modifying this ARMP, may be made without maintaining or amending the RMP.

1.3 CURRENT AIR QUALITY

Based on available monitoring data for rural oil and gas nativity areas in eastern Montana, air quality is good as described in Chapter 3, *Affected Environment*. Non-tribal areas within the MCFO attain the National Ambient Air Quality Standards (NAAQS) and state-based standards, which are known as the Montana Ambient Air Quality Standards (MAAQS).

For all criteria pollutants except ozone, ambient monitoring data available as of December 31, 2012 indicate that concentrations at the Birney, Broadus, and Sidney monitors near oil and gas areas within the planning area are less than 55 percent of the NAAQS and MAAQS. Ozone concentrations are no more than 75 percent of the 8-hour ozone standard. Table ARMP-1 provides recent concentration data for each pollutant monitored at the Birney, Broadus, and Sidney monitors. NAAQS and MAAQS set forth allowable concentrations in terms of parts per million (ppm) or parts per billion (ppb) for gaseous pollutants while particulate pollutant concentrations are provided in micrograms per cubic meter ($\mu g/m^3$).

1.4 BACKGROUND OF THE AIR QUALITY TECHNICAL WORKGROUP AND THE MEMORANDUM OF UNDERSTANDING REGARDING AIR QUALITY ANALYSES AND MITIGATION FOR FEDERAL OIL AND GAS DECISIONS THROUGH THE NATIONAL ENVIRONMENTAL POLICY ACT PROCESS

The Air Quality Technical Workgroup (AQTW) is required to include representatives from the following agencies: the BLM, USEPA, United States Forest Service (USFS), United States Fish and Wildlife Service (USFWS), and the National Park Service (NPS). Each of these agencies is a party to the *Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process* (USDA et al. 2011) (referred to as the MOU). This agreement is designed to "... facilitate the completion of NEPA [National Environmental Policy Act] environmental analyses for Federal land use planning and oil and gas development decisions"(USDA et al. 2011, p. 1). Additional entities, such as the Montana Department of Environmental Quality (MDEQ) and tribal entities, may also participate in the AQTW.

This MOU sets forth collaborative procedures that the AQTW agencies use to analyze potential air quality and AQRV impacts. The agencies also work together to identify potential mitigation measures that may be needed to reduce impacts to air quality and AQRVs. The lead agency (the BLM in this case), in collaboration with the other agencies, has the responsibility to identify reasonable mitigation and control measures and design features to address adverse impacts to air quality. Mitigation measures may also address impacts to AQRVs at Class I areas and at sensitive Class II areas that have been identified by the BLM, USFS, USFWS, and NPS.

The AQTW provided input to this ARMP and will continue to work collaboratively on future modeling efforts associated with this RMP. Provisions of the MOU continue to apply to future oil and gas activities in the planning area. In some cases, air quality and AQRV modeling performed under this ARMP may be sufficient to address modeling needs for future oil and gas projects that would otherwise require additional modeling under the MOU. However, the ARMP in no way replaces provisions of the MOU. Determinations of existing modeling adequacy for future oil and gas activities that trigger the MOU would be made collaboratively by the AQTW using the procedures included in the MOU.

The MDEQ has the primary authority to protect air quality within the state. Although the MDEQ is not a signatory to the national MOU, successful air quality management of BLM-authorized oil and gas activities depends on a close working relationship between the BLM and the MDEQ. The two agencies have worked

together to improve air quality monitoring and will continue to cooperate by sharing data, planning modeling efforts, and working together to identify emission reduction measures needed to maintain good air quality.

TABLE ARMP-1.
AMBIENT CONCENTRATION DATA FOR POLLUTANTS MONITORED IN THE PLANNING AREA

Pollu-tant	Avg. Period	Metric	Form	NAAQS	NAAQS Units	Monitored Concentrations During Monitored Years (Birney, Broadus, Sidney)[1]	Percentage of Standard (Birney, Broadus, Sidney) (%)
NO_2	1-hour	98th Percentile	3-year average	100	ppb	8, 16, 9	8%, 16%, 9%
O_3	8-hour	4th maximum	3-year average	0.075	ppm	0.056, 0.055, 0.056	75%, 73%, 75%
$PM_{2.5}$	24-hour	98th Percentile	3-year average	35	µg/m^3	12, 16, 43	34%, 46%, 43%
	Annual	Mean	3-year average	12.0 [2]	µg/m^3	4.9, 6.2, 6.6	41%, 52%, 55%
PM_{10}	24-hour	Not to be exceeded more than once per year	3-year average	150	µg/m^3	Not exceeded, not exceeded, not exceeded	13%, 21%, 16% [3]
SO_2	1-hour	99th Percentile	3-year average	75	ppb	NA/NA/5	NA/NA/7%

Source: MDEQ 2013.
NA = not available
[1]Based on calendar year 2010 to 2012 data.
[2]The annual $PM_{2.5}$ primary NAAQS was revised from 15.0 µg/m^3 to 12.0 µg/m^3, effective on March 18, 2013.
[3]Estimated by comparing the second maximum value to the NAAQS.

1.5 MDEQ AIR QUALITY MANAGEMENT AND BLM MITIGATION MEASURES

Primary air quality management authority and responsibility for the planning area rest with the MDEQ (for non-tribal areas of the planning area) and the USEPA for tribal areas. However, the BLM also plays a role in protecting air resources under the Federal Land Policy and Management Act (FLPMA) and NEPA. Due to the nature of NEPA analyses for land use planning, the BLM's air resource management role is forward-looking because air resource impacts are analyzed for future activities that may or may not occur.

1.5.1 MDEQ Air Quality Programs

The MDEQ has been delegated Federal Clean Air Act authority from USEPA to regulate air quality and air emissions requirements within the non-tribal areas of Montana. The MDEQ also implements state ambient air quality standards for additional air pollutants and has established more stringent standards for some criteria air pollutants, as shown in Table ARMP-3. As part of NAAQS implementation, the MDEQ operates air quality monitors through Montana.

The MDEQ has State Implementation Plan approved New Source Review permitting programs, which include Prevention of Significant Deterioration, Nonattainment Area, and minor source programs. The MDEQ's Prevention of Significant Deterioration and Nonattainment Area permitting programs impose controls on major stationary sources in order to control emissions of regulated pollutants. Emission controls are typically required through the application of Best Available Control Technology or Lowest Achievable Emission Rate, depending on the applicable New Source Review permitting program. In addition, the MDEQ implements a minor source New Source Review permitting program (e.g. minor source Montana Air Quality Permits and registrations). The MDEQ's minor source New Source Review program requires sources with a potential to emit greater than 25 tons per year of any regulated air pollutant to apply for a permit to construct pursuant to the Montana Air Quality Permits requirements or register with the MDEQ pursuant to the registration requirements under the Administrative Rules of Montana. To ensure compliance with the NAAQS, MDEQ's minor New Source Review program contains regulatory requirements that track activity and require the application of Best Available Control Technology. Additionally, the Administrative Rules of Montana require reasonable precautions to limit fugitive particulate emissions from all activities in Montana (i.e., permitted, registered, and those facilities that do not require a permit/registration). MDEQ's New Source Review program not only provides the emission benefits necessary to attain Montana's air quality goals, but also includes many features that provide regulatory certainty while still allowing flexibility in the implementation of Montana's air quality programs.

1.5.2 MDEQ Oil and Gas Emission Control Requirements

The MDEQ minor source permitting and registration program for oil and gas facilities includes a robust set of emission controls. MDEQ rules require oil or gas well facilities to control emissions from the time the well is completed until the source is registered or permitted. Facilities that choose to register must meet the emission control requirements contained in Administrative Rules of Montana 17.8.17. If a source cannot meet these requirements it must apply for an Montana Air Quality Permits. The Montana Air Quality Permits requires a case-by-case Best Available Control Technology analysis. A case-by-case Best Available Control Technology analysis may include design, equipment, work practice, or operational standards in place of or in combination with an emission limitation.

Examples of MDEQ emission control requirements for oil and gas facilities (defined as those with a potential to emit more than 25 tons per year of any airborne pollutant) include the following measures to limit emissions.

- Each piece of oil or gas well facility equipment containing volatile organic compound (VOC) vapors (as defined in the permitting or registration regulations) with a potential to emit 15 tons per year or more must be routed to a gas pipeline or to air pollution control equipment with 95 percent or greater control efficiency (registered facilities). This requirement applies to the following equipment.
    - Oil and gas wellhead production equipment including, but not limited to, wellhead assemblies, amine units, prime mover engines, phase separators, heater treatment units, dehydrator units, storage tanks, and connector tubing
    - Transport vehicle loading operations
- Hydrocarbon liquids must be loaded into transport vehicles using submerged fill technology.
- Stationary internal combustion engines greater than 85 brake horsepower must be equipped with nonselective catalytic reduction (for rich burn engines) or oxidation catalytic reduction (for lean burn engines) or equivalent emission reduction technologies.
- Piping components containing VOCs must be inspected for leaks each month. The first attempt to repair any leaking VOC equipment must occur within 5 days and the repair must be completed no later than 15 days after the leak is initially detected unless facility shutdown is required. Facilities are required to maintain monthly leak inspection and repair records.

Although MDEQ emission control requirements do not mention Greenhouse Gas, the VOC emission control measures would also reduce methane emissions, while the engine emission controls would reduce nitrous oxide emissions.

The MDEQ oil and gas emission control requirements have successfully protected air quality throughout the planning area, as evidenced by ambient air quality monitoring data that indicate good air quality in oil and gas activity areas.

1.5.3 BLM Air Resource Management and MDEQ Coordination

The BLM's authority to address air resources derives primarily from FLPMA and NEPA. Under FLPMA, the BLM must "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans" in the development and revision of land use plans (Section 202 (c)(8)). FLPMA also authorizes the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" (Section 102 (8)).

Under NEPA, the BLM ensures that information on the potential environmental and human impact of Federal actions is available to public officials and citizens before decisions are made and before actions are taken. One of the purposes of the Act is to "promote efforts which will prevent or eliminate damage to the environment and biosphere," and to promote human health and welfare (Section 2). NEPA requires that BLM and other federal agencies prepare a detailed statement on the environmental impact of the proposed action for major Federal actions expected to significantly affect the quality of the human environment (Section 102 (C)).

The BLM's authority under the Clean Air Act primarily derives from the requirement that BLM-authorized activities comply with the Clean Air Act. BLM-authorized activities may not violate the Clean Air Act or federal and state regulations and State Implementation Plans issued to implement the Act. When air quality or AQRV modeling performed during NEPA analysis predicts potential violations of the Clean Air Act or unacceptable AQRV impacts, the BLM evaluates the data and determines whether mitigation measures are needed. For example, the initial mitigation measure requiring drill rig engines to meet Tier 4 emission standards reduces NO_2 emissions and was demonstrated via modeling to prevent NAAQS violations from multiple large drill rig engines that may operate on one well pad. The mitigation measure includes an exception that allows use of drill rig engines meeting Tier 1, 2, or 3 emission standards if future modeling or near-field monitoring demonstrates compliance with the NAAQS.

When determining whether mitigation measures are needed, the BLM reviews current and proposed federal, state, and local regulations to determine whether mitigation will occur due to other agency actions. If the BLM determines that additional mitigation is needed while implementing this ARMP, the BLM will work closely with the MDEQ to coordinate future mitigation measures for BLM-authorized activities.

1.6 RELATIONSHIP TO THE MONTANA RECORD OF DECISION FOR THE SUPPLEMENT TO THE MONTANA STATEWIDE OIL AND GAS ENVIRONMENTAL IMPACT STATEMENT AND AMENDMENT OF THE POWDER RIVER AND BILLINGS RESOURCE MANAGEMENT PLANS ARMP

This ARMP integrates and supplements earlier ARMP provisions within the *Record of Decision for the Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans* (BLM 2008b). Provisions of this document's ARMP are currently in effect and were developed to address substantial predicted growth in coal bed natural gas (CBNG) drilling and production in the Powder River Basin (PRB). Based on extensive air quality and AQRV far-field modeling, predicted impacts described in the *Supplemental Air Quality Analysis to the Draft Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans* (BLM 2007; BLM 2008a) were associated primarily with projected emission increases from the operation of additional compressor engines. Consequently, increases in total compression horsepower were determined to be an indicator of growth in oil and gas activity that could potentially degrade air quality and AQRVs.

ARMP provisions included in the BLM's 2008 *Record of Decision for the Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans* are summarized below.

Emission Mitigation

- Fugitive dust controls are required to reduce particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) emissions from unpaved roads.
- The number of wells connected to each compressor must be maximized and natural-gas-fired or electrical compressors or generators are required.
- Operators within 5 miles of the Northern Cheyenne Indian Reservation and the Crow Indian Reservation may be required to restrict the timing or location of CBNG development if monitoring or modeling by the MDEQ finds that their CBNG development is causing or threatening to cause noncompliance with applicable local, state, tribal, and federal air quality laws, regulations, and standards, as well as state implementation plans developed by the MDEQ.

Activity and Emission Monitoring

- Compression horsepower associated with CBNG is required to be reviewed.
- Annual emission inventory reports for CBNG operations are required to be submitted by operators.

Ambient Air Quality Monitoring

- The BLM will develop monitoring plans to track regional cumulative impacts to air quality and establish programmatic mitigation at predetermined action levels.
- Ambient concentration data from the Birney and Broadus sites will be used to meet ambient monitoring requirements included in Table MON-1 in the *Monitoring Appendix* of the BLM's 2008 *Record of Decision for the Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans*.

Air Quality Impact Review

- Oil and gas operators are required to provide information necessary for the BLM to conduct an analysis of air quality impacts when submitting exploration applications for permits to drill or field development project plans for CBNG development. The BLM uses the information to determine the individual and cumulative impacts on Tribal air quality, disclose the analysis results in the appropriate NEPA document, and consult with the Tribe when the analysis shows impacts from a specific drilling or development proposal.
- An interagency working group (IWG) was formed consisting of the BLM, USEPA, NPS, and USFS and other federal, state agencies, and tribal authorities to address CBNG development in the Montana portion of the PRB and its impacts to air quality. In addition to other resource responsibilities, the IWG is responsible for developing and recommending the monitoring and mitigation measures needed for each agency to ensure its actions achieve compliance with applicable air quality standards across jurisdictional boundaries.

Air Quality and Visibility Modeling

- The MDEQ agreed to complete an annual cumulative air quality impact model to track air quality impacts of CBNG development, including relevant CBNG development in Wyoming.
- The BLM and the MDEQ will perform additional visibility modeling to assess visibility impacts when horsepower requirements for new CBNG wells in the Montana portion of the PRB exceed 133,956 horsepower.

The above requirements are being integrated into this ARMP. Some provisions are being updated to reflect the current state of knowledge while other provisions are being expanded to provide for a more comprehensive adaptive management strategy. Modeling provisions within the ARMP included in the BLM's 2008 *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the*

Powder River and Billings Resource Management Plans are being revised to reflect an improved modeling approach (described in Section 5.1 of visibility and criteria pollutants, including ozone. CBNG development in the Montana portion of the PRB did not materialize as predicted at the time of the BLM's *Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans*. According to the MDEQ, CBNG compression within the PRB has decreased by 1,676 horsepower since January 1, 2010 (MDEQ 2011). Because of the lack of CBNG development and the lack of new compression equipment to model, the MDEQ determined that additional ambient air quality monitoring would be the best air quality indicator. With funding provided by the BLM, two new monitoring stations were installed in the PRB near Birney (Rosebud County) and Broadus (Powder River County) in 2009. Due to the low level of oil and gas activity in the area, the following two emission reduction provisions from the Supplemental Environmental Impact Statement are not carried forward by this ARMP: (1) maximize the number of wells connected to each compressor, and (2) utilize natural gas or electrical compressors or generators. The need for these measures will be assessed during review of photochemical grid modeling (PGM) results from modeling performed as part of this ARMP. The PGM will use emission inventories reflecting more recent oil and gas activity data.

The remainder of this ARMP describes each of the provisions being carried forward from the ARMP included in the BLM's 2008 *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans*.

2.0 OIL AND GAS ACTIVITY ASSESSMENT

Each year, the BLM would track the number and locations of new oil and gas wells drilled on federal mineral estate and the number of new and abandoned producing wells on federal mineral estate. These numbers would be compared to the planning area reasonably foreseeable development and to the level of oil and gas development identified in the Miles City Field Office Proposed Resource Management Plan and Final Environmental Impact Statement.

In addition, the BLM would estimate oil and gas emissions from federal mineral estate every 3 years for oil and gas wells drilled and producing after the record of decision (ROD) is signed. Emission estimates would be based on well types, well numbers, and knowledge of typical equipment and operations. Methods used to estimate emissions are expected to improve over time as better data become available. The emission estimates will also account for implemented mitigation measures and for new emission control regulations as they become effective. Each 3-year oil and gas emission inventory would be compared to emission estimates for the reasonably foreseeable development for the Miles City Field Office Proposed Resource Management Plan and Final Environmental Impact Statement. BLM would collect additional data related to oil and gas equipment and operations to improve emission inventory quality. One area identified for improvement involves acquiring better data on oil and gas equipment used in the planning area. In order to improve fugitive dust emission estimates, the number, type, and length of vehicle trips in high-activity areas would be assessed.

For the portion of the PRB located in the MCFO, increases in compressor horsepower will be tracked annually using data provided by the MDEQ.

3.0 AMBIENT AIR QUALITY MONITORING SUPPORT

The Air Resources Management Bureau of the MDEQ has primary responsibility for siting and operating ambient air quality monitors within Montana and for reporting monitoring data to the USEPA and to the public. As described in its annual *State of Montana Air Quality Monitoring Network Plan* (MDEQ 2013), the MDEQ identifies monitoring objectives for assessing ambient concentrations of criteria air pollutants and assessing compliance with the NAAQS and MAAQS. Historically, most MDEQ monitors were placed in cities to assess human health impacts in the more densely populated areas of Montana.

The BLM is working collaboratively with the MDEQ to place ambient air quality monitors in less densely populated areas in which oil and gas activities are occurring or may occur in the future. The purpose of these monitors is:

- to assess compliance with ambient air quality standards, and
- to provide background ambient air quality concentrations for use in modeling efforts.

Using cooperative agreements, the BLM has provided funding to help purchase, install, and operate monitoring equipment at the locations shown in Table ARMP-2.

Each of the monitors described above measures ambient concentrations of nitrogen dioxide, nitric oxide, nitrogen oxides, ozone, particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$), as well as meteorological parameters such as temperature, wind speed, and wind direction. In addition, the Sidney monitoring station began monitoring sulfur dioxide during 2011.

TABLE ARMP-2.
MILES CITY FIELD OFFICE MONITORING STATIONS

Station Name	Monitored Pollutants	Year Installed	Station Number	County	Latitude	Longitude
Birney	NO, NO_2, NO_x, O_3, PM_{10}, $PM_{2.5}$	2010	30-87-0001	Rosebud	45.3662	-106.4894
Broadus	NO, NO_2, NO_x, O_3, PM_{10}, $PM_{2.5}$	2010	30-75-0001	Powder River	45.4403	-105.3702
Sidney	NO, NO_2, NO_x, O_3, PM_{10}, $PM_{2.5}$, SO_2[1]	2008	30-83-001	Richland	47.8034	-104.4856

[1]SO_2 monitoring began in June 2011.

In its 2013 *State of Montana Air Quality Monitoring Network Plan*, the MDEQ proposed to change the status of particulate matter (PM_{10}) monitors at the Birney, Broadus, and Sidney monitoring sites (MDEQ 2012). Particulate matter (PM_{10}) monitors at the Birney and Broadus sites are currently designated as State or Local Air Monitoring Station monitors, which are used to determine compliance with the NAAQS and MAAQS. However, the MDEQ has proposed to the USEPA that the Birney and Broadus particulate matter (PM_{10}) monitors be redesignated to non-regulatory special purpose monitors because the monitors are located within 60 meters of unpaved gravel roads used for ranching access. High episodic particulate matter (PM_{10}) levels have been measured at the Birney and Broadus sites. The MDEQ characterizes the high episodic monitored concentrations as "... not indicative or representative of general PM_{10} concentrations in the desired monitored area" (MDEQ 2012, p. 14).

Existing monitors at the Sidney monitoring station are currently designated as "industrial-non-regulatory" monitors. In response to a request from the USEPA, the MDEQ intends to redesignate each of the Sidney monitors to State or Local Air Monitoring Station monitors, except for the particulate matter (PM_{10}) monitor. Because of concerns regarding episodic particulate matter (PM_{10}) concentrations associated with travel on unpaved gravel roads, the MDEQ does not plan to change the status of the Sidney particulate matter (PM_{10}) monitor (MDEQ 2012).

Although the particulate matter (PM_{10}) monitors proposed for redesignation indicate high particulate matter (PM_{10}) concentrations, data through 2011 indicate that particulate matter (PM_{10}) concentrations are well below the NAAQS and MAAQS at the Birney and Sidney monitors (Table ARMP-1). In contrast, 24-hour particulate matter (PM_{10}) concentrations at the Broadus monitor (based on only 1 year of data) are approaching the NAAQS.

4.0 AIR QUALITY AND AQRV ASSESSMENT

The BLM would assess air quality and AQRVs on an annual basis using quality-assured data from the USEPA, MDEQ, USFS, USFWS, NPS, and other sources. In addition, preliminary assessments of ozone concentrations would be performed on a weekly basis using data provided by the MDEQ.

4.1 ANNUAL NATIONAL AMBIENT AIR QUALITY STANDARDS AND MONTANA AMBIENT AIR QUALITY STANDARDS ASSESSMENT

Based on the monitors listed in Section 3.0, the BLM would assess air quality monitoring data annually and share the results of the assessment with the MDEQ and AQTW. The purposes of the annual assessment are to compare monitored data to NAAQS and MAAQS and to identify seasonal and long-term trends in air pollutant concentrations. The BLM would complete the annual assessment will be performed by May 31 of each year in order to ensure that quality-assured data are available for review. Monitoring data associated with exceptional events, typically due to wildfires, would be excluded from the assessment.

NAAQS and MAAQS are provided in Table ARMP-3 for pollutants monitored within the planning area. Montana standards are shown only if they are more stringent than the NAAQS. As of November 1, 2012, lead and carbon monoxide are criteria pollutants that are not monitored within the planning area. With regard to pollutants regulated exclusively under the MAAQS, hydrogen sulfide and settleable particulate matter are not monitored within the planning area. Hydrogen sulfide is not monitored because ambient concentrations are believed to be very low due to low sulfur levels in gas produced in the area. Settleable particulate matter is not monitored in the area because the MDEQ prioritizes monitoring of pollutants subject to NAAQS and settleable particulate matter is a state ambient air quality standard.

The BLM would use design values to compare ambient monitoring data to the NAAQS. Design values reflect the form of the NAAQS and MAAQS; they define the statistical metric used to compare monitoring data to federal and state standards. Depending on the pollutant and averaging time being assessed, a NAAQS is typically stated in terms of the maximum or second maximum concentration, average concentration, or a percentile of the standard. The form of a standard also states whether the design value is determined based on 1 or more years of monitoring data. USEPA-calculated design values serve a critically important regulatory purpose of determining whether areas are designated attainment or nonattainment. As such, the USEPA's design value determinations may take more than a year to finalize.

In order to review air quality trends more quickly, the BLM would determine "mitigation design values" by May 31 of each year for the previous calendar year or years. The mitigation design value would be a metric calculated by the MDEQ or BLM that uses procedures similar to the USEPA's regulatory design value calculation methodology, with the advantage that the MDEQ/BLM-calculated mitigation design values can be determined more quickly. The timing allows the MDEQ adequate time to quality assure monitoring data. However, the MDEQ may not yet have USEPA concurrence on data that has been flagged by the MDEQ resulting from exceptional events, such as wildfires. Consequently, the MDEQ/BLM-calculated mitigation design values would exclude monitoring data associated with MDEQ-identified exceptional events. Each BLM annual assessment would look back the requisite number of years for each pollutant and include data from the time period prior to ROD issuance for the first several annual BLM assessments. Additional information concerning design value calculations is provided in Section 6.2.3. The BLM will work closely with the MDEQ to ensure that only data certified by the MDEQ and procedures consistent with MDEQ procedures are used in design value calculations.

Results of the annual NAAQS assessment would be used to determine if additional mitigation measures were needed to reduce air quality impacts from oil and gas operations, as discussed in Section 6.2.2 or 6.2.4.

4.2 PRELIMINARY OZONE ASSESSMENT

The BLM would perform weekly preliminary ozone concentration reviews to determine if high ozone events occur at the monitors listed in Section 3.0. If a high-ozone event occurred, the BLM would document meteorological and other conditions that may have contributed to the event. Because high-ozone events in other rural parts of the nation are not well understood and contributing factors can be site-specific, the BLM would gather data to develop baseline information relevant to any high-ozone events that may occur within the planning area. Relevant baseline information includes capturing meteorological data for each event, determining the amount of snow on the ground (if applicable), and identifying any other data that may help describe circumstances associated with the event. For the purposes of this effort, a high-ozone event would be defined as a day for which the maximum 8-hour average ozone concentration is at or above 0.065 ppm.

In order to quickly ascertain relevant circumstances, the preliminary ozone assessments would use non-quality-assured data provided by the MDEQ. As part of the annual NAAQS assessment, quality-assured ozone data would be reviewed to determine if the preliminary ozone monitoring data were valid or if monitored high ozone concentrations were due to monitor malfunctions or exceptional natural events.

If high-ozone events occur within the planning area, a summary of events and a discussion of relevant meteorological data and circumstances would be developed as part of the annual NAAQS assessment. These summaries and the underlying data will create baseline information describing ozone behavior in the planning area. The data may provide important information that can be used to identify mitigation measures that could prevent future events.

TABLE ARMP-3.
AMBIENT AIR QUALITY STANDARDS FOR
POLLUTANTS MONITORED IN THE PLANNING AREA

Pollutant	Averaging Period	Federal NAAQS[1]			MAAQS[2]
		Concentration	Standard Type	Form of NAAQS Primary Standard	Concentration
NO_2	1-hour	100 ppb	Primary	3-year average of the 98th percentile concentrations	0.30 ppm
	Annual	53 ppb	Primary, Secondary	Annual mean	0.05 ppm[7]
Ozone	1-hour	0.10 ppm	---	---	0.12 ppm[8]
	8-hour	0.075 ppm	Primary, Secondary	3-year average of the fourth daily maximum 8-hour average	---
$PM_{2.5}$	24-hour	35 µg/m^3	Primary, Secondary[3]	3-year average of the maximum	---
	Annual	12.0 µg/m^3	Primary[8]	Annual mean	---
	Annual	15.0 µg/m^3	Secondary[8]	Annual mean	---
PM_{10}	24-hour	150 µg/m^3	Primary, Secondary	Not to be exceeded more than one per year on average over 3 years	---
	Annual	Revoked[4]	---	---	50 µg/m^3, [6]
SO_2	1-hour	75 ppb	Primary	3-year average of the 99th percentile concentrations	0.50 ppm
SO_2	3-hour	0.5 ppm	Secondary	Annual 2nd maximum	---
	24-hour	0.14 ppm[5]	Primary	Annual 2nd maximum	0.10 ppm
	Annual	0.030[5]	Primary	Annual mean	0.02 ppm[7]

[1]NAAQS are codified in Title 40 of the Code of Federal Regulations (CFR), Part 50.
[2]Montana AAQS are codified in Title 17, Chapter 8, Subchapter 2 of the Ambient Air Quality in the Administrative Rules of Montana.
[3]USEPA proposed a new secondary standard for $PM_{2.5}$ visibility of 28 or 30 deciviews (equivalent to 24 or 19 kilometers [15 or 12 miles] standard visual range).
[4]The annual PM_{10} NAAQS was revoked October 17, 2006.
[5]The existing annual and 24-hour SO_2 NAAQS will be revoked 1 year after the effective date in areas with a designated attainment status for the revised SO_2 NAAQS, per 40 CFR §50.4(e).
[6]Based on annual second maximum.
[7]Not to be exceeded in the averaging period specified.
[8]State violation when exceeded more than once during any 12 consecutive months.

4.3 ASSESSMENT

Federal land managers track the status, condition, and trends of AQRVs for Class I and sensitive Class II areas under their jurisdictions. Consequently, the BLM would request visibility, sulfur, and nitrogen deposition, and lake acid neutralizing capacity data from the USFS, USFWS, and NPS and would include agency-submitted data in the BLM's annual review of AQRV trends. The annual review would also include AQRV data from any Class I or data for sensitive Class II areas BLM jurisdiction.

Based on these reviews, the BLM would maintain an awareness of AQRV trends. However, it should be noted that the reviews would not necessarily link AQRV trends to oil and gas development. AQRV impacts are often associated with pollutants that can be transported long distances from many different types of sources. For example, visibility degradation in eastern Montana primarily results from large stationary sources such as electric generating units and cement kilns, as described in the Montana Regional Haze Federal Implementation Plan (USEPA 2012).

PGM would provide information concerning the potential impact of oil and gas activities on AQRVs.

5.0 FUTURE MODELING

The BLM has committed to perform PGM in order to assess regional air quality and AQRV impacts. Because of insufficient monitoring and regional emissions data available during development of the RMP, PGM would not be completed prior to issuance of the RMP and the ROD. In order to complete PGM expeditiously, the BLM has begun data acquisition and PGM protocol development. When PGM is completed and the results assessed, the BLM may identify additional emission mitigation measures for oil and gas activities.

5.1 PHOTOCHEMICAL GRID MODELING

Comprehensive regional air quality and AQRV regional modeling of emission sources within the MCFO and surrounding areas requires PGM. This type of modeling can predict ozone and regional haze impacts (major pollutants and precursors can be transported for many hundreds of miles).

5.1.1 Data Acquisition

PGM requires three main types of concurrent data:

- meteorological data,
- ambient monitoring data, and
- comprehensive emission data.

The BLM's analysis determined that the latter two types of data need to be augmented and updated prior to performing PGM.

5.1.1.1 Additional Monitoring

Ambient monitoring data throughout the PGM domain (which would extend throughout most of Montana and into adjacent states) are needed in order to validate model performance, which is assessed by modeling a previous year and comparing the model's predicted concentrations to actual monitored concentrations.

In cooperation with the MDEQ, the BLM funded two new monitoring stations in north-central Montana and would provide staffing and additional funding to operate the monitors. One monitor is located near Malta in Phillips County and the other is located in Lewistown (Fergus County). Both monitors became operational in July 2012 and measure ambient concentrations of nitric oxide (NO), nitrogen dioxide, nitrogen oxides (NO_x, an ozone precursor), ozone, particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). These data would be particularly helpful in assessing the model's ability to accurately predict concentrations of these pollutants and its ability to accurately predict regional haze and visibility impacts west of the planning area.

5.1.1.2 Updating Emission Inventories

Comprehensive emission inventories are also critically important in predicting cumulative air quality and AQRV impacts. Prior to 2012, oil and gas regional emission inventories lacked comprehensive coverage of Montana sources and also underestimated emissions of VOCs, which contribute to ozone formation.

The BLM Montana and Dakotas State Office is providing financial assistance to the Western States Air Resources Council to complete oil and gas emission inventories for the Williston Basin and the Central Montana (Great Plains) Basin. These inventories would represent calendar year 2011 emissions. In addition to covering the planning area, the inventories would include comprehensive recent emission estimates for oil and gas activity in North Dakota and South Dakota.

5.1.2 Photochemical Grid Modeling Schedule

In order to use a full 12 months of ambient monitoring data from the new Malta and Lewistown monitors, the baseline year for PGM is expected to be 2013 or a 12-month period beginning in late 2012 and ending in 2013. PGM planning began in 2012 and development of the PGM modeling protocol is expected to be completed during 2013, with modeling occurring primarily in 2014 and early 2015. Review and assessment of PGM results would be completed by Fall 2015. Table ARMP-4 provides the planned data acquisition and PGM schedule.

The Weather Research and Forecasting (or WRF) model will likely be used to model meteorological conditions and the PGM to be used will be either the USEPA Models-3/Community Multiscale Air Quality modeling system or the Comprehensive Air Quality Model with Extensions. In addition, multiple models will be used to develop and process emission inventories for input into the PGM. When modeling is completed, an air resource technical support document will be developed.

Initial PGM would include future year modeling for a year between 2017 and 2020 using emissions representing full development of BLM oil and gas resources under the selected Alternative; the specific year would be determined by the BLM based on the ability to predict future cumulative regional oil and gas emissions in the Williston and Central Montana basins. After initial PGM is completed, the BLM would begin an assessment process to determine when additional PGM may be needed. Factors to be considered in determining when additional PGM is needed include the adequacy of the adaptive management strategy to maintain good air quality, and the level of BLM-authorized oil and gas activity and emissions compared to modeled levels.

5.1.3 Air Quality Technical Workgroup and Interagency Working Group Review and Input to Photochemical Grid Modeling

Throughout the PGM data collection and modeling process, the BLM will work collaboratively with the MDEQ and the AQTW that was formed to work on this RMP, and with a other agencies or Tribes that request to be involved in the PGM effort. These collaborators provided technical review and comment on the draft modeling protocol, and would review and comment on the WRF and PGM performance evaluations, and on the draft air resource technical support document. Substantial time has been included in the schedule shown in Table ARMP-4 to allow adequate review and comment periods during the PGM process.

5.1.4 Availability of Photochemical Grid Modeling Results

Future PGM results would be presented in the final air resource technical support document and in a summary of the results. The air resource technical support document and summary document would be posted on the MCFO BLM website. In addition, the modeling protocol document will be provided via the website when the photochemical modeling air resource technical support document is made available. Outreach information regarding the availability of the results would be made through the MDEQ, AQTW, IWG, and agencies involved in the PGM process, as well as other interested parties.

5.2 LIMITED CALPUFF VISIBILITY MODELING

Through their participation under the air quality MOU, the USFWS and the NPS specifically requested that limited CALPUFF modeling be prepared between the Draft and the Final RMP. This limited modeling effort was performed and assessed direct visibility impacts from potential future BLM-authorized oil and gas sources in the northern portion of the planning area near the USFWS UL Bend Wilderness and Medicine Lake Wilderness.

The CALPUFF modeling was used as a screening tool to estimate direct oil and gas visibility impacts at Class I and sensitive Class II areas. In addition, potential plume blight impacts were assessed using the VISCREEN model. Results of these efforts are disclosed in Chapter 4.

TABLE ARMP-4.
DATA ACQUISITION AND PHOTOCHEMICAL GRID MODELING SCHEDULE

Task/Subtask	Duration (calendar days)	Start Date	End Date
Pre-Modeling Emission Inventory and Protocol Development			
Western Regional Air Partnership Williston and Central Montana Basin Inventory	426	11/1/2012	12/31/2013
Develop WRF and PGM Protocol	195	10/1/2012	4/15/2013
Base Year Modeling and Evaluation *			
WRF Modeling	142	10/1/2013	2/20/2014
Draft WRF Model Evaluation	30	2/20/2014	3/22/2014
AQTW and IWG WRF Evaluation Review	30	3/22/2014	4/21/2014
Emission Modeling (Base and Future Year) and Report	120	10/23/2013	2/20/2014
PGM of Base Year	150	2/20/2014	7/20/2014
Draft PGM Evaluation	30	7/20/2014	8/19/2014
AQTW and IWG PGM Evaluation Review	30	8/19/2014	9/18/2014
Finalize WRF and PGM Evaluations	21	9/18/2014	10/9/2014
Future Year Modeling and Evaluation *			
PGM of Future Year	150	10/9/2014	3/8/2015
Analyze Air Quality and AQRV Impacts	21	3/8/2015	3/29/2015
Draft air resource technical support document	21	3/29/2015	4/19/2015
AQTW and IWG air resource technical support document review	30	4/19/2015	5/19/2015
Finalize air resource technical support document	21	5/19/2015	6/9/2015

*** Duration and dates are subject to revision; they are estimated to provide the general timing of future modeling activities.**

Regional far-field visibility and other AQRV impact analysis for this RMP would be based on results from future PGM. Photochemical grid models are recommended for AQRV analysis of large domains in the Appendix to the MOU (USDA et al. 2011).

5.3 POST-PHOTOCHEMICAL GRID MODELING

To the extent that future emission increases are within the levels modeled with PGM or other modeling and are proximate to modeled emission locations, far-field air quality and AQRV impact analysis may incorporate by reference PGM and other modeling results. The BLM and the AQTW would determine whether previous

modeling is sufficient to satisfy MOU requirements. This air quality management approach is consistent with the MOU (USDA et al. 2011) and allows for efficient air quality and AQRV impact analysis.

If additional modeling is performed after PGM is complete, an assessment of air quality and AQRV impacts would be made and, if necessary, additional mitigation measures may be identified.

6.0 MITIGATION

Air quality and AQRV impact mitigation would involve two types of mitigation:

- initial mitigation measures that become effective when the ROD is signed, and
- enhanced mitigation measures that may be identified based on future ambient monitoring data or modeling results.

6.1 INITIAL MITIGATION ACTIONS

The air quality mitigation measures described below will be applied upon issuance of the ROD through leasing documents and project-specific NEPA documents. To the extent practical, emission reductions associated with these mitigation measures have been included in the MCFO emission inventory.

1. Design and construct roads and well pads to reduce the amount of fugitive dust generated by traffic or other activities. During construction activities, apply water, apply dust-suppression chemicals, apply gravel, or use other control methods to achieve 50-percent fugitive dust control efficiency except when the ground is wet or frozen.
2. Use water or other BLM-approved dust suppression during drilling, completion, and well workover operations for dust abatement on access roads, as needed, to achieve 50-percent fugitive dust control efficiency except when ground is wet or frozen.
3. Use water or other BLM-approved dust suppression in high traffic areas during production operations for dust abatement, as needed, to achieve 50-percent fugitive dust control efficiency except when ground is wet or frozen. Operators would work with local government agencies to improve dust suppression on roads.
4. For oil and gas project plans of development (PODs), oil and gas operators would establish speed limits for project-required unpaved roads in and adjacent to the project area; oil and gas operator employees would comply with these speed limits.
5. For oil and gas project PODs, oil and gas operators would be encouraged to reduce surface disturbance, vehicle traffic, and fugitive dust emissions by consolidating facilities (e.g., using multi-well pads, storage vessels) when feasible.
6. Diesel drill rig engines greater than 200 horsepower will meet Tier 4 emission standards for non-road diesel engines. Alternatively, oil and gas operators may use drill rig engines that exceed Tier 4 emission standards if modeling or monitoring at the project level or at a programmatic level demonstrates compliance with the NAAQS and protection of AQRVs.
7. For hydraulically fractured gas wells that do not qualify as “low pressure wells”, “wildcat,” or “delineation” wells, oil and gas operators would comply with reduced emissions completion requirements specified in Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution (40 CFR Section 60.5375) within 6 months of ROD issuance.
8. Non-road diesel engines would be required to use ultra-low sulfur diesel fuel (15 parts per million weight as required by 40 CFR Section 80.610(e)(3)(iii).
9. Natural-gas-fired or electrical compressors or generators would be required at compressor stations in the PRB.
10. CBNG operators proposing a POD within 5 miles of the Northern Cheyenne Indian Reservation or the Crow Indian Reservation would be required to provide the information necessary for the BLM to conduct an analysis of air quality impacts. The BLM will use the information to determine the impact on air quality in the Northern Cheyenne Indian Reservation and the Crow Indian Reservation, disclose the analysis results and subsequent mitigation in the appropriate NEPA document, and consult with the

Tribes when the analysis shows that air quality or AQRV impacts are anticipated from a specific development proposal.

11. CBNG operators within 5 miles of the Northern Cheyenne Indian Reservation and the Crow Indian Reservation may be required to restrict the timing or location of CBNG development if monitoring or modeling by the MDEQ finds that their CBNG development is causing or threatening to cause noncompliance with applicable local, state, Tribal, and federal air quality laws, regulations, and standards, as well as state implementation plans developed by the MDEQ.

6.2 MONITORING-BASED MITIGATION

Enhanced mitigation would be evaluated and implemented if ambient monitoring data at monitors located in oil and gas activity areas within the planning area indicate that pollutant concentrations are approaching or threatening the NAQQS or MAAQS. Prior to completion of initial PGM, monitoring-based thresholds would be based on evaluation of exceedances of the NAAQS, as described in Section 6.2.1. After completion of initial PGM, monitoring-based thresholds would be based on BLM-calculated design values, as described in Section 6.2.3.

6.2.1 Monitoring-based Thresholds before Photochemical Grid Modeling Completion

Based on requests from the USEPA during the MOU review process, the BLM would review NAAQS exceedances and determine if enhanced mitigation would be warranted during the interim period between ROD issuance and PGM completion. Unless the BLM determines that enhanced mitigation is not warranted after completing specified steps (as outlined below and in Section 6.2.2), the BLM would require enhanced mitigation for BLM-authorized oil and gas activities if there is a monitored exceedance of the NAAQS at the Birney, Broadus, or Sidney monitors.

1. The BLM would notify the USEPA and the MDEQ within 30 days after monitoring data showing an exceedance has been posted on the USEPA's Air Quality System. An exceedance is defined as any monitored concentration (other than one occurring during an exceptional event) that is greater than the NAAQS, without consideration of the statistical form of the NAAQS or multi-year averaging. The notification would state that (1) the BLM requests concurrence from the MDEQ and USEPA that an exceedance occurred, and (2) the BLM would, upon concurrence by both agencies, review the exceedance according to this procedure.
2. After consulting with the MDEQ, the BLM would determine whether an exceptional event may have caused the exceedance[1].

    - If the MDEQ informs the BLM that an exceptional event likely caused the exceedance, the BLM would provide a letter to that effect to the USEPA and no further action would be necessary.
    - If an exceptional event did not cause the exceedance or if the MDEQ would not submit an exceptional event waiver to the USEPA, the BLM would perform Step 3.

3. The BLM would conduct a screening level analysis[2] to determine the likely source and location of the exceedance and whether mitigation is needed.[3]

    - If the screening analysis indicates that the exceedance was not caused by BLM-authorized oil and gas sources within the planning area or indicates that the BLM-authorized oil and gas

[1] The BLM would not formally decide that an exceptional event occurred, because this decision would be made by MDEQ. Until a final determination of an exceptional event is presented to the USEPA by the MDEQ and the USEPA has concurred, the BLM would assume that an exceptional event occurred based on a stated intention by the MDEQ to submit an exceptional event waiver.

[2] Publicly available web-based applications suggested by the USEPA to identify sources of air pollution and potential impacts include the following sites: trajectory analysis tools like HySplit (http://ready.arl.noaa.gov/), air quality data at the USEPA's air quality system site (http://airnow.gov), state regulatory agency sites and airnowtech.org, an interactive snow site (http://www.nohrsc.nws.gov/interactive/html/map.html), daily ozone modeling (http://airquality.weather.gov/), daily ozone and PM2.5 modeling site (http://www.getbluesky.org/), and daily satellite imagery site (http://ge.ssec.wisc.edu/modis-today/).

[3] If data necessary to conduct a screening level analysis is not available, the BLM would consult with the MDEQ and the USEPA regarding source attribution and the need for mitigation.

sources within the planning area did not contribute to the exceedance, the BLM would convey this finding in writing to the MDEQ and USEPA for review and comment. No further action would be necessary.
- If the screening analysis indicates that the exceedance was caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would perform Step 4.

4. The BLM would consult with the MDEQ and USEPA to determine whether there is a need for a refined attribution analysis (e.g., attribution test using Comprehensive Air Quality Model with Extensions ozone source attribution technology or anthropogenic precursor's culpability assessment), or mitigation on BLM-authorized oil and gas emission sources within the planning area. If the refined analysis:

    - is warranted, the BLM would perform the refined analysis within 6 months of completing Step 3 in consultation with MDEQ and USEPA;
    - indicates that the exceedance was not caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would provide that recommendation to the MDEQ and USEPA for review and comment (no further action would be necessary); or
    - indicates that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, the BLM would evaluate enhanced mitigation measures as described in Section 6.2.2.

6.2.2 Determination of Enhanced Mitigation Measures before Photochemical Grid Modeling Completion

If a NAAQS exceedance occurs prior to completion of PGM and the refined analysis in Step 4 above determined that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, one or more enhanced mitigation measures would be evaluated and selected by the BLM, in cooperation with the MDEQ, IWG, and AQTW, when appropriate. The geographic extent of the mitigation measure(s) would be determined based on the analysis performed under Section 6.2.1 and would be limited to the area determined to be at risk for future exceedances. Preference would be given to mitigation methods that the MDEQ intends to impose as new regulations or air quality permitting provisions. Selected mitigation measures would be implemented within 1 year after the BLM decision to apply additional mitigation.

Potential enhanced mitigation measures may include one or more of the measures listed below. Additional measures or equivalent methods or emission restrictions may be identified in the future. Potential measures include:

- drilling or blowdown activity restrictions based on meteorological conditions,
- construction activity restrictions based on meteorological conditions,
- centralization of gathering facilities,
- electric drill rigs,
- field electrification for compressors or pumpjack engines,
- plunger lift systems with smart automation,
- oil tank load out vapor recovery,
- VOC controls on tanks with a potential to emit less than 5 tons per year,
- selective catalytic reduction on non-drill rig stationary engines,
- reduced emission completions beyond those required by USEPA regulations if determined to be technically and economically feasible,
- well pad density limitations,
- a reduced total number of drill rigs operating simultaneously,
- seasonal reductions or cessations of drilling during specified periods,
- use of only lower-emitting drill and completion rig engines during specified time periods,
- use of natural-gas-fired drill and completion rig engines,
- replacement of internal combustion engines with gas turbines for natural gas compression,
- employment of a monthly, forward-looking infrared leak detection program to reduce VOCs,

- tank load out vapor recovery,
- enhanced VOC emission controls with 95-percent control efficiency on additional production equipment having a potential to emit of greater than 5 tons per year, and
- enhanced direct inspection and maintenance program.

6.2.3 Monitoring-Based Thresholds after Photochemical Grid Modeling Completion

By May 31 of each year following completion of PGM and annually thereafter, the BLM would calculate design values for each pollutant monitored at a federal reference monitor or federal equivalent method monitor within the planning area and identified as a representative monitor in Section 3.0. The design value would be calculated based on calendar year monitoring data available at the time. For pollutants requiring 3 years of monitoring data for design value calculation, data from the appropriate prior period would be used. For example, based on PGM completion in mid-2015, the first annual design value calculation would be performed by May 31, 2016, and would include monitoring data for calendar years 2013, 2014, and 2015 for 3-year design values and on monitoring data for calendar year 2015 for single-year design values.

Calculation methods would, to the extent possible, follow USEPA procedures provided in the appendices described below within Title 40 of the CFR, Part 50 in effect as of December 1, 2012:

- nitrogen dioxide (Appendix S),
- ozone (Appendix P),
- particulate matter (PM_{10}) (Appendix K),
- fine particulate matter ($PM_{2.5}$) (Appendix N), and
- sulfur dioxide (Appendix T).

These procedures may be updated by future USEPA regulations and this section of the ARMP would be revised to reflect changing regulations.

Design values would be calculated on a site-specific basis (i.e., no spatial averaging of multiple monitors). BLM design value calculations would exclude data associated with MDEQ-identified exceptional events and would be performed in accordance with USEPA regulations and guidance.

6.2.4 Determination of Enhanced Mitigation Measures after Photochemical Grid Modeling Completion

If the air quality assessment described in Section 6.2.3 indicates that a BLM-calculated design value is greater than 85 percent of a NAAQS, one or more enhanced mitigation measures addressing that pollutant or pollutant precursor would be evaluated and could be selected by the BLM, in cooperation with the MDEQ, IWG, and USEPA. The geographic extent of the mitigation measure(s) would be determined based on the analysis performed in Section 6.2.3. Potential enhanced mitigation measures include the measures listed above in Section 6.2.2 as well as additional measures that may be identified in the future. Selected mitigation measures would be implemented within 1 year after the BLM decision to apply additional mitigation.

6.3 MODELING-BASED MITIGATION

6.3.1 Modeling-based Thresholds

Future modeling would assess air quality and AQRV impacts from future BLM-authorized oil and gas activity and would include regional PGM and project-specific modeling. Modeling-based thresholds for evaluating enhanced mitigation would include potential future impacts on NAAQS or MAAQS or impacts above specific levels of concern for AQRVs in Class I or sensitive Class II areas (as identified on a case-by-case basis by MDEQ or a federal land management or Tribal agency).

6.3.2 Determination of Modeling-based Enhanced Mitigation Measures

If BLM-authorized oil and gas activity is predicted to cause or contribute to impacts above the thresholds described above, the BLM would facilitate an interagency process to ensure that a comprehensive strategy is developed to manage air quality impacts from future oil and gas development within the region. The local, state,

federal, and Tribal agencies involved in the regulation of air quality and the authorization of oil and gas development would evaluate modeling results from future modeling studies and identify potential air quality concerns and necessary reductions in air emissions. If the modeling predicts significant impacts, these agencies would use their respective authorities to implement enhanced emission control strategies, operating limitations, equipment standards, or pacing of development as necessary to ensure continued compliance with applicable ambient air quality standards, including the enhanced mitigation measures listed in Section 6.2.2; other future mitigation measures identified through the BLM's adaptive management strategy; or reasonable mitigation measures suggested by the MDEQ, IWG, or AQTW. If necessary, implementation of mitigation measures would occur within 1 year of obtaining final modeling results for mitigation measures that conform to currently implemented land use planning decisions and constraints.

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<End of ARMP>

DISTURBANCE APPENDIX
CHAPTER 4 – SURFACE DISTURBANCE FROM BLM AUTHORIZED REASONABLY FORESEEABLE ACTIONS

INTRODUCTION

This appendix contains information on the assumed BLM authorized surface disturbance over the long-term (next 20 years) by Alternative. The surface disturbance estimations are illustrated by a resource use (e.g. oil and gas development) and by a resource benefit activity (e.g. watershed enhancement project).

METHODOLOGY

The oil and gas, coal, locatable minerals, and mineral material programs have standalone Reasonably Foreseeable Development (RFD) Scenarios contained with the *Minerals Appendix*. The program specific RDFs provide the methodology and assumptions for the BLM authorized surface disturbance acreage contained in Table 1 below.

For the other resource use development acres and resource benefit project acres the following was utilized to determine the assumed acres of surface disturbance. The first step in the process was to provide an unconstrained scenario. The assumption for the unconstrained scenario was that there would be no restrictions on the resource use development or the resource benefit projects. From this unconstrained scenario, each BLM specialist relied on historical information (e.g. miles of BLM authorized fence constructed in the last 10 years) and professional judgment to determine how many acres of BLM authorized surface disturbance would occur in the planning area.

The second step involved utilizing GIS to calculate by Alternative the number of BLM administered acres where surface disturbing activities would not be allowed: Alternative A – 119,915 acres; Alternative B – 2,193,327 acres; Alternative C – 168,777 acres; Alternative D – 108,780 acres; and Alternative E – 93,555 acres. As the last step, the baseline number was reduced by the percentage of the BLM administer acres allowing surface disturbance.

Clarifications

Here is a list of clarifications on some of the calculations the reader will observe in the tables in this Appendix:

- Coal - A management common to all alternatives action to carry forward coal leasing decisions from previous land use planning documents does not change by alternative; therefore the acreages do not change.
- Locatable – The development of locatable minerals is governed by the 1872 Mining Law and therefore the management options for denying development are very limited. See the *Minerals Section* in Chapter 3 and the *Minerals Appendix* for more information.
- Mineral Materials – The acreage development acres for mineral materials (e.g. sand and gravel) was not changed per alternative because it is a discretionary action.
- Fuels Treatments – Includes only acres from soil disturbance (e.g. fire line construction) and not from the fire itself.
- Forestry Projects – The reader will notice the major driver in the change of acreages for resource uses between Alternatives A, C, D, and E is the Forestry Projects category. This reasoning is that the current land use plans are either very restrictive or do not allow forestry projects. The data used for qualification is historical timber information, but does not infer that forestry product is strictly for sawmill use.

TABLE 1.
ANTICIPATED SURFACE DISTURBANCE ACREAGES[1] FOR EACH ALTERNATIVE FROM BLM ASSUMED ACTIONS

Type of Disturbance	Unconstrained Acres[2]	Alternative A Acres[2,3]	Alternative B Acres[2,4]	Alternative C Acres[2,5]	Alternative D Acres[2,6]	Alternative E Acres[2,7]
Water; Riparian and Wetland Areas						
Watershed Enhancement Projects						
Short-term Disturbance	2,000	1,900	700	1,900	1,900	1,900
Assumes up to 10 acres of disturbance per project	20 – 200 projects	19 – 190 projects	7 – 73 projects	19 – 190 projects	19 – 190 projects	19 – 190 projects
Reclaimed	2,000	1,900	700	1,900	1,900	1,900
Long-term Disturbance	0	0	0	0	0	0
Riparian/Wetland Projects						
Acres Short-term Disturbance	2,000	1,900	700	1,900	1,900	1,900
Assumes up to 10 acres of disturbance per project	20 – 200 projects	19 – 190 projects	7 – 73 projects	19 – 190 projects	19 – 190 projects	19 – 190 projects
Reclaimed	2,000	1,900	700	1,900	1,900	1,900
Long-term Disturbance	0	0	0	0	0	0
Vegetation						
Mechanical Treatments						
Short-term Disturbance	40,000	38,000	15,000	38,000	38,000	39,000
Reclaimed	40,000	38,000	15,000	38,000	38,000	39,000
Long-term Disturbance	0	0	0	0	0	0
Fish and Wildlife						
Aquatic Wildlife Projects						
Short-term Disturbance	2,000	1,900	700	1,900	1,900	1,900
Assumes up to 10 acres of disturbance per project	20 – 200 projects	19 – 190 projects	7 – 73 projects	19 – 190 projects.	19 – 190 projects	19 – 190 projects
Reclaimed	2,000	1,900	700	1,900	1,900	1,900
Long-term Disturbance	0	0	0	0	0	0
Terrestrial Wildlife Projects						
Short-term Disturbance	2,000	1,900	700	1,900	1,900	1,900
Assumes up to 10 acres of disturbance per project	20 – 200 projects	19 – 190 projects	7 – 73 projects	19 – 190 projects	19 – 190 projects	19 – 190 projects
Reclaimed	2,000	1,900	700	1,900	1,900	1,900
Long-term Disturbance	0	0	0	0	0	0
Wildland Fire Management and Ecology						
Prescribed Fire						
Short-term Disturbance	2,000	1,900	700	1,900	1,900	1,900
Reclaimed	2,000	1,900	700	1,900	1,900	1,900
Long-term Disturbance	0	0	0	0	0	0

Type of Disturbance	Unconstrained Acres[2]	Alternative A Acres[2,3]	Alternative B Acres[2,4]	Alternative C Acres[2,5]	Alternative D Acres[2,6]	Alternative E Acres[2,7]
Cultural Resources; Paleontological Resources						
Cultural Resource Excavations						
Short-term Disturbance	20	19	4	14	19	19
Assumes up to 5 acres of disturbance per excavation	4 excavations	4 excavations	1 excavation	3 excavations	4 excavations	4 excavations
Reclaimed	20	19	4	14	19	19
Long-term Disturbance	0	0	0	0	0	0
Paleontological Resource Excavations						
Short-term Disturbance	150	140	30	110	140	150
Assumes up to 0.5 acre of disturbance per excavation	200 – 300 excavations	190 – 288 excavations	39 – 59 excavations	140 – 220 excavations	190 – 290 excavations	190 – 290 excavations
Reclaimed	150	140	30	110	140	150
Long-term Disturbance	0	0	0	0	0	0
Forestry and Woodland Products						
Timber Sales						
Short-term Disturbance	27,000	1,400	280	2,600	5,800	5,800
Assumptions	--	Assumes 72.4 acres of salvage harvest per year based on 652 acres over the period 1999-2007		Assumes 176.8 acres of commercial sawtimber harvest per year based on PSQ of 650 mbf/year and an average harvest of 3.677 mbf/acre over the period 1999-2007	Assumes 299.2 acres of commercial sawtimber harvest per year based on PSQ of 1,100 MBF/year and an average harvest of 3.677 mbf/acre over the period 1999-2007	
Reclaimed	27,000	1,400	280	2,600	5,800	5,800
Long-term Disturbance	0	0	0	0	0	0
Livestock Grazing						
Fence Development						
Short-term Disturbance	600	580	120	430	580	580
Assumes up to 1.2 acres of disturbance per mile of fence	500 miles of fence	480 miles of fence	98 miles of fence	360 miles of fence	480 miles of fence	480 miles of fence
Reclaimed	600	580	120	430	580	580
Long-term Disturbance	0	0	0	0	0	0
Pipeline Development						
Short-term Disturbance	950	920	190	690	920	920
Assumes up to 1.7 acres of disturbance per mile of pipeline	560 miles of pipeline	540 miles of pipeline	110 miles of pipeline	400 miles of pipeline	540 miles of pipeline	540 miles of pipeline
Reclaimed	950	920	190	690	920	920

Type of Disturbance	Unconstrained Acres[2]	Alternative A Acres[2,3]	Alternative B Acres[2,4]	Alternative C Acres[2,5]	Alternative D Acres[2,6]	Alternative E Acres[2,7]
Long-term Disturbance	0	0	0	0	0	0
Range Improvement Facility Development						
Short-term Disturbance	75	72	15	54	72	72
Assumptions	1 facility per 0.75 mile of pipeline and 0.1 acre of disturbance per facility					
Reclaimed	0	0	0	0	0	0
Long-term Disturbance	75	72	15	54	72	72
Reservoir/Pit Development						
Short-term Disturbance	740	710	0	530	710	710
Assumes 1 acre of disturbance per reservoir/pit	740 reservoirs/pits	710 reservoirs/pits	0 reservoirs/pits	530 reservoirs/pits	710 reservoirs/pits	710 reservoirs/pits
Reclaimed	0	0	0	0	0	0
Long-term Disturbance	740	710	0	530	710	710
Spring Development						
Short-term Disturbance	10	10	2	7	10	10
Assumes 0.25 acre of disturbance per spring development	40 spring developments	38 spring developments	8 spring developments	29 spring developments	38 spring developments	39 spring developments
Reclaimed	10	10	2	7	10	10
Long-term Disturbance	0	0	0	0	0	0
Well Development						
Short-term Disturbance	50	48	10	36	48	48
Assumes 0.25 acre of disturbance per well	200 wells	190 wells	39 wells	140 wells	191902 wells	190 wells
Reclaimed	50	48	10	36	48	48
Long-term Disturbance	0	0	0	0	0	0
Minerals						
Coal						
Short-term Disturbance	8,700	8,700	8,700	8,700	8,700	8,700
Reclaimed	3,100	3,100	3,100	3,100	3,100	3,100
Long-term Disturbance[8]	5,700	5,700	5,700	5,700	5,700	5,700
Oil and Gas						
Short-term Disturbance	3,600	3,400	2,200	3,500	3,500	3,100
Reclaimed	2,500	2,300	1,500	2,400	2,400	2,200
Long-term Disturbance	1,100	1,000	700	1,100	1,100	1,000
Locatable Minerals						
Short-term Disturbance	4,000	4,000	4,000	4,000	4,000	4,000
Reclaimed	3,000	3,000	3,000	3,000	3,000	3,000
Long-term Disturbance[9]	1,000	1,000	1,000	1,000	1,000	1,000
Mineral Materials						
Short-term Disturbance	500	480	190	480	490	490
Reclaimed	500	480	190	480	490	490
Long-term Disturbance[10]	0	0	0	0	0	0

Type of Disturbance	Unconstrained Acres[2]	Alternative A Acres[2,3]	Alternative B Acres[2,4]	Alternative C Acres[2,5]	Alternative D Acres[2,6]	Alternative E Acres[2,7]
Recreation						
Short-term Disturbance	1,000	960	200	720	960	970
Assumptions	50 recreational facilities	48 recreational facilities	10 recreational facilities	36 recreational facilities	48 recreational facilities	48 recreational facilities
Reclaimed	0	0	0	0	0	0
Long-term Disturbance	1,000	960	200	720	960	970
Renewable Energy						
Short-term Disturbance	1,100	1,000	210	830	1,100	730
Assumptions	Assumes 8 ROWs issued for utility-scale wind energy projects, 25 turbines/ project, and 1 utility-scale solar project		Assumes 2 ROW issued for utility-scale wind energy projects, 5 turbines/ project, and 1 utility-scale solar project	Assumes 6 ROWs issued for utility-scale wind energy projects, 19 turbines/ project, and 1 utility-scale solar project	Assumes 8 ROWs issued for utility-scale wind energy projects, 24 turbines/ project, and 1 utility-scale solar project	Assumes 5 ROWs issued for utility-scale wind energy projects, 17 turbines/ project, and 1 utility-scale solar project
Reclaimed	400	380	78	300	380	270
Long-term Disturbance	700	670	140	530	670	470
Lands and Realty – Rights-of-Way, Section 302 FLPMA Leases and Permits, and R&PP Leases						
Pipelines and Roads						
Short-term Disturbance	3,500	3,400	680	2,600	3,400	3,400
Assumes 50 percent of minor ROW and major pipeline ROW disturbance would be reclaimed in the long term	Assumes 1,040 minor ROWs and 12 major pipeline ROWs	Assumes 991 minor ROWs and 11 major pipeline ROWs	Assumes 202 minor ROWs and 2 major pipeline ROWs	Assumes 782 minor ROWs and 9 major pipeline ROWs	Assumes 998 minor ROWs and 12 major pipeline ROWs	Assumes 1,003 minor ROWs and 12 major pipeline ROWs
Reclaimed	1,800	1,700	340	1,300	1,700	1,700
Long-term Disturbance	1,800	1,700	340	1,300	1,700	1,700
Powerlines						
Short-term Disturbance	680	650	130	510	650	660
Assumes 1/3 of minor and major power line disturbance would be reclaimed in the long term	60 minor overhead powerline ROWs and 8 major powerline ROWs	57 minor overhead powerline ROWs and 8 major powerline ROWs	12 minor overhead powerline ROWs and 2 major powerline ROWs	45 minor overhead powerline ROWs and 6 major powerline ROWs	58 minor overhead powerline ROWs and 8 major powerline ROWs	58 minor overhead powerline ROWs and 8 major powerline ROWs
Reclaimed	450	430	88	340	440	440
Long-term Disturbance	230	220	44	170	220	220
Railroads						
Short-term Disturbance[11]	140	140	140	140	140	140
Reclaimed	0	0	0	0	0	0
Long-term Disturbance	140	140	140	140	140	140
CO_2 Pilot Projects						
Short-term Disturbance	180	170	30	130	170	170

Type of Disturbance	Unconstrained Acres[2]	Alternative A Acres[2,3]	Alternative B Acres[2,4]	Alternative C Acres[2,5]	Alternative D Acres[2,6]	Alternative E Acres[2,7]
Assumes 50 percent of CO_2 pilot project disturbance would be reclaimed in the long term	7 CO_2 pilot projects	7 CO_2 pilot projects	1 CO_2 pilot projects	5 CO_2 pilot projects	7 CO_2 pilot projects	7 CO_2 pilot projects
Reclaimed	90	80	20	70	80	80
Long-term Disturbance	90	80	20	70	80	80
Other Facilities						
Short-term Disturbance	260	250	50	200	250	250
Assumes 25 percent of 2920 permits and amendments will be reclaimed in the long term	20 new 2920 permits and 4 amendments to 2920 permits	20 new 2920 permits and 4 amendments to 2920 permits	3 new 2920 permits and 1 amendment to 2920 permits	14 new 2920 permits and 3 amendments to 2920 permits	16 new 2920 permits and 3 amendments to 2920 permits	20 new 2920 permits and 4 amendments to 2920 permits
Reclaimed	65	62	13	49	62	63
Long-term Disturbance	200	190	38	150	190	190
Cumulative Disturbance						
Maximum Short-term Disturbance	103,000	75,000	36,000	73,000	80,000	79,000
Maximum Reclaimed	91,000	62,000	27,000	62,000	67,000	67,000
Maximum Long-term Disturbance	13,000	12,000	8,300	11,000	12,000	12,000

[1]All acres are assumed maximum values based on the assumptions made in Chapter 4 of the PRMP/FEIS. They should not be treated as exact values. All acres are rounded.
[2]Adding "Reclaimed" and "Long-term Disturbance" may not exactly equal "Short-term Disturbance".
[3] "Short-term Disturbance" under Alternative A are reduced below the Unconstrained scenario by 4.4 percent for resource, cultural, paleontological, forestry and woodland product, and recreation actions; 3.9 percent for livestock grazing actions; 4.7 percent for most ROW and renewable energy actions; and 3.3 percent for mineral materials actions.
[4] "Short-term Disturbance" under Alternative B are reduced below the Unconstrained scenario by 63.3 percent for resource actions; 80.4 percent for cultural, paleontological, forestry and woodland product, livestock grazing, and recreation actions; 80.6 percent for most ROW and renewable energy actions; and 62.0 percent for mineral materials actions.
[5] "Short-term Disturbance" under Alternative C are reduced below the Unconstrained scenario by 6.1 percent for resource actions; 27.8 percent for cultural, paleontological, forestry and woodland product, livestock grazing, and recreation actions; 24.8 percent for most ROW and renewable energy actions; and 4.5 percent for mineral materials actions.
[6] "Short-term Disturbance" under Alternative D are reduced below the Unconstrained scenario by 3.8 percent for resource, cultural, paleontological, forestry and woodland product, livestock grazing, and recreation actions; 4.0 percent for most ROW and renewable energy actions; and 1.6 percent for mineral materials actions.
[7] "Short-term Disturbance" under Alternative E are reduced below the Unconstrained scenario by 3.5 percent for resource, cultural, paleontological, forestry and woodland product, livestock grazing, and recreation actions; 3.5 percent for most ROW actions; 33.2 percent for renewable energy actions; and 2.1 percent for mineral materials actions.
[8]Assumes 35 percent of short-term disturbance would be reclaimed within 20 years based on a 10 to 13 year cycle from initial disturbance to final reclamation.
[9]Assumes 75 percent of short-term disturbance would be reclaimed within 20 years based on a 5-year cycle from initial disturbance to final reclamation.
[10]Assumes 5 mineral materials permits per year and a disturbance area of 5 acres per permit.
[11]Assumes 1 major railroad ROW.

ECONOMIC IMPACT ANALYSIS METHODOLOGY

INTRODUCTION

This appendix describes the methodology and data used to model the economic impacts of public land management decisions on communities surrounding federal lands. Input-output models, such as the Impact Analysis for Planning (IMPLAN) model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, can be found in the Economic Conditions section in Chapter 4. The first section of this appendix describes general aspects of the IMPLAN model and how it was used to estimate economic impacts. The remaining sections provide additional detailed data used in the analysis for livestock grazing, recreation, and oil and gas.

THE IMPLAN MODEL

IMPLAN is a widely accepted economic model commonly used for regional contribution and impact analysis. This model provides a mathematical representation of the local economy, which enables the flow of money, goods, and services to be tracked and reported in terms of regional jobs and income. IMPLAN models the way a dollar injected into one sector is spent and re-spent in other sectors of the local economy, creating a ripple-like effect. This ripple effect, also called the "multiplier effect," reflects changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

This analysis conducted for this RMP used IMPLAN 2012; prior to running the model, cost and price data were converted to a consistent dollar year (2021) using sector-specific adjustment factors from the IMPLAN model. The values in this appendix are expressed in year 2012 dollars so that the earnings and employment estimates can be easily compared to the latest (i.e., 2012) earnings and employment data available from the Bureau of Economic Analysis. The current IMPLAN model has 440 economic sectors, of which 178 are represented in the seventeen planning area counties. This analysis involved direct changes in economic activity for 54 IMPLAN economic sectors, as well as changes in all other related sectors due to the ripple effect. The IMPLAN production coefficients were modified to reflect the interaction of producing sectors in the study area. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the study area compared to a model using unadjusted national coefficients. For instance, worker productivity in oil and gas production is higher in Montana than the national average.

Key variables within the IMPLAN model use data specific to the region surrounding the Miles City Field Office in Montana, including employment estimates, labor earnings, and total industry output. Data on resource outputs from BLM (recreation visits, AUMs, mineral uses etc.) are also specific to BLM in the Miles City region. Because resource outputs from BLM are only available at the multi-county level the IMPLAN model is run at a regional (multi-county) scale, with the coefficients that describe linkages between sectors aggregated to the eight-county level. Because of this mathematical aggregation, impacts for individual counties and communities are not included.

Livestock Grazing

Economic impacts associated with livestock grazing on BLM administered lands within the planning area were estimated in accordance with protocols developed by Economists at the Bureau of Land Management and

Forest Service (U.S. Department of Interior 2012). Forage availability was measured in animal unit months (AUMs), with one AUM defined as the amount of forage needed to feed a cow calf pair or five sheep for one month. Average annual AUMs authorized within the Field Office were obtained from the BLM's Rangeland Administration System (BLM 2013). According to Rangeland Reports the MCFO supported 524,648 cattle AUMs and 21,860 sheep AUMs in 2012.

The direct employment associated with cattle and sheep grazing on BLM administered lands within the planning area was estimated in two steps. First, the number of hired farm laborers was taken from the Census of Agriculture for the beef cattle ranching and sheep and goat farming sectors. Second, unpaid and self-employed individuals are considered since the Census of Agriculture data does not include these individuals. The 2005-2009 American Community Survey includes information on the class of worker (e.g., self-employed, local government, unpaid family worker) by two-digit NAICS industry. In order to determine how public land forage contributed to industry employment (hired laborers, unpaid and self-employed individuals) the number of direct jobs per unit of forage was calculated. Data from the Census of Agriculture on total inventory of beef cows that calved, ewes one year or older, and all goats was used to calculate total forage requirements.[1] The ratio of employment to forage requirements was then used to calculate direct contributions from BLM administered forage across the MCFO, using data on authorized AUMs[2] in 2012. The indirect and induced contributions were then estimated using analysis-by-parts in IMPLAN.[3] Economic impacts associated with changes in range management under the alternatives were modeled in similar fashion.

Recreation

Visitation data collected from BLM's Recreation Management Information System RMiS suggests that BLM administered lands within the MCFO support more than 135,255 recreational visits annually, more than half of which are associated with wildlife related activities (BLM, RMIS 2011). On their way to the planning area, and once they arrive, these visitors spend money on goods and services such as gas, food, lodging, and souvenirs. In contrast to many other resource and land uses, outdoor recreation is not captured by any one industrial sector. Instead, spending associated with recreational visits to the MCFO stimulates economic activity in a wide range of economic sectors associated with accommodations and food service, arts and entertainment, passenger transportation, and retail trade (Marcouiller and Xia 2008).

Rather than measuring economic impacts, the analysis conducted for the revised MCFO RMP examined the economic significance of outdoor recreation on planning area lands to the local economy. While both impact and significance analysis measures the amount of economic activity in the local economy attributable to outdoor recreation within a defined area, impact analysis only includes spending by visitors who reside outside of the local region since their spending constitutes "new dollars" being injected into the local economy. A significance analysis however, includes the effects of spending by all visitors, both those who reside in the planning area and those who do not. Since much of the spending by local recreationists would likely be shifted to other sectors of the local economy, the results of this analysis do not reflect the loss to the local economy if recreation on the BLM administered lands across the MCFO were eliminated. Instead, the significance analysis shows the size and nature of economic activity associated with these recreational experiences to show how importance they are to the local economy.

Outdoor recreationists participating in activities on public lands have unique spending profiles. Analyses of expenditures reported by national forest visitors has shown that the primary factor determining the amount of money spent on a recreational visit to public lands was the type of trip taken rather than the specific activity they intended to participate while visiting (White, Goodding, and Stynes , 2013). Based on this assumption, estimates of visitation to BLM administered lands within the MCFO were segmented into local and non-local visits and then by trip type. Trip segments examined in the significance analysis included:

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[1] Total cattle annual Animal Unit Months (AUM) required = total inventory * 12; Total sheep annual AUMs required = (Sheep & lambs or Goats * 12)/5

[2] Authorized AUMs are those AUMs that are authorized under a term grazing permit or lease.

[3] Analysis-by-parts is a method of calculating the impacts of a particular activity by separating out the various spending activities of that activity and analyzing their specific impacts. This is done since production functions for IMPLAN sectors 11 and 14 for cattle ranching and other animal production, are not considered completely adequate for consideration of indirect and induced contributions.

Visitors who reside greater than 50 miles from BLM administered land within the planning area:

- Non-local residents on day trips
- Non-local residents staying overnight on BLM administered land
- Non-local residents staying overnight off BLM administered land

Visitors who live within 50 miles of BLM administered land within the planning area:

- Local residents on day trips
- Local residents staying overnight on BLM administered land
- Local residents staying overnight off BLM administered land

The analysis of recreation on BLM administered lands within the MCFO assumes that visitation in the planning area would be similar to that found nearby Dakota Prairie National Grasslands (DPNG), enabling analysts to utilize detailed National Visitor Use Monitoring (NVUM) data. Expenditures associated with these visits were estimated using national forest visitor spending profiles developed by the U.S. Forest Service from NVUM survey responses[4]. Using the DPNG as a proxy for the MCFO, local recreation-related spending associated with visits to the MCFO was estimated by applying NF spending profiles (Table 2) to field office visits by trip type (Table 1). The economic contributions of current recreational visits to BLM administered lands within the MCFO, and those anticipated under alternative management actions were modeled in IMPLAN to estimate the indirect and induced effects of recreation related spending under the alternatives on the local economy.

TABLE 1.
ANNUAL MCFO RECREATION VISITS BY TRIP SEGMENT

Annual Visits	Non-Local Segments			Local Segments			Total Annual Visits
	Day	Overnight on BLM	Overnight off BLM	Day	Overnight on BLM	Overnight off BLM	
Non-Wildlife Related	2,113	3,170	7,396	30,113	528	9,509	52,829
Wildlife Related	2,417	3,626	8,460	34,443	604	10,877	60,427
Share of Total Visits	**4%**	**6%**	**14%**	**57%**	**1%**	**18%**	113,256

Source: BLM, RMIS 2011; Percentages derived from White, Goodding, and Stynes, 2013

TABLE 2.
SPENDING PROFILES BY TRIP SEGMENTS FOR AVERAGE SPENDING FORESTS*

Spending Category	Non-Local Segments			Local Segments			Non-Primary‡
	Day	Overnight on NF	Overnight off NF	Day	Overnight on NF	Overnight off NF	
Lodging	0	64	183	0	31	55	136
Restaurant	16	28	119	5	7	36	95
Groceries	10	60	73	7	72	59	46
Gas and Oil	25	57	76	14	41	43	51
Other Transportation	1	2	4	0	0	1	3
Activities	4	9	29	2	4	6	18

[4] National average spending profiles are developed for seven trip type segments: day trips and overnight trips involving stays on and off the forest for local and non-local visitors, and visitors whose primary trip purpose was not recreation on the forest. Distinct spending profiles are also estimated for high and low spending areas and for selected recreation activity subgroups.

Spending Category	Non-Local Segments			Local Segments			Non-Primary‡
	Day	Overnight on NF	Overnight off NF	Day	Overnight on NF	Overnight off NF	
Admissions/Fees	5	10	19	2	4	7	12
Souvenirs/Other	7	21	46	5	15	21	34
Total	**67**	**249**	**550**	**35**	**173**	**228**	**397**

Source: White, Goodding, and Stynes 2013
*** Dollar figures are expressed in 2012 dollars and represent the spending of the entire group on BLM administered lands and within 50 miles of the boundary of BLM administered lands during the trip. Figures have been adjusted to 2012 dollars using the Bureau of Labor Statistics' CPI Inflation Calculator, available online: http://www.bls.gov/data/inflation_calculator.htm. The spending figures depicted in this table are one of three sets of national-level spending averages developed from the NVUM data. The shown spending averages are those determined to be most-applicable to the selected forest based on statistical analysis. For more information see "Estimation of National Forest Visitor Spending Averages from National Visitor Use Monitoring: Round 2" by E.M. White, D. B. Goodding, and D. J. Stynes (2013), available online: http://www.fs.fed.us/pnw/pubs/pnw_gtr883.pdf.**

Minerals

The economic impact analysis for mineral development reflects drilling, completion, and production activities. Future development scenarios of federally administered minerals within the Miles City Field Office were developed by BLM minerals specialists based on known mineral potential and commercial interest in developing these resources.

Since the BLM does not know exactly what areas will be targeted for development in the future, or how technological advances may affect future production costs or industry outputs, potential impacts of future oil and gas development under the alternatives were estimated from the Reasonable Foreseeable Development scenario developed by BLM minerals specialists see tables 3 and 4).

TABLE 3.
FEDERAL SOLID MINERALS RFD

	Annual Average					
	Existing	Alt A	Alt B	Alt C	Alt D	Alt E
Coal (short tons)	16,714,925	22,487,143	22,487,143	22,487,143	22,487,143	22,487,143
Bentonite (short tons)	337,838	337,838	337,838	337,838	337,838	337,838

TABLE 4.
FEDERAL FLUID MINERALS RFD

	Annual Average					
Wells	Existing	Alt A	Alt B	Alt C	Alt D	Alt E
New CBNG Wells- Producing	--	26.26	17.74	26.53	27.00	25.58
New Gas Wells - Producing	--	20.11	12.84	20.63	20.79	18.42
New Oil Wells - Producing	--	24.00	15.32	24.53	24.89	21.95
New Dry CBNG Wells	--	1.11	0.79	1.11	1.11	1.05
New Dry Gas Wells	--	5.37	3.37	5.42	5.58	4.84
New Dry Oil Wells	--	6.79	4.32	6.95	7.00	6.21
Gas Production (mcfs)	7,560,000	7,962,105	7,816,842	7,972,632	7,975,789	7,928,421
Oil Production (barrels)	5,595,000	5,955,000	5,824,737	5,962,895	5,968,421	5,924,211

The minerals analysis was based on forecasts of federal coal and bentonite production from BLM administered minerals within the planning area (Table 5) and average 2012 prices for Powder River Basin coal and domestic

bentonite (USGS, 2013). To quantify economic contributions of current federal solid mineral production, and those supported by anticipated production under the alternatives, the 2012 value of federal production was entered into IMPLAN as a change in final demand in the industrial sectors for coal and clay mining.

Since prices for fluid minerals are much more volatile than those for solids, economic contributions and impacts associated with federal oil and gas production were estimated based on the ratio of industry output to employment rather than as a change in final demand. This ratio was estimated based on total oil and gas production and industry employment. Data specific to the 17- county study was collected from DNRC: BOG and IMPLAN, and provided.

This ratio was then multiplied by the oil and gas output attributable to federals minerals administered by the MCFO to obtain the direct employment effect of BLM production in the planning area. The indirect and induced effects were then estimated from this direct effect using IMPLAN. Impacts associated with oil and gas development under the alternatives were estimated using the same two-step process where direct employment is calculated by maintaining the industry output to employment ratio and using IMPLAN to calculate the secondary effects (indirect and induced).

TABLE 5.
BASELINE CONTRIBUTIONS & IMPACTS

Baseline Data	
Total Value of 17-County Production	$ 2,276,386,550
Average Output per Worker	$ 1,732,805
Total Local Employment Contribution (jobs)	548
Direct Employment	315
Indirect & Induced Employment	233
Total Local Income Contribution	$ 30,911,763
Direct Income	$ 21,545,107
Indirect & Induced Income	$ 9,366,656

Source: IMPLAN Impact Analysis for Planning, 2012
*** Multipliers are used to measure economy-wide impacts of industry-specific economic changes. Estimated as the ratio of total to direct impacts, multipliers are a measure of the ripple effect created by new money**

Payments to Counties

Federal land management agencies administer a number of revenue-sharing programs to compensate states and counties for federal lands within their boundaries. These programs are complex and include stipulations affecting the formulas for the distribution of the payments, the recipients of the payments, and the timing, number, or specified uses of the payments. Since many of the programs and payments are crosscutting, numerous land management agencies work in partnership to collect and distribute revenue to counties entitled to compensation. While only a small portion of natural resource related payments are associated with BLM resources, these payments are critical to funding basic services such as law enforcement, education, fire protection and road maintenance in rural communities across the West.

Revenue-sharing programs administered by the Bureau of Land Management entitle local governments to a portion of receipts derived from the use, extraction, or sale of natural resources on BLM administered lands within their jurisdiction; as well as, payments in lieu of the property taxes (PILT) that would have been received if these federal lands were privately owned (Table 6). While PILT payments are calculated based on population size and the number of federal acres, revenue-sharing payments are determined by use levels and whether the

revenue was generated on acquired or public domain lands[5].

Federal revenues (Table 4-146) associated with livestock graving, mineral development, right-of-ways, timber, and recreation were estimated based on current permit and rental costs, and market values. The distribution of these payments back to State and local governments were then estimated in accordance with the regulations in Table 6 and based on the assumption that 75% of minerals and 65% of surface acres administered by the Miles City Field Office are public domain and 25% of minerals and 35% of surface lands were LU acquired lands.

While payments associated with BLM resources only account for a portion of natural resource related revenue distributed to counties across MCFO, local rural communities rely heavily on these payments to cover basic operating costs and to fund basic community services. The economic contributions of payments to counties from BLM natural resources were analyzed through the salary and non-salary expenditures funded by these payments. Using institutional and household spending profiles developed by the US Forest Service, general local government, education, road, and household spending associated with natural resource revenues were modeled in IMPLAN. To assess how management actions under the alternatives may affect future payments to counties, changes in federal, state, and county revenue from BLM administered land and resource uses were estimated and anticipated levels of local government, education, construction, and household spending associated with these payments were modeled in IMPLAN.

TABLE 6.
DISTRIBUTION OF NATURAL RESOURCE RELATED PAYMENTS TO STATE/COUNTIES

Type of Payment	Public Domain Lands	Acquired (LU) Lands	Reclamation Lands
Taylor Grazing Act of 1934 (43 U.S.C. 315)	50% of grazing fees from section 3 (inside grazing districts) and 12.5% of grazing fees from section 15 (outside grazing district) are distributed to the State. 100% of these funds area reallocated back to the counties where 50% goes to the general fund and 50% goes to schools		
Bankhead Jones Farm Tenant Act of 1937 (7 U.S.C. 1012)		25% of gross revenue from land uses (i.e. grazing, recreation, minerals, timber, and right-of-ways) are paid to the state who distributes 100% back to counties of production for schools, roads, or both.	
Mineral Leasing Act of 1920 (30 U.S.C. 181)	49% of gross revenue is distributed to the State. These funds are redistributed back to counties of production and put towards the general fund and schools		

[5] **There are two types of land under federal ownership: public domain and acquired. Public domain lands are those that have always been in federal ownership, while acquired lands (LU) are lands in federal ownership but were obtained from private owners.**

Type of Payment	**Public Domain Lands**	**Acquired (LU) Lands**	**Reclamation Lands**
Proceed of Sales Payments (31 U.S.C. 487)			4% of gross revenues from the sale of lands and materials is distributed to the State
PILT	Annual PILT payments are estimated in two ways based on 1) eligible federal acres in the county, 2) federal revenue sharing prior fiscal year, and 3) the population of the county to the extent that it provides a limit for the payment. The county then receives the larger of the two calculated amounts as PILT which is put towards the general fund.		

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FISH, AQUATIC AND WILDLIFE HABITAT INCLUDING SPECIAL STATUS SPECIES APPENDIX

FISH, AQUATIC, AND WILDLIFE HABITAT, INCLUDING SPECIAL STATUS SPECIES APPENDIX

INTRODUCTION

This appendix contains in-depth information and specific conservation plans, actions, and guidelines to guide wildlife management in the resource management plan (RMP) planning area, including:

- A complete list of aquatic species occurring in the planning area is included in this appendix.
- A list of Bureau of Land Management (BLM) designated Special Status Species (SSS) potentially occurring in the planning area.
- Guidance for terrestrial wildlife in this appendix includes the following.
    - Bighorn sheep management, which includes information for specialized design features to minimize or prevent contact between bighorn sheep and domestic sheep or goats.
    - Sage-grouse management, which includes the Western Association of Fish and Wildlife Agencies (WAFWA) sage-grouse guidelines and guidance for monitoring of sage-grouse and sagebrush habitat.
    - Migratory bird conservation guidelines, which include guidance and conservation strategies under applicable plans.
    - BLM SSS list for the planning area.
    - Special status wildlife species information, which includes a list of relevant plans and detailed information regarding consultation with the United States Fish and Wildlife Service (USFWS).
    - Survey and monitoring protocols for entities seeking to conduct surface disturbing or disruptive activities on BLM lands and those lands underlain with federal mineral estate.

AQUATIC WILDLIFE

AMPHIBIANS

The planning area supports six species of amphibians in the planning area (and possibly the nonnative American bullfrog) (Table 1).

TABLE 1.
NATIVE AND NONNATIVE AMPHIBIAN SPECIES OCCURRING IN THE PLANNING AREA

Native		Nonnative	
Boreal chorus frog	*Pseudacris maculata*	American bullfrog[1]	*Rana catesbeiana*
Great plains toad	*Bufo cognatus*		
Northern leopard frog	*Rana pipiens*		
Plains spadefoot	*Spea bombifrons*		
Tiger salamander	*Ambystomia tigrinum*		
Woodhouse's toad	*Bufo woodhousii*		

[1]Although the American bullfrog has not been officially documented in the planning area, it is likely present in low abundance.

REPTILES

The planning area supports 14 species of reptiles in the planning area (Table 2).

TABLE 2.
NATIVE AND NONNATIVE REPTILE SPECIES OCCURRING IN THE PLANNING AREA

Native		Nonnative
Common gartersnake	*Thamnophis radix*	There are no known introduced reptiles in the planning area.
Common sagebrush lizard	*Sceloporus gracious*	
Eastern racer	*Coluber constrictor*	
Greater short-horned lizard	*Phrynosoma hernandesi*	
Gophersnake	*Pituophis catenifer*	
Milksnake	*Lampropeltis triangulum*	
Painted turtle	*Chrysemys picta*	
Plains gartersnake	*Thamnophis radix*	
Western rattlesnake	*Crotalus viridis*	
Smooth greensnake	*Opheodrys vernalis*	
Snapping turtle	*Chelydra serpentine*	
Spiny softshell turtle	*Apalone spinifera*	
Terrestrial gartersnake	*Thamnophis elegans*	
Western hog-nosed snake	*Heterdon nasicus*	

FISH

The planning area supports 63 species of fish, including 35 native and 28 nonnative (introduced) species (Holton and Johnson 2003; MFWP 2010b) (Table 3).

TABLE 3.
NATIVE AND NONNATIVE FISH SPECIES OCCURRING IN THE PLANNING AREA

Native	**Nonnative**
Bigmouth buffalo *(Ictiobus cyprinellus)*	Black bullhead *(Ameiurus melas)*
Blue sucker *(Cycleptus elongatus)*[3]	Black crappie *(Pomoxis nigromaculatus)*
Brassy minnow *(Hybognathus hankinsoni)*	Bluegill *(Lepomis macrochirus)*
Brook stickleback *(Culaea inconstans)*	Brook trout *(Salvelinus fontinalis)*
Burbot *(Lota lota)*	Brown trout *(Salmo trutta)*
Channel catfish *(Ictalurus punctatus)*	Chinook salmon *(Oncorhynchus tshawytscha)*
Creek chub *(Semotilus atromaculatus)*	Cisco *(Coregonus artedi)*
Emerald shiner *(Notropis atherinoides)*	Common carp *(Cyprinus carpio)*
Fathead minnow *(Pimephales promelas)*	Golden shiner *(Notemigonus crysoleucas)*
Flathead chub *(Hybopsis gracilis)*	Green sunfish *(Lepomis cyanellus)*
Freshwater drum *(Aplodinotus grunniens)*	Goldfish *(Carassius auratus)*
Goldeye *(Hiodon alosoides)*	Kokanee salmon *(Oncorhynchus nerka)*
Iowa darter *(Etheostoma exile)*	Lake trout *(Salvelinus namaycush)*
Lake chub *(Couesius plumbeus)*	Largemouth bass *(Micropterus salmoides)*
Longnose dace *(Rhinichthys cataractae)*	Northern pike *(Esox lucius)*
Longnose sucker *(Catostomus catostomus)*	Plains killifish *(Fundulus kansae)*
Northern redbelly dace (*Phoxinus eos)*	Pumpkinseed *(Lepomis gibbosus)*
Northern red-belly x finescale dace hybrid *(Phoxinus eos x phoxinus eogaeus)*[3]	Rainbow smelt *(Osmerus mordax)*
Paddlefish *(Polyodon spathula)*[3]	Rainbow trout *(Oncorhynchus mykiss)*

Native	**Nonnative**
Pallid sturgeon *(Scaphirhynchus albus)*[1]	Rock bass *(Ambloplites rupestris)*
Pearl dace *(Margariscus margarita)*[3]	Smallmouth bass *(Micropterus dolomieu)*
Plains minnow *(Hybognathus placitus)*	Spottail shiner *(Notropis hudsonius)*
River carpsucker *(Carpiodes carpio)*	Walleye (*Sander vitreus)*
Sand shiner (*Notropis stramineus)*	Western mosquitofish *(Gambusia affinis)*
Sauger *(Stizostedion canadense)*[3]	White bass *(Morone chrysops)*
Shorthead redhorse *(Moxostoma macrolepidotum)*	White crappie *(Pomoxis annularis)*
Shortnose gar *(Lepisosteus platostomus)*[1]	Yellow bullhead *(Ameiurus natalis)*
Shovelnose sturgeon *(Scaphirhynchus platorynchus)*	Yellow perch *(Perca flavescens)*
Sicklefin chub *(Macrohybopsis meeki)*[1]	
Smallmouth buffalo *(Ictiobus bubalus)*	
Stonecat *(Noturus flavus)*	
Sturgeon chub *(Macrohybopsis gelida)*[3]	
Western silvery minnow *(Hybognathus argyritis)*	
White sucker *(Catostomus commersoni)*	

[1]Montana Fish, Wildlife, and Parks (MFWP) species of special concern
[2E]ndangered species and BLM SSS
[3] MFWP species of special concern and BLM sensitive species

TERRESTRIAL WILDLIFE

SPECIAL STATUS SPECIES

Special status species (SSS), collectively, are USFWS federally listed or proposed species, and the BLM sensitive species from the 2009 Montana/Dakota's sensitive species list. The Montana/Dakotas sensitive species list is revised periodically. BLM sensitive species also include both federal candidate species and delisted species within 5 years of delisting. Table 4 includes a list of species, BLM and USFWS status and whether the planning area is within the current range of the species.

TABLE 4.
SPECIAL STATUS SPECIES

Species	USFWS Status	BLM Status	Known to occur in Planning Area
Mammals			
Gray Wolf*	None	Sensitive	Yes
Grizzly Bear**	Threatened	SSS	No
Black-footed ferret (BFF)	Endangered	SSS	No
Black-tailed prairie dog	None	Sensitive	Yes
Swift fox	None	Sensitive	Yes
Fisher	None	Sensitive	No
Great Basin Pocket Mouse	None	Sensitive	No
North American Wolverine	None	Sensitive	No
Pygmy rabbit	None	Sensitive	No
Fringed Myotis	None	Sensitive	Yes
Pallid bat	None	Sensitive	Yes
Northern Myotis	None	Sensitive	Yes
Townsend's big-eared bat	None	Sensitive	Yes
White-tailed prairie dog	None	Sensitive	No
Birds			

Species	USFWS Status	BLM Status	Known to occur in Planning Area
Franklin's gull	None	Sensitive	Yes
Interior least tern	Endangered	SSS	Yes
Black tern	None	Sensitive	Yes
White-faced ibis	None	Sensitive	Yes
Whooping crane	Endangered	SSS	Yes
Yellow rail	None	Sensitive	Yes
Piping plover	Threatened, with critical habitat	SSS	Yes
Mountain plover	None	Sensitive	Yes
Long-billed curlew	BCC	Sensitive	Yes
Greater sage-grouse	Candidate	Sensitive	Yes
Burrowing owl	BCC	Sensitive	Yes
Great gray owl	None	Sensitive	No
Trumpeter swan	None	Sensitive	No
Flammulated owl	None	Sensitive	No
Bald eagle	BCC	Sensitive	Yes
Golden eagle	None	Sensitive	Yes
Ferruginous hawk	None	Sensitive	Yes
Peregrine falcon	None	Sensitive	Yes
Sage thrasher	BCC	Sensitive	Yes
Sprague's pipit	Candidate	Sensitive	Yes
Loggerhead shrike	BCC	Sensitive	Yes
Chestnut-collared longspur	BCC	Sensitive	Yes
McCown's longspur	BCC	Sensitive	Yes
Baird's sparrow	BCC	Sensitive	Yes
Brewer's sparrow	BCC	Sensitive	Yes
American bittern	BCC	None	Yes
Yellow-billed Cuckoo	BCC	Sensitive	Yes
Lewis's woodpecker	BCC	None	No
Red-headed woodpecker	BCC	Sensitive	Yes
Black-backed woodpecker	None	Sensitive	Yes
Sage sparrow	BCC	Sensitive	Yes
Blue-gray natcatcher	None	Sensitive	No
Amphibians			
Great Plains toad	None	Sensitive	Yes
Northern leopard frog	None	Sensitive	Yes
Plains spadefoot toad	None	Sensitive	Yes
Boreal/Western Toad	None	Sensitive	No
Fish			
Pallid Sturgeon	Endangered	SSS	Yes
Northern Redbelly Dace***	None	None	Yes
Northern Redbelly X Finescale Dace	None	Sensitive	Yes
Paddlefish	None	Sensitive	Yes
Pearl Dace	None	Sensitive	Yes
Sauger	None	Sensitive	Yes
Iowa Darter***	None	None	Yes
Sicklefin Chub***	None	None	Yes
Sturgeon Chub	None	Sensitive	Yes

Species	USFWS Status	BLM Status	Known to occur in Planning Area
Reptiles			
Snapping turtle	None	Sensitive	Yes
Spiny softshell	None	Sensitive	Yes
Greater short-horned lizard	None	Sensitive	Yes
Milk snake	None	Sensitive	Yes
Western hog-nosed snake	None	Sensitive	Yes

Sources: Montana Bird Distribution Committee 2012; Werner, Maxell, Hendricks, and Flath. 2004; Foresman 2001; MTNHP, 2010; BLM, 2009; USDA – NRCS Plants Database, 2010
***Gray wolf has been delisted so has been moved to the sensitive list**
****Grizzly bear has been delisted for the Greater Yellowstone ecosystem. In that area it is a Bureau sensitive species.**
***** Iowa darter, northern redbelly dace, and sicklefin chub are listed as species of concern by MFWP.**

BIGHORN SHEEP

The following guidelines are design features to reduce contact between bighorn sheep and domestic sheep and goats:

- Provide instructions addressing management, retrieval, and disposition of any stray domestic sheep and goats used for invasive weed control left on public lands;
- use of herders, dogs, or other guarding animals trained to repel animals foreign to domestic sheep bands or goat flocks;
- confinement of domestic sheep and goats at night to minimize strays and the use of adequate fencing configurations designed to achieve the most effective separation possible; and
- evaluation of timing of permitted domestic sheep and goat trailing or grazing activities to reduce disease transmission risk.

MIGRATORY BIRD CONSERVATION

The Miles City Field Office (MCFO) will use the following to implement migratory bird conservation in the planning area. Management actions should focus on providing a variety of habitat characteristics that support successful breeding by migratory birds. This generally requires providing properly functioning habitats with the appropriate vegetation diversity, density, and structure based on site potential to support nesting, security and foraging. Vegetation modification actions that reduce the capability of habitats to support these needs, such as prescribed fire, timber harvest, and livestock grazing, need to be evaluated for potential adverse impacts, particularly if they occur during the spring or early summer. The timing and intensity of these actions, as well as the type of habitat and bird species present, may substantially influence the level of impact to migratory birds. Such impacts have been considered to represent “take” per USFWS regulations and have management implications.

BLM MIGRATORY BIRD CONSERVATION STRATEGY

Non-game migratory birds are the primary concern under migratory bird conservation. Whereas waterfowl and migratory game birds are cooperatively managed by individual states and the USFWS, there has been less emphasis on developing and implementing management strategies to protect populations and habitat for other migratory birds, particularly neotropical migrants. Neotropical migrants are species of songbirds, shorebirds, and raptors that typically breed in North America but winter in Latin or South America. Because of these long-range migrations, it is important that quality habitats are present in their breeding habitat and adequately distributed along their migration routes to successfully reach their breeding, nesting and wintering grounds. It is also essential to provide sufficient quantities of suitable breeding habitat to maintain viable populations.

The BLM's *Nongame Migratory Bird Habitat Conservation Plan* (McClure et al. 1992) provides the foundation for proactive habitat management on behalf of non-game birds that migrate to the tropics or use neotropical habitats. The overall intent is to reverse the decline in some bird populations and to implement this proactive program for other migratory species. The plan addresses goals for inventory and monitoring, habitat management, research and studies, training, education, outreach and communication, domestic partnerships, and international partnerships. Habitat management goals, management opportunities, and recommended strategies from the plan include those described below.

MILES CITY FIELD OFFICE MIGRATORY BIRD TREATY ACT GUIDELINES

The following guidance is for those entities intending to conduct surface disturbing or disruptive activities on BLM administered lands.

The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures;

a) **avoidance by timing**; ground disturbing activities will not occur from April 15 to July 15,
b) **habitat manipulation**; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the area scheduled for activities between April 15 and July 15 of that year to deter nesting,) or

c) **survey-buffer-monitor**; surveys will be conducted by an operator funded, BLM approved biologist within the area of the proposed action and a 300 foot buffer from the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the BLM-MCFO.

OTHER CONSERVATION PLAN OBJECTIVES

The North American Wetland Conservation Act (16 United States Code [U.S.C.] 4401 et seq.) provides the primary funding source for joint venture projects that can now be implemented for all bird species and their habitats, based on national priorities. The objectives for all of these plans are similar:

1. determine population status and trends and identify their habitats on the public lands,
2. restore, maintain, and enhance populations through habitat management,
3. conduct research and studies to obtain knowledge needed for informed decision making for on-the-ground management of the importance of birds and their value to our natural heritage,
4. develop a broad awareness and understanding of the importance of birds and their value to our natural heritage,
5. build on existing relationships and create new partnerships to foster conservation programs, and
6. establish international relationships to enhance hemispheric conservation programs for migratory species.

<u>PRIORITY SPECIES OF CONCERN</u>

Many of the high priority bird species identified in bird conservation plans are not currently included on BLM SSS lists. It is the intent of the BLM to work with the bird conservation initiatives and the Partners in Flight prioritization process to identify where SSS recognition is warranted (see BLM Manual Supplement 6840, *Special Status Species Management*). BLM sensitive species lists are reviewed periodically at the state level and should ensure coordination with USFWS and Partners in Flight priority bird lists (USFWS 2008).

The USFWS provides a list of Birds of Conservation Concern for specific geographic areas (USFWS 2008). The MCFO is included in the Northern Rockies Bird Conservation Region (also known as BCR10), which recognizes the following priority species (USFWS 2008):

- Swainson's hawk,
- golden eagle,
- peregrine falcon,
- American golden-plover,
- mountain plover,
- upland sandpiper,
- yellow-billed cuckoo,
- black swift,
- Lewis' woodpecker,
- red-naped sapsucker,
- loggerhead shrike,
- Virginia's warbler,
- McCown's longspur,
- ferruginous hawk,
- prairie falcon,
- Brewer's sparrow,
- snowy plover,
- solitary sandpiper,
- whimbrel,
- long-billed curlew,
- sanderling,
- Wilson's phalarope,
- marbled godwit,
- flammulated owl,
- Williamson's sapsucker,
- white-headed woodpecker,
- pygmy nuthatch, and
- yellow rail.

Partners in Flight lists are developed nationally, regionally, and by individual states through specific plans. The *Montana Bird Conservation Plan* identifies numerous priority species for grassland, shrubland, forest, riparian and wetland habitats with reasons for concern, management issues and recommendations, and population and habitat objectives (Montana Partners in Flight 2000). The following are considered Priority 1 species in the plan:

- common loon,
- trumpeter swan,
- piping plover,
- mountain plover,
- flammulated owl,
- black-backed woodpecker,
- brown creeper,
- Sprague's pipit,
- Baird's sparrow,
- olive-sided flycatcher,
- burrowing owl,
- harlequin duck
- sage-grouse, and
- interior least tern.

SPECIAL STATUS WILDLIFE SPECIES

Table 5 lists plans and regulations for SSS management in the planning area.

TABLE 5.
RELEVANT PLANS AND REGULATIONS FOR SPECIAL STATUS SPECIES IN THE PLANNING AREA

Document Title	Year	Relevance
BLM Documents		
BLM National Greater Sage-grouse Land Use Planning Strategy, IM No. 2012-044	2011	Provides land-use plan direction for sage-grouse conservation and consideration of measures identified in the BLM's 2011 *A Report on National Greater Sage-grouse Conservation Measures* in accordance with the 2011 *National Greater Sage-grouse Land Use Planning Strategy*.
WAFWA Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats (Connelly et al. 2004)	2004	Establishes a comprehensive approach to management of sage-grouse habitat on public lands.
Miles City District Black-tailed Prairie Dog Management Plan	1986	Provides guidelines on prairie dog control or management activities.
BLM Manual 6840	2008	Provides guidelines for the management of SSS.
BLM Use Planning Handbook H-1601	2005	This manual provides guidance for the BLM to manage species of special concern in a manner that will not cause these species to become threatened or endangered.
*Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana, North Dakota, and South Dakot*a	1997	Guideline 13 states that grazing management practices should maintain or improve habitat for federal listed threatened, endangered, and special status plants and animals.
Other Federal and Tribal Regulations and Plans		
Endangered Species Act	1973	Provides guidelines in the protection of federally listed species (16 U.S.C. 1531 et seq.).
Bald and Golden Eagle Protection Act	1940/1962	Provides guidelines for the protection of bald eagles (16 U.S.C. 668–668d).
Migratory Bird Treaty Act	1918/1972	Prohibits the take, capture, or kill any migratory bird, any part, nest, or eggs of any such bird (16 U.S.C. 703(a)), this includes all special status avian species (16 U.S.C. 703–712).
Multi-State Conservation Plan for the Black-tailed Prairie Dog in the United States	2002	Guidelines to develop management plans for individual states and their respective working groups. The plan for state of Montana has been developed.
Black-footed Ferret Recovery Plan	1988	Outlines steps for recovery of the BFF throughout its historic range, including Montana. Includes captive rearing with establishment of at least ten populations in the wild.
Conservation Assessment and Conservation Strategy for Swift Fox in the United States	1997	Provides objectives, strategies, and activities designed to achieve the goal of maintaining and restoring swift fox populations in ten states, including Montana.

Document Title	Year	Relevance
Recovery Plan for the Interior Population of the Least Tern	1990	Provides recovery objectives, and the actions needed to achieve those objectives, for the interior least tern population.
Draft International Recovery Plan for the Whooping Crane	2005	Plan provides a recovery strategy to achieve the goal of establishing multiple self-sustaining whooping crane populations in North America.
Revised Recovery Plan for Piping Plovers	1994	Provides piping plover recovery objectives, and the actions needed to achieve those objectives, in the Northern Great Plains and Great Lakes.
State Plans		
Conservation Plan for Black-Tailed and White-Tailed Prairie Dogs in Montana	2002	Plan establishes workgroups to identify opportunities to manage prairie dogs so that the distribution and abundance objectives from the state plan are met. Workgroups are to identify specific prairie dog complexes and priority areas for maintaining and enhancing their numbers.
Montana Bald Eagle Management Plan and the Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan	1994/2010	Provides specific direction to use nest site management zones to eliminate potential threats to nesting bald eagles.
Management Plan and Conservation Strategies for Sage-grouse in Montana-Final	2004	Plan establishes a process to achieve sage-grouse management objectives and provide framework to guide local management efforts. Overall goal of the plan is to provide for the long-term conservation and enhancement of the sagebrush steppe/mixed-grass prairie complex within Montana in a manner that supports sage-grouse, other wildlife, and human uses.
Montana's Comprehensive Fish and Wildlife Conservation Strategy-Draft	2005	Provides priorities for management to preserve wildlife and habitat for those species in greatest need.
Montana Interior Least Tern Management Plan	2006	Recommends specific management and research activities believed necessary to sustain the population and aid long-term recovery efforts.
Montana Piping Plover Management Plan	2006	Provides recommendations as a multifaceted approach to managing piping plover breeding habitat and increasing levels of productivity.

The following Wildlife Survey Protocols were developed for entities wishing or directed to conduct wildlife surveys in advance of BLM authorized surface disturbing or disruptive activities. These protocols shall be adhered to in order for BLM to address current resources and accurately assess impacts of these proposed activities through the appropriate NEPA document.

TABLE 6.
MILES CITY FIELD OFFICE WILDLIFE SURVEY PROTOCOL

SPECIES	PROTECTED ACTIVITY	HABITAT	SURVEY DISTANCE FROM ACTIVITY*	SURVEY DATES
Bald Eagle	Winter Roosts	Stands of mature trees within or adjacent to riverine or perennial riparian systems	1.0 mile	Dec. 1 – Feb. 28
All raptor and owl species, excluding burrowing owls	Nesting	Nesting Substrates: mature trees, outcrops, cliffs, stream banks, ridges, knolls, trees, etc.	1.0 mile	April 15 – June 15
Black-tailed prairie dog	Prairie dog colonies	Prairie habitats	0.5 miles	Year-round
Mountain Plover	Nesting	Flat, shortgrass prairie, low/sparse veg., alkali flats, prairie dog towns	0.25 miles	May 1 – June 15
Burrowing owl	Nesting	Prairie dog/other burrows (active or inactive)	Prairie dog towns and burrows within 0.5 miles	June - August
BFF	To be Determined (TBD) in coordination w/United States Fish and Wildlife Service (USFWS)	Prairie dog colonies/complexes	Colonies ≥80 acres within project area; or all complexes (2 or more colonies within 1.5 km of each other, with at least a portion of 1 colony within project area) totaling ≥80 acres	See USFWS BFF Surveys guidelines (1989)
Greater Sage Grouse	Strutting Grounds (leks)	Openings within sagebrush	2.0 miles	April 1 – May 7
Greater Sage Grouse	Winter habitat	Sagebrush Grasslands	2.0 miles	Dec. 1 – Feb. 28
Plains Sharp-tailed Grouse	Dancing Grounds (leks)	Ridges, high points, knobs, or other flat areas within grasslands habitat	2.0 miles	April 1 – May 7
Wading Birds	Rookeries	Mature trees within riparian corridors, or ground nesting on islands	1.0 mile	April 15 – Aug. 31
All Other Migratory Birds**	Nesting	All	Project area plus 300 foot buffer.	April 15 – July 15 (if project activities occur within this timeframe)
Other Threatened, Endangered, Sensitive Species; and /or other general wildlife species inventory/monitoring	TBD, as necessary in coordination with USFWS and MFWP			

***For linear projects such as pipelines and other major Rights-Of-Ways (ROWs), each side is to be surveyed out to the identified distance in the column.**
****Actions affecting all other migratory birds (ex. ground nesting songbirds) may defer to any agreement in place between project proponent and USFWS.**

See "Wildlife Survey Protocol for Coal Bed Natural Gas Development, Powder River Basin Wildlife Taskforce" (BLM 2005h) for survey specifics, forms, and reporting requirements. For any discrepancies in survey dates and distances, use the table above.

<The following was sent to the USFWS Field Supervisor, Helena, MT, on March 17, 2011.>

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Miles City Field Office
111 Garryowen Road
Miles City, Montana 59301-0940
http://www.mt.blm.gov/mcfo/

Memorandum

To: Field Supervisor, U.S. Fish and Wildlife Service, Montana Ecological Services Field Office, Helena, Montana

From: Deborah K. Johnson, Field Manager

Subject: Preparation of Resource Management Plan for the Miles City Field Office Planning Area

The Bureau of Land Management (BLM) Miles City Field Office (MCFO) is preparing a new resource management plan (RMP) for the MCFO planning area. The new RMP would replace the existing Big Dry RMP and the Powder River RMP. The new Miles City Field Office RMP would guide management actions for the BLM on federal surface and federal mineral estate within the MCFO planning area.

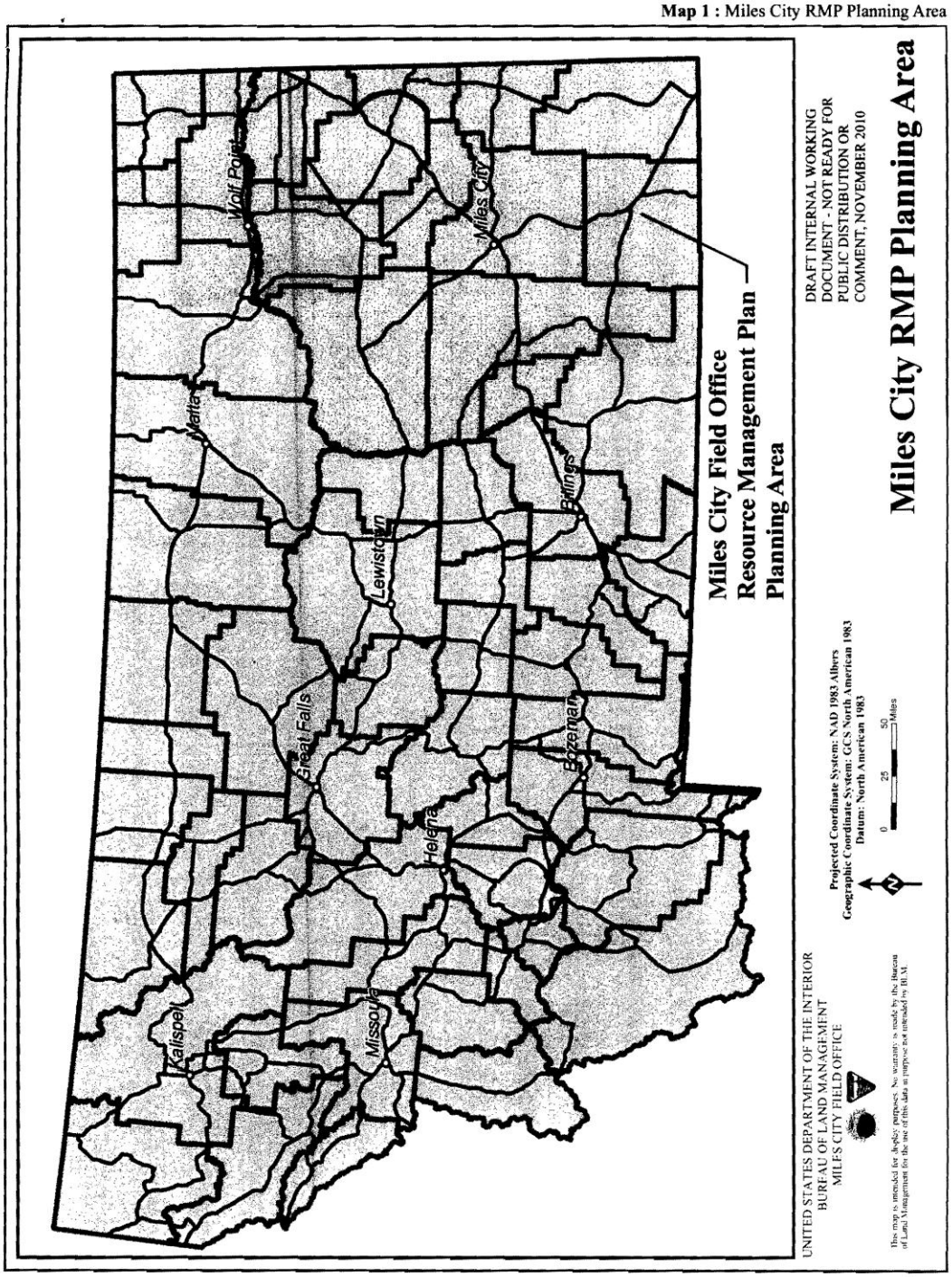
The MCFO staff is preparing a draft environmental impact statement (EIS) in compliance with the National Environmental Policy Act of 1969 and the Federal Land Policy and Management Act of 1976. The EIS will address effects of the new RMP on public lands and mineral estate within the MCFO planning area. The EIS will also evaluate potential effects of management actions approved through the new RMP on federally listed species listed and critical habitat.

Therefore, we request that the U.S. Fish and Wildlife Service specify what federally listed, proposed, or candidate species, as well as **c**ritical habitat or proposed critical habitat, may be in or immediately adjacent to the MCFO planning area (see attached map). The planning area includes the following counties: Carter, Powder River, Fallon, Custer, Rosebud, Wibaux, Prairie, Garfield, McCone, Dawson Richland, Roosevelt, Sheridan, Daniels, Treasure, and the eastern one-third of Valley County, and the southeast corner of Bighorn County.

If you have any questions on this request or require additional information, please contact Kent Undlin, Wildlife Biologist, at 406-233-2845.

Attachment: MCFO planning area map

Map 1 : Miles City RMP Planning Area



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<End of letter.>

<Letter from the United States Fish and Wildlife Service>

United States Department of the Interior

FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
MONTANA FIELD OFFICE
585 SHEPARD WAY
HELENA, MONTANA 59601
PHONE (406) 449-5225, FAX (406) 449-5339

M.02 BLM (MCFO) June 27, 2011

Memorandum

To: Deborah K. Johnson, Field Manager, Bureau of Land Management, Miles City Field Office

From: R. Mark Wilson, Field Supervisor, Montana Ecological Services Field Office, Helena, Montana

Subject: Preparation of Resource Management Plan for the Miles City Field Office Planning Area

This is in response to your request for information from the U.S. Fish and Wildlife Service (Service) regarding federally listed and proposed threatened and endangered species, candidate species, and critical habitat that may occur in the vicinity of the Miles City Field Office (MCFO) planning area. The planning area includes Carter, Powder River, Fallon, Custer, Rosebud, Wibaux, Prairie, Garfield, McCone, Dawson, Richland, Roosevelt, Sheridan, Daniels, and Treasure counties, as well as the eastern one third of Valley County and the southeast corner of Big Horn County.

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed species may be present in the MCFO planning area counties:

County/Scientific Name	Common Name	Status
CARTER		
Mustela nigripes	Black-footed Ferret	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
POWDER RIVER		
Mustela nigripes	Black-footed Ferret	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
FALLON		
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C

County/Scientific Name	Common Name	Status
CUSTER		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Mustela nigripes	Black-footed Ferret	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
ROSEBUD		
Mustela nigripes	Black-footed Ferret	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
WIBAUX		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
PRAIRIE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Mustela nigripes	Black-footed Ferret	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
GARFIELD		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Mustela nigripes	Black-footed Ferret	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
McCONE		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Mustela nigripes	Black-footed Ferret	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
DAWSON		
Scaphirhynchus albus	Pallid Sturgeon	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C

County/Scientific Name	Common Name	Status
Anthus spragueii	Sprague's Pipit	C
RICHLAND		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
ROOSEVELT		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Anthus spragueii	Sprague's Pipit	C
SHERIDAN		
Charadrius melodus	Piping Plover	LT, CH
Grus americana	Whooping Crane	LE
Anthus spragueii	Sprague's Pipit	C
DANIELS		
Grus americana	Whooping Crane	LE
Anthus spragueii	Sprague's Pipit	C
TREASURE		
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
VALLEY		
Scaphirhynchus albus	Pallid Sturgeon	LE
Charadrius melodus	Piping Plover	LT, CH
Mustela nigripes	Black-footed Ferret	LE
Sterna antillarum athalassos	Interior Least Tern	LE
Grus americana	Whooping Crane	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C
BIG HORN		
Mustela nigripes	Black-footed Ferret	LE
Centrocercus urophasianus	Greater Sage-Grouse	C
Anthus spragueii	Sprague's Pipit	C

* LT = Listed Threatened; LE = Listed Endangered; CH = Critical Habitat; C = Candidate

Section 7(c) of the Act requires federal agencies that authorize, fund or carry out major construction activities complete a biological assessment to determine the effects of the proposed actions on listed and proposed species. A major construction activity is defined as "a construction project (or other undertaking having similar physical impacts) which is a major federal action significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act" (50 CFR Part 402). If a biological assessment is not required (i.e., all other actions), the federal agency is still required to review their proposed

activities to determine whether listed species may be affected. If such a determination is made, formal consultation with the Service is required.
For those actions wherein a biological assessment is required, the assessment should be completed within 180 days of initiation. This time frame can be extended by mutual agreement between the federal agency or its designated non-federal representative and the Service. If an assessment is not initiated within 90 days, this list of threatened and endangered species should be verified with the Service prior to initiation of the assessment. The biological assessment may be undertaken as part of the federal agency's compliance of section 102 of the NEPA and incorporated into the NEPA documents. We recommend that biological assessments include the following:

1. A description of the project.
2. A description of the specific area that may be affected by the action.
3. The current status, habitat use, and behavior of T/E species in the project area.
4. Discussion of the methods used to determine the information in Item 3.
5. An affects analysis of the action for listed species and proposed species and their habitats, including an analysis of any cumulative effects.
6. Coordination/mitigation measures that will reduce/eliminate adverse impacts to T/E species.
7. The expected status of T/E species in the future (short and long term) during and after project completion.
8. A determination of "May affect, likely to adversely affect" or "May affect, not likely to adversely affect" for listed species.
9. A determination of "is likely to jeopardize" or "is not likely to jeopardize" for proposed species.
10. Citation of literature and personal contacts used in developing the assessment.

If it is determined a proposed program or project "is likely to adversely affect" any listed species, formal consultation should be initiated with this office. If it is concluded the project "is not likely to adversely affect" listed species, the Service should be asked to review the assessment and concur with the determination of no adverse effect.

A federal agency may designate a non-federal representative to conduct informal consultation or prepare biological assessments. However, the ultimate responsibility for section 7 compliance remains with the federal agency and written notice should be provided to the Service upon such a designation. We recommend federal agencies provide their non-federal representatives with proper guidance and oversight during preparation of biological assessments and evaluation of potential impacts to listed species.

Section 7(d) of the Act requires that the federal agency and permit/license applicant shall not make any irreversible or irretrievable commitment of resources which would preclude the formulation of reasonable and prudent alternatives until consultation on listed species is completed.

The Service appreciates your efforts to incorporate fish and wildlife resource concerns, including threatened and endangered species, into your project planning. If you have questions or comments related to this issue, please contact Jeff Berglund at 406-449-5225 extension 206.

United States Department of the Interior
Fish and Wildlife Service
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Montana Field Office
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Helena, Montana 59601-6287
Phone: (406) 449-5225 Fax: (406) 449-5339

File: M02 BLM March 30, 2015

Memorandum

To: Jamie Connell, State Director, Bureau of Land Management, Montana/Dakotas State Office, Billings, Montana

From: *for* Jodi L. Bush, Field Supervisor, U.S. Fish and Wildlife Service, Montana Field Office, Helena, Montana

Subject: Updated List of Endangered, Threatened, Proposed, and Candidate Species

This is in response to your office's March 19, 2015 email request for updated information from the U.S. Fish and Wildlife Service (Service) regarding federally listed and proposed threatened and endangered species, candidate species, and critical habitat that may occur in the vicinity of the Lewistown, Billings and Pompey's Pillar National Monument, HiLine, and Miles City Field Office Resource Management Plan (RMP) Amendment / Revision and Environmental Impact Statement (EIS) planning areas in central and eastern Montana.

We understand the planning areas to include portions of the following counties:

- Lewistown RMP - Chouteau, Fergus, Judith Basin, Meagher, and Petroleum;
- Billings and Pompey's Pillar National Monument RMP - Big Horn, Carbon, Golden Valley, Musselshell, Stillwater, Sweet Grass, Wheatland, and Yellowstone;
- HiLine RMP - Glacier, Toole, Liberty, Hill, Blaine, Phillips, Valley, and Choteau;
- Miles City RMP - Carter, Powder River, Fallon, Custer, Rosebud, Wibaux, Prairie, Garfield, McCone, Dawson, Richland, Roosevelt, Sheridan, Daniels, Treasure, Valley, and Big Horn.

Our comments are provided as a cooperating agency pursuant to the National Environmental Policy Act (NEPA) and 40 Code of Federal Regulations Part 1500-1508, 43 C.F.R. 46.230, and as requested per the March 2012 Memorandum of Understanding (MOU) between BLM, the U.S. Fish and Wildlife Service (Service) and the U.S. Forest Service (USFS). These comments are authorized under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et. seq.), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). In accordance with section 7(c) of the ESA, the Service has determined that the following listed species may be present in the subject planning area vicinities:

Species	Status[1]	Resource Management Plan Planning Areas			
		Billings and Pompey's Pillar National Monument	HiLine	Lewistown	Miles City
Black-footed Ferret (*Mustela nigripes*)	LE/XN	x	x	x	x
Whooping Crane (*Grus americana*)	LE		x		x
Least Tern (*Sterna antillarum*)	LE		x		x
Pallid Sturgeon (*Scaphirhynchus albus*)	LE		x	x	x
Grizzly Bear (*Ursus arctos horribilis*)	LT	x	x		
Piping Plover (*Charadrius melodus*)	LT CH		x		x
Canada Lynx (*Lynx Canadensis*)	LT CH	x		x	
Red Knot (*Calidris canutus rufa*)	LT	x	x		x
Northern Long-eared Bat (*Myotis septentrionalis*)	P				x
Greater sage-grouse (*Centrocercus urophasianus*)	C	x	x	x	x
Sprague's Pipit (*Anthus spragueii*)	C	x	x	x	x
Whitebark Pine (*Pinus albicaulis*)	C	x	x	x	

[1] LT = Listed Threatened; LE = Listed Endangered; P = Proposed Threatened or Endangered; CH = Critical Habitat; C = Candidate; XN = Experimental Non-Essential Population

The Service appreciates your efforts to incorporate fish and wildlife resource concerns, including threatened and endangered species, into your project planning. If you have questions or comments related to this issue, please contact Jeff Berglund at (406) 449-5225, extension 206.

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GRSG CONSERVATION BUFFER APPENDIX
Applying Lek Buffer-Distances When Approving Actions

Buffer Distances and Evaluation of Impacts to Leks

Evaluate impacts to leks from actions requiring NEPA analysis. In addition to any other relevant information determined to be appropriate (e.g. State wildlife agency plans), the BLM will assess and address impacts from the following activities using the lek buffer-distances as identified in the USGS Report *Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review* (Open File Report 2014-1239). The BLM will apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

- linear features (roads) within 3.1 miles of leks
- infrastructure related to energy development within 3.1 miles of leks.
- tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks.
- low structures (e.g., fences, rangeland structures) within 1.2 miles of leks.
- surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks.
- noise and related disruptive activities including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks.

Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognized "that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range". The USGS report also states that "various protection measures have been developed and implemented… [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands". All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.

In determining lek locations, the BLM will use the most recent active or occupied lek data available from the state wildlife agency.

For Actions in GHMA

The BLM will apply the lek buffer-distances identified above as required conservation measures, such as Conditions of Approval, to fully address the impacts to leks as identified in the NEPA analysis. Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if:

- Based on best available science, landscape features, and other existing protections, (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
- The BLM determines that impacts to GRSG and its habitat are minimized such that the project will cause minor or no new disturbance (ex. co-location with existing authorizations); and

- Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the GRSG Regional Mitigation Strategy Appendix.

For Actions in PHMA

The BLM will apply the lek buffer-distances identified above as Conditions of Approval to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in PHMA that are within the applicable lek buffer distance identified above only if:

- The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.

Range improvements which do not impact GRSG, or range improvements which provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, meet the lek buffer requirement.

The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.

GREATER SAGE-GROUSE (GRSG) DISTURBANCE CAP APPENDIX

INTRODUCTION

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010. The 18 threats have been aggregated into three measures:

Sagebrush Availability (percent of sagebrush per unit area)
Habitat Degradation (percent of human activity per unit area)
Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

Disturbance Cap:

This land use plan has incorporated a 3% anthropogenic disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

> *If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG Priority Habitat Management Areas (PHMA) in any given Biologically Significant Unit (BSU), then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within GRSG PHMAs in any given BSU until the disturbance has been reduced to less than the cap.*
>
> *If the 3% disturbance cap is exceeded on all lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a proposed project analysis area in a Priority Habitat Management Areas, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance in has been reduced to less than the cap. If the BLM determines that the State of Montana has adopted a GRSG Habitat Conservation Program that contains comparable components to those found in the State of Wyoming's Core Area Strategy including an all lands approach for calculating anthropogenic disturbances, a clear methodology for measuring the density of operations, and a fully operational Density Disturbance Calculation Tool, the 3% disturbance cap will be converted to a 5% cap for all sources of habitat alteration within a project analysis area.*

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (Table 1) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

TABLE 1.
ANTHROPOGENIC DISTURBANCE TYPES FOR DISTURBANCE CALCULATIONS. DATA SOURCES ARE DESCRIBED FOR THE WEST-WIDE HABITAT DEGRADATION ESTIMATES (TABLE COPIED FROM THE GRSG MONITORING FRAMEWORK)

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/ Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

% Degradation Disturbance = (combined acres of the 12 degradation threats[1]) ÷ (acres of all lands within the PHMAs in a BSU) x 100.

- For the Project Analysis Area:

  % Degradation Disturbance = (combined acres of the 12 degradation threats[1] plus the 7 site scale threats[2] and acres of habitat loss[1]) ÷ (acres of all lands within the PHMA in the project analysis area) x 100.

  [1] see Table 1. [2] see Table 2

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

Density Cap:

This land use plan has also incorporated a cap on the density of energy and mining facilities at an average of one facility per 640 acres in the PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than [1] facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of 1 facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.). Facilities included in the density calculation (Table 3) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments).

Project Analysis Area Method for Permitting Surface Disturbance Activities:

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in Table 1, the 7 additional features that are considered threats to sage-grouse (Table 2), and areas of sagebrush loss. Using 1 meter resolution NAIP imagery is recommended. Use existing local data if available.
- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If existing disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer the project.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is

greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.

- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

TABLE 2.
THE SEVEN SITE SCALE FEATURES CONSIDERED THREATS TO SAGE-GROUSE INCLUDED IN THE DISTURBANCE CALCULATION FOR PROJECT AUTHORIZATIONS

1. **Coalbed Methane Ponds**
2. **Meteorological Towers**
3. **Nuclear Energy Facilities**
4. **Airport Facilities and Infrastructure**
5. **Military Range Facilities & Infrastructure**
6. **Hydroelectric Plants**
7. **Recreation Areas Facilities and Infrastructure**

Definitions:

1. Coalbed Methane and other Energy-related Retention Ponds – The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.

2. Meteorological Towers – This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.

3. Nuclear Energy Facilities – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

4. Airport Facilities and Infrastructure (public and private) –The footprint boundary of will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.

5. Military Range Facilities & Infrastructure – The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.

6. Hydroelectric Plants – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

7. Recreation Areas & Facilities – This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

TABLE 3.
RELATIONSHIP BETWEEN THE 18 THREATS AND THE THREE HABITAT DISTURBANCE MEASURES FOR MONITORING AND DISTURBANCE CALCULATIONS

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

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GRSG EFFECTS ANALYSIS PROCESS APPENDIX

GREATER SAGE-GROUSE EFFECTS ANALYSIS PROCESS

INTRODUCTION

The BLM will ensure that any activities or projects in greater sage-grouse habitats would: 1) only occur in compliance with the Miles City Resource Management Plan (RMP) greater sage-grouse goals and objectives for priority and general management areas; and 2) maintain neutral or positive greater sage-grouse population trends and habitat by avoiding, minimizing, and offsetting unavoidable impacts to assure a conservation gain at the scale of this land use plan and within greater sage-grouse population areas, State boundaries, and WAFWA Management Zones through the application of mitigation for implementation-level decisions. The mitigation process will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy, while also following Secretary of the Interior Order 3330 and consulting BLM, USFWS and other current and appropriate mitigation guidance. If it is determined that residual impacts to greater sage-grouse from implementation-level actions would remain after applying avoidance and minimization measures to the extent possible, then compensatory mitigation projects will be used to offset residual impacts, or the project may be deferred or denied if necessary to achieve the goals and objectives for priority and general management areas in the Miles City RMP.

To ensure that impacts from activities proposed in sage-grouse priority and general management areas (PHMA and GHMA) are appropriately mitigated, the BLM will apply mitigation measures and conservation actions and potentially modify the location, design, construction, and/or operation of proposed land uses or activities to comply with statutory requirements for environmental protection. The mitigation measures and conservation actions (*GRGS Required Design Features Appendix)* for proposed projects or activities in these areas will be identified as part of the National Environmental Policy Act (NEPA) environmental review process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate, per the mitigation hierarchy referenced above, impacts from the activity or project such that sage-grouse goals and objectives are met. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

To achieve the goals and objectives for PHMA and GHMA in the Miles City RMP, the BLM will assess all proposed land uses or activities such as road, pipeline, communication tower, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities proposed for location in sage-grouse PHMA and GHMA in a step-wise manner. The following steps identify a screening process for review of proposed activities or projects in these areas. This process will provide a consistent approach and ensure that authorization of these projects, if granted, will appropriately mitigate impacts and be consistent with the LUP goals and objectives for sage-grouse. The following steps provide for a sequential screening of proposals. However, Steps 2-6 can be done concurrently.

Step 1 – Determine Proposal Adequacy

This screening process is initiated upon formal submittal of a proposal for authorization for use of BLM lands. The actual documentation of the proposal would include at a minimum a description of the location, scale of the

project and timing of the disturbance. The acceptance of the proposal(s) for review would be consistent with existing protocol and procedures for each type of use.

Step 2 – Evaluate Proposal Consistency with LUP

This initial review should evaluate whether the proposal would be allowed as prescribed in the Land Use Plan. For example, some activities or types of development are prohibited in PHMA or GHMA. Evaluation of projects will also include an assessment of the current state of the Adaptive Management hard and soft triggers. If the proposal is for an activity that is specifically prohibited, the applicant should be informed that the application is being rejected since it would not be allowed, regardless of the design of the project.

Step 3 – Determine Proposal Consistency with Density and Disturbance Limitations

If the proposed activity occurs within a PHMA, evaluate whether the disturbance from the activity exceeds the limit on the amount of disturbance allowed within the activity or project area (DDCT process). If current disturbance within the activity area or the anticipated disturbance from the proposed activity exceeds this threshold, the project would be deferred until such time as the amount of disturbance within the area has been reduced below the threshold, redesigned so as to not result in any additional surface disturbance (collocation) or redesigned to move it outside of PHMA.

Step 4 – Determine Projected Sage-Grouse Population and Habitat Impacts

Determine if the project will have a direct or indirect impact on sage-grouse populations or habitat within PHMA or GHMA. This will include:

- Reviewing Greater Sage-Grouse Habitat delineation maps to initially assess potential impacts to sage-grouse.

  Use of the *USGS report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review* to assess potential project impacts based upon the distance to the nearest lek, using the most recent active lek data available from the state wildlife agency. This assessment will be based upon the direction in the *GRSG Conservation Buffer Appendix*:

- Review and application of current science recommendations.
- Reviewing the ‘Base Line Environment Report’ (USGS) which identifies areas of direct and indirect effect for various anthropogenic activities.
- Consultation with agency or State Wildlife Agency biologist.
- Evaluating consistency with (at a minimum) State sage-grouse regulations
- Or other methods needed to provide an accurate assessment of impacts.

If the proposal will not have a direct or indirect impact on either the habitat or population, document the findings in the NEPA and proceed with the appropriate process for review, decision and implementation of the project.

Step 5 –Apply Avoidance and Minimization Measures to Comply with Sage-Grouse Goals and Objectives

If the project can be relocated so as to not have an impact on sage-grouse and still achieve objectives of the proposal and the disturbance limitations, relocate the proposed activity and proceed with the appropriate process for review, decision and implementation (NEPA and Decision Record). This Step does not consider redesign of the project to reduce or eliminate direct and indirect impacts, but rather authorization of the project in a physical location that will not impact Greater Sage-Grouse. If the preliminary review of the proposal concludes that there may be adverse impacts to sage-grouse habitat or populations in Step 4 and the project cannot be effectively relocated to avoid these impacts, proceed with the appropriate process for review, decision and implementation

(NEPA and Decision Record) with the inclusion of appropriate mitigation requirements to further reduce or eliminate impacts to sage-grouse habitat and populations and achieve compliance with sage-grouse objectives. Mitigation measures could include disturbance buffer limits, timing of disturbance limits, noise restrictions, design modifications of the proposal, site disturbance restoration, post project reclamation, etc. (see GRSG Required Design Features Appendix for a more complete list of measures). Compensatory or offsite mitigation may be required (Step 6) in situations where residual impacts remain after application of all avoidance and minimization measures.

Step 6 – Apply Compensatory Mitigation or Reject / Defer Proposal

If screening of the proposal (Steps 1-5) has determined that direct and indirect impacts cannot be eliminated through avoidance or minimization, evaluate the proposal to determine if compensatory mitigation can be used to offset the remaining adverse impacts and achieve sage-grouse goals and objectives. If the impacts cannot be effectively mitigated, reject or defer the proposal. The criteria for determining this situation could include but are not limited to:

- The current trend within the Priority Habitat is down and additional impacts, whether mitigated or not, could lead to further decline of the species or habitat.
- The proposed mitigation is inadequate in scope or duration, has proven to be ineffective or is unproven is terms of science based approach.
- The project would impact habitat that has been determined to be a limiting factor for species sustainability.
- Other site specific information and analysis that determined the project would lead to a downward change of the current species population or habitat and not comply with sage-grouse goals and objectives.

If, following application of available impact avoidance and minimization measures, the project can be mitigated to fully offset impacts and assure conservation gain to the species and comply with sage-grouse goals and objectives, proceed with the appropriate process for review, decision and implementation (NEPA and Decision Record).

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy to address greater sage-grouse impacts within that Zone. The WAFWA Management Zone Regional Mitigation Strategy will be applicable to the States/Field Offices/Forests within the Zone's boundaries. Subsequently, the BLM Miles City Field Office NEPA analyses for implementation-level decisions, which have the potential to impact greater sage-grouse, will include analysis of mitigation recommendations from the relevant WAFWA Management Zone Regional Mitigation Strategy(ies).

Implementation of the Regional Mitigation Strategy may involve managing compensatory mitigation funds, implementing compensatory mitigation projects, certifying mitigation/conservation banks, and reporting on the effectiveness of those projects. These types of mitigation implementation actions may be most effectively managed at the State-level, in collaboration with partners. BLM State Office may find it most effective to enter into an agreement with a State-level program administrator (e.g. a NGO, a State-level entity) to help manage these aspects of mitigation. The BLM will remain responsible for making decisions that affect Federal lands.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The *GRSG Regional Mitigation Strategy Appendix* provides additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

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THE GREATER SAGE-GROUSE (GRSG) MONITORING FRAMEWORK APPENDIX

Developed by the Interagency GRSG Disturbance and Monitoring Sub-Team

INTRODUCTION

The purpose of this U.S. Bureau of Land Management (BLM) Greater Sage-grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM planning strategy (BLM IM 2012-044) (BLM 2011e) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations, based on the sensitivity of the resource to the decisions involved. Therefore, BLM will use the methods described herein to collect monitoring data to evaluate implementation and effectiveness of the Greater Sage-grouse (hereafter, sage-grouse) planning strategy and the conservation measures contained in land use plans. The type of monitoring data to be collected at the land use plan scale will be described in the monitoring plan which will be developed after the signing of the ROD. For a summary of the frequency of reporting see Attachment A. Adaptive management will be informed by data collected at any and all scales.

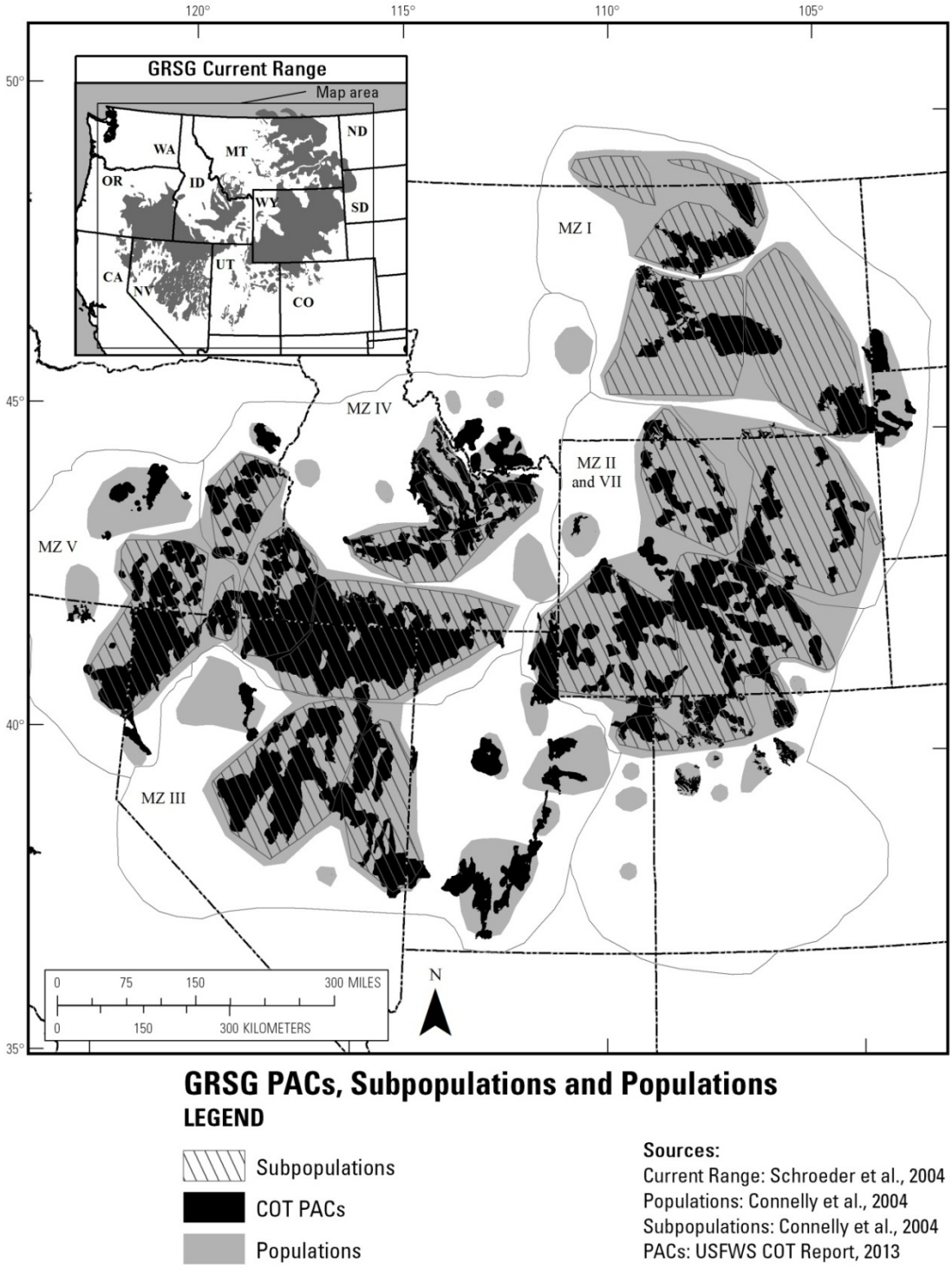
To ensure the BLM and USFS have the ability to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology for monitoring the implementation and evaluating the effectiveness of BLM/USFS actions to conserve the species and its habitat through monitoring that informs effectiveness at multiple scales. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions.

Implementation monitoring results will provide information to allow the BLM and USFS to evaluate the extent that decisions from the BLM resource management plans (RMP) and USFS land management plans (LMP) to conserve sage-grouse and its habitat have been implemented. Population monitoring information will be collected by state fish and wildlife agencies and will be incorporated into effectiveness monitoring as it is made available.

This multi-scale monitoring approach is necessary as sage-grouse are a landscape species and conservation is scale-dependent whereby conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and Stiver et al. (2014) as first order (broad scale), second order (mid-scale), third order (fine scale), and fourth order (site scale) to apply them to sage-grouse habitat selection. Habitat selection and habitat use by sage-grouse occurs at multiple scales and is driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat utilization by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits the ability for managers to identify the threats to sage-grouse and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see the Sage-grouse Habitat Assessment Framework (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Range wide best-available datasets for broad and mid-scale monitoring will be acquired. If these exiting datasets are not readily available or are inadequate, but are necessary to effectively inform the three measurable quantitative indicators (sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions), the BLM will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine and site scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004; Figure 1).

FIGURE 1. MAP OF GREATER SAGE-GROUSE RANGE, POPULATIONS, SUBPOPULATIONS AND PRIORITY AREAS FOR CONSERVATION (PACS) AS OF 2013.



This broad and mid-scale monitoring data and analysis will provide context for RMP/LMP areas; states; Sage-grouse Priority Habitat, General Habitat and other sage-grouse designated management areas; and Priority Areas for Conservation (PACs) as defined in the Greater Sage-grouse Conservation Objectives: Final Report (COT, U.S. Fish and Wildlife Service 2013). Throughout the remainder of the document, all of these areas will be referred to as "sage-grouse areas".

This monitoring framework is divided into two sections. The broad and mid-scale methods, described in Section I, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of BLM and USFS planning strategy and management decisions (see Table 1). For the sage-grouse habitat fine and site scales (Section II), this framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of the BLM and USFS multi-scale monitoring commitments see Attachment A.

TABLE 1. INDICATORS FOR MONITORING IMPLEMENTATION OF THE STRATEGY, DECISIONS, SAGE-GROUSE HABITAT, AND SAGE-GROUSE POPULATIONS AT THE BROAD AND MID-SCALES

	Implementation	Habitat		Population (State Wildlife Agencies)
Geographic Scales		Availability	Degradation	Demographics
Broad Scale: From the range of sage-grouse to WAFWA Management Zones	BLM/USFS Planning Strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mining and infrastructure facilities	WAFWA Management Zone population trend
Mid-scale: From WAFWA Management Zone to populations. PACs	RMP/LMP decisions	Mid-scale habitat indicators (HAF 2014; Table 2 e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining and infrastructure facilities (Table 2)	Individual population trend

I. BROAD AND MID-SCALES

First order habitat selection at the broad scale describes the physical or geographical range of a species. The first order habitat, the range of the species, is defined by populations of sage-grouse associated with sagebrush landscapes based on Schroeder et al. 2004, Connelly et al. 2004 and population surveys and local adjustments based on population or habitat surveys since 2004. There is an intermediate scale between the broad and mid-scales that was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-grouse MZs. Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.
Second order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi^2. PACs range from 20 to 20,400 mi^2 and are nested within population areas, and populations are nested within Management Zones.

Other mid-scale landscape indicators such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate

these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

A. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of land use plan decisions. The BLM and the USFS will monitor implementation of project level and/or site specific actions and authorizations with their associated conditions of approval/stipulations for sage-grouse spatially (as appropriate) within Priority Habitat, General Habitat and other sage-grouse designated management areas, at a minimum, for the Miles City RMP. These actions and authorizations as well as progress toward completing and implementing activity-level plans will be monitored consistently across all planning units and reported to BLM/USFS headquarters annually, with a summary report every 5 years, for the Miles City RMP. A national-level Land Use Plan Implementation Monitoring and Reporting Structure (IMARS) that describes how the BLM/USFS will consistently and systematically monitor and report implementation level activity plans and implementation actions for all plans within the range of sage-grouse will be developed by the Implementation Monitoring Team and will be included in the Record of Decision (ROD)/Approved Plan. A centralized tracking tool (IMARS) for collection, roll-up and reporting of tabular and spatially explicit data will be utilized. BLM/USFS will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B. Habitat Monitoring

In the USFWS's 2010 listing decision for the sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010). The BLM and USFS will therefore monitor the relative extent of these threats that remove sagebrush (see Table 2), both spatially and temporally, on all lands within an analysis area, and to report on amount, pattern and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)
Measure 2: Habitat Degradation (percent of human activity per unit area)
Measure 3: Density of Energy and Mining (facilities and locations per unit area)

TABLE 2. RELATIONSHIP BETWEEN THE 18 THREATS AND THE THREE HABITAT DISTURBANCE MEASURES FOR MONITORING. DATA AVAILABILITY MAY PRECLUDE SPECIFIC ANALYSIS OF INDIVIDUAL LAYERS. SEE THE DETAILED METHODOLOGY FOR MORE INFORMATION

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Density of Energy and Mining
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and salable developments)		X	X
Infrastructure (roads)		X	

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Density of Energy and Mining
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights of ways		X	

These three habitat disturbance measures will evaluate disturbance on all lands regardless of land ownership. The direct area of influence will be assessed with the goal to account for actual removal of sagebrush upon which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape), and therefore monitors the change in sagebrush availability, or specifically where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability to support sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see *B1: Sagebrush Availability* below). Measures 2 and 3 (see *B2: Habitat Degradation* below) focus on where habitat degradation is occurring using the footprint/area of direct disturbance and the number of facilities at the mid-scale to identify the relative amount of degradation per geographic unit of interest and in areas that have the capability to support sagebrush and seasonal sage-grouse use. Measure 2 is not only a quantification of footprint/area of direct disturbance but also a surrogate for those threats most likely to have ongoing activity. In addition, energy development and mining activities are typically the most intensive activities in sagebrush habitat. Therefore, measure 3, the density of active energy development, production, and mining sites will be monitored to help identify areas of particular concern for factors such as noise, dust, traffic, etc., that degrade sage-grouse habitat.
The methods to monitor disturbance found herein differ slightly from methods used in the Sage-Grouse Baseline Environmental Report (BER; Manier et al. 2013) that provided a baseline of datasets of disturbance across jurisdictions. One difference is that, for some threats, the data in the BER were for federal lands only. In addition, threats were assessed individually in that report, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to utilize the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate the three measures.

B.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. This measure has been divided into two sub-measures to describe sagebrush availability on the landscape:

> Measure 1a) the current amount of sagebrush on the landscape of interest and
> Measure 1b) the amount of sagebrush on the landscape of interest compared to the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic unit of interest]. The appropriate geographic units of interest for sagebrush availability include the species' range, WAFWA Management Zones, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the area of interest) will be calculated using this formula: [the existing updated sagebrush layer (EVT)] divided by [pre Euro-American geographic extent of lands that could have supported sagebrush (BpS)]. This will provide information during evaluations of monitoring data to set the context for a given geographic unit of interest. That information could also be used for management options for restoration or mitigation.

The sagebrush base layer for the sagebrush availability measure will be based on geospatial vegetation data adjusted for the threats listed in Table 2. The following sub-sections of this monitoring framework describe the methodology to determine both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid-scales.

a. Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the range wide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2010). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the range wide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability to support sagebrush vegetation pre Euro-American settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area compared with how much sagebrush existed historically (Measure 1b). Therefore, BLM and USFS have determined that LANDFIRE provides the best available data at broad and mid-scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. Along with aggregating the sagebrush types into the sagebrush base layer, BLM and USFS will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. For the long-term, BLM through its Assessment, Inventory, and Monitoring (AIM) program and specifically the BLM'S Landscape Monitoring Framework (Taylor et al., *in press*) will provide field data to the LANDFIRE program to support continuous quality improvements in their products specifically for rangeland systems to improve the LANDFIRE EVT layer.

Within the USFS and BLM, forest-wide and field office-wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than provided through LANDFIRE. Where available, these finer scale products are useful for additional and complimentary mid-scale indicators and local scale analyses (see Section II: Fine and Site Scale). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid-scale where consistency of data products is necessary across broader geographies.

The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of existing percent sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will be used to determine the trend in other landscape indicators, e.g. patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated bi-annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (See Section D).

Data Sources to Establish and Monitor Sagebrush Availability

In much the same manner as how the LANDFIRE data was selected as the data source, described above, the criteria for selecting the datasets (Table 3) for establishing and monitoring the change in sagebrush availability, Measure 1, were threefold:

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Dataset is continually maintained with a known update interval.

TABLE 3. DATASETS FOR ESTABLISHING AND MONITORING CHANGES IN SAGEBRUSH AVAILABILITY

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting (BpS) v1.1	LANDFIRE	Static	2008	Denominator for Sagebrush Availability (1.b.)
Existing Vegetation Type (EVT) v1.2	LANDFIRE	Static	2010	Numerator for Sagebrush Availability
Cropland Data Layer (CDL)	National Agricultural Statistics Service (NASS)	Annual	2012	Agricultural Updates; removes existing sagebrush from numerator of sagebrush availability
National Land Cover Dataset (NLCD) Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5 Year	2011 available in March 2014	Urban Area Updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000 acres Fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity (MTBS)	Annual	2012 available in April 2014	> 1,000 acres Fire Updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping, there have been two update efforts: version 1.1 represents changes up to 2008 and version 1.2 reflects changes on the landscape up to 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer. Ecological systems from the LANDFIRE EVT to be used in the sagebrush base layer were determined by sage-grouse subject matter experts through the identification of the ecological systems that have the capability of supporting sagebrush vegetation and could provide suitable seasonal habitat for the sage-grouse (Table 4). Two additional vegetation types that are not ecological systems were added to the EVT and are *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological

systems in LANDFIRE BpS. In LANDFIRE EVT however, in some map zones, the Rocky Mountain Lower Montane - Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance respectively.

TABLE 4. ECOLOGICAL SYSTEMS IN BPS AND EVT CAPABLE OF SUPPORTING SAGEBRUSH VEGETATION AND COULD PROVIDE SUITABLE SEASONAL HABITAT FOR GREATER SAGE-GROUSE

Ecological System	**Sagebrush Vegetation that the Ecological System has the Capability to Produce**
Colorado Plateau Mixed Low Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longiloba* *Artemisia bigelovii* *Artemisia nova* *Artemisia frigida* *Artemisia tridentata* ssp. *wyomingensis*
Columbia Plateau Scabland Shrubland	*Artemisia rigida*
Great Basin Xeric Mixed Sagebrush Shrubland	*Artemisia arbuscula* ssp. *longicaulis* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Big Sagebrush Shrubland	*Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis*
Inter-Mountain Basins Mixed Salt Desert Scrub	*Artemisia tridentata* ssp. *wyomingensis* *Artemisia spinescens*
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	*Artemisia arbuscula* ssp. *longiloba* *Artemisia nova* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *rupicola*
Columbia Plateau Low Sagebrush Steppe	*Artemisia arbuscula* *Artemisia arbuscula* ssp. *longiloba* *Artemisia nova*
Inter-Mountain Basins Big Sagebrush Steppe	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *xericensis* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tripartita* ssp. *tripartita* *Artemisia frigida*
Inter-Mountain Basins Montane Sagebrush Steppe	*Artemisia tridentata* ssp. *vaseyana* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia nova* *Artemisia arbuscula* *Artemisia tridentata* ssp. *spiciformis*
Northwestern Great Plains Mixed grass Prairie	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *vaseyana* *Artemisia frigida*
Northwestern Great Plains Shrubland	*Artemisia cana* ssp. *cana* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis*
Western Great Plains Sand Prairie	*Artemisia cana* ssp. *cana*
Western Great Plains Floodplain Systems	*Artemisia cana* ssp. *cana*
Columbia Plateau Steppe and Grassland	*Artemisia* spp.

Ecological System	**Sagebrush Vegetation that the Ecological System has the Capability to Produce**
Inter-Mountain Basins Semi-Desert Shrub-Steppe	*Artemisia tridentata* *Artemisia bigelovii* *Artemisia tridentata* ssp. *wyomingensis*
Rocky Mountain Lower Montane-Foothill Shrubland	*Artemisia nova* *Artemisia tridentata* *Artemisia frigida*
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	*Artemisia tridentata*
Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland	*Artemisia tridentata* ssp. *vaseyana* *Artemisia arbuscula* *Artemisia tridentata*
Artemisia tridentata ssp. *vaseyana* Shrubland Alliance (EVT only)	*Artemisia tridentata* ssp. *vaseyana*
Quercus gambelii Shrubland Alliance (EVT only)	*Artemisia tridentata*

Accuracy and Appropriate Use of LANDFIRE Datasets
Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table 4 will be merged into one value that represents the sagebrush base layer. By aggregating all ecological systems, the combined accuracy of the sagebrush base layer (EVT) is much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of their EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historic range of sage-grouse as defined by Schroeder (2004). Attachment C lists the user and producer accuracies for the aggregated ecological systems that make up the sagebrush base layer and also defines user and producer accuracies. The aggregated sagebrush base layer for monitoring had producer accuracies ranging from 56.7% to 100% and user accuracies ranging from 57.1% to 85.7%.

LANDFIRE EVT data are not designed to be used at a local level. In reporting the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the pixel level ($30m^2$ resolution of raster data) for any reporting. The smallest geographic extent use of the data for this purpose is at the PAC level and for the smallest PACs the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer
The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (http://www.nass.usda.gov/research/Cropland/Release/index.htm). CDL data are generated on an annual basis with "estimated producer accuracies for large row crops from the mid 80 to mid-90 percent" depending on the State (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Readers are referred to the NASS metadata website for specific information on accuracy (http://www.nass.usda.gov/research/Cropland/metadata/meta.htm). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes as well as non-agricultural classes. For this effort, as was also done in the Baseline Environmental Report (Manier et al. 2013), non-agricultural classes were removed from the original dataset. The excluded classes are:

> Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142),

Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of CDL classifies that pixel as one of the non-ag classes listed above. The assumption is that even though individual pixels may get classified as a non-agricultural class in any given year the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table 4. It is further assumed that once an area has moved into agricultural use, it is unlikely that it would be restored to sagebrush, however, should that occur, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the Restoration Updates section of this framework.

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Dataset (NLCD) Percent Imperviousness was selected as the best available dataset to be used for urban updates. These data are generated on a five-year cycle and specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel will be removed from the sagebrush base layer during the update process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, there are two reasons why this is acceptable for this process. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones because unincorporated urban areas were not being included thus leaving large chunks of urban pixels unaccounted for in this rule set. Secondly, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, it was determined to include all impervious pixels.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires all fires with sizes greater than 10 acres to be reported to GeoMac, therefore there will be many small fires less than 10 acres in size that will not be accounted for in the fire updates. In the update process using fire perimeters from GeoMac, all sagebrush pixels falling within the perimeter of fires less than 1000 acres in size will be used to update the sagebrush layer. MTBS was selected for use as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (http://www.mtbs.gov) is an on-going multi-year project to consistently map fire severity and fire perimeters across the U.S. For lands in the western U.S., MTBS only maps burn severity for fires greater than 1,000 acres in size. One of the burn severity classes within MTBS is an unburned to low severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter that will be retained in the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. However, not all wildfires have the same impact on the recovery of sagebrush habitat depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed restoration, than the warmer, dryer sagebrush habitat. These areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of greater sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation which results in sage-grouse habitat loss include various juniper species such as Utah juniper (*Juniperus osteosperma*), western juniper (*Juniperus occidentalis*), Rocky Mountain juniper (*Juniperus scopulorum*), pinyon species including singleleaf pinyon (*Pinus monophylla*) and pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and Douglas-fir (*Pseudotsuga menziesii*) (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to be used for determination of the existing sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they have the capability of supporting the conifer species (listed above) and have the capability of supporting sagebrush vegetation. Those ecological systems (Table 5) were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. Sagebrush vegetation was defined as including sagebrush species (Attachment B) that provide habitat for the greater sage-grouse and are included in the Sage-Grouse Habitat Assessment Framework. An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems and these immediately adjacent sagebrush pixels were removed from the sagebrush base layer.

TABLE 5. ECOLOGICAL SYSTEMS WITH CONIFERS MOST LIKELY TO ENCROACH INTO SAGEBRUSH VEGETATION

EVT Ecological Systems	**Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce**
Colorado Plateau Pinyon-Juniper Woodland	*Pinus edulis* *Juniperus osteosperma* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* ssp. *tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp. *vaseyana* *Artemisia bigelovii* *Artemisia pygmaea*
Columbia Plateau Western Juniper Woodland and Savanna	*Juniperus occidentalis* *Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia rigida* *Artemisia tridentata* ssp. *vaseyana*
East Cascades Oak-Ponderosa Pine Forest and Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Artemisia tridentata* *Artemisia nova*
Great Basin Pinyon-Juniper Woodland	*Pinus monophylla* *Juniperus osteosperma* *Artemisia arbuscula* *Artemisia nova* *Artemisia tridentata* *Artemisia tridentata* ssp. *vaseyana*
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus ponderosa* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*
Rocky Mountain Foothill Limber Pine-Juniper Woodland	*Juniperus osteosperma* *Juniperus scopulorum* *Artemisia nova* *Artemisia tridentata*
Rocky Mountain Poor-Site Lodgepole Pine Forest	*Pinus contorta* *Pseudotsuga menziesii* *Pinus ponderosa* *Artemisia tridentata*
Southern Rocky Mountain Pinyon-Juniper Woodland	*Pinus edulis*

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability to Produce
	Juniperus monosperma *Artemisia bigelovii* *Artemisia tridentata* *Artemisia tridentata* ssp. *wyomingensis* *Artemisia tridentata* ssp.*vaseyana*
Southern Rocky Mountain Ponderosa Pine Woodland	*Pinus ponderosa* *Pseudotsuga menziesii* *Pinus edulis* *Pinus contorta* *Juniperus* spp. *Artemisia nova* *Artemisia tridentata* *Artemisia arbuscula* *Artemisia tridentata* ssp. *vaseyana*

Invasive Annual Grasses Adjustments for the Sagebrush Base Layer
There are no invasive species datasets from 2010 to present (beyond the LANDFIRE data) that meet our 3 criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see the Monitoring Sagebrush Availability section (Section I.B.1.b.).

Sagebrush Restoration Adjustments for the Sagebrush Base Layer
There are no datasets from 2010 to present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (Version 1.2) due to restoration activities since 2010. Successful restoration treatments prior to 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Updating the Sagebrush Availability Sagebrush Base Layer
Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

> ***2010 Existing Sagebrush Base Layer*** = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires < 1,000 acres] minus [2009/10 MTBS Fires excluding unburned sagebrush islands] minus [Conifer Encroachment Layer]
>
> ***2012 Existing Sagebrush Update*** = [Base 2010 Existing Sagebrush Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]
>
> ***2013 and beyond Existing Sagebrush Updates*** = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] plus [restoration/monitoring data provided by the field].

Sagebrush Restoration Updates
Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper, are examples of updates to the sagebrush base layer that can add sagebrush vegetation back in. When restoration has been determined to be successful through range wide, consistent, interagency fine and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad and mid-scale sagebrush base layer.

Measure 1b – Context for the change in the amount of sagebrush in a landscape of interest
Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre Euro-American settlement (biophysical setting (BpS) v1.2 of LANDFIRE). This measure (1b) will provide information during evaluations of monitoring data to set the context for a given geographic area of interest. The information could also be used to inform management options for restoration, mitigation and inform effectiveness monitoring.

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre Euro-American settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units which are based on NatureServe's (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that have the capability of supporting sagebrush vegetation and could provide seasonal habitat for the sage-grouse. These ecological systems are listed in Table 4 with the exception of the *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and the *Quercus gambelii* Shrubland Alliance. Ecological systems selected included sagebrush species or subspecies that are included in the Sage-Grouse Habitat Assessment Framework and are found in Attachment B.

Attributable to the lack of any reference data, the BpS layer does not have an associated accuracy assessment. Visual inspection, however, of the BpS data reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies between map zones are the decision rules used to map a given ecological system will vary between map zones based on different physical, biological, disturbance and atmospheric regimes of the region. This can result in artificial edges in the map that are an artifact of the mapping process. However, metrics will be calculated at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels, therefore, the magnitude of these observable errors in the BpS layer is minor compared with the size of the reporting units. Therefore, since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will only have a minor impact on the percent sagebrush availability calculation.

LANDFIRE BpS data are not designed to be used at a local level. In reporting the percent sagebrush statistic for the various reporting units, the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the pixel level ($30m^2$) for any reporting. The smallest geographic extent use of the data for this purpose is at the PAC level and for the smallest PACs the initial percent sagebrush remaining estimate will have greater uncertainties compared with the much larger PACs.

Tracking
BLM and USFS will analyze and monitor sagebrush availability (Measure 1) on a bi-annual basis and it will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to fire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meets criteria of adding sagebrush areas back into the sagebrush base layer will begin to be factored in as data allows. Attributable to data availability, there will be a two year lag (approximately) between when the estimate is generated and when the data used for the estimate becomes available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans
Geospatial data used to generate the sagebrush base layer will be available through BLM's EGIS Web Portal and Geospatial Gateway or through the authoritative data source. Legacy datasets will be preserved, so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to share to help users understand the limitation of the sagebrush estimates and will be summarized spatially by map zone and included in the Portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to greatly improve overall quality of the data products primarily through the use of higher quality remote sensing datasets. Additionally, BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad and mid-scale analyses through the Grass/Shrub mapping effort in partnership with the MRLC. The Grass/Shrub mapping effort applies the Wyoming multi-scale sagebrush habitat methodology (Homer et al. 2009) to spatially depict fractional percent cover estimates for five components range and west-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. One of the benefits of the design of these fractional cover maps is that they facilitate monitoring "with-in" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "with-in" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub effort is not a substitute for fine scale monitoring, but will leverage fine scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. The earliest possible date for this evaluation will not occur until 2018 or 2019 depending on data availability.

B.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table 2. The footprint is defined as the direct area of influence of "active" energy and infrastructure and is used as a surrogate for human activity. Thus, the footprint of habitat degradation per sage-grouse area will be calculated. Although these analyses will try to summarize results at the aforementioned meaningful landscape units, some may be too small to appropriately report the metrics and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure are detailed below. All datasets will be updated annually to monitor broad and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be available to the USFWS.

a. Habitat Degradation Datasets and Assumptions:

Energy (oil and gas wells and development facilities)
This dataset will be a compilation of two oil and gas well databases: the proprietary IHS Enerdeq® database and the BLM Automated Fluid Minerals Support System (AFMSS) database (AFMSS data will be used to supplement the IHS data). Point data from wells active within the last ten years from IHS and producing wells from AFMSS will be considered as a 5 acre (2.0ha) footprint (BLM WO 2014) centered on the well point. Plugged and abandoned wells will be removed, though only if the date of well abandonment was prior to the first day of the reporting year (i.e. for the 2010 reporting year a well must be plugged and abandoned by 12/31/2009 to be removed).

> ***Additional Measure: Reclaimed Energy-related Degradation*** This dataset will include those wells that have been plugged and abandoned in an effort to measure energy-related degradation that has been reclaimed but not necessary fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last ten years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed by 2-10 years from energy development activities (Harju et al. 2010), while reclamation actions may require two or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take six or more years from the point of seeding, depending on variables such as annual precipitation,

annual temperature, and soil type and depth (Pyke, 2011). This ten-year period is conservative, assuming some level of habitat improvement ten years after plugging. However, research by Hemstrom et al. (2002) proposes an even longer period of greater than 100 years for recovery of sagebrush habitats even with active restoration approaches. Direct area of influence will be considered 3acres (1.2ha) (J. Perry, personal communication February 12, 2014). This additional layer/measure could be used at the broad and mid-scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded and where further investigation at the fine or site-scale would be warranted to: (1) quantify the level of reclamation already conducted, and (2) evaluate the amount of restoration still required (for sagebrush habitat recovery). At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to fire and agriculture conversion (see Sagebrush Restoration Updates in Section I.B.1.b.). This dataset will be updated annually with new plugged and abandoned well from the IHS dataset.

Energy (coal mines)
Currently there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement (OSMRE) coal mining permit polygons (as available), and USGS Mineral Resources Data System (MRDS) mine occurrence points. These data will inform where active coal mining may be occurring. Aerial imagery will then be used to manually digitize active coal mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from ESRI and/or Google will be utilized to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine footprints. Coal mine location data source and imagery date will be documented for each digitized coal footprint polygon at the time of creation. Sub-surface facility locations (polygon or point location as available) will also be collected, if available, and included in density calculations, and added to the active surface activity layer as appropriate (if actual footprint can be located).

Energy (wind energy facilities)
This dataset will be a subset of the Federal Aviation Administration Digital Obstacles point file to include points where “Type_” = “WINDMILL”. Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2 ha) centered on each tower point (BLM Wind Energy Programmatic Environmental Impact Statement, 2005). Additionally, we will use Platts Power Plants and Generating Units database for transformer stations associated with wind energy sites.

Energy (solar energy facilities)
This dataset will include solar plants in existence or under construction as compiled with the proprietary Platts in the Power Plants and Generating Units database. The point data will be buffered to represent a 3 acre (1.2 ha) direct area of influence.

Energy (geothermal energy facilities)
This dataset will include geothermal plants in existence or under construction as compiled with the proprietary I.H.S and Platts (Power Plants and Generating Units) databases. The point data will be buffered to represent a 3 acre (1.2 ha) direct area of influence.

Mining (active developments; locatable, leasable, saleable)
This dataset will include active mining locations as compiled with the proprietary InfoMine® database. Other data sources will be evaluated as they are identified or become available. The point data will be buffered to represent a 5 acre (2.0 ha) direct area of influence, unless actual surface disturbance is available.

Infrastructure (roads)
This dataset will be compiled from the proprietary ESRI® StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstates, Major Roads, and Surface Streets to capture most paved and “crowned and

ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in our broad and mid-scale monitoring, may support a volume of traffic that can have deleterious effects to sage-grouse leks. It may be appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine/project scale analysis will require more site-specific data than is identified in this monitoring framework. The direct influence area for roads will be represented by 240.2ft , 84.0ft, and 40.7ft (73.2m, 25.6m, and 12.4m) total widths centered on the line feature for Interstates, Major Roads, and Surface Streets respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: this is a related but different dataset as was used in the Summary of Science, Activities, Programs, and Policies That Influence the Rangewide Conservation of Greater Sage-Grouse (Manier et al., 2013). Individual BLM/USFS planning units may utilize different roads layers for fine and site scale monitoring.*

Infrastructure (railroads)
This dataset will be a compilation of Federal Railroad Administration (FRA) Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct influence area for railroads will be represented by a 30.8 ft (9.4m) total width (Knick et al. 2011) centered on non-abandoned railroad line feature.

Infrastructure (power lines)
This line dataset will be a compilation from EV Energy Map, Platts/Global Energy of transmission lines, substations, electric power generation plants, and energy distribution control facilities. Linear features in the dataset attributed as "buried" will be removed from the disturbance calculation. Only "In Service" lines will be used, not "Proposed" lines. Direct area of influence will be determined by the kV designation: 1-199 kV (100ft/30.5m), 200-399 kV (150ft/45.7m), 500-699 kV (200ft/61.0m), and 700-or greater kV (250ft/76.2m) based on average ROW and structure widths.

Infrastructure (communication towers)
This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.47 acres (1.0ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)
This point dataset will be compiled from the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where "Type_" = "WINDMILL" will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.47 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other developed rights-of-ways
Currently no additional data sources for other rights-of-ways have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in categories above. Our newly purchased IHS data does contain pipeline information, but further investigation is needed to determine if the dataset is comprehensive. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to the threats above.

b. Habitat Degradation Threat Combination and Calculation:

The threats targeted for measuring human activity from Table 2, will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. However, individual datasets will be preserved to ascertain which types of threats may be contributing to overall habitat degradation. Percentages will be calculated as follows: This measure has been divided into three sub-measures to describe habitat degradation on the landscape:

- Measure 2a) Footprint by landscape unit: Divide area of the active/direct footprint within a sage-grouse area by the total area of the sage-grouse area (% disturbance in landscape unit).

- Measure 2b) Active/direct footprint by historic sagebrush potential: Divide area of the active footprint that coincides with areas with historic sagebrush potential (BpS calculation from habitat availability) within a given landscape unit by the total area with sagebrush potential within the landscape unit. (% disturbance on potential historic sagebrush in landscape unit).
- Measure 2c) Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given landscape unit by the total area that is current sagebrush within the landscape unit (% disturbance on current sagebrush in landscape unit).

TABLE 6. GEOSPATIAL DATA SOURCES FOR HABITAT DEGRADATION (MEASURE 2)

USFWS Listing Decision Threat	Data Source	Direct Area of Influence
Agriculture	National Agriculture Statistics Service	Polygon Area
Urbanization	USGS Percent Imperviousness	Polygon Area
Wildfire	Geospatial Multi-Agency Coordination Group; Monitoring Trends in Burn Severity	Polygon Area
Conifer encroachment	LANDFIRE	Polygon Area
Energy (oil and gas wells and development facilities)	IHS; BLM (AFMSS)	5ac (2.0ha)
Energy (reclaimed site degradation)	IHS; BLM (AFMSS)	3 ac (1.2ha)
Energy (coal mines)	BLM & FS data; Office of Surface Mining Reclamation and Enforcement	Polygon Area
Energy (wind towers)	Federal Aviation Administration	3ac (1.2ha)
Energy (solar fields)	Argonne National Laboratory	Polygon Area
Energy (geothermal)	Argonne National Laboratory	Polygon Area or 5ac (2.0ha)
Mining (active locatable, leasable, and salable developments)	InfoMine	Polygon Area or 5ac (2.0ha)
Infrastructure (roads)	ESRI StreetMap Premium	40.7-240.2ft (12.4-73.2m)
Infrastructure (railroads)	Federal Railroad Administration	30.8ft (9.4m)
Infrastructure (power lines)	Platts Transmission Lines	100-250ft (30.5-76.2m)
Infrastructure (communication towers)	Federal Communications Commission	2.5ac (1.0ha)
Infrastructure (other vertical structures)	Federal Aviation Administration	2.5ac (1.0ha)

B.3. Density of Energy and Mining (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of threats identified in Table 2. This will provide an estimate of intensity of human activity or intensity of habitat degradation. The number energy facilities and mining locations will be summed and divided by the area of meaningful landscape units to calculate density of these activities. Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and

methodology for each threat, and the combined measure are detailed below. All datasets will be updated annually to monitor broad and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

a. Density of Energy and Mining Datasets and Assumptions:

Energy (oil and gas wells and development facilities)
[See section B.2]

Energy (coal mines)
[See section B.2]

Energy (wind towers)
[See section B.2]

Energy (solar energy facilities)
[See section B.2]

Energy (geothermal energy facilities)
[See section B.2]

Mining (active developments; locatable, leasable, saleable)
[See section B.2]

b. Density of Energy and Mining Threat Combination and Calculation:

Datasets for energy and mining will be collected in two primary forms: point locations (e.g. wells) and polygon areas (e.g. surface coal mining). The following rule set will be used to calculate density for meaningful landscape units including standard grids and per polygon:

1) Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
2) Polygons will not be merged, nor features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
3) The analysis unit (polygon or 640 acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit all point features will be summed, and any individual polygons will be counted as one (e.g.; a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g. a polygon crossing multiple 640 acre sections would be counted as one in each 640 acre section for a density per 640 acre section calculation).
4) In methodologies with different sized units (e.g. MZs, populations, etc.) raw counts will be converted to densities by dividing by the total area of the unit. Typically this will be measured as facilities per 640 acres.
5) For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
6) Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help with display and conveying information about areas within meaningful landscape units that have high energy and/or mining activity.

7) Additional statistics for each defined unit may also include adjusting the area to only include area with the historic potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Key habitat degradation individual datasets and threat combination datasets will be available through BLM's EGIS Web Portal and Geospatial Gateway. Legacy datasets will be preserved, so that trends may be calculated.

C. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to BLM and USFS through the Sage-grouse Implementation Memorandum of Understanding (2013) signed by WAFWA, BLM, USFS, NRCS, USGS, Farm Service Agency, and USFWS. An amendment to the MOU (2014) will outline a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information. The Landscape Conservation Management and Analysis Portal (LC MAP) will be used as the instrument for state wildlife agencies to annually submit population data and analyses that will be accessed by the BLM through a data sharing agreement. Population areas were refined from the Greater Sage-grouse Conservation Objectives: Final Report (COT) report by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and inform the adaptive management responses.

D. Effectiveness Monitoring

Effectiveness monitoring will provide the information to evaluate BLM and USFS actions to reach the objective of the planning strategy (BLM IM 2012-044), to conserve sage-grouse populations and its habitat, and the objectives in the Miles City RMP. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this LUP. Effectiveness information used for these larger scale evaluations includes all-lands in the area of interest regardless of surface ownership/ management and will help inform where finer scale evaluations are needed such as population areas smaller than a LUP or PACs within a LUP (described in Section II). The information will also include the trend of disturbance within these areas of interest which informs the need to initiate adaptive management responses as described in the Miles City RMP.

Effectiveness monitoring reported for these larger areas provides the context to then conduct effectiveness monitoring at finer scales and helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines. These large area evaluations would not exclude the need for concurrent finer scale evaluations where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse planning strategy, the BLM and USFS will evaluate the answers to the following questions and prepare a broad and mid-scale effectiveness report:

1. Sagebrush Availability and Condition:

    a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
    b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre Euro-American historical distribution of sagebrush (BpS)?
    c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?

2. Habitat Degradation and Intensity of Activities:

    a. What is the amount of habitat degradation and the change in that amount?
    b. What is the intensity of activities and the change in the intensity?
    c. What is the amount of reclaimed energy-related degradation and the change in the amount?

3. What is the population estimation of sage-grouse and the change in the population estimation?
4. How are the BLM and USFS contributing to changes in the amount of sagebrush?
5. How are the BLM and USFS contributing to disturbance?

The compilation of broad and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule, which may be accelerated to respond to critical emerging issues (in consultation with USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and will be consistent with and inform the BLM and the USFS adaptive management strategy (see "Adaptive Management" section of the EIS).

To determine the effectiveness of the sage-grouse objectives of the Miles City RMP, the BLM and USFS will evaluate the answers to the following questions and prepare a plan effectiveness report:

1. Is this plan meeting the sage-grouse habitat objectives?
2. Are sage-grouse areas within the land use plan meeting, or making progress towards meeting, land health standards, including the Special Status Species/ wildlife habitat standard?
3. Is the plan meeting the disturbance objective(s) within sage-grouse areas?
4. Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies identify the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM's EGIS Web Portal and the Geospatial Gateway.

Methods:
At the broad and mid- biological scales (PACs and above) the BLM and the USFS will summarize the vegetation, disturbance, and population data (when available). Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to appropriately report the metrics and may need to be combined to provide an estimate with an acceptable level of accuracy or they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM and USFS will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas due to successful restoration; and the amount of new disturbance the BLM/ USFS has permitted. This information could be supplemented with population data to understand the correlation between habitat and PACs within a population when population data are available. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will utilize the information from Measure 1a (Section B1, Sagebrush Availability) and calculate the change from the 2012 Baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (Section B1, Sagebrush Availability) will be utilized. To calculate the trend in the condition of sagebrush at the mid-scale, 3 sources of data will be utilized: the BLM Grass/ Shrub mapping effort (Section B1, Future Plans); the results from the calculation of the landscape indicators such as patch size (described below); and the BLM Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data is collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid-scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid-scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and

fragmentation at the broad and mid-scales will be utilized using the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with NRCS. The objective of the LMF effort is to provide non-biased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. *in press*), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented BLM, USFWS, WAFWA, NRCS, ARS, state wildlife agencies, and academia. The common indicators that were identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS Rangeland Monitoring Survey.

The Sage-grouse Intensification baseline data will be collected over a 5 year period and an annual Sage-grouse Intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report which will be available on an annual basis thereafter contingent upon continuation of the current monitoring budget. This information, in combination with the Grass/ Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the Planning Strategy Effectiveness Report.

Calculating Question 2, Planning Strategy Effectiveness: The amount of habitat degradation and the intensity of the activities in the area of interest will utilize the information from Measures 2 and 3 (Section B2, Habitat Degradation). The amount of reclaimed energy-related degradation will be collected by the FO on plugged and abandoned and oil/gas well sites. The data will demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the Planning Strategy Effectiveness Report.

Calculating Question 3, Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section C, Population Monitoring) will be used to answer Question 3 of the Planning Strategy Effectiveness Report.

Calculating Question 4, Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of sagebrush in the area of interest will utilize the information from Measure 1a (Section B1, Sagebrush Availability).This measure is derived from the national data sets that remove sagebrush (Sagebrush Availability, Table 2). To determine the relative contribution of the BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in area of interest. This information will be used to answer Question 4 of the Planning Strategy Effectiveness Report.

Calculating Question 5, Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of disturbance in the area of interest will utilize the information from Measure 2a (Section B2, Habitat Degradation, Percent) and Measure 3 (Section B2, Habitat Degradation, Intensity). These measures are all derived from the national disturbance data sets that degrade habitat (Habitat Degradation, Table 2). To determine the relative contribution of the BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in area of interests. This information will be used to answer Question 5 of the Planning Strategy Effectiveness Report.

Answering the 5 questions that determine the effectiveness of the BLM/ USFS Planning Strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence the objectives of the Planning Strategy to maintain populations and

their habitats have been met. Conversely, where information indicates sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and populations are declining relative to the baseline, there is evidence the objectives of the Planning Strategy are not being achieved. This would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

At the Land Use Plan area, the BLM and the USFS will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM/ USFS surface management areas and will help inform where finer scale evaluations are needed such as seasonal habitats, corridors, or linkage areas. The information should also include the trend of disturbance within the sage-grouse areas which informs the need to initiate adaptive management responses as described in the Miles City RMP.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting Land Health Standards in sage-grouse areas will both be used as part of the determination of the effectiveness of the LUP in meeting the vegetation objectives in sage-grouse habitat set forth in this LUP. The collection of this data will be the responsibility of the Field Office/Ranger District. In order for this data to be consistent and comparable, common indicators, consistent methods, and a nonbiased sampling framework should be implemented following the principles in the AIM Strategy (Toevs, et al, BLM TN 440 BLM Core Indicators and Methods), in the BLM Technical Reference Interpreting Indicators of Rangeland Health (Pellant et al. 2005), and the HAF (Stiver et al. in press) or other approved WAFWA MZ consistent guidance to measure and monitor sage-grouse habitats. The analysis of this information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used as part of the determination of the effectiveness of the LUP in meeting the disturbance objectives set forth in this LUP. National data sets can be used to calculate the amount of disturbance, but Field Office data will likely increase the accuracy of this estimate. This information will be used to answer Question 2 of the Land Use Plan Effectiveness Report.

Calculating Question 3, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available and will part of the determination of effectiveness. This population data (Section C, Population Monitoring) will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the land use plan will be used to inform the need for finer scales investigations, initiate Adaptive Management actions as described in Chapter 2, initiate causation determination, and/ or determine if changes to management decisions are warranted. The measures used at the broad and mid-scales will provide a suite of characteristics from which the effectiveness of the adaptive management strategy will be evaluated.

II. FINE AND SITE SCALES

Fine scale (third order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges including breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek, or lek group within a population or subpopulation area. Fine and site scale monitoring should inform LUP effectiveness monitoring (see Section D, Effectiveness Monitoring) and the hard and soft triggers identified in the Adaptive Management section of the land use plan.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation as well as vegetation associated with riparian areas, wet meadows, and other mesic

habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (Section III), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan of the Miles City RMP. The need for fine and site-scale specific habitat monitoring will vary by area depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluating the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM AIM Strategy (Toevs, et. al., 2011) and AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy (Taylor, et.al., *in press*). Approved monitoring methods are:

- BLM Core Terrestrial Indicators and Methods, (MacKinnon, et. al, 2011);
- BLM Technical Reference Interpreting Indicators of Rangeland Health (Pellant et al. 2005); and
- Sage-Grouse Habitat Assessment Framework.

Other state-specific disturbance tracking models include: the BLM Wyoming Density and Disturbance Calculation Tool (http://ddct.wygisc.org/); and the BLM White River Data Management System (WRDMS) in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine and site scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the assessment, inventory and monitoring (AIM) strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF and any such adjustments should be ecologically defensible. However, to foster consistency, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for doing so and that justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site scale indicators they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer reviewed by the appropriate wildlife management agency(s) and researchers.

When conducting land heath assessments, at a minimum, the BLM should follow Interpreting Indicators of Rangeland Health (Pellant, et. al., 2005) and the BLM Core Terrestrial Indicators and Methods, (MacKinnon, et. al, 2011). If the assessment is being conducted in sage-grouse areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and roll-up analysis among management units; will be useful to provide consistent data to inform the classification and interpretation of imagery; and will provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section D, Effectiveness Monitoring).

III. CONCLUSION

This Greater Sage-grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid-scales and sets the stage for BLM and USFS to collaborate with partners/other agencies to develop the Miles City RMP Monitoring Plan using this Greater Sage-grouse Monitoring Framework as a guide.

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ATTACHMENT A: AN OVERVIEW OF MONITORING COMMITMENTS

	Broad and Mid-scales					Fine & Site Scales
	Implement-ation	**Sagebrush Availability**	**Habitat Degradation**	**Population**	**Effectiveness**	
How will the data be used?	Tracking and documenting implementation of land use plan decisions and inform adaptive management	Tracking changes in land cover (sagebrush) and inform adaptive management	Tracking changes in disturbance (threats) to sage-grouse habitat and inform adaptive management	Tracking trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	Characterizing the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management	Measuring seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculating disturbance and inform adaptive management
Who is collecting the data?	BLM FO and FS Forest	NOC and NIFC	National data sets (NOC), BLM FOs and FS Forests as applicable	State wildlife agencies through WAFWA	Comes from other broad and mid-scale monitoring types, analyzed by the NOC	BLM FO and SO, FS Forests and RO (with partners) including disturbance
How often are the data collected, reported and made available to USFWS?	Collected and reported annually; summary every 5 years	Updated and changes reported annually; summary reports every 5 years	Collected and changes reported annually; summary reports every 5 years	State data reported annually per WAFWA MOU; summary reports every 5 years	Collected and reported every 5 years (coincident with LUP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
What is the spatial scale?	Summarized by LUP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by MZ, and LUP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)
What are the potential personnel and budget impacts?	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained; data mgmt cost are TBD	At a minimum, current skills and capacity must be maintained; data mgmt and data layer purchase cost are TBD	No additional personnel or budget impacts for BLM or USFS	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment
Who has primary and secondary responsibilities for reporting?	1) BLM FO & SO; FS Forest & RO 2) BLM & FS Planning	1) NOC 2) WO	1) NOC 2) BLM SO, FS RO & appropriate programs	1) WAFWA & state wildlife agencies 2) BLM SO, FS RO, NOC	1) Broad and mid-scale at the NOC, LUP at BLM SO, USFS RO	1) BLM FO & FS Forests 2) BLM SO & FS RO
What new processes/ tools are needed?	National implementation data sets and analysis tools	Updates to national land cover data	Data standards and roll-up methods for these data	Standards in population monitoring (WAFWA)	Reporting methodologies	Data standards data storage; and reporting

ATTACHMENT B: LIST OF ALL SAGEBRUSH SPECIES AND SUBSPECIES INCLUDED IN THE SELECTION CRITERIA FOR BUILDING THE EVT AND BPS LAYERS

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*

ATTACHMENT C: USER AND PRODUCER ACCURACIES FOR AGGREGATED ECOLOGICAL SYSTEMS WITHIN LANDFIRE MAP ZONES

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historic Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

There are two anomalous map zones with 0% user and producer accuracies attributable to no available reference data for the ecological systems of interest.

Producer's accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? ***Omission Error*** equates to excluding a pixel that should have been included in the class (i.e., omission error = 1 - producers accuracy).

User's accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? ***Commission Error*** equates to including a pixel in a class when it should have been excluded (i.e., commission error = 1 – user's accuracy).

GRSG REGIONAL MITIGATION STRATEGY APPENDIX

INTRODUCTION

In undertaking BLM/USFS management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM/USFS will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM/USFS management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see glossary).

The BLM/USFS, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to greater sage-grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to greater sage-grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Developing a WAFWA Management Zone Regional Mitigation Strategy

The BLM/USFS, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM/USFS management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level greater sage-grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2, the BLM/USFS will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of greater sage-grouse, within 90 days of the issuance of the Record of Decision. The Strategy will be developed within one year of the issuance of the Record of Decision.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

Avoidance

Include avoidance areas (e.g. right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g. Resource Management Plans, Forest Plans, State Plans); and,

Include any potential, additional avoidance actions (e.g. additional avoidance best management practices) with regard to greater sage-grouse conservation.

Minimization

Include minimization actions (e.g. required design features, best management practices) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and,

Include any potential, additional minimization actions (e.g. additional minimization best management practices) with regard to greater sage-grouse conservation.

Compensation

Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.

Residual Impact and Compensatory Mitigation Project Valuation Guidance

A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.

This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project. For compensatory mitigation projects, consideration of durability (see glossary), timeliness (see glossary), and the potential for failure (e.g. uncertainty associated with effectiveness) may require an upward adjustment of the valuation.

The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for Greater Sage-grouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).

Compensatory Mitigation Options

Options for implementing compensatory mitigation should be identified, such as:

- Utilizing certified mitigation/conservation bank or credit exchanges.
- Contributing to an existing mitigation/conservation fund.
- Authorized-user conducted mitigation projects.

For any compensatory mitigation project, the investment must be additional (i.e. additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).

Compensatory Mitigation Siting

Sites should be in areas that have the potential to yield a net conservation gain to the greater sage-grouse, regardless of land ownership.

Sites should be durable (see glossary).

Sites identified by existing plans and strategies (e.g. fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to greater sage-grouse and are durable.

Compensatory Mitigation Project Types and Costs

Project types should be identified that help reduce threats to greater sage-grouse (e.g. protection, conservation, and restoration projects).

Each project type should have a goal and measurable objectives.

Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.

To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.

Compensatory Mitigation Compliance and Monitoring

Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.

Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.

Compensatory Mitigation Reporting

Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.

Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if greater sage-grouse conservation has been achieved and/or to support adaptive management recommendations.

Compensatory Mitigation Program Implementation Guidelines

Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

Incorporating the Regional Mitigation Strategy into NEPA Analyses

The BLM/USFS will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM/USFS management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program

The BLM/USFS need to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA Management Zone, a Field Office, or a Forest), in collaboration with our partners (e.g. Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM/USFS will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the Record of Decision. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM/USFS will remain responsible for making decisions that affect Federal lands.

Glossary Terms

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (Adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g. may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements). (Adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (Adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): the maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (Adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

GREATER SAGE-GROUSE REQUIRED DESIGN FEATURES APPENDIX

INTRODUCTION

This appendix includes the Required Design Features for Greater Sage-Grouse Habitat. Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

REQUIRED DESIGN FEATURES FOR HOW TO MAKE A POND THAT WON'T PRODUCE MOSQUITOES THAT TRANSMIT WEST NILE VIRUS (from Doherty 2007)

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtmann et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.

6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

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REQUIRED DESIGN FEATURES FOR FLUID MINERAL DEVELOPMENT

Priority Habitat Management Areas (PHMA)

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among right-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.

- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
- Overbuild size of ponds for muddy and non-vegetated shorelines.
- Build steep shorelines to decrease vegetation and increase wave actions.
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
- Construct dams or impoundments that restrict down slope seepage or overflow.
- Line the channel where discharge water flows into the pond with crushed rock.
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- The BLM would work with proponents to limit project-related noise where it would be expected to reduce functionality of habitats that support GRSG populations. The BLM would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.
- As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated, and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on GRSG population behavioral cycles.

- As new research is completed, new specific limitations would be coordinated with the MFWP and partners. Noise levels at the perimeter of the lek should not exceed 10 dBA above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. in preparation).
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside PH and design them to reduce noise that may be directed towards PH.
- Clean up refuse.
- Locate man camps outside of PH.

Reclamation

- Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

General Sage-Grouse Habitat Management Areas (GHMA)

- Make applicable BMPs mandatory as Conditions of Approval (COA) within GH. BMPs are continuously improving as new science and technology become available and therefore are subject to change. At a minimum include the following BMPs:

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Use directional and horizontal drilling to reduce surface disturbance.

- Clean up refuse.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Doherty 2007).

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

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REQUIRED DESIGN FEATURES FOR FIRE AND FUELS

Fuels Management

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-rouse biology, habitat requirements, and identification of areas utilized locally.
3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly et al. 2000*)
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within two miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond two miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to ail in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management

1. Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.
2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire

suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.

4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
5. During periods of multiple fires, ensure line officers are involved in setting priorities.
6. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
7. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
8. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
9. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
11. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

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INTRODUCTION

The following measures would be applied as RDFs for all solid minerals. They would also apply to locatable minerals subject to valid existing rights and consistent with applicable law. The measures outlined below would be applied as recommended BMPs for locatable minerals. The RDFs or BMPs would be applied as appropriate in PH and GH, and to the extent allowable by law (i.e., to prevent unnecessary and undue degradation).

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e.g., use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.
- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
- Overbuild size of ponds for muddy and non-vegetated shorelines.
- Build steep shorelines to decrease vegetation and increase wave actions.
- Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
- Construct dams or impoundments that restrict down slope seepage or overflow.
- Line the channel where discharge water flows into the pond with crushed rock.
- Construct spillway with steep sides and line it with crushed rock.
- Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- Require sage-grouse-safe fences around sumps.
- Clean up refuse (Bui et al. 2010).
- Locate man camps outside of PH.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

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LANDS AND REALTY-RENEWABLE ENERGY APPENDIX

INTRODUCTION

This appendix contains in-depth information for lands and realty and renewable energy in the planning area. Information includes:

- carbon geo-sequestration,
- right-of-way (ROW) corridors,
- conveyance of federally owned mineral interests,
- information regarding land ownership adjustments,
- withdrawals, and
- wind energy program guidance and best management practices (BMPs).

LANDS AND REALTY

CARBON GEO-SEQUESTRATION

Applications for carbon geo-sequestration exploration and site characterization projects and long-term sequestration projects would be processed in accordance with Bureau-wide policy and direction.

Conditions of approval, BMPs, and design features used when developing oil and gas resources would be applied to authorizations for carbon geo-sequestration projects (see the *Minerals Appendix*, under *Oil and Gas, Conditions of Approval*, and *Best Management Practices* and the Bureau of Land Management (BLM) oil and gas website, http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/technical_information.html, for more information).

Stipulations for projects may be changed by application of waivers, exceptions, or modifications to protect or mitigate other resource values while allowing carbon geo-sequestration (see the *Minerals Appendix*).

ROW CORRIDORS

Major transportation and energy corridors were considered but not analyzed in detail. Because the planning area contains a scattered or checkerboard land pattern of federal lands mixed with private and state lands, an alternative to consider corridors would not be achievable during implementation. Instead, this resource management Plan (RMP) has a BMP which states that "Whenever possible, ROWs would be constructed within or next to compatible existing ROWs, such as roads, pipelines, communication sites, and railroads." Also, the following Assumption is included in the Lands and Realty Assumptions Section of Chapter 4, “It is assumed that new Major ROWs would be located within or next to compatible existing Major ROWs, for example within or next to the Bison Pipeline ROW area (MTM-98321) and the Bridger-Butte Pipeline (MTM-018460)/WBI Grasslands Pipeline (MTM-91539) ROWs area in Carter County.” Not concentrating some major ROW facilities in certain areas could reduce their vulnerability and, because they rely upon these facilities, the public’s vulnerability, to potential natural disasters or terrorism.

CONVEYANCE OF FEDERALLY OWNED MINERAL INTERESTS

Section 209(b) of the Federal Land Policy and Management Act (FLPMA) provides for the conveyance of mineral interests owned by the United States where the surface is, or will be, in non-federal ownership. There must be a finding that there are no known mineral values in the land or that the reservation of the mineral rights in the United States is interfering with or precluding appropriate non-mineral development of the land and that such development is a more beneficial use of the land than mineral development. Such conveyance of mineral

interests can only be made to the existing or proposed record owner of the surface upon payment of administrative costs and the fair market value of the interests being conveyed.

GENERAL INFORMATION PERTAINING TO LAND OWNERSHIP ADJUSTMENTS

The Federal Land Policy and Management Act states, "The Congress declares that it is the policy of the United States that – (1) the public lands be retained in Federal ownership, unless as a result of the land use planning procedures provided for in this Act, it is determined that disposal of a particular parcel will serve the national interest;" Sec. 102.(a)(1).

Lands are categorized for management into three categories:

- Category 1 retention lands, which will not be transferred from BLM management by any method during the life of the plan (unless the plan is amended). These lands include Congressionally designated wilderness, WSAs, and lands acquired with Land and Water Conservation Fund Act appropriations;
- Category 2 retention lands, which are available to be considered for limited disposal through all disposal authorities and methods except by sale under Section 203 of FLPMA (unless the plan is amended); and
- Category 3 disposal lands, which are available to be considered for disposal through all disposal methods, including sale.

METHODS OF ACQUISITION

Acquisition of lands or interests in lands would be by such methods as exchange, purchase, donation, or public agency jurisdictional transfer.

METHODS OF DISPOSAL

Disposal methods to implement land ownership adjustment actions would include the following:

- exchanges,
- sales,
- Recreation and Public Purposes Act conveyances,
- airport grants,
- public agency jurisdictional transfers,
- state grants, including Indemnity Selections
- agricultural entries, and
- Indian allotments.

Mineral patents are not considered a land ownership adjustment for the purposes of this plan.

RETENTION, DISPOSAL, AND ACQUISITION (INCLUDING ACCESS) CRITERIA

The retention and disposal lands identified in the Big Dry and Powder River RMPs, as amended (BLM 1985c and 1996) are carried forward into this plan. There are approximately 83,000 acres of Category 1 land and 2.6 million acres of Category 2 lands which are identified for retention and 83,000 acres of Category 3 land identified as available for disposal in the planning area as shown on Map 14. These acreage figures are approximate and it should not be inferred that they reflect exact or precise acres. Land ownership adjustments would be considered in accordance with applicable laws and regulations on a case-by-case basis based on retention, acquisition, and disposal criteria, which can be found below. Disposal of individual tracts within Category 2 lands may occur when significant public benefits result. All land or mineral ownership adjustments and access actions would be based on a willing buyer and willing seller basis unless law, regulation, court order, or Congressional action required otherwise.

LAND EXCHANGES

This type of real estate transaction is typically processed under the authority of FLPMA and involves the discretionary, voluntary exchange of lands or interest in lands between the federal government and a nonfederal party. It is required that:

- the federal and non-federal lands involved be located in the same state;
- the federal and non-federal lands be of equal value, or in certain circumstances, approximately equal in value; and
- exchanges be completed only after a finding that the public interest would be well served.

In considering whether an exchange is in the public interest, consideration is given to the opportunity to:

- achieve better management of federal lands;
- meet the needs of state and local residents and their economies; and
- secure important objectives, including but not limited to, protection of fish and wildlife habitats, cultural resources, watersheds, wilderness and aesthetic values; enhancement of recreation opportunities and public access; consolidation of lands or interests in lands; consolidation of split estate; expansion of communities; accommodation of land use authorizations; promotion of multiple-use values; and fulfillment of public needs.

In making the public interest determination, there needs to be a finding that:

- the resource values and the public objectives that the federal lands or interests to be conveyed may serve if retained in federal ownership are not more than the resource values of the non-federal lands or interests and the public objectives they could serve if acquired, and
- the intended use of the conveyed federal lands will not significantly conflict with established management objectives on adjacent federal lands and Indian trust lands.

COMPARISON TO OTHER METHODS OF DISPOSAL OR ACQUISITION INCLUDING ACCESS

To help assure the integrity of state and local tax bases, land exchange would be the first priority for both acquisition and for the conveyance into nonfederal ownership of those parcels identified for disposal, except under the circumstances described below.

- Land sale may be considered where there is a competitive market situation and multiple entities are interested in a parcel of land.
- A disposal method other than exchange may be considered where one of the following situations applies:
    - for resolving inadvertent unauthorized use or occupancy;
    - for providing for community expansion and development;
    - for meeting obligations completing state selections; and
    - for creating facilities or service for public health, safety, and welfare.

Sales

Sales of public lands are authorized under section 203 of FLPMA and made at not less than fair market value. Public lands determined suitable for sale are offered only on the initiative of the BLM. Such sales have to meet at least one of the FLPMA sales criteria described below.

- Section 203(a)(1): such tract, because of its location or other characteristics, is difficult and uneconomic to manage as part of the public lands and is not suitable for management by another federal department or agency;

- Section 203(a)(2): such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose; or
- Section 203(a)(3): disposal of such tract will serve important public objectives (including but not limited to, expansion of communities and economic development) that cannot be achieved prudently or feasibly on land other than public land and that outweigh other public objectives and values (including, but not limited to, recreation and scenic values) which would be served by maintaining such tract in federal ownership.

The preferred method of sale of public lands is by competitive bidding at public auction. However, modified competitive bidding may be used to protect on-going uses, to assure compatibility of the possible uses with adjacent lands, or to avoid dislocation of existing users. Direct sale may be used when the public lands offered for sale are; 1) completely surrounded by lands in one ownership, 2) with no public access, 3) where the lands are needed by state or local governments or non-profit corporations, or 4) where necessary to protect existing equities in the lands or resolve inadvertent unauthorized use or occupancy.

Direct Purchases

Direct purchases would generally be limited to cases where no practical alternatives exist and high public values would be obtained. Such actions would need to meet the acquisition criteria for the particular alternative being considered.

LAND PATTERN REVIEW CRITERIA

The public lands subject to these criteria are those lands, minerals, or interests in land administered by BLM. Criteria are presented to assist in categorizing the public lands for retention or disposal. Criteria are also provided to facilitate the selection of lands to be received in exchanges or other types of acquisition. The criteria range from specific to general and are designed to provide direction for statewide consistency while allowing the manager flexibility in identifying circumstances that dictate the category in which lands can be placed. All land or mineral ownership adjustments and access actions would be based on a willing buyer and willing seller basis unless law, regulation, court order, or Congressional action required otherwise.

A. Retention: The BLM's long-term objectives for retention areas are to retain and manage the public lands. Specific objectives are to consolidate public land with public access and important resource values into units the BLM can effectively manage. Although the underlying philosophy is long-term public ownership, individual tracts or parcels in the retention areas may be disposed of or repositioned through exchange when significant management efficiency, greater public values, or other objectives would be met and the public interest better served. Retention criteria follow.

    1. Areas of national environmental significance, including but not limited to:
        - wilderness and wilderness study areas (WSAs),
        - wild and scenic rivers,
        - national and historic trails,
        - national conservation areas,
        - wetlands and riparian areas under Executive Order 11990 (May 24, 1977),
        - other Congressionally designated areas,
        - wild horse management areas, and
        - areas of critical environmental concern.
    2. Areas of national economic significance including, but not limited to:
        - designated Mineral Resource Areas where disposal of the surface would unnecessarily interfere with the logical development of the mineral estate, e.g., surface minerals, coal, phosphate, known geologic structures, and others; and
        - public lands containing strategic minerals needed for national defense.
    3. Public lands used in support of national defense, including but not limited to National Guard maneuver areas.

4. Areas where management is cost-effective or lands containing other important characteristics and public values that can best be managed in public ownership by BLM, including but not limited to:
    - key tracts along rivers and lakes,
    - community watersheds and/or flood-plains,
    - wildlife priority areas (including greater sage-grouse), and
    - important hunting or fishing areas.
5. Lands with a combination of broad multiple use values that dictate they should be retained in public ownership and managed by the BLM.
6. Areas where future plans will lead to further consolidation and improvement of land patterns and reduce the costs of management.
7. Areas that the general public and state and local governments consider suitable for permanent public ownership.
8. Public lands withdrawn by the BLM or other federal agency for which the purpose of the withdrawal remains valid and the resource uses can be managed by the BLM concurrently.
9. Public lands that contribute significantly to the stability of the local economy by virtue of federal ownership.
10. Public lands that provide public access and contain previously mentioned public values which, when considered together, warrant their retention.

B. Lands considered for disposal are lands identified for potential removal from public ownership through sale or exchange, or transfer to federal, state, county, or local public entities. The public land in the disposal areas consists of many small tracts or parcels that are widely scattered, possess limited resource values, and are difficult to manage. Although the BLM's objective is to dispose of these types of public land in the disposal area, tracts would be retained if the environmental analyses show resource values worth retaining. In addition to land internally identified for disposal, the BLM will respond to proposals from the public. Exchanges or acquisitions may be considered to acquire desirable tracts within the disposal areas or add to existing public lands within these areas meeting the long-term management objective criteria. Disposal actions would be processed in accordance with Title II of FLPMA of October 21, 1976 based upon the criteria described below.

1. Lands of limited public value.
2. Widely scattered parcels that are difficult for the BLM to manage with anything beyond minimal custodial administration and are not suitable for management by another Federal department or agency.
3. Lands with high public values proper for management by other federal agencies or state or local governments.
4. Lands around expanding communities and lands available for community expansion.
5. Lands where disposal would aid in aggregating or repositioning other public lands or public land resource values to facilitate national, state, and local objectives.
6. Lands acquired for a specific federal purpose that are no longer required for that or any other federal purpose.
7. Lands with long term unauthorized use problems and lands not required for specific public purposes.
8. Lands where disposal would increase the range of economic opportunities provided to the general public.
9. Lands designated for agricultural, commercial, or industrial development as the highest value or most appropriate long-term use.
10. Lands involved in BLM and United States Forest Service jurisdictional transfers, state indemnity selections, or ongoing exchanges will continue as initiated.

C. Acquisition Criteria: used to evaluate proposals that would result in the transfer of lands or minerals, or interests in lands, including access, to the BLM through exchange, purchase, donation, or other transactions.

1. These criteria help to assure that any BLM decision to acquire a tract of land provides significant public benefits.
2. The criteria range from "general" standards, against which to evaluate all proposals, to "specific" guidelines covering the selected or prioritized program areas.
3. These standards are designed to provide consistent direction, while allowing the line manager flexibility to meet local, state, and national needs.

General Criteria

All proposals will be evaluated to determine if the selected lands will:

1. Facilitate access to areas retained for long-term public use.
2. Be primarily focused in the retention areas.
3. Facilitate national, state, and local BLM priorities or mission statement needs.
4. Place emphasis where BLM land use or activity plans are completed. Proposals must facilitate implementation or be consistent with these plans.
5. Stabilize or enhance local economics or values.
6. Meet long-term goals instead of short-term gains.
7. Be of sufficient size to improve use of adjoining public lands or, if isolated, large enough in scale to allow the identified potential public land use.
8. Allow more diverse or more intensive use or a change in uses to better fulfill the BLM's mission.
9. Maintain or enhance important and recognized public land values. Especially noteworthy are identified, designated, special, or high interest value areas.
10. Enhance the opportunity for new or emerging public land uses or values.
11. Contribute to a wide spectrum of uses or a large number of public land users.
12. Facilitate management practices, uses, scale of operations or degrees of management intensity that are viable under economic program efficiency standards.
13. Enhance designated ACECs.
14. Secure for the public significant water-related land interest, which would include lakeshore, riverfront, stream, or pond sites.
15. Secure important riparian or wetland areas.
16. Avoid acquisition of cultivated lands, buildings and other improvements, unless such acquisition is clearly necessary to attain a specific resource goal.

Cultural Resources

Any cultural site to be acquired should meet the following evaluation standards:

1. contain high research values;
2. be of moderate scarcity; and
3. possess some unique values, such as association with an important historic person or high aesthetic value.

Minerals

1. Consolidation of mineral estates.
2. Acquisition in response to a federal project need, as in the case of a dam project. Criteria for this type of acquisition would generally include:
    - the development of a federal project that precludes the mineral estate owner from exercising development rights, or
    - the exercise of the mineral estate owner's right of development that would materially interfere with the federal project.

Recreation

Acquire land with the following significant values:

1. national values, such as Congressionally designated areas, rivers, or trails;
2. state values that enhance recreation trails and waterways or interstate, state, and multi-county use; or
3. local values for extensive use, such as hunting and fishing or off-highway vehicle (OHV) and snowmobile use.

Wilderness

Acquire inholdings within WSAs and within the boundaries of Congressionally designated wilderness areas under BLM administration.

Wildlife Habitat Management

Areas for acquisition would be lands of any size with significant wildlife values as defined below:

1. Priority, special status, or sensitive species (including federally listed species, federal candidate species, and state-listed species of special concern);
2. Fisheries;
3. Big game (including important habitat such as crucial winter areas, fawning, calving, and security areas);
4. Upland game birds, migratory birds, and waterfowl (including crucial breeding, nesting, resting, roosting, feeding, and wintering habitat areas of complexes);
5. Raptors (including existing and potential nesting areas for sensitive species or significant nesting complexes for non-sensitive species); and
6. Non-game, including crucial habitat complexes.

WITHDRAWALS

A withdrawal is a management tool in the real estate tool box used to implement resource management planning prescriptions or as a means to transfer administrative jurisdiction from one federal agency to another. A withdrawal creates a title encumbrance on the land restricting an agency's ability to manage its lands under multiple use management principles. The restrictions generally segregate the lands from some or all the public land laws and some or all of the mining and mineral leasing laws for a specific period of time, generally 20 years for post FLPMA withdrawals.

There are four major categories of formal withdrawals:

1. Administrative - Made by the President, the Secretary of the Interior, or other authorized officer of the Executive branch of the Federal government. Examples include Executive Orders, Presidential Proclamations, Secretarial Orders, Public Land Orders, Departmental Orders, U.S. Geological Survey Orders, BLM Orders, etc. Currently, only the public land order signed by the Secretary or Assistant Secretary of the Interior is used for administrative withdrawals. However, the President still has authority to make emergency withdrawals.
2. Presidential Proclamations - Made by the President pursuant to the authority under the Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431). The President may use the authority to designate historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest.
3. Congressional - Legislative actions by Congress in the form of public laws (Acts of Congress). Examples are Wilderness designations, National Parks, Wild and Scenic River designations, etc.
4. Federal Power Act or Federal Energy Regulatory Commission Withdrawals - Established under the authority of the Federal Power Act of June 10, 1920. Such withdrawals are automatically created upon filing an application for hydroelectric power development with the Federal Energy Regulatory Commission, formerly the Federal Power Commission.

Withdrawals must accomplish one or more of the following:

- transfer total or partial jurisdiction of Federal land between Federal agencies,
- close (segregate) Federal land to operation of all or some of the public land laws and/or mineral laws, or
- dedicate Federal land to a specific public purpose.

INTERNATIONAL BOUNDARY

This withdrawal affects 158 acres of surface and mineral estate within Daniels County and 135 acres within Sheridan County. The purpose of the withdrawal is to establish a buffer zone between the United States and Canada. The withdrawal segregates the lands from all forms of entry, including mineral entry, although they are open to lease under the 1920 Mineral Leasing Act (BLM 1996).

MEDICINE LAKE NATIONAL WILDLIFE REFUGE

This withdrawal affects 22,742 acres of subsurface minerals, which includes 994 surface acres of public lands within Sheridan County. In Roosevelt County, 1,766 acres of subsurface minerals, including 40 acres of public surface acres, are withdrawn. This withdrawal established the Medicine Lake National Wildlife Refuge for the purpose of waterfowl protection. These lands are segregated from all forms of entry, including mineral entry, although they are open to leasing under the 1920 Mineral Leasing Act (BLM 1996).

FOX LAKE GAME MANAGEMENT AREA

This withdrawal affects 160 acres in Richland County. The lands are primarily used as wetlands habitat, and these lands are closed to entry, including location under the General Mining Law of 1872, and to oil and gas leasing pursuant to the classification agreement of February 5, 1965 (BLM 1996).

BUREAU OF SPORTS FISHERIES AND WILDLIFE WATERFOWL PRODUCTION AREA

This withdrawal affects 26 acres of subsurface minerals and public surface. The land is situated in the extreme northeast corner of Montana, within the Prairie Potholes region. The withdrawal segregates the lands from all forms of entry, including mineral entry, although they are open to leasing under the 1920 Mineral Leasing Act (BLM 1996).

CHARLES M. RUSSELL NATIONAL WILDLIFE REFUGE

In total, 290,222 acres of public lands are withdrawn in Garfield and McCone counties for refuge purposes (BLM 1996). Federal minerals underlying the private surface are subject to the conditions of the withdrawal. The withdrawal segregates the lands from all forms of entry, including mineral entry. Mineral leasing is restricted only to cases involving drainage and does not permit surface occupancy. Of these lands withdrawn, 206,976 acres are also included in the Corps of Engineers withdrawal for the Fort Peck Dam (BLM 1996).

UNITED STATES ARMY CORPS OF ENGINEERS, FORT PECK DAM

Public lands totaling 210,732 acres are withdrawn for the United States Army Corps of Engineers. Of these, 206,976 acres overlap the Charles M. Russell National Wildlife Refuge withdrawal. This withdrawal segregates the land from entry with the exception of restricted mineral entry for metalliferous mining. A majority of the land in this withdrawal was recommended for relinquishment, with those lands used for the operation of the dam and hydroelectric facilities, consisting of 3,756 acres, to remain under the effect of the withdrawal (BLM 1996).

FORT UNION TRADING POST NATIONAL HISTORIC SITE

This withdrawal of 62 acres was to the National Park Service for this historic site established by an Act of Congress on June 20, 1966, and modified by an Act of Congress on November 20, 1978 (BLM 2010g).

FORT KEOGH LIVESTOCK EXPERIMENT STATION

This station was established by an Act of Congress in 1924. Prior to dedication of these lands for livestock research, the lands were reserved as a waterfowl refuge, pre-dated by a military reserve. The lands are withdrawn from all forms of entry, including mineral entry. Mineral leasing is allowed under the terms of the withdrawal. Because the withdrawal was invoked by Congress, revocation can only occur by an Act of Congress. No revocation or modification of this withdrawal has been proposed. The withdrawal affects a total of 55,765 acres of land within the planning area (BLM 1985c, 1996, and 2010g).

BELLTOWER TOWNSITE

Located in Carter County, the 80-acre Belltower Townsite withdrawal was created by Executive Order 2147 on March 16, 1915 (BLM 2010g).

LOWER YELLOWSTONE PROJECT (BUREAU OF RECLAMATION)

This withdrawal affects approximately 51,872 acres of public land in Richland and Dawson counties. The lands lie along the Yellowstone River, from the area of Glendive, Montana, to the mouth of the Yellowstone River in western North Dakota. Several withdrawal actions were enacted between 1903 and 1969 for the project and a majority of these lands were second-form withdrawals, which allowed homestead entry subject to specific conditions. All lands were subsequently open to mineral leasing following passage of the Mineral Leasing Act of 1920. About 860 acres of this withdrawal were recommended for revocation (BLM 1996 and 2010g).

FORT BUFORD PROJECT (BUREAU OF RECLAMATION)

This withdrawal affects 914 acres of lands along the Yellowstone River in Dawson and Richland counties. This withdrawal was recommended for revocation (BLM 1996). The withdrawal segregated the lands from all forms of entry, including mineral entry, but left the land open to mineral leasing.

PUBLIC WATER RESERVE 107 (MCCONE COUNTY)

This withdrawal includes 238 acres of public lands for water reserves in McCone County (BLM 1996). Two hundred acres of the overall total lies within the Charles M. Russell National Wildlife Refuge boundary. This withdrawal was recommended for revocation since reservations of local water sources are no longer needed to protect public interests. Furthermore, this action opens 37 acres to public land laws, while the remaining 200 acres are subject to the conditions of the Charles M. Russell National Wildlife Refuge withdrawal.

MILK RIVER PROJECT (BUREAU OF RECLAMATION)

This withdrawal affects 37 acres in McCone County for the Bureau of Reclamation's Milk River Project (BLM 1996). This withdrawal was combined for review with the Milk River Project in the Lewistown District. Withdrawal on two parcels is in effect along the Missouri River in McCone County for the projects. The withdrawals segregate the lands from entry, including mineral entry under the General Mining Law, although the lands remain open for leasing under the 1920 Mineral Leasing Act. This withdrawal was recommended for revocation.

BUFFALO RAPIDS PROJECT

A total of approximately 305 acres is withdrawn for the Bureau of Reclamation in Prairie and Dawson counties for the Buffalo Rapids Project. This was a first form withdrawal, which closes the lands to all forms of entry, although mineral leasing is allowed. This withdrawal was recommended for revocation because there are no physical improvements. Relinquishment opens these lands to operation under existing statutes (BLM 1996 and 2010g).

POWER SITES

Primarily located in the Moorhead area, approximately 2,777 acres have been withdrawn by classification for power site purposes. These sites are expected to be revoked. The Moorhead Reservoir Withdrawal, consisting of approximately 2,700 acres was revoked in 1982.

TONGUE RIVER RESERVOIR

A total of 160 acres were withdrawn from settlement, location, sale, or entry by Executive Order 7960 for Reservoir Site Reserve No. 20 on August 22, 1938. Forty acres of these lands have been transferred out of BLM administration, and revocation has been recommended for the remaining lands (BLM 2010g).

BIA-NORTHERN CHEYENNE TRUST-WATER RIGHTS SETTLEMENT

Jurisdiction of 320 acres in Big Horn County near the Tongue River Reservoir was transferred to the BIA in Trust for the Northern Cheyenne Tribe as part of the Northern Cheyenne Water Settlement Act (106 Statute 1186) in 1994 (BLM 2010g).

BIA-CROW TRUST-CROW BOUNDARY SETTLEMENT

Jurisdiction of approximately 9,873 acres of minerals or surface in Big Horn County, within the Miles City and Billings field offices, was transferred to the BIA in Trust for the Crow Tribe as part of the Crow Boundary Settlement Act in 1995 (BLM 2010g).

RENEWABLE ENERGY

Information on renewable energy can be found on BLM's web page at http://www.blm.gov/wo/st/en/prog/energy.html and the Department of Energy National Renewable Energy Laboratory site at http://www.nrel.gov. The Department of Energy's National Renewable Energy Laboratory maps and information would be used when considering and evaluating wind and solar project proposals and applications.

BLM continues to issue updated policies and guidance on renewable energy development including a suite of instruction memorandums in 2011 (WO IM Nos. 2011-059, 060, and 061).

Requests for solar energy project ROWs would be processed according to Washington Office (WO) direction, currently provided via Instruction Memorandum (IM) 2011-003 (BLM 2010d). General guidance outlined in the Record of Decision for Solar Energy Development in Six States, dated October 12, 2012, would also be used as applicable for processing solar ROW applications (for more information see http://solareis.anl.gov/).

Maps of Potential Wind Development Areas depicting areas in Wind Class 4 and above with few or no known resource restrictions in which ROW applications for wind energy projects could be considered can be found for each alternative in Volume IV.

BLM WIND ENERGY PROGRAM POLICIES AND BMPS

The BLM has established a number of policies, provided below, and BMPs (see the BMP Appendix) regarding the development of wind energy resources on BLM-administered public lands.

<The following policies are from Attachment 1 of BLM WO IM No. 2009-043, December 19, 2008).>
The policies and BMPs are applicable to all wind energy development projects on BLM-administered public lands. The policies address the administration of wind energy development activities, and the BMPs identify required mitigation measures that will be incorporated into project-specific Plans of Development (PODs) and right-of-way (ROW) authorization stipulations. Additional mitigation measures will be applied to individual projects, in the form of stipulations in the ROW authorization as appropriate, to address site-specific and species-specific issues.

Policies

- The BLM will not issue ROW authorizations for wind energy development on lands on which wind energy development is incompatible with specific resource values. Lands excluded from wind energy site monitoring and testing and development include designated areas that are part of the National Landscape Conservation System (NLCS) (e.g., Wilderness Areas, Wilderness Study Areas, National Monuments, National Conservation Areas, Wild and Scenic Rivers, and National Historic and Scenic Trails). (Wind energy development is permitted in one NCA, the California Desert Conservation Area, in accordance with the provisions of the California Desert Conservation Area Plan 1980, as amended.) Additional areas may be excluded from wind energy development based resource impacts that cannot be mitigated and/or conflict with existing multiple-use activities or land use plans. Areas of Critical Environmental Concern (ACEC) are not universally excluded from wind energy site monitoring and testing or wind energy development, but will be managed consistent with the management prescriptions for the individual ACEC.
- To the extent possible, wind energy projects shall be developed in a manner that will not prevent other land uses, including minerals extraction, livestock grazing, recreational use, and other ROW uses.
- Entities seeking to develop a wind energy project on BLM-administered lands shall consult with appropriate Federal, State, and local agencies regarding specific projects as early in the planning process as appropriate to ensure that all potential construction, operation, and decommissioning issues and concerns are identified and adequately addressed.
- The BLM will initiate government-to-government consultation with Indian tribal governments whose interests might be directly and substantially affected by activities on BLM-administered lands as early in the planning process as appropriate to ensure that construction, operation, and decommissioning issues and concerns are identified and adequately addressed.
- Entities seeking to develop a wind energy project on BLM-administered lands shall consult with the U.S. Department of Defense (DOD), in conjunction with BLM Washington Office and Field Office staff, regarding the location of wind power projects and turbine siting as early in the planning process as appropriate. This consultation shall occur concurrently at both the installation/field level and the Pentagon/BLM Washington Office level. The consultation process is outlined in an interagency protocol agreement.
- The BLM will consult with the U.S. Fish and Wildlife Service (USFWS) as required by Section 7 of the Endangered Species Act of 1973 (ESA). The specific consultation requirements will be determined on a project-by-project basis.
- The BLM will consult with the State Historic Preservation Office (SHPO) as required by Section 106 of the National Historic Preservation Act of 1966 (NHPA). The specific consultation requirements will be determined on a project-by-project basis. If programmatic section 106 consultations have been conducted and are adequate to cover a proposed project, additional consultation may not be needed.
- Existing land use plans will be amended, as appropriate, to (1) adopt provisions of the BLM's Wind Energy Development Program, (2) identify land considered available for wind energy development, and (3) identify land that will not be available for wind energy development.
- The level of environmental analysis to be required under the National Environmental Policy Act (NEPA) for individual wind power projects will be determined at the field office level. For many projects, it may be determined that a tiered environmental assessment (EA) is appropriate in lieu of an Environmental Impact Statement (EIS). To the extent that the Programmatic EIS (PEIS) addresses anticipated issues and concerns associated with an individual project, including potential cumulative impacts, the BLM will tier based on the decisions embedded in the PEIS and limit the scope of additional project-specific NEPA analyses. The site-specific NEPA analyses will include analyses of project site configuration and micrositing considerations, monitoring program requirements, and appropriate mitigation measures. In particular, the mitigation measures discussed in chapter 5 of the PEIS may be consulted in determining site-specific requirements. Public involvement will be incorporated into all wind energy development projects to ensure that all concerns and issues are identified and adequately addressed. In general, the scope of the NEPA analyses will be limited to the proposed action on BLM-administered

public lands; however, if access to proposed development on adjacent non-BLM-administered lands is entirely dependent on obtaining ROW access across BLM-administered public lands and there are no alternatives to that access, the NEPA analysis for the proposed ROW may need to assess the environmental effects from that proposed development. The BLM's analyses of ROW access projects may tier based on the PEIS to the extent that the proposed project falls within the scope of the PEIS analyses.

- Site-specific environmental analyses will tier from the PEIS and identify and assess any cumulative impacts that are beyond the scope of the cumulative impacts addressed in the PEIS.
- The Categorical Exclusion (CX) applicable to the issuance of short-term ROWs or land use authorizations may be applicable to some site monitoring and testing activities. The relevant CX, established in the BLM NEPA Handbook, H-1790-1, Appendix 4, Section E. 19 (January 30, 2008), encompasses "issuance of short-term (3 years or less) rights-of-way or land use authorizations for such uses as storage sites, apiary sites, and construction sites where the proposal includes rehabilitation to restore the land to its natural or original condition." The CX for "nondestructive data collection, inventory, study, research, and monitoring activities" may also be applicable to wind energy site testing and monitoring activities.
- The BLM will require financial bonds for all wind energy development projects on BLM-administered public lands to ensure compliance with the terms and conditions of the rights-of-way authorization and the requirements of applicable regulatory requirements, including reclamation costs. The amount of the required bond will be determined during the rights-of-way authorization process on the basis of site-specific and project-specific factors. A minimum bond will be required for site monitoring and testing authorizations.
- Entities seeking to develop a wind energy project on BLM-administered public lands shall develop a project-specific Plan of Development (POD) that incorporates all BMPs and, as appropriate, the requirements of other existing and relevant BLM mitigation guidance, including the BLM's offsite mitigation guidance. Additional mitigation measures will be incorporated into the POD and into the ROW authorization as project stipulations, as needed, to address site-specific and species-specific issues. The POD will include a site plan showing the locations of turbines, roads, power lines, other infrastructure, and other areas of short- and long-term disturbance.
- The BLM will incorporate management goals and objectives specific to habitat conservation for species of concern (e.g., sage-grouse, raptors, bats), as appropriate, into the POD for proposed wind energy projects.
- The BLM will consider the visual resource values of the public lands involved in proposed wind energy development projects, consistent with BLM Visual Resource Management (VRM) policies and guidance. The BLM will work with the ROW applicant to incorporate visual design considerations into the planning and design of the project to minimize potential visual impacts of the proposal and to meet the VRM objectives of the area.
- Operators of wind power facilities on BLM-administered public lands shall consult with the BLM and other appropriate Federal, State, and local agencies regarding any planned upgrades or changes to the wind facility design or operation. Proposed changes of this nature may require additional environmental analysis and/or revision of the POD.
- The BLM's Wind Energy Development Program will incorporate adaptive management strategies to ensure that potential adverse impacts of wind energy development are avoided if possible, minimized, or mitigated to acceptable levels. The programmatic policies and BMPs will be updated and revised as new data regarding the impacts of wind power projects become available. At the project level, operators will be required to develop monitoring programs to evaluate the environmental conditions at the site through all phases of development, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and project-specific stipulations.

<End of Attachment 1 from BLM IM No. 2009-043>

LIVESTOCK GRAZING APPENDIX

INTRODUCTION

This appendix contains in-depth information for livestock grazing and management in the planning area. Information includes:

- allotment categories,
- screening criteria for allotments,
- base property criteria, and
- reserve common allotments (RCAs).

ALLOTMENT CATEGORIES

The existing selective management categories (Improve or I, Maintain or M, and Custodial or C) are the foundation for designating allotment categories. The selective management category process was initiated in 1982 and was used primarily to establish priorities for improving management and investing in range improvements. Criteria for the original designations can be found in Handbook 1740-1, Appendix 1, pages 3 and 4.

Below are the criteria in addition to those found in Handbook 1740-1 that are to be used to designate allotments as Category I, M, or C. Allotments are categorized as appropriate and recorded in the Rangeland Administration System. Allotments may be re-categorized as new information from monitoring, land health evaluations, habitat assessments, sensitive species data, or other information becomes available. Assigning allotments to one of the three categories in accordance with the following criteria will help determine priorities for focusing staff and fiscal resources when processing grazing permits and leases, monitoring allotments, evaluating rangeland health, and implementing range improvements.

- Category I: Allotments where current livestock grazing management or level of use on public land is, or is expected to be, a significant causal factor in non-compliance with land health standards, or where a change in mandatory terms and conditions in the grazing authorization is or may be necessary. When identifying Category I allotments, review condition of critical habitat and conflicts with sage-grouse and consider whether projects have been proposed specifically for implementing the land health initiatives.

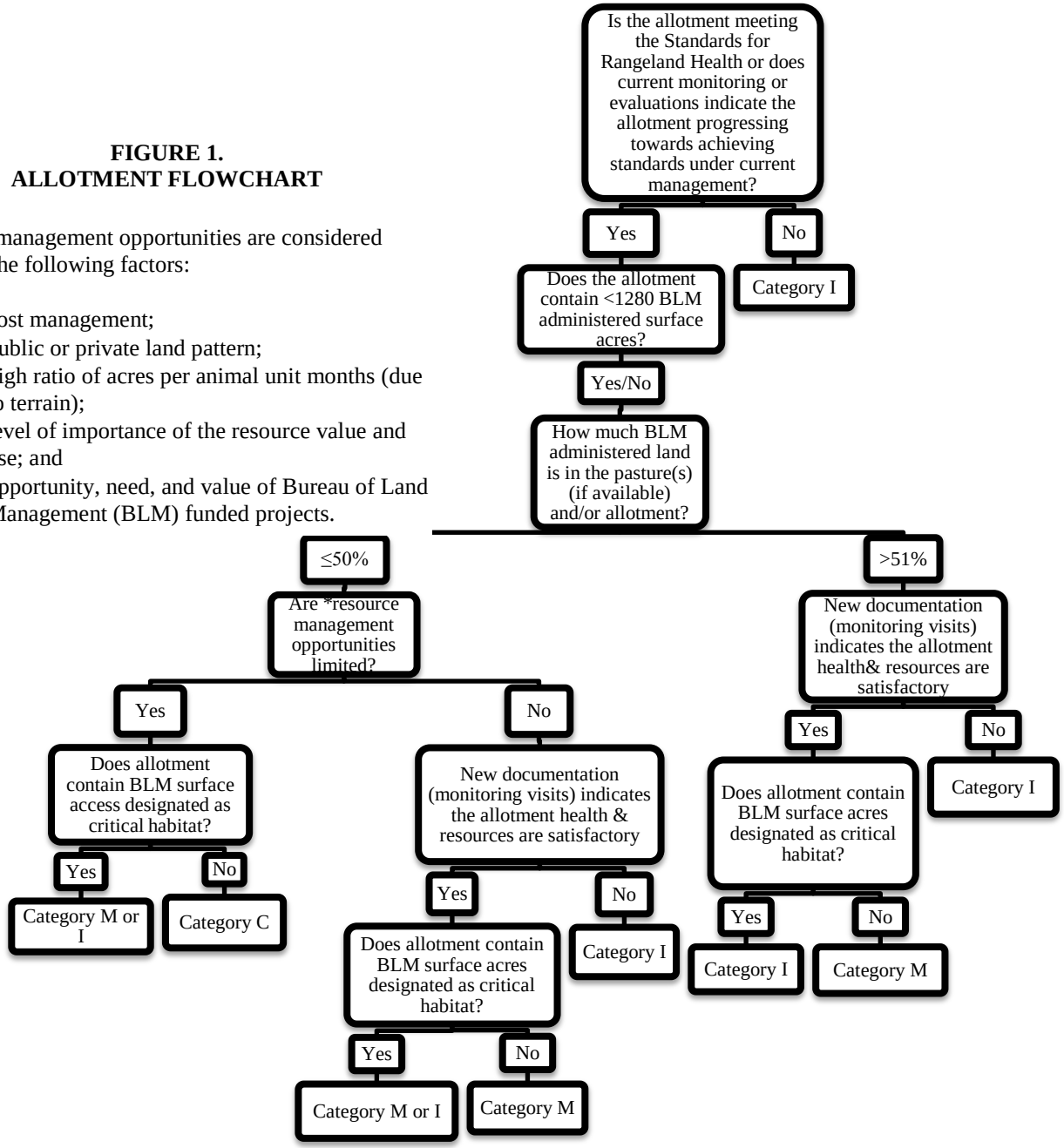
- Category M: Allotments where land health standards are met or where livestock grazing on public land is not a significant causal factor for non-compliance with the standards and current livestock management is in conformance with guidelines developed by State Directors in consultation with Resource Advisory Councils. Allotments where an evaluation of land health standards has not been completed, but existing monitoring data indicates that resource conditions are satisfactory.

- Category C: Allotments where public lands produce less than 50 percent of the forage in the allotment are less than 50 percent of the land area. An allotment should generally not be designated Category C if the public land in the allotment contains critical habitat for a threatened or endangered species. See Figure 1 for more information.

FIGURE 1.
ALLOTMENT FLOWCHART

Resource management opportunities are considered based on the following factors:

- cost management;
- public or private land pattern;
- high ratio of acres per animal unit months (due to terrain);
- level of importance of the resource value and use; and
- opportunity, need, and value of Bureau of Land Management (BLM) funded projects.



SCREENING CRITERIA

A screening criteria checklist would be reviewed prior to transfer or renewal. If an allotment passes the screening checklist, the permit would be renewed. If the allotment does not pass the screening checklist then the proposed transfer or renewal represents an exception and an environmental assessment should be prepared.

SCREENING CRITERIA CHECKLIST FOR 10-YEAR GRAZING PERMITS, LEASE RENEWALS, OR TRANSFERS

This section contains information about current processes used in the Miles City Field Office and is subject to change based on Bureau policy changes. To determine if a proposed renewal or transfer is eligible, the following screening criteria should be applied. If the answer to every question is "Yes", the proposed renewal or transfer qualifies and permits could be renewed or transferred. However, if the answer to any question is "No" the proposal represents an exception and an individual environmental assessment should be prepared.

- Does the allotment contain either a sagebrush focal area (SFA) or Priority Habitat Management Area (PHMA) for sage-grouse?
    - If "Yes" continue to Section B regardless of allotment category.
    - If "No" continue to next question.
- Is the allotment currently categorized as an "I" category allotment?
    - If "Yes", do not use this Screening Criteria, analyze action in appropriate National Environmental Policy Act (NEPA) document.
    - If "No", continue to next question.
- Is the allotment currently categorized as a "C" category allotment?
    - If "Yes", go to Section A.
    - If "No", continue to next question.
- Is the allotment currently categorized as an "M" category allotment?
    - If "Yes", go to Section B.

Section A: ("C" Allotments)

- Does the allotment meet the Miles City Field Office **Standards for Rangeland Health**?
    - Uplands are in proper functioning condition?
    - Riparian areas and wetlands are in proper functioning condition?
    - Water quality meets Montana State standards?
    - Air quality meets Montana State standards?
    - Habitats are provided for healthy, productive, and diverse native plant and animal populations and communities. Habitats are improved or maintained for special status species (federally threatened, endangered, candidate, or Montana species of special concern, including greater sage-grouse)? (Does the environment contain all the necessary components to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential?)
- Will the proposed renewal or transfer maintain the class of livestock, season of use (14 days), or terms and conditions?

Section B: ("M" Allotments)

- Does field visit information exist that is current (i.e., less than 5 years old)? If yes, does the current information indicate that the allotment meets the Miles City Field Office Standards for Rangeland Health?
    - Riparian areas and wet meadows are present and in proper functioning condition?
    - Uplands are in proper functioning condition?
    - Water quality meets Montana State standards?
    - Air quality meets Montana State standards?
    - Habitats are provided for healthy, productive, and diverse native plant and animal populations and communities. Habitats are improved or maintained for special status species (federally threatened, endangered, candidate or Montana species of special concern)? (Does the environment contain all the necessary components to support viable populations of a sensitive/threatened and endangered species in a given area relative to site potential?)
    - Are habitat objectives and management considerations being met in priority sage-grouse habitat?

- If not, allotment conditions must be verified. If allotment conditions are verified, does allotment continue to meet Standards for Rangeland Health?

- Will the proposed renewal or transfer maintain the class of livestock, change in the season of use? (14 days), or change in the terms and conditions?

RESERVE COMMON ALLOTMENT CRITERIA

Establishment of RCAs would be evaluated when base property is acquired through land exchange, grazing preference is voluntarily relinquished, or preference is cancelled due to non-compliance with terms and conditions of authorized use.

Priority for using RCAs would be as follows:

1) permittees and lessees whose "normally permitted" allotments are under an approved restoration or recovery project, and
2) permittees and lessees whose "normally permitted" allotments are temporarily unavailable because of emergency conditions such as wildfire.

Competing applications (depending on the RCA allotment management plan and objectives, there may be more than one applicant selected to graze a particular RCA) would be evaluated based on the benefit to the resource and consider factors such as:

1) amount of public land benefited,
2) the prioritization of projects benefitting special status species, and
3) history of grazing permit compliance.

The authorized officer will make the selection based on the above listed factors.

MINERALS APPENDIX

INTRODUCTION

This appendix contains in-depth information for minerals and management in the planning area. Information includes:

- procedures in oil and gas recovery;
- oil and gas leasing stipulations by alternative;
- oil and gas regulations;
- oil and gas production and development guidelines;
- reasonably foreseeable development (RFD) scenario for fluid minerals (including the RFD for the proposed Carter Master Leasing Plan [MLP] area);
- coal decisions carried forward under this plan; and
- the solid minerals RFD.

FLUID MINERALS

GEOPHYSICAL EXPLORATION

Oil and gas geophysical exploration activities include data acquisition by use of ground vehicle or aircraft. Data are acquired to determine structures that may contain oil or gas. Geophysical exploration does not include core drilling for subsurface geologic information or well drilling for oil and gas. A federal oil and gas lease is not required before conducting geophysical operations.

Information from geophysical exploration can assist in the selection of drill sites on existing leases or lead oil companies or others to request lands be offered for lease.

Existing road systems are used where available. Roads may be cleared of vegetation and loose rocks to improve access for trucks if that action is allowed by the permit. Because blading and road construction for seismic operations are not usually allowed, environmental impacts are minimized. Seismic work is conducted by helicopter or airplane rather than by ground vehicles in areas with rugged terrain, areas without access roads, or during certain seasons of the year. Geophysical operations that do not cause additional surface disturbance include remote sensing, gravity prospecting, and aeromagnetic surveying.

NOTIFICATION PROCESS

Geophysical operations on public lands are reviewed by the Bureau of Land Management (BLM). Exploration on public lands requires review and approval following the procedures in 43 Code of Federal Regulations (CFR) 3150, 3151, and 3154. Additional guidance is found in BLM Manual Section 3150 and Handbook 3150.

In the Miles City Field Office (MCFO), the field manager is authorized to approve geophysical operations. Geophysical operator and field manager responsibilities during geophysical operations are described below.

GEOPHYSICAL OPERATOR

The operator is required to file a Notice of Intent (NOI) to conduct oil and gas exploration operations (BLM Form 3150-4) for operations on public lands administered by the BLM. Maps (preferably 1:24,000 scale topographic maps) showing the location of the proposed lines and access routes must accompany the NOI. The BLM would review NOIs in the planning area and develop appropriate mitigation measures so as not to create undue and unnecessary degradation. A site-specific environmental review would occur for each NOI filed. When the NOI is filed, the authorized officer (AO) may request a pre-work conference or field inspection.

Special requirements or procedures that are identified by the AO are included in the Terms and Conditions for NOI to Conduct Geophysical Exploration (BLM Form 3150-4a and a copy of the state requirements). By signing the NOI and Terms and Conditions, the operator agrees to comply with requirements specified by the AO. The NOI, maps, and a signed copy of the Terms and Conditions must be filed in the BLM field office before operations begin.

Bonding of the operator is required. A copy of proof of satisfactory bonding shall accompany the NOI. Proper bonding may include a nationwide or statewide oil and gas bond, with a rider for geophysical exploration, or a $5,000 individual bond filed with the AO.

A full reclamation bond specific to the site would be required in accordance with 43 CFR 3104.2, 3104.3, and 3104.5. Bonds would be sufficient for costs relative to reclamation (Connelly, Schroeder, Sands, and Braun 2000; Hagen, Connelly, and Schroeder 2007) that would result in full restoration of the lands to the condition existing prior to disturbance. The reclamation costs would be based on the assumption that contractors for the BLM would perform the work.

The operator is required to comply with applicable federal, state, and local laws such as Federal Land Policy and Management Act of 1976 (FLPMA), the National Historic Preservation Act of 1966 (NHPA), and the Endangered Species Act of 1973 (ESA), as amended. Operators may be required to submit an archeological evaluation if dirt work is considered or there is reason to believe that significant cultural resources may be adversely affected. Any changes in the original NOI must be submitted in writing to the AO. Written approval must be secured before activities proceed.

When geophysical operations have been completed, the operator is required to file a Notice of Completion of Oil and Gas Geophysical Exploration (BLM Form 3150-5) and include certification that all terms and conditions of the approved NOI have been fulfilled. The operator must also submit a map (preferably a 1:24,000 scale topographic map) that shows the actual line location, access route, and other survey details.

BLM FIELD MANAGERS (AUTHORIZED OFFICERS)

The AO is required to contact the operator within 5 working days after receiving the NOI to explain the terms of the notice, including the terms and conditions, all current laws, and BLM administrative requirements. At the time of the pre-work conference or field inspection, written instructions or orders are given to the operator. The AO is responsible for the examination of resource values to determine appropriate surface protection and reclamation measures.

The AO is required to make a final inspection following filing of the Notice of Completion. When reclamation is approved, obligation against the operator's bond is released. The BLM has 30 days after filing of the Notice of Completion to notify the operator whether the reclamation is satisfactory or if additional reclamation work is necessary. Bonding liability will automatically terminate within 90 days after filing of the Notice of Completion unless the AO notifies the operator of the need for additional reclamation work.

STATE STANDARDS

Geophysical operators register with the state through the County Clerk and Recorder's office. State regulations include requirements for shothole locations, drilling techniques, plugging techniques, and reclamation.

MITIGATION

When a geophysical NOI is received, restrictions may be placed on the application to protect or mitigate impacts to resource values. Some of these requirements may be the same as oil and gas lease stipulations. Other, less restrictive measures may be used when impacts to resource values will be less severe, which is due in part to the temporary nature of geophysical exploration. The decisions concerning the level of protection required are made on a case-by-case basis when an NOI is received.

LEASING PROCESS

Federal oil and gas leasing authority is found in the 1920 Mineral Leasing Act, as amended, for public lands and the 1947 Acquired Lands Leasing Act, as amended (30 United States Code [U.S.C.] 351 et seq.), for acquired lands. Leasing of federal oil and gas is affected by other acts such as the Wilderness Act of 1964, NHPA, National Environmental Policy Act of 1969 (NEPA), ESA, FLPMA, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 226 et seq.) Regulations governing federal oil and gas leasing are contained in 43 CFR 3100 with additional requirements and clarification found in onshore operating orders and Washington Office (WO) manuals and instruction memorandums.

The BLM planning process is the mechanism used to evaluate and determine where and how federal oil and gas resources will be made available for leasing. Areas where oil and gas development will conflict with other land uses or resources despite mitigation measures will be closed to leasing. Areas where oil and gas development could coexist with other land uses or resources will be open to leasing.

All leases are subject to the terms and conditions of the lease, found on the lease form, and federal regulations. Lease rights may be subject to lease stipulations and permit approval requirements. Leases may be issued with or without stipulations based upon decisions in the land use document. Stipulations are a part of the lease only when environmental and planning records demonstrate the necessity for the stipulations (modifications of the lease). See *Drainage Provisions* section below regarding leasing of unavailable lands within the planning area.

For lands open to leasing, the leasing process is initiated when members of the public file Expressions of Interest to nominate parcels for leasing to the BLM. Consistent with WO Instruction Memorandum (IM) No. 2010-117, an Interdisciplinary Parcel Review team of resource specialists review the nominated parcels and ensure compliance with NEPA and other legal and policy requirements. Because certain resources in the planning area require protection from impacts associated with oil and gas activities, the Interdisciplinary Parcel Review team may recommend lease stipulations. Lease stipulations are usually No Surface Occupancy (NSO), Controlled Surface Use (CSU), or Timing Limitation (Seasonal Restriction). A notice may also be included with a lease to provide guidance regarding resources or land uses. See the *Fluid Minerals; Lease Stipulations* in the Minerals Appendix.

In addition to an Interdisciplinary Parcel Review team review, the WO IM requires BLM to complete public involvement throughout the leasing process. Letters are sent to land owners, who own lands which overlie federal oil and gas minerals, at the time an Expression of Interest is filed to notify them of the oil and gas minerals being nominated. Two public review periods are conducted for each lease sale, a 15-day scoping period on the preliminary review of the nominated parcels and recommended stipulations, and a 30-day public comment period on the NEPA document. Proper coordination and/or consultation are also conducted throughout the leasing process with Tribes, external entities, and Surface Management Agencies.

Leases are issued as either a competitive or noncompetitive lease; both have a primary lease term of 10 years. All tracts must first be offered at an oral auction; the minimum bid per acre is $2.00. Competitive leases will be issued to the highest qualified bidder at the auction. Tracts that do not receive a bid during the auction will be available for noncompetitive leasing for a 2-year period after the sale date. If a noncompetitive offer is not filed within the 2-year period, the tract must be offered again at an oral auction before it can be leased. Rental payments for competitive and noncompetitive leases are $1.50 per acre for the first 5 years and $2.00 per acre thereafter until production is established. Leases will be issued with a fixed 12.5 percent royalty rate.

The lease grants the right to explore, extract, remove, and dispose of oil and gas deposits that may be found in the leased lands. Lease rights may be subject to lease stipulations and permit approval requirements, also known as conditions of approval (COAs). Stipulations and permit requirements describe how lease rights are modified. See the *Fluid Minerals; Lease Stipulations* for details on modifying lease stipulations and the COA section below for examples of COAs.

The terms and conditions of existing oil and gas leases would not be changed by the decisions in this document. However, post-lease actions or authorizations (e.g., Application for Permit to Drill (APD) or road or pipeline right-of-way (ROW)) would potentially be encumbered by mitigation measures, as necessary, on a case-by-case

basis as required through project-specific NEPA analysis or other environmental reviews. The stipulations and COAs would be in accordance with laws, regulations, and lease terms. The lease stipulations and permit COAs allow for management of federal oil and gas resources in concert with other resources and land uses. When a lease expires, it would be managed for oil and gas according to the decisions reached in the Resource Management Plan (RMP).

PLAN MAINTENANCE

New information may lead to changes in existing resource inventories. New use areas and resource locations may be identified or use areas and resource locations that are no longer valid may be identified. These resources usually cover small areas requiring the same protection or mitigation as identified in this plan. Identification of new areas or removal of old areas that no longer have those resource values will result in the use of the same lease stipulation identified in this plan. These areas will be added to the existing data inventory without a plan amendment. In cases where the changes constitute a change in resource allocation outside the scope of this plan, a plan amendment would be required.

OPERATING STANDARDS AND APPROVAL PROCEDURES

PERMITTING PROCESS

A federal lessee or the operator of record is governed by procedures set forth in Onshore Oil and Gas Order No. 1 (updated in May 2007), “Approval of Operations on Onshore Federal and Indian Oil and Gas Leases,” issued under 43 CFR 3164. These procedures cover the full scope of operations on federal minerals, from initial permitting of the well, to subsequent operations, to final abandonment. Before beginning construction or drilling a well, the lessee or its operator must have an approved APD, including requirements for surface and subsurface operations.

In the initial permitting process, the lessee or its operator selects the location of a proposed drill site based upon the Montana Board of Oil and Gas Commission's (MBOGC) spacing requirements, subsurface geology, topography, and avoidance of known sensitive surface resource values. At that point, the lessee or its operator is able to survey and stake the well, access road and pipeline without notice to the BLM. Cultural inventories can also be obtained without notice.

After the lessee or its operator makes the decision to drill a well, it must decide whether to submit a Notice of Staking (NOS) or APD. The NOS and APD are described as follows:

NOS – The NOS is an abbreviated notice that consists of a NOS form, staked location map, and sketched site plan. This notice is posted for a 30-day public review and begins the processing timeframe for approval of the APD. The NOS triggers the onsite inspection of the well, which determines whether any conflicts with critical resource values are evident and provides the preliminary data to assess what additional items are necessary to complete the APD.

APD – The lessee or its operator can submit a completed APD in lieu of a NOS but, in either case, no surface-disturbing activity can be conducted in conjunction with the drilling operations until the APD is approved by the AO. The APD must be posted for a minimum of 30 days to allow for review by the public. If applicable, a copy of the APD is also posted with the Surface Management Agency.

In accordance to Onshore Oil and Gas Order No. 1, a complete APD must consist of a completed Form 3160–3; Well Plat, Drilling Plan, Surface Use Plan of Operations (SUPO), Bonding, Operator Certification, an Onsite Inspection, and anything else required by the AO.

The on-site inspection team includes BLM and surface management agency representatives, the operator or agent, and other interested parties, such as the dirt work contractor or drilling contractor. When the location is on private surface, the surface owner is invited. The purpose of the on-site inspection is to identify problems and potential environmental impacts associated with the proposal and methods to mitigate these impacts. Based

on information from the on-site inspection and the APD, the BLM develops COAs for individual APDs. These measures are designed to protect surface and subsurface resources located at or near the drilling location. The results of the on-site inspection and all mitigating measures are documented. The AO is responsible for preparing environmental documentation necessary in accordance to NEPA requirements and to provide any mitigation measures needed to protect the affected resource values.

Within 30 days after the lessee or its operator has submitted a complete application, including incorporating any changes that resulted from the onsite inspection, the BLM will:

- Approve the application, subject to reasonable COAs, if the appropriate requirements of the NEPA, NHPA, ESA, and other applicable law have been met and, if on United States Forest Service (USFS) lands, the USFS has approved the SUPO;
- Notify the lessee or its operator that it is deferring action on the permit; or
- Deny the permit if it cannot be approved and the BLM cannot identify any actions that the lessee or its operator could take that would enable the BLM to issue the permit or the USFS to approve the SUPO, if applicable.

When final approval is given by the BLM, the lessee or its operator can commence construction and drilling operations. Approval of an APD is valid for 2 years. If drilling does not begin within 2 years, the COAs can be revised with additional NEPA review prior to extending the APD for 2 more years.

For drilling operations proposed on lands with state or private mineral ownership, the lessee or its operator must meet the requirements of the mineral owner and the state regulatory agency. The BLM does not have jurisdiction over non-federal minerals; however, the BLM has surface management responsibility in situations of BLM surface located over non-federal mineral ownership.

BONDING

There are two types of bonds associated with oil and gas lease development activities, a 3104 Performance Bond and a Surface Owner Protection Bond, also known as a Damages Bond or 3814 Bond. BLM will not consider an APD or Sundry Notice administratively or technically complete until the federal lessee or its operator has the necessary bonds in place.

A 3104 Performance Bond is required when an APD is submitted to the BLM. It ensures compliance during drilling, production, plugging, and abandonment, and reclamation. The minimum bond amounts are: $10,000 per lease, $25,000 statewide, and $150,000 nationwide. The BLM can require a greater bond amount in accordance to federal policy.

A Surface Owner Protection Bond is applied if the lessee or its operator and surface owner fail to reach a Surface Use Agreement. Compliance with Onshore Oil and Gas Order No. 1 requires the federal mineral lessee or its operator to enter into good-faith negotiations with the private surface owner to reach an agreement for the protection of surface resources and reclamation of the disturbed areas, or payment in lieu thereof, to compensate the surface owner for loss of crops and damages to tangible improvements, if any. The lessee or its operator shall include as part of the APD or Sundry Notice, where surface disturbance will occur on the private surface, the surface owner's name, contact address, telephone number, and any other relevant and necessary contact information, if known. The APD or Sundry Notice shall also include a statement by the federal lessee or its operator that it has obtained one of the following:

(1) a surface owner agreement for access to enter the leased lands,
(2) a waiver from the surface owner for access to the leased lands,
(3) an agreement regarding compensation to the surface owner for damages for loss of crops and tangible improvements, or
(4) in lieu thereof, an adequate bond, sufficient in amount, to secure payment for loss of damages to crops and tangible improvements.

Prior to the approval of any APD or Sundry Notice, where surface disturbance will occur on the private surface, the AO will ensure compliance with these requirements. If a good-faith effort by the federal lessee, its operator or representatives has not produced an agreement with the surface owner as described in options (1), (2), or (3) above, the AO will require an adequate surface owner bond in an amount sufficient to indemnify the surface owner against the reasonable and foreseeable damages for loss of crops and tangible improvements from the proposed operations. Bond coverage depends on the statute under which the land was patented. For example, under the Stock Raising Homestead Act, for reasonable and foreseeable damages to crops (including grazing lands) and tangible improvements, the minimum amount is $1,000.

The surface owner has 30 days to object or accept the bond. The surface owner may appeal the BLM's final decision on the amount of the Damages Bond to the Interior Board of Land Appeals (IBLA). If the surface owner objects to the sufficiency of the bond under 43 CFR Subpart 3814, the AO for BLM will determine the sufficiency of the bond needed to indemnify the surface owner for the reasonable and foreseeable damages.

In the instances where the lessee or its operator cannot reach agreement with the surface owner and provides a surface owner bond, the federal lessee or its operator must provide the BLM the original bond and evidence of service of the bond on the surface owner, and evidence that the surface owner was notified of its right to object to the sufficiency of the bond in accordance with the procedures under 43 CFR 3814. After this evidence is provided, the BLM will independently notify the surface owner, in writing, of its rights under the procedures regarding protests and appeals to the sufficiency of the bond. The 3814 bond will be released after compensation of damages to crops and tangible improvements to the surface owner has occurred and the mineral lessee or operator requests release of the bond. BLM will make a reasonable effort to contact the surface owner and confirm that compensation has been received prior to release of the bond.

The Surface Owner Agreement between the surface owner and the lessee or its operator is not to be submitted as part of the APD or Sundry Notice, since it may contain confidential information regarding the agreement between the surface owner and the lessee or operator. However, a completed self-certification statement must be part of the permit. The surface owner can request that specific items be made part of the permit as COAs. The AO may include those conditions in the application if the AO deems them beneficial to the development of the lease and consistent with lease terms and conditions. Non-compliance with the approved permit and COAs by the lessee or its operator may result in an incident of non-compliance and assessments under the Oil and Gas Leasing Reform Act of 1987. Relief from non-compliance with conditions of the Surface Owner Agreement that are not part of the APD or Sundry Notice cannot be obtained by the Federal Inspection and Enforcement process.

APPEALS

The BLM's final decision may be appealed to the IBLA, Office of the Secretary, in accordance with the regulations contained in 43 CFR 4.400 and Form 1842 1 (Enclosure 10). If an appeal is taken, a Notice of Appeal must be filed in the field office at the aforementioned address within 30 days from receipt of the decision. A copy of the Notice of Appeal and of any statement of reasons, written arguments, or briefs must also be served on the Office of the Solicitor at the address shown on Form 1842 1. It is also requested that a copy of any statement of reasons, written arguments, or briefs be sent to the field office. The appellant has the burden of showing that the Decision appealed from is in error.

If the appellant wishes to file a Petition for a Stay of the decision, pursuant to 43 CFR 4.21, the Petition must accompany the Notice of Appeal. A Petition for a Stay is required to show sufficient justification based on the standards listed below. Copies of the Notice of Appeal and Petition for a Stay must also be submitted to each party named in the Decision and to the IBLA and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with the field office. If the appellant requests a stay, the appellant has the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay are listed below. Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a Decision pending appeal shall show sufficient justification based on the following standards:

(1) the relative harm to the parties if the stay is granted or denied;
(2) the likelihood of the appellant's success on the merits;
(3) the likelihood of immediate and irreparable harm if the stay is not granted; and
(4) whether the public interest favors granting the stay.

CONDITIONS OF APPROVAL

An approval letter is sent to the operator that includes COAs, which the operator must follow from site construction through abandonment. COAs are mitigation measures that implement lease restrictions to site-specific conditions. In addition, the approval letter contains informational notices that cite the regulatory requirements from the CFR, Onshore Operating Orders 1 and 2 (BLM and USFS 2007a; BLM 1988), and other guidance.

Site-specific operating requirements are based on analysis of the proposed location for the well site. Operating requirements may affect the drilling program, access road, production facilities, water supply, waste disposal, well site layout, and surface restoration.

The following mitigation measures may be applied to permits as COAs. The listing is not all inclusive, but presents the most often used COAs in the planning area. The wording of the COA may be modified or additional COAs may be developed to address specific conditions.

Access Road

1. Prior to construction, a minimum of 4 inches of topsoil must be removed from the area necessary for road and ditch construction, including backslopes. Topsoil must be stored for use in reclamation.
2. For drilling and production operations, the access road must be flat-bladed but sloped to provide drainage off the road. The access road width must not exceed 16 feet.
3. For drilling and production operations, the access road must be crowned and ditched. The access road width must not exceed 16 feet. Ditches must have flat or rounded bottoms.
4. The access road must be surfaced with and maintained with, at a minimum, a 3-inch layer of gravel.
5. A minimum 18-inch diameter culvert (or culverts) must be installed in the designated drainage or drainages. The culvert or culverts must be installed on undisturbed ground and extend a minimum of 1 foot beyond the toe of the fill slopes. Riprap material must be placed at the inlet and outlet ends of the culvert or culverts.
6. A cattleguard must be installed at the designated fence crossing or crossings.
7. A low-water crossing must be constructed at the designated drainage or drainages. A minimum 6-inch layer of gravel must be placed on the road in the crossing.
8. The access road and associated structures must be maintained in a safe condition. Off-road vehicle travel is not authorized.

Well Pad

1. Prior to construction, a minimum of 4 inches of topsoil must be removed from the area necessary for pad construction, including to the toe of the cut and fill slopes. Topsoil must be stockpiled separately from all other material.
2. The reserve pit must be lined with an impervious plastic liner with a minimum 140 pounds per square inch burst strength and 30 pounds tear strength. The liner must be installed over material that will not puncture or tear the liner.
3. The reserve pit must be fenced on three sides during drilling operations and the fourth side after completion of drilling operations. Netting may be required over the reserve pit.
4. All storage tanks must be located on the well pad. Storage tanks must be surrounded with a dike or trench sloped to the reserve pit.
5. All trash must be stored in an enclosed container and disposed of in an approved disposal facility. Trash or debris is not allowed in the reserve pit.
6. Erosion control measures must be constructed or installed as prescribed.

Production Facilities

1. Storage tanks and treater must be located on the cut portion of the well pad.
2. The storage tanks and treater or the entire well pad must be surrounded by an earthen dike. The dike must be of sufficient size to contain 110 percent of the volume of the largest single tank in use.
3. Production facilities such as storage tanks and the treater and pump unit must be painted a specific color from the Munsell Soil Color Chart.
4. Fluid storage pits must be permitted, constructed, and maintained in accordance with state requirements.
5. The well site and production facility site must be maintained in a safe and orderly manner. All trash and debris must be stored in an enclosed container and disposed of at an approved disposal facility. All unused equipment must be stored in an orderly manner or removed. All containers must be installed and maintained in accordance with the manufacturer's and Occupational Safety and Health Act (29 U.S.C. 651 et seq.) requirements.

Reclamation

1. *Pit Reclamation*

    a. The pit must be closed properly to ensure protection of soil, water, and vegetation.
    b. The pit may not be cut or trenched.
    c. Prior to pit closure, free fluids must be removed and disposed of properly.
    d. Pit mud and sludge material may be buried on site after the material has been tested and has met the following criteria:

        - the range of pH is 6 to 9,
        - the moisture content is less than 50 percent by weight,
        - the oil and grease content is less than 3 percent by weight,
        - the electrical conductivity is less than 12 mmhos (millimhos) per centimeter (unconfined compressive strength: greater than 20 pounds per square inch), and
        - the total metals content must not exceed United States Environmental Protection Agency (USEPA) limits.

    e. The liner may be cut off above the pit material or pushed over the pit material.
    f. The pit material must be covered with a minimum of 5 feet of native soil.

2. *Site Reclamation*

    a. For production, the unused portion of the pad must be recontoured with slopes not steeper than 3:1. Proper drainage must be established. Erosion control measures may be required.
    b. For final abandonment, the site must be cleaned of all equipment, material, and debris. All surfacing material must be removed.
    c. For final abandonment, the site must be recontoured to blend with the adjacent terrain.
    d. Specific erosion control measures will be prescribed as necessary.
    e. For production or abandonment, recontoured areas must be scarified, mulched, and seeded. After scarification to a depth of 12 inches, topsoil must be spread evenly over the recontoured area. Weed-free straw mulch must then be applied evenly over the recontoured area at a rate of 1 ton per acre. The mulch must be crimped into the soil. The recontoured area must then be seeded with a prescribed seed mixture. Seed must be drilled on the contour with 6-inch drill row spacing at a depth of 0.5 to 0.75 inches. The most commonly prescribed grass species include:

        - western wheatgrass,
        - slender wheatgrass,
        - intermediate wheatgrass,
        - thickspike wheatgrass,
        - green needlegrass,

- dryland alfalfa, and
- yellow sweetclover.

f. After seeding, the site must be fenced with four strands of barbed wire, metal line posts, and wood corner and brace posts. The fence must be maintained to exclude livestock until reclamation work has been approved.
g. For final abandonment on privately owned surface, reclamation must be completed in accordance with the surface owner's requirements unless the surface owner defers to BLM requirements.
h. The reclamation work will be considered successful when the seeded area is stabilized, potential water erosion is effectively controlled, and the vegetative stand is established with at least a 60 percent cover of the prescribed grass species.
i. An interim reclamation plan may be required if the site has been constructed but no other work has been accomplished within 6 months after permit approval.

3. *Road Reclamation*

a. For final abandonment, the surfacing material and structures (culverts, cattleguards) must be removed.
b. For final abandonment, the road and ditches must be recontoured. Erosion control measures may be required.
c. For final abandonment, the recontoured area must be scarified, mulched, and seeded in the same manner as well sites.
d. For final abandonment, drainages must be restored to a free-flowing condition and the reclaimed area protected to prevent eroding and scouring.
e. For final abandonment on privately owned surface, reclamation must be completed in accordance with the surface owner's requirements unless the surface owner defers to BLM requirements.
f. The reclamation work will be considered successful when the seeded area is stabilized, potential water erosion is effectively controlled, and the vegetative stand is established with at least 60 percent cover of the prescribed grass species.

4. *Pipeline Reclamation*

a. The pipeline must be tested for leaks prior to backfilling the trench.
b. The trench must be backfilled immediately after completion of pipeline leak testing procedures. The fill material must be compacted.
c. Topsoil must be spread evenly over the disturbed area.
d. Erosion control measures must be installed as prescribed.
e. Drainages must be restored to a free-flowing condition and the reclaimed area protected to prevent eroding and scouring.
f. The disturbed area must be seeded in the same manner as well sites.

The following COAs in addition to any site-specific conditions are included with each approved APD.

1. *Verbal Notification*

a. Notify this office verbally at least 48 hours prior to commencing construction.
b. Notify this office verbally at least 12 hours prior to spudding the well. (To be followed up in writing within 5 days.)
c. Notify this office verbally at least 12 hours prior to running any casing or conducting a blowout preventer (BOP) tests. (To be followed up in writing within 5 days.)
d. Notify this office verbally at least 6 hours prior to commencing any Drill Stem Test.
e. Notify this office verbally at least 24 hours prior to plugging the well to receive verbal plugging orders. (Refer to Informational Notice Item 2, Drilling Operations, Onshore Order No. 2, for additional abandonment instructions.)
f. Notify this office verbally at least 24 hours prior to removal of fluids from the reserve pit.

Failure to comply within specified notification timeframes may incur an assessment under 43 CFR 3163.1 and may also incur civil penalties under 43 CFR 3163.2.

2. A complete copy of the approved APD, including conditions, stipulations, and the Hydrogen Sulfide contingency plan (if required) shall be available for reference at the well site during the construction and drilling phases. A copy of the approved SUPO and COAs shall be provided to the surface owner(s) prior to initiating construction.
3. This drilling permit is valid for either 2 years from the approval date or until the lease expires, whichever occurs first.
4. If any cultural values (sites, artifacts, human remains, etc.) are observed during operation of this lease/permit/ROW, they are to be left intact and the MCFO notified. The AO will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archeological sites or for collecting artifacts. If historic or archeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials and contact the AO. Within 5 working days, the AO will inform the operator as to:

    - whether the materials appear eligible for the National Register of Historic Places (NRHP);
    - the mitigation measures the operator will likely have to undertake before the site can be used (assuming in site preservation is not necessary); and,
    - a timeframe for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate.

    If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.
5. If any cultural or paleontological resources are unearthed/discovered during the construction of the proposed well location and associated actions, the operator shall cease work immediately and contact the appropriate official at the BLM MCFO as soon as possible, 406-233-2800.
6. It is the responsibility of the operator to control noxious weeds on lands disturbed in association with oil and gas lease operations. Lease-associated weed control strategies, when required by the BLM, are to be coordinated with any involved surface owners and local weed control boards. A pesticide-use proposal must be prepared and then reviewed and approved by the BLM, prior to any herbicide application on lands disturbed by federal oil and gas lease operations. A pesticide application record must be completed within 24 hours after completion of application of herbicides.
7. The operator is responsible for the suppression of any fires started as a result of operations. The contractor must have the necessary equipment, including fire extinguishers or water, to provide initial suppression of fire.
8. The abandonment marker shall exhibit the same information required for the well sign (refer to Informational Notice Item 6, Well Identification [43 CFR 3162.6]). The abandonment marker (steel plate welded to surface casing 4′ below ground level) must be installed when the well is plugged.
9. Additional requirements may be imposed if changes in operational or environmental conditions dictate.
10. This office shall be notified in writing if the well pad has been constructed but no drilling operations have been initiated within 6 months of the construction.

Informational Notice

The following items are from the federal oil and gas regulations (43 CFR 3160, Onshore Orders Numbers 1 and 2, Notice To Lessees (NTL), and other guidance). This is not a complete list of requirements but an abstract of some major requirements.

1. General Requirements

a. The lessee or designated operator shall comply with applicable laws and regulations; the lease terms, onshore oil and gas orders, NTLs; and other orders and instructions of the AO. Any deviation from the terms of the approved APD requires prior approval from the BLM (43 CFR 3162.1(a))
b. If at any time the facilities located on public lands authorized by the terms of the lease are no longer included in the lease (caused by a contraction in the unit or other lease or unit boundary change), the BLM will process a change in authorization to the appropriate statute. The authorization will be subject to appropriate rental or other financial obligations determined by the AO.

2. Drilling Operations (Onshore Order No. 2)

a. If Drill Stem Tests are run, all applicable safety precautions outlined in Onshore Order No. 2 shall be observed.
b. The proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals.

3. Well Abandonment (43 CFR 3162.3-4, Onshore Order No. 1, Sec. V)

a. Approval for abandonment shall be obtained prior to beginning plugging operations. Initial approval for plugging operations may be verbal, but shall be followed up in writing within 30 days. Subsequent and final abandonment notifications are required and shall be submitted on Sundry Notices and Reports on Wells, Form 3160.5, in triplicate.

4. Reports and Notifications (43 CFR 3162.4-1, 3162.4-3)

a. Within 30 days of completion of the well as a dry hole or producer, a copy of all logs, core descriptions, core analyses, well-test data, geologic summaries, sample descriptions, or data obtained and compiled during the drilling, workover, or completion operations shall be filed with Well Completion or Recompletion Report and Log, Form 3160-4, in duplicate.
b. In accordance with 43 CFR 3162.4-3, this well shall be reported on MMS Form 4054, “Oil and Gas Operations Report, starting with the month in which any operations commence, including drilling, and continuing each month until the well is physically plugged and abandoned.
c. Notify this office within 5 business days of production start-up if either of the below conditions occur:

    i. the well is placed on production (shipment or sales of hydrocarbons from temporary tanks, production into permanent facilities, or measurement through permanent facilities); or
    ii. the well resumes production after being off production for more than 90 days.

        1. Notification may be written or verbal with written follow-up within 15 days and must include the following information:

            a. operator name, address, and telephone number;
            b. well name and number, county and state;
            c. well location, ¼¼, Section, Township, Range, P.M.;
            d. date well begins or resumes production;
            e. the nature of the well’s production (crude oil, or crude oil casing gas, or natural gas and entrained liquid hydrocarbons);
            f. the federal or Indian lease number;

g. as appropriate, the Unit Agreement name, number, and Participating Area name; and
h. as appropriate, the Communitization Agreement number.

5. Environmental Obligations and Disposition of Production (43 CFR 3162.5-1, 3162.7-1 and 40 CFR 302.4)

a. With BLM approval, water produced from newly completed wells may be temporarily stored in reserve pits up to 90 days. During this initial period, application for the permanent disposal method shall be made to this office in accordance with Onshore Order No. 7. If underground injection is proposed, a USEPA or State permit shall also be obtained. If surface discharge of produced water is proposed, an MPDES permit shall also be required.
b. Spills, accidents, fires, injuries, blowouts, and other undesirable events must be reported to this office within the timeframes in NTL-MSO-1-92.
c. You are required to take all necessary steps to prevent any death of a migratory bird in pits or open vessels associated with the drilling, testing, completion, or production of this well. The death of any migratory bird found in such a pit or open vessel is a violation of the Migratory Bird Treaty Act and is considered a criminal act. Any deaths of migratory birds attributable to pits or open vessels associated with drilling, testing, completing or production operations must be reported to this office and the United States Fish and Wildlife Service (USFWS) within 24 hours. We may require that the pit be designed or the open vessel be covered to deter the entry of birds in any facility associated with drilling, testing, completion or production of this well. Fencing, screening and netting of pits may be required as a means to deter bird entry. These conditions would most likely be imposed to prevent the entry of migratory birds if oil is left in pits or open vessels after the cessation of drilling or completion of operations, if water disposal pits consistently receive oil, or if pits or open vessels are used repeatedly for emergency situations which result in the accumulation of oil. Voluntary pit fencing, screening and netting, or sealing vessels, is encouraged to avoid potential instances that may result in the death of a migratory bird.
d. Gas produced from this well may not be vented or flared beyond an initial, authorized test period of 30 days or 50 MMCF following its completion, whichever first occurs, without the prior, written approval of the AO. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue the venting or flaring as uneconomic is granted, and you shall be required to compensate the lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.

6. Well Identification (43 CFR 3162.6)

Each drilling, producing, or abandoned well shall be identified with the operator's name, the lease serial number, the well number, and the surveyed description of the well (footages or the quarter-quarter section, the section, township, and range). The Indian lessor's name may also be required. All markings shall be legible and in a conspicuous place.

7. Site Security (43 CFR 3162.7.5)

a. Oil storage facilities shall be clearly identified with a sign, and tanks must be individually identified (43 CFR 3162.6 (c)).
b. Site security plans shall be completed within 60 days of production startup (43 CFR 3162.7-5(c)).
c. Site facility diagrams shall be filed in this office within 60 days after facilities are installed or modified (43 CFR 3162.7-5(d)(1)).

8. Public Availability of Information (43 CFR 3100.4)

All submitted information not marked "CONFIDENTIAL INFORMATION" will be available for public inspection upon request. The exception is Indian lease information, which is always considered confidential.

You have the right to request a State Director Review of this decision and these COAs pursuant to 43 CFR 3165.3(b). A State Director Review, including all supporting documentation must be filed with the Montana State Office (MSO), State Director (MT-920) at 5001 Southgate Drive, Billings, Montana 59101-4669 within 20 business days of your receipt of this decision. If adversely affected by the State Director's decision, it can be further appealed to the IBLA pursuant to 43 CFR 3165.4, 43 CFR 4.411, and 43 CFR 4.413. Should you fail to timely request a State Director Review, or after receiving the State Director's decision, fail to timely file an appeal with IBLA, no further administrative review of this decision would be possible.

Field Office Address and Contacts

The approval letter concludes with the complete address, phone number, and business hours for the MCFO. A list of staff members, their job titles, and home phone numbers is also provided for the company to use when the office is closed.

MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

Mitigation measures and BMPs are restrictions on lease operations, which are intended to minimize or avoid impacts to resources or land uses from oil and gas activities. If needed, mitigation measures and BMPs would be applied to permits or approvals granted by the BLM as COAs. Mitigation measures and BMPs would be included as appropriate to address site-specific concerns as necessary, on a case-by-case basis as required through project-specific NEPA analysis or other environmental review. See the Mitigation Measures and Conservation Actions Appendix and the GRSG Required Design Features appendices for revisions and guidance.

SITE CONSTRUCTION

After the APD is approved, the operator moves construction equipment, usually dozers (track-mounted and rubber-tired), scrapers, and motor graders, over existing roads to the point where the access road will begin. Existing roads and vehicle routes are improved in places and, occasionally, culverts and cattle guards are installed as specified in the approved APD.

The length of the access road varies. Environmental factors or the landowner's wishes may dictate a longer route. In areas with gentle topography and shallow depth of wells , wells can typically be drilled using a truck-mounted rig, which often means that very little or no access road work is needed. In rough terrain, the type of construction is sidecasting (using the material taken from the cut portion of the road to construct the fill portion); slightly less than one-half of the roadbed is on a cut area and the rest is on a fill area. Roads are usually constructed with a l4-foot (single lane) running surface. Soil texture, steepness of the topography, and moisture conditions may dictate surfacing the access road. The total acreage disturbed for each mile of access road constructed varies significantly with topography.

Well locations are constructed by one of three different general types of construction but, in every case, all soil material suitable for plant growth is first removed and stockpiled in a designated area. Sites on flat terrain usually require little more than removing the topsoil material and vegetation. Drilling sites on ridge tops and hillsides are constructed by cutting and filling portions of the location. The majority of the excess cut material is stockpiled in an area that will allow it to be easily recovered for rehabilitation. It is important to confine extra cut material in a stockpile rather than cast it down hillsides and drainages where it cannot be recovered for rehabilitation.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, and the depth and type of the well. The amount of level surface required averages 200 by 250 feet and should be constructed so that the drill rig can be placed on the cut surface instead of fill material to prevent the derrick from leaning or toppling as a result of the settling of uncompacted soil.

In addition to the drilling rig footprint, a reserve pit is constructed, usually square or oblong, but sometimes in another shape to accommodate topography. Generally, the reserve pit is 6 to 12 feet deep by 15 to 20 feet wide by 40 to 50 feet in length, but may be deeper to compensate for smaller length and width or deeper drilling depths. For air drilling, smaller reserve pits are used, usually less than 10 feet by 10 feet and approximately 6 to 10 feet in depth. Depending upon the soil permeability, pits can be lined with an impermeable material to contain the drilling fluids. If water is encountered while digging the reserve pit, a closed mud system consisting of steel tanks may be required. For oil-base mud, closed systems are mandatory, and the mud and cuttings must be recycled or disposed of in an approved manner.

Depending on how the drill site is located relative to a natural drainage, it may be necessary to construct water bars or diversions to control surface runoff and erosion. The area disturbed for construction and the potential for successful re-vegetation depends largely on topography, soil type, climate and the degree of disturbance. Necessary erosion mitigation measures are installed throughout the road and well site. Drilling activities usually begin within a week or two after the location and access road have been constructed. If the well is determined to be a dry hole, it will typically be plugged while the drill rig is still on location.

DRILLING OPERATIONS

To ensure that drilling and completion operations are conducted in a safe and environmentally sound manner, the BLM reviews, and evaluates, approves and regulates all drilling and completion operations, and related surface disturbance associated with Federal and Indian oil and gas mineral development. Operators must submit APDs to the agency in accordance to Onshore Oil and Gas Order No.1. Prior to approving an APD, the BLM identifies all potential subsurface formations that will be penetrated by the wellbore. This includes groundwater aquifers and any zones that would present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures. All well casing and cementing operations that occur on Federal/Indian lands would be reviewed and approved by BLM and conducted in accordance with the applicable requirements specified in Onshore Oil and Gas Order No. 2 and the American Petroleum Institute (API) standards.

VERTICAL DRILLING

The vertical wells producing in the planning area are completed in a variety of formations for both gas and oil. The most productive horizon completed have been those of the Red River, Eagle, Bakken, and Muddy Formations. Vertical well depths in Montana range from CBNG wells a few hundred feet in the south-central portion of the planning area to over 13,000 feet in the Williston Basin in Richland County.

DIRECTIONAL AND HORIZONTAL

The majority of the currently producing horizontal wells in the planning area are producing oil from the Ordovician Red River Formation and the Upper Devonian-Lower Mississippian Bakken Formation, a horizontal play in North Dakota, Montana, and Saskatchewan that recently has been the focus of drilling in the area.

Directional drilling may be used where the drill site cannot be located directly over the drilling target. There are limits to both the degree that the wellbore can be deviated from the vertical and the horizontal distance the well can be drilled away from the well site. Directional drilling can theoretically develop lands near the outer boundary of a lease affected by a NSO stipulation. Directional drilling can theoretically develop lands near the outer boundary of a lease affected by a NSO stipulation. Gas wells in the planning area are not deviated for technical and economic reasons. See *Drilling Access with NSO Stipulations on Oil Leases* below for additional information.

Some benefits of directional drilling include the avoidance of sensitive or inaccessible surface features (resulting in greater protection of sensitive environments), and, when multiple wells are drilled from the same vertical wellbore or from the same surface location, a reduction in drilling time, overall surface disturbance, and associated waste volumes and emissions.

While unconventional zones (methane-bearing coal zones, oil or gas bearing shale zones, gas hydrates or "tight gas" in low porosity or low permeability traditional zones), have long been surpassed by the oil and gas industry, recent technological advances in horizontal drilling and hydraulic fracturing described below, have allowed development of these formations that were once universally considered as uneconomic.

Horizontal drilling is defined as deviating a wellbore at least 80 degrees from the vertical so that the borehole penetrates a productive formation in a manner parallel to the formation. Most horizontal wells are drilled vertically from the surface to several hundred feet above the productive formation. The wellbore is then drilled in a curve ending with the well going horizontal through the productive formation.

In addition to the benefits listed for directional drilling above, another benefit of horizontal drilling is that it exposes the wellbore to a far greater surface area of hydrocarbon-bearing rock when compared to a typical vertical well. Horizontal wells tend to produce more than vertical wells since there is more reservoir rock exposed. This technology also eliminates the need to drill as many wells, since a horizontal well would be capable of producing the oil and gas from a larger areal extent. While this technology may reduce the overall foot print of an oil or gas field, as a result of having multiple wells (multi-well pad), and possibly production facilities on one well pad, the pad is typically larger in size to handle drilling and production operations. This reduces the acres of surface disturbance per well. See section below *Multiple Wells On A Single Well Pad* below for further details on multi-well pads.

Drilling time may be longer for a horizontal well than for a vertical well drilled to the same producing formation. The need for more drilling mud volume may also increase water needs, pit size or number of holding tanks on site compared to a vertical well to the same producing formation.

Drilling and completion costs for directional and horizontal wells are typically significantly higher than for conventional vertical boreholes, even when the cost savings associated with reduced need for surface disturbance is considered. Eustes (2003) and Fritz, Horn, and Joshi (1991) identified the following specialized requirements and risk factors unique to horizontal and directional drilling that can affect drilling and completion costs for these types of wells:

- specialized equipment (e.g., mud motors, measurement while drilling tools) and specially trained personnel;
- a larger drilling rig and associated equipment;
- casing and drilling string modifications to address problems associated with ovality and bending stresses;
- increased risk of borehole damage due to unique tectonic stresses;
- lengthened overall drilling time on location because more hole is drilled in S-shaped boreholes and horizontal boreholes compared to vertical wells;
- increased torque and drag on borehole equipment; and,
- lengthened overall drilling time on location compared to vertical wells because of slower penetration rates due to increased torque and drag in directional and horizontal wellbores (however, increased operator and driller experience with horizontal drilling has resulted in decreased drilling times in the Williston Basin over the past several years).

In addition to increased costs, the risk of losing the well because of geologic or mechanical failures is also greater in directional and, particularly, horizontal boreholes than in conventional vertical boreholes. As a result of these increased costs and risk, operators tend to prefer vertical over directional or horizontal boreholes unless special circumstances exist that make such drilling a necessity or economically attractive. For example, the geology of a reservoir may be such that a vertical borehole may only contact a few feet of the productive horizon, while a horizontal borehole may be able to contact tens to thousands of feet (depending on factors such as how the well is completed and the areal extent of the pool). In a case such as this, the operator must make the

determination that the increased potential for productivity outweighs the increased drilling costs and inherent risks involved in directional and horizontal drilling.

ROTARY DRILLING

The actual commencement of the drilling is referred to as spudding. Initially, drilling proceeds rapidly because of the unconsolidated nature of shallow formations. Drilling is accomplished by rotating the drill string and putting variable weights on the bit located at the bottom of the string. The weight on the bits is controlled to maintain as vertical a hole as possible or deviate from vertical when desired, and to prevent premature wearing of the bit. While drilling, the derrick and associated hoisting equipment bear a majority of the drill string's weight. The combination of rotary motion and weight on the bit causes rock to be gouged away at the bottom of the hole. The rotary motion is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table sits on the drilling rig floor and, as the bit advances, the kelly slides down through it. When the kelly has gone as deep as it can, it is raised and a new piece of drill pipe about 30 feet in length is attached in its place. The drill pipe is then lowered, the kelly is reattached, and drilling recommences. When the bit becomes dull, it is necessary to "trip" the drill string and replace the bit. This is a time-consuming process of withdrawing 90-foot sections of the drill pipe until the bit is out of the hole. Once the bit is replaced the drill string is reassembled, lowered into the hole, and drilling recommences. This process requires a large part of the total drilling time and may cause other hole problems. New bits constructed with modern metals and manufactured polycrystalline diamonds, along with down hole mud motors, have revolutionized drilling operations so that thousands of feet of hole can be drilled with one bit run.

Drilling mud is circulated through the drill pipe to the bottom of the hole, through the bit, up the annulus of the well, across a screen that separates the rock chips, and into holding tanks from which finer sediments settle from the mud before it is pumped back into the well. The mud is maintained at a required weight and viscosity to cool the bit, reduce the drag of the drill pipe on the sides of the hole, seal off any porous zones, contain formation fluids to prevent a blowout, and bring the rock chips to the surface for disposal. Various additives are used in maintaining the mud at the appropriate viscosity and weight. Most of the mud consists of bentonite, a naturally occurring mineral that is mined in Montana. Drilling muds are not allowed to contain any hazardous or toxic substances.

High pressure air is sometimes used in place of mud. The use of mud or air is largely dependent upon the target formation, drilling depth and type of completion desired. When drilling with air, the cuttings are blown into another pit called the blooie pit, where compressed air and cuttings leave the drill system. By regulation, the blooie pit must be located no closer than 100 feet from the well bore.

All cementing operation plans are reviewed and conducted in accordance with the applicable requirements specified in Onshore Oil and Gas Order No. 2 and the API standards. This ensures cement is placed at the appropriate depths and a sufficient quantity is utilized to effectively seal all freshwater-bearing formations from contamination by inter-formational mixing or migration of fluids.

A determination is made regarding the productive potential of the well. If oil or gas is not discovered in commercial quantities, the well is considered dry. The operator is then required to follow BLM procedures to properly plug the dry hole. The drill site and access road are then rehabilitated in accordance with the approved APD. If the well will be completed for production, drilling rig operations continue until the production casing is cemented into the well prior to removing the drilling equipment from the location. BLM personnel would conduct inspections of the drilling rig and operations to ensure compliance with the approved plans in the APD and regulations.

REVERSE CIRCULATION DRILLING

Reverse circulation drilling uses a dual-wall drill string. Drilling fluid is carried to the bit between the outer and inner wall of the drill pipe and cuttings and fluid are returned to the surface in the inner part of the pipe. Reverse circulation drilling appears to be an ideal system for drilling and producing tight low- or under-pressured formations that could be easily damaged by conventional drilling. K2 Energy of Calgary has applied this

technology to successfully drill and test gas wells in the low-pressure (formation pressure estimated at 150 pounds per square inch) Bow Island Formation on the Blackfeet Indian Reservation and in the Montana Thrust Belt (Mackay, 2003). The planning area does not lend its self to this drilling method.

SLIMHOLE DRILLING AND COILED TUBING

Slimhole drilling, a technique used to recover reserves in mature fields, has not yet been used much in the Rocky Mountain area. This technique has the potential to improve efficiency and reduce costs of both exploration and production drilling. Coiled tubing used effectively for drilling in reentry, underbalanced, and highly deviated wells is often used in slimhole drilling. Most coiled tubing rigs are limited to relatively shallow drilling. Most planning area oil wells have been historically drilled to depths greater than 5,000 feet and would not be as amenable to coiled tubing rigs. Coiled tubing will most likely be first used in some workover situations in the planning area.

LIGHT MODULAR DRILLING RIGS AND PAD DRILLING

Light modular drilling rigs can be more easily used in remote areas and are quickly disassembled and moved. Rig components are made with lighter and stronger materials and a modular nature reduces the impacts of surface disturbance. Also, these rigs reduce fuel use and emissions. Light modular rigs also have potential for use in situations in which pad drilling is being used. Pad drilling refers to the drilling of multiple directional boreholes from one surface location. Pads are the flat, graded land surfaces that serve as the foundation for the drilling rig. Since modular rigs allow quicker breakdown and movement to new locations, they reduce time to drill and rig costs. Shallow drilling targets in the planning area are not conducive to the use of significant amounts of directional drilling so pad drilling would be unlikely in those parts of the planning area.

PNEUMATIC DRILLING

Pneumatic drilling is a technique in which boreholes are drilled using air or other gases rather than water or other drilling liquids. This type of drilling can be used in mature fields and formations with low downhole pressures and where formations are sensitive to the fluids commonly used in drilling. Some formations in the planning area meet these criteria. This type of drilling significantly reduces waste, shortens drilling time, cuts surface disturbance, and decreases power consumption and emissions.

CASING

All well casing and cementing operations that occur on Federal/Indian lands would be reviewed and approved by BLM and conducted in accordance with the applicable requirements specified in Onshore Oil and Gas Order No. 2 and the API standards.

Various types of casing are placed in the drilled hole to enhance completion operations and safety. Casing is a string of steel pipe composed of approximately 40-foot lengths of pipe that are threaded together. Casing is cemented into the wellbore to protect against migration of fluids within the hole and to isolate the productive zones so they can be completed and produced without interference from other zones containing hydrocarbons or water. Hole deviation, depth, bore hole environment, placement of centralizers (if any), and a myriad of other factors affect the integrity of the casing and cement job and must be considered in the original design.

Surface casing that is properly set and cemented also protects surface aquifers from contamination by drilling and production operations. Surface casing is set to a depth greater than the deepest fresh water aquifer that could be reasonably developed. Usable water may exist at greater depths but these aquifers are not normally considered to be important water sources. Surface casing is designed to be large enough to allow subsequent strings of smaller casing to be set as the well is drilled deeper. Cement is placed in the annulus of the surface casing from casing shoe to ground level. The surface casing is the first string on which BOP equipment is installed. The BOP allows the well to be shut in at any time that conditions warrant, protecting against unanticipated formation pressures and allowing safe control of the well. BOP equipment is tested and inspected regularly by both the rig personnel and the inspection and enforcement branch of BLM. Minimum standards

and enforcement provisions are part of Onshore Order No. 2. Well-trained rig personnel are a necessity for proper blowout prevention.

Production casing is designed to provide isolation of oil and gas formations and also to provide a high-pressure conduit to the hydrocarbon zones that allows stimulation of these intervals to improve the productivity. In accordance with federal regulations, production casing is required to be cemented from the production casing shoe all the way to the surface. This requirement ensures adequate protection from interzonal migration of unsuitable water and hydrocarbons.

WELL LOGGING

Geophysical logs are obtained by running various instruments into the hole on a wire cable. Logs are usually run at a depth point where production casing will be installed. A log is not usually run before surface casing is set but, in most instances, a log recording natural gamma radiation is run through the surface casing to determine the geology of that section. The logs can determine water resistivity, hydrocarbon saturations, natural gamma radiations, porosity of the rock by density, permeability, pressure, temperature, hole geometry, and subsurface track. Logs are used to evaluate whether the well is dry or has the potential for a satisfactory completion. Logs also delineate the various geologic horizons; hydrocarbon zones; fresh, usable, and unusable water; and sands, shales, limestones, coals, and other minerals. Logs are used to specify hydrocarbon these intervals so that they can be perforated and stimulated during the completion program. Normally in the planning area, logs recording resistivity, porosity log of density, cement bond characteristics, and nuclear receptivity may be run in the well.

COMPLETION OPERATIONS

WELL TESTING AND COMPLETION

After the well is drilled, testing operations would commence. If testing indicates the presence of an economic level of oil and/or gas, the well would be completed. Typical completion operations would involve setting and cementing the production casing to the total depth of the well. There are also instances where casing is set at the top of the target zone, and the formation is completed in the open hole.

To ensure that drilling and completion operations are conducted in a safe and environmentally sound manner, the BLM approves and regulates all drilling and completion operations as discussed above in the *Drilling Operations* section.

After the proper casings are set, wells are often treated to improve the recovery of hydrocarbons by increasing the rate and volume of hydrocarbons moving from the natural oil and gas reservoir into the wellbore. These processes are known as well-stimulation treatments, and they are designed to create new fluid passageways in the producing formation or remove blockages within existing passageways. They include fracturing, acidizing, and other mechanical and chemical treatments often used in combination. The results from the different treatments are additive and often complement each other, which makes it possible to introduce fluids carrying sand, walnut hulls, or other small particles of material into the newly created crevices to keep the fractures open when the pressure is relieved. This increases the flow rate and volume of reservoir fluids that move from the producing formation into the wellbore.

Water produced during drilling and completion operations is contained in a lined reserve pit or in steel tanks on location. The water can be disposed of by trucking it to an authorized disposal pit, allowing the water in the lined pit to evaporate within required timeframes, through subsurface injection, or treated and reused to drill or complete another well. The disposal of water generated during drilling and completion operations in an injection or disposal well requires permit(s) from the primacy state or the USEPA. See *Produced Water* section below for details on primacy. A NEPA analysis is prepared for all requests concerning disposal of water generated from federal wells and in accordance to federal and state regulations.

After completion operations are finished, wellhead equipment consisting of various valves and pressure regulators are installed to control the oil or gas flow to the production facilities and allow safely shutting in the well under any conditions.

HYDRAULIC FRACTURING

Hydraulic fracturing has been utilized by the oil and gas industry since the late 1940s. Within the planning area, hydraulic fracturing, in conjunction with horizontal drilling described above, has allowed for development of unconventional zones that were once considered uneconomical, like the Bakken and Three Forks Formations in the Williston Basin area.

Hydraulic fracturing is a technique used to create additional space and connecting existing fractures and existing rock pores with newly created fractures that are located in deep underground geologic formations. The induced space allows the rock to more readily release oil and natural gas so it can flow to the surface via the well bore that would otherwise be uneconomical to develop. Wells that undergo hydraulic fracturing may be drilled vertically, horizontally, or directionally and the resultant fractures induced by the hydraulic fracturing can be vertical, horizontal, or both. The typical steps of hydraulic fracturing can be described as follows:

1. Water, sand and additives are pumped at high pressures down the wellbore.
2. The liquid goes through perforated sections of the wellbore and into the surrounding formation, fracturing the rock and injecting sand or other proppants into the cracks to hold them open.
3. Experts continuously monitor and gauge pressures along with the volume of fluids and proppants, while studying how the sand reacts when it hits the bottom of the wellbore; slowly increasing the density of sand to water as the frac progresses.
4. This process may be repeated multiple times, in “stages” to reach maximum areas of the wellbore. When this is done, the wellbore is temporarily plugged between each stage to maintain the highest water pressure possible and get maximum fracturing results in the rock.
5. Frac plugs are drilled or removed from the wellbore and the well is tested for results.
6. The water pressure is reduced and fluids are returned up the wellbore for disposal or treatment and re-use, leaving the sand in place to prop open the cracks and allow the oil/gas to flow to the well bore.

Fracturing fluid is typically more than 98 percent water and sand, with small amounts of readily available chemical additives used to carry the proppant and control the chemical and mechanical properties of the water and sand mixture. Proppant, consisting of synthetic or natural silica sand, may be used in quantities of few hundred tons for a vertical well to a few thousand tons for a horizontal well. The amount of water needed to fracture a well in the planning area depends on the geologic basin, the formation, and depth and type of well (vertical, horizontal, directional), and the proposed completion process. The amount of water used to hydraulic fracture a Bakken or Three Forks well is approximately 2-4 million gallons (6.1 to 12.3 acre-feet) of freshwater (EPA, 2012).

Several sources of water are available for hydraulic fracturing and drilling operations in the planning area. The use of any specific water source on a federally administered well, requires the proposal be reviewed and analyzed through the NEPA process for BLM approval during the APD stage to ensure compliance with Montana water laws and federal regulations.

All project proponents must adhere to Montana water laws when obtaining and using specific sources of water. Important parts of Montana’s statutes include:

- Water cannot be transported for out-of-state use.
- Any new beneficial use of water requires a Provisional Permit.
- A change in point of diversions, place of use, purpose of use, or storage of an existing water right requires a Change Authorization.

Potential water sources available for hydraulic fracturing and drilling operations in the planning area are:

- Water transported from outside the state. The operator may transport water from outside the state as long as stringent Montana water law requirements are met.
- Irrigation water leased or purchased from a landowner. The landowner may have rights to surface water, delivered by a ditch or canal that is used to irrigate land. The operator may choose to enter into an agreement with the landowner to purchase or lease a portion of that water. This is allowable; however, the water right is limited to the period of diversion, point of diversion, place of use, and purpose of use identified. For example, the use of an irrigation water right is limited to irrigation use including the period of diversion of that use, and cannot be used for well drilling and hydraulic fracturing operations. To allow its use for drilling and hydraulic fracturing, the owner of the water right and the operator must apply to change the water right through a formal process with the Montana Department of Natural Resources and Conservation (MDNRC). If the proposed use is needed year-round, the operator must apply for a provisional permit for the period not covered by the irrigation right with MDNRC.
- Temporary Water Right Lease. A water right may be temporarily leased by the water right owner. The temporary process is less rigorous that a permanent lease; however, authorization to lease the water right must be obtained through MDNRC.
- Treated water or raw water leased or purchased from a water provider. The operator may choose to enter into an agreement with a water provider to purchase or lease water from the water provider's system. Municipalities and other water providers may have a surplus of water in their system before it is treated (raw water) that can be used for drilling and hydraulic fracturing operations. This would be allowed only if the operator's use were compliant with the water provider's water rights.
- Water treated at a waste water treatment plant leased or purchased from a water provider. Municipalities and other water providers discharge their treated waste water into the streams where it becomes part of the public resource, ready to be appropriated once again in the priority system. Proper authorizations would need to be obtained from MDNRC.
- New diversion of surface water flowing in streams and rivers. New diversion of surface waters in many parts of the state are rare because the surface streams are already "over appropriated," that is, the flows do not reliably occur in such a magnitude that all of the existing water rights on those streams can be satisfied. Therefore, the only time that an operator may be able to divert water directly from a river is during periods of high flow and less demand. These periods do occur but not reliably or predictably. The operator must apply for all new diversions and receive a provisional permit from MDNRC.
- Produced Water. Water produced at an existing oil or gas well for drilling and hydraulic fracturing operations; however, a water right is required from MDNRC.
- Reused or Recycled Drilling Water. Water that is used for drilling of one well may be recovered and reused in the construction of subsequent wells. The BLM encourages reuse and recycling of both the water used in well drilling and the water produced at an existing oil or gas well. A water right is required and would need to be granted specifically to accommodate the reuse.
- On-Location Water Supply Wells. Operators must apply for, and receive, permission from the MDNRC to drill and use a new water supply well. These wells are usually drilled on location to provide an on-demand supply. These industrial-type water supply wells are typically drilled deeper than nearby domestic and/or stock wells to minimize drawdown interference, and have large capacity pumps. The proper construction, operation and maintenance, backflow prevention and security of these water supply wells are critical considerations at the time they are proposed to minimize impacts to the well and/or the waters in the well and are under the jurisdiction of the MDNRC. Plugging these wells is also under the jurisdiction of the MDNRC.

Montana's water law can change on a yearly basis. Additional information can be obtained at the local MDNRC Water Resources Office to ensure the proper authorizations are in place prior to using specific water sources in Montana.

Before hydraulic fracturing takes place, all surface casing and some deeper, intermediate zones are required to be cemented from the bottom of the cased hole to the surface in accordance to Onshore Oil and Gas Order No. 2, MBOGC rules and regulations, and API standards. The cemented well is pressure tested to ensure there are no leaks and a cement bond log is run to ensure the cement has bonded to the casing and the formation.

MBOGC regulations also ensure that all resources including groundwater are protected. The MBOGC regulations require new and existing wells which will be stimulated by hydraulic fracturing must demonstrate suitable and safe mechanical configuration for the stimulation treatment proposed. If the operator proposes hydraulic fracturing through production casing or through intermediate casing, the casing must be tested to the maximum anticipated treating pressure. In accordance with MBOGC Rule 36.22.1015 operators are required to disclose and report the amount and type of fluids used in well stimulation to the Board or, if approved by the Board, to the Interstate Oil and Gas Compact Commission/Groundwater Protection Council hydraulic fracturing web site (FracFocus.org).

PRODUCTION AND DEVELOPMENT

GAS PRODUCTION

The installation of gas production facilities generally requires little additional surface disturbance beyond that necessary for drilling and completion; however, additional disturbance could result from pipeline and gathering line installations if they are installed across undisturbed areas. If pipelines follow existing access roads, no appreciable additional surface disturbance is necessary to hook the well up to production.

Equipment that would stay with the well during its life include a well head, a gas meter house usually a 10 feet by 10 feet by 8 feet skid-mounted steel shed that houses the well head and gas flow meter, and a pumpjack if necessary. Pumpjacks are used when water is produced with the gas or there is a gas reservoir pressure decline to a point that is not adequate to overcome the hydrostatic pressure created by a column of water in the well. Pumpjacks are usually 8 to 10 feet in height, require a slightly larger surface area than a gas meter house, and may or may not be skid-mounted. They are powered by either electric motors or natural gas/propane internal combustion engines. Production facility colors are required to be from the standard color chart and are specified in the APD COAs.

If the gas well is producing some oil or condensate, oil tanks are used to store the oil or condensate until it is sold via truck or pipeline. Pipeline quality gas at the wellhead requires a minimum of processing equipment. As the quality of gas decreases with the increased presence of water, solids, or liquid hydrocarbons, the amount of processing equipment increases. Water or liquid hydrocarbons in the gas are removed before the gas is sold, usually in the separation equipment near the wellhead. If liquid hydrocarbons are present, storage facilities (tank batteries) are required to store the liquids until they accumulate in sufficient quantities to be hauled out by large trucks.

Typical wells in the planning area are identified as “sweet gas” wells, that is, they contain no hydrogen sulfide gas; therefore, hydrogen sulfide facilities are generally not required to be used in order to produce the gas. As the wells produce in an area, pressures eventually become depleted to the point that they require an artificial lift method to lower the well pressure to allow for production to continue. Once this occurs, the operator may design and install a compressor station that further enables the production of natural gas from the wells.

Water produced from gas wells is managed in accordance to Onshore Oil and Gas Order No. 7 Disposal of Produced Water. See *Water Production* below.

Gas that occurs with oil well production is managed in accordance with NTL-4A. Gas is separated at the tank battery. If enough casinghead gas is separated to make it economical for marketing, a plant can be constructed to process the gas, or a pipeline can be constructed to carry the product to an existing plant. If the volume of casinghead gas is insufficient or uneconomic to warrant marketing, it is usually used as fuel for pump engines in the field, heating fuel for the heater-treaters, or is flared or vented into the atmosphere as approved by the AO.

OIL PRODUCTION

In the planning area, oil is generally produced using artificial lift methods (pump units). The oil production equipment (heater-treater, tank battery, and holding facility for production water) is either placed on a portion of the location (on cut rather than fill) and located a safe distance from the wellhead, or placed as a centralized

facility that services a number of wells with a pipeline connection. The heater-treater and tanks are surrounded by earthen dikes to contain accidental spills. Either all of the facilities or only the produced water pit (if present) will be fenced. Production facility colors are required to be from the standard color chart and are specified in the APD COAs.

Production from several wells on one lease can be carried by pipeline to a central tank battery. Use of a central tank battery can depend on whether the oil is from the same formation, the same lease ownership, or multiple lease ownerships and formations if a commingling agreement is approved. Generally, because of the nature of the oil, adequate separation of oil and water is only obtained through applications of heat. The fluid stream arrives at a separator point where the flash gas is taken off and, in most cases; this flash gas is used for lease operations. The remainder of the flash gas is either compressed and sold or flared. Flash gas is defined as solution gas liberated from the oil through a reduction in pressure. Water and oil are also separated at this point by gravity segregation. The oil is sent to storage tanks, and the water is sent to a disposal or injection facility. Once the oil is in the storage tanks, it can then be measured and sold. The primary method of oil measurement in the planning area is tank gauging. Measurement is required by 43 CFR 3162.7-2 and Onshore Order No. 4 to ensure proper and full payment of federal royalty.

Oil wells can be completed as flowing (those wells with sufficient underground pressure to raise the oil to the surface) or, if the pressure is inadequate, they are completed with the installation of subsurface pumps. The subsurface pumps are usually mechanically powered by a pumping unit. Pumping units come in a variety of sizes; however, most pumping units in the planning area are 15 feet or less in height. The units are powered by internal combustion engines or electric motors. Fuel for the engines may be casinghead gas or propane. In cases where large volumes of water are produced with the oil, electric submersible pumps may be installed. These pumps may produce up to 6,000 barrels of fluid per day at an oil cut of 1/2 of 1% oil.

COAL BED NATURAL GAS PRODUCTION

Typical coal bed natural gas (CBNG) production combines high water production rates of some oil fields with low-pressure operations of some gas fields. Because of the reservoir characteristics of coal, high water production rates are initially required to dewater the reservoir and allow gas to be liberated from cleat surfaces within the coal. In a coal reservoir, gas is primarily trapped on the face of the coal within the cleat system via molecular attraction. Pressure must be reduced to liberate the gas molecules from the coal face. The production history of typical CBNG wells shows that water production rates begin high, with little or no gas. The water rate then drops at a constant rate, with increasing gas rates until a maximum gas rate is achieved relative to the original gas saturation and reservoir pressures. The gas rate then declines to the economic limit. This process is the exact opposite of that associated with most oil and gas production, which starts at high hydrocarbon rates and low water rates and advances to low hydrocarbon rates and high water rates. The depth limit of a CBNG well is dictated by the coal permeability, which is highly sensitive to overburden weight.

A CBNG operation usually consists of a high-capacity submersible or progressive cavity pump, with water produced out of the tubing and low-pressure gas produced out of the casing. Centralized facilities collect the gas for compression to pipeline pressures and the water for disposal. Electric power is usually used to power the well pumps and is connected to the well via a subsurface cable (or overhead power) laid with the water and gas lines. The producing well pad is very small, with only the well head and an insulating house to cover the well head. Operators have begun to complete wells as monobore wells (multiple zones are completed at the same time and produced from the same well bore to help reduce surface disturbance). The centralized production facilities typically contain well header buildings where the individual well gas is measured and that house collection tanks, injection wells, pumps for disposal of the water, and multistage compressors to bring the very low pressure gas to sales line pressure.

WATER PRODUCTION

Associated water produced with the oil, gas, or CBNG production operations is disposed of in accordance with Onshore Oil and Gas Order No. 7. Disposal methods include trucking the water to an authorized disposal pit, placing the water in lined or unlined pits, discharging the water into surface drainages, or through subsurface injection. The disposal of produced water in an injection or disposal well requires permit(s) from the primacy

state or the USEPA. Primacy means that a state or agency has the ultimate responsibility for permitting and monitoring the Underground Injection Control program for Class 2 wells (saltwater disposal and secondary recovery wells). Montana is currently a primacy state candidate; operators in Montana must seek USEPA approval until primacy is granted. In some instances, an additional surface management agency authorization may be necessary. The quality of the water often dictates the appropriate disposal method, and the Montana Department of Environmental Quality (MDEQ) has primacy through the USEPA to approve surface disposal of this water. A NEPA analysis is prepared for all requests concerning disposal of produced water from federal wells and in accordance to federal and state regulations.

FURTHER SEISMIC TESTING

More detailed seismic work can be done to achieve better definition of the petroleum reservoir. Diagonal seismic lines can be required to tie the previous seismic work to the discovery well. The discovery well can be used to conduct studies to correct the previous seismic work and provide more accurate subsurface data.

SPACING REQUIREMENTS

A well-spacing pattern must be established before development drilling begins (Table 1). Information considered in establishment of a spacing pattern includes data from the discovery well on porosity, permeability, pressure, composition, and depth of formations in the reservoir; well production rates and type (predominantly oil or gas); and the economic effect of the proposed spacing on recovery. The MBOGC establishes well-spacing patterns for both exploratory and development wells. The state specifies the minimum distance from lease lines or government survey lines for the bottomhole location of the wellbore, depending upon depth of the oil well and specifies a minimum distance for gas wells. The spacing regulations determine the acres assigned to each well.

TABLE 1.
GENERAL STATEWIDE SPACING RULES FOR MONTANA

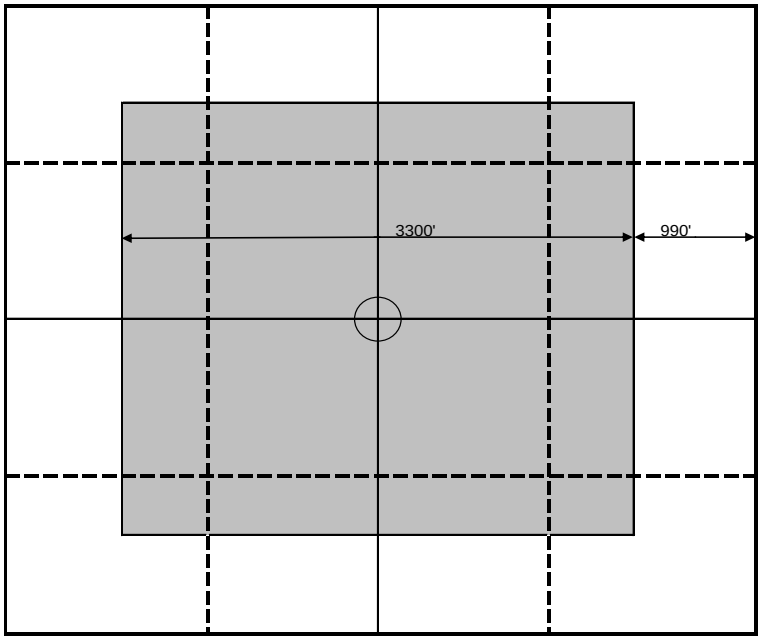
Well Depth (feet)	Spacing (acres)	Nearest Boundary (feet)	Topographic Tolerance (feet)	Minimum Well Distance (feet)
0 to 6,000	40 and 80	330	75	255
6,001 to 11,000	160	660	150	510
11,001 and greater	320	660	none	none

Source: BLM 1995

Spacing unit size is established to provide for the most efficient and economic recovery of oil or gas from a reservoir. Well spacing ranges from 40 acres to 640 acres (Figures 1 and 2). Well depths greater than 0 feet below ground surface should have a minimum distance of 990 feet from the section boundary (Figure 1). Only one producing well per formation in each 40-, 80-, 160-, 320-, and 640-acre unit is allowed. For the 320 acre spacing (1,650 well tolerance) and the 80 acre spacing, the drilling unit will be delineated either north to south or east to west. Wells should be drilled within the shaded areas identified in Figures 1 and 2.

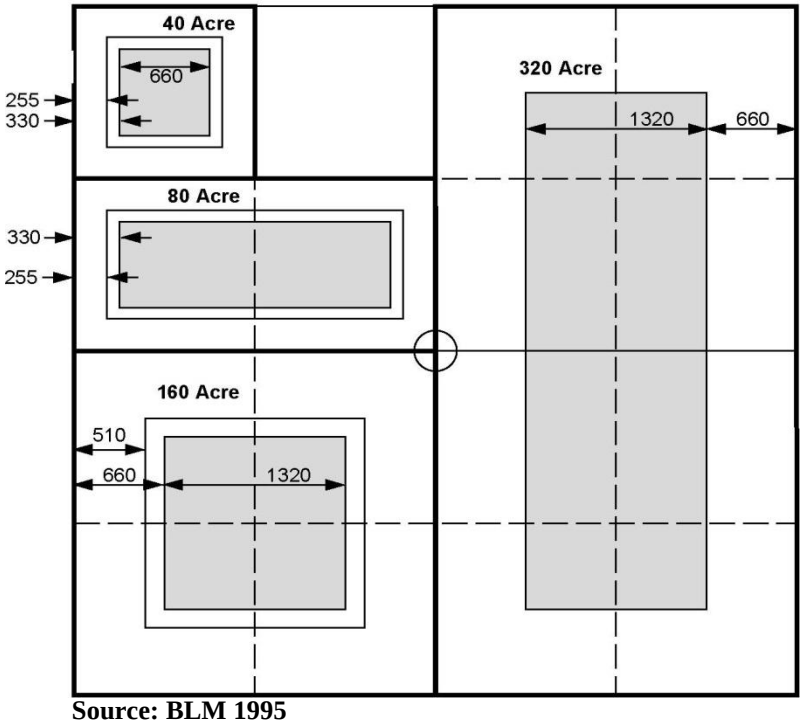
The procedures used in drilling development wells are the same as those used for wildcat wells, but usually with less subsurface sampling, testing, and evaluation. The rate at which development wells are drilled in a field depends on factors such as whether the field is developed on a lease basis or unitized basis, the probability of profitable production, the availability of drilling equipment, lease requirements, and the degree to which limits of the field are known.

FIGURE 1.
GAS WELL SPACING SECTION PLAT



Source: BLM 1995

FIGURE 2.
OIL WELL SPACING SECTION PLAT



Source: BLM 1995

FLOWLINES

Oil and gas are transferred from the well to storage facilities through small diameter (<6 inches) flow lines. Flow lines can be on the surface, buried, or elevated. Produced water, gas or polymerized liquid is transferred from storage facilities to injection wells for secondary recovery.

SEPARATING, TREATMENT, AND STORAGE

Any water or gas associated with produced oil is separated from the oil before it is placed in storage tanks. The treating facilities are located at a storage tank battery. Low-pressure petroleum that must be pumped from the well is treated in a single separation. High-pressure, flowing petroleum can require several stages or separation, with a pressure reduction accompanying each stage.

When gas is produced with the hydrocarbons, it is separated and managed in accordance with NTL-4A. See *Gas Production* above. Pipeline-quality gas can be stored in good quality reservoirs with excellent sealing parameters. This gas is pumped into the reservoir during nonpeak, usually lower priced time periods, and then pumped out into the transmission lines at times of peak demand and good prices. The differential in price pays the governmental storage fees for the use of the reservoir and the injection/compression costs required to store and retrieve the gas. It also serves as a buffer for cold periods when demand is high and levels out the summer slack period of production. Currently, there is one federal gas storage unit agreement within the planning area.

When water is produced with the hydrocarbons, it is separated before the gas is removed. In primary operations, where natural pressures or gravity cause the petroleum in the reservoir to flow to the wellbores, the degree of mixing is high enough to require chemical and heat treatment to separate the oil and water. In secondary production, where water injection or other methods are used to force additional petroleum to the wellbore, the oil and water often are not highly emulsified. In this case, the oil and water can be separated by gravity in a tall settling tank. Produced water can be disposed of through injection into the subsurface, surface evaporation, or beneficial purposes such as water for livestock or irrigation.

Produced water from oil and gas operations is normally disposed of by subsurface injection or in surface pits. Regardless of the method of disposal, it must be acceptable to the BLM, in accordance with the requirements of Onshore Oil and Gas Order No. 7, Disposal of Produced Water (BLM 1993).

The oil is transported to storage tanks through flow lines after separation from any water or gas. Storage tanks are usually located on the lease either at the producing well or at a central production facility. The number and size of tanks are dependent upon the type and amount of production on the lease.

PRIMARY, SECONDARY AND ENHANCED OIL RECOVERY

Primary recovery produces oil, gas, or water using the natural pressure in the reservoir. Well may be stimulated to improve the flow of oil and gas to the borehole. Other techniques include artificial lift, pumping, and gas lift, help extend productive life when a reservoir's natural pressure dissipates. Once the pressure is depleted, the reservoir must either be abandoned or other methods for recovering additional hydrocarbons must be employed.

Gas reservoirs typically have no secondary recovery associated with the recovery of gas. This is because natural gas is produced by expansion resulting from the reduction of reservoir pressure. Typically a high reservoir recovery factor can be expected from this expansion process unless the reservoir is of such low permeability that economics becomes a factor in the recovery efficiency.

Economics is a determining factor because of the expense of operating compression facilities to reduce the reservoir pressure to the minimum. In the planning area, most of the reservoirs are overpressured but have very low permeability. The overpressure allows more gas to be stored but the low permeability limits the recovery to a smaller portion of the area around each well. In rare cases where the gas is very rich and contains a large quantity of entrained liquids, secondary recovery uses inert gases like nitrogen or dry natural gas to keep the reservoir pressure above the condensation point in order to produce the maximum amount of liquids. This secondary recovery process requires sweeping the reservoir with undersaturated gas to entrain and sweep out

the rich gas. After this secondary process is accomplished, especially in dry natural gas secondary recovery operations, the reservoir is depressurized to recover the maximum amount of the remaining gas reserves.

Two basic secondary recovery methods are in use: (1) water flooding, and (2) displacement by gas. The preferred secondary recovery method is water flooding. This process involves injecting water into oil reservoirs to maintain or increase pressure. The process is usually most efficient when the pressure has not fallen to the point where the reservoir is highly saturated with gas. Reservoir heterogeneity in the form of fractures, directional permeability, and thin zones may limit the success of this process.

The process of injecting gas is a less popular secondary recovery technique. Historically, produced gas was considered a waste product and was flared (burned) at the point of production. Later, it was recognized that the energy could be conserved and the recovery of oil increased if the produced gas was reinjected into the reservoir. Increased production was achieved by (1) maintaining reservoir pressure by injecting the gas into the existing gas cap; and (2) injecting the gas directly into the oil-saturated zone, creating an immiscible gas drive that displaced the oil. To achieve miscibility, the reservoir must have reasonably high pressures and temperatures and contain high-gravity oil. Many gas injection projects use the Water and Gas process (i.e., inject water and gas alternately to achieve better contact with the oil within the reservoir). The high price and demand for natural gas has precluded this type of secondary recovery.

The term “enhanced oil recovery” is used to describe recovery processes other than the more traditional secondary recovery procedures. These enhanced recovery methods include thermal, chemical, and miscible (mixable) drives.

Some reservoirs contain large quantities of heavy oil that cannot be produced using normal or secondary methods. These may be stimulated by thermal drive processes in which heat is introduced from the surface or developed in place in the subsurface reservoir. In the surface introduction process, hot water or steam is injected. Raising the temperature of heavy oil reduces the viscosity and makes the oil more mobile. Thermal recovery techniques are not likely to be tried in the planning area because the oils present are not heavy oils. In the in-situ process, both heavy and light oils can be processed. Spontaneous or induced ignition within the reservoir is induced by injected air to develop a fire front that burns the hydrocarbons. Evaporation of the lighter ends immediately ahead of the fire front and later condensation is the primary recovery mechanism. The remaining hydrocarbons are consumed by the fire and are generally not considered of any value. These techniques are very expensive and must have large reserves and thick pay zones to be economical. It is unlikely they will be used within the planning area in the immediate future unless new discoveries are made.

Several chemical drive techniques are currently in use, including (1) polymer flooding, (2) caustic flooding, and (3) surfactant-polymer injection. These methods attempt to change reservoir conditions to allow recovery of additional oil. Caustic and surfactant-polymer flooding have not been economical in the past, and unless a breakthrough in technology is achieved, they will probably not be considered during the planning period. Polymer flooding is an economically viable process but is used mainly in viscous reservoirs with high permeability. No such reservoirs currently exist in the planning area, but future discoveries could be made.

CO2 appears to have the best potential for enhanced and tertiary recovery methods. CO2 is miscible with oil at relatively low pressures and temperatures, and can be used with oil with a wide range of characteristics. CO2 miscibility reduces the oil viscosity and allows much more efficient displacement by water. Usually CO2 is injected via the Water and Gas process in alternating slugs of CO2 and water. Not only does CO2 create miscible flow but it also can displace oil by gravity segregation between the CO2, gas, and oil. This process may allow sequestration of large volumes of the CO2 greenhouse gas in the many applicable reservoirs in the eastern portion of the planning area and recover the last possible oil reserves. Denbury Resources has an active carbon dioxide enhanced oil recovery (EOR) project in the Bell Creek Field of Powder River County. Sequestration of CO2 is advocated as a method to remove the gas from the earth’s atmosphere by storing the gas for geologic time. Carbon dioxide enhanced recovery projects are becoming increasingly used throughout the United States and are receiving attention as ways to also sequester carbon dioxide in geologic formations. Carbon sequestration (often a natural result of carbon dioxide enhanced recovery projects) is also being increasingly studied as it relates to reversing or slowing the anthropogenic effects on climate change.

PLUGGING AND ABANDONMENT

When drilling wells are unsuccessful or production wells are no longer useful, the well is plugged in accordance with Onshore Oil and Gas Order No. 2, equipment is removed from the well site or production facility site, and the site is abandoned in accordance with the approved APD. The wellbore is secured by placing cement plugs to isolate hydrocarbon-producing formations from contaminating other mineral or water bearing formations. Rehabilitation requirements generally are made a part of the APD. Upon completion of abandonment and rehabilitation operations, the lessee or operator notifies the BLM that the location is ready for inspection. Final abandonment will not be approved until the required surface reclamation work has been completed to the satisfaction of the BLM or surface owner. The period of bond liability for the well site is terminated after approval of final abandonment.

INSPECTIONS

Geophysical operations and lease operations are inspected to determine compliance with approved permits, to resolve conflicts or correct problems, and to determine effectiveness and need of lease stipulations. All inspections are documented. Operators are required to correct problems or violations as instructed by the AO. Lease stipulations and permit conditions may be changed or eliminated as a result of an inspection. Lease operation inspections are conducted during site construction, drilling of the well, production, interim and final reclamation phases.

SUBSEQUENT WELL OPERATIONS

Producing wells in active oil and gas fields periodically require repair and workover operations. Even if no new surface disturbance occurs, requests to redrill, deepen, and plug back require prior approval by the field office. Requests to perform other operations such as casing repairs, altering casing, performing non-routine fracturing jobs, recompletion in a different zone, completion of water shutoff, commingling production, or converting to injection or disposal well require the submission of the Sundry Notice and Reports on Wells, BLM Form 3160-5 for prior approval by the AO.

Unless additional surface disturbance is involved, prior approval is not required for routine fracturing or acidizing jobs or recompletion in the same interval when applications conform to standard and prudent operating practices. However, a Sundry Notice must be filed subsequent to these activities.

No prior approval or subsequent report is required for well cleanout work, routine well maintenance, bottom-hole pressure surveys or for repair, replacement, or modification of surface production equipment as long as no additional surface disturbance is involved.

MULTIPLE WELLS FROM A SINGLE WELL PAD

Polling of active operators in North Dakota conducted in May 2010, indicated areas of activity in which development is expected to occur with an average of 1.5 wells per well pad. The areas are locations in which either the Bakken or Three Forks Formation new exploratory oil well development is expected to include some multi-pad (Smart well pad) drilling for either Three Forks or Bakken Formation oil, as well as areas in which existing or new Bakken Formation wells will be co-located with Three Forks Formation wells. It is important to note that since 2010 proposals for multi-well pads have increased and many well pads in parts on North Dakota are likely to be drilled with an average of eight wells per average 1,280 acre spacing unit, but many more will still be single-well pads.

A multi-pad is typically larger in size for drilling and production operations as a result of having multiple wells and possibly production facilities on one well pad. Because the same well pad, pipeline corridor, access road, and production facilities are being used for multiple wells, it reduces the surface disturbance per well. Multi-pad development is a BMP being applied in the planning area on a case-by-case basis to co-locate and reduce surface disturbance for oil wells in areas of Bakken or Three Forks Formations development and CBNG development areas using monobore drilling techniques.

REGULATIONS, LAWS, AND SPECIAL PROCEDURES

UNIT AND COMMUNITIZATION AGREEMENTS

Unit and communitization agreements can be formed in the interest of conservation and to allow for the orderly development of oil and gas reserves.

A unit agreement provides for the recovery of oil and gas from the lands as a single consolidated entity without regard to separate lease ownerships. An exploratory unit is used for the discovery and development of the field in an orderly and efficient manner. Paying and nonpaying well determinations are made for each well drilled. If the well is nonpaying as defined by the agreement, the production is allocated on a lease basis. If the well is a paying unit well, a participating area is formed and the production is allocated to all interest owners in the participating area on the basis of surface area.

A communitization agreement combines two or more leases that otherwise could not be independently developed in conformity with established well-spacing patterns. The leases within the spacing unit share in the costs and benefits of the well drilled in the spacing unit. Therefore, unit and communitization agreements can reduce the amount of damage to the environment and save dollars by eliminating unnecessary wells, roads, pipelines, and lease equipment.

DRAINAGE PROVISIONS

Federal oil and gas leases include a clause that the lessee must protect the leased area from drainage by off-lease wells. If the BLM determines that federal oil or gas is being drained (physically removed) by an off-lease well, the federal lessee will be notified. The lessee has the option of drilling a protective well on lease or paying compensatory royalty for the lost oil or gas. The lessee also has the options of relinquishing the portion of the lease subject to drainage after payment of compensatory royalty for drainage that did occur or submitting data showing that drainage is not occurring.

When federal oil and gas minerals are being drained from unleased federal minerals, the BLM would determine if the unleased federal minerals can be leased in accordance to the land use plan. This will allow a well to be drilled to protect federal royalties from being drained or receive compensatory royalty from drainage. If the unleased federal minerals cannot be leased, the BLM relinquishes all rights to compensatory royalty for the lost oil or gas being drained.

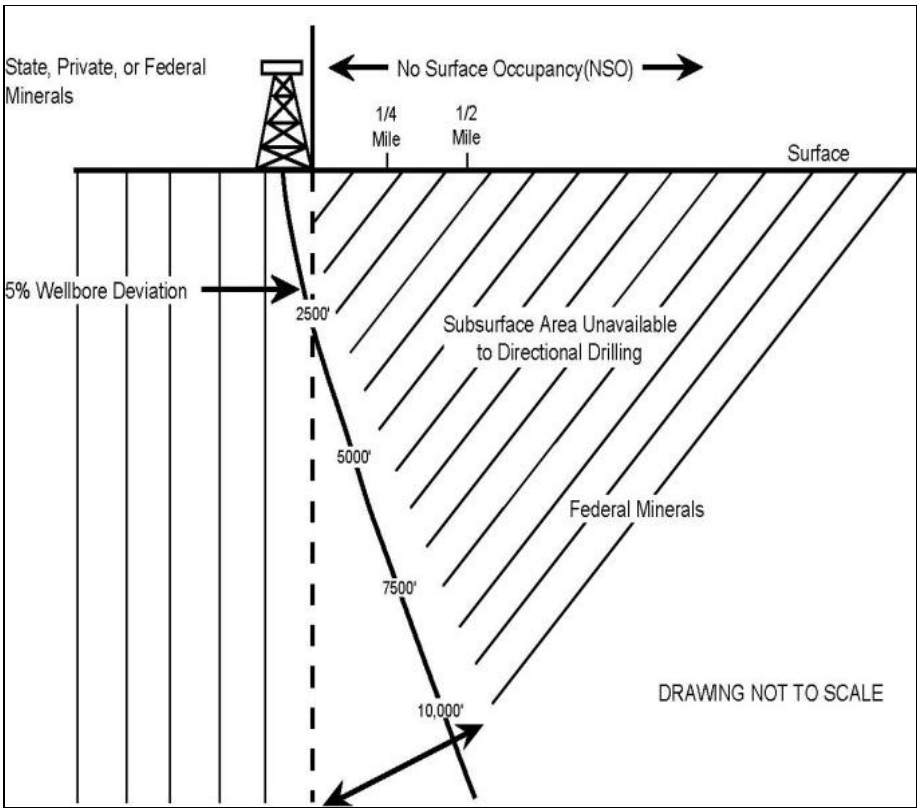
In areas where oil and gas development may conflict with other resources, the areas may be closed to leasing in accordance with decisions made from this document. Regulations at part 43 CFR 3100.0-3(d); the Secretary's general authority to prevent the waste and dissipation of public property; and the Attorney General's Opinion of April 2, 1941 (Vol. 40 Op. Atty. Gen 41) allow the BLM to lease lands that are otherwise unavailable for leasing if oil and gas is being drained from such lands. If the unavailable lands were under the jurisdiction of another agency, leasing of such lands would only occur following consultation, and consent if necessary, from the surface management agency. Unavailable lands for this RMP (see Table 2-5 in Chapter 2) would be leased only if a state or private well is proposed or completed within the same spacing unit, or if the lands are within a unit agreement. These lands would be leased with an NSO stipulation without WEM provisions. There would only be a paper transaction with no physical impacts on the unavailable lands. There would be no exploration or development (drilling or production) within the unavailable lands. After issuance of a lease, the lease would be committed to a communitization agreement or unit agreement and the United States would then receive revenue according to terms of the agreement.

DRILLING ACCESS WITH NSO STIPULATIONS ON OIL LEASES

The NSO stipulations can restrict the development potential of a federal oil and gas lease and can limit the area that can be developed by restricting the amount of surface acreage available for occupancy. NSO restrictions often do not affect access to oil and gas resources unless there are blocks of contiguous land with NSO

stipulations or the drilling depth is presumed to be shallow. The drilling access area is that area under a NSO lease or lease parcel that can be accessed by the wellbore from a surface location outside of the area (Figure 3).

FIGURE 3.
DIRECTIONAL DRILLING ACCESSIBILITY CONCEPT



Source: BLM 1995

Directional drilling can theoretically develop lands near the outer boundary of a lease affected by a NSO stipulation. The BLM cannot assume that a prudent operator would use new technology such as horizontal drilling to access an entire lease area. Although the technology might allow exploration, the expense might make the venture uneconomical. However, the BLM can assume that an operator might be willing to drill wells directionally using equipment and drilling techniques that make the venture economical. For a directionally drilled well, a maximum deviation of approximately 5 degrees is a commonly used rule of thumb for how much a vertical hole can be deviated economically using a standard drilling rig. The BLM has estimated typical oil well depths for various parts of the MCFO based on drilling history and geologic data. Gas wells in this planning area probably cannot and will not be deviated for technical and economic reasons.

A “directional drilling accessibility” concept has been developed for leases affected by NSO stipulations. Shallow wells in Montana (less than 6,000 feet deep) can be deviated up to an eighth of a mile and have the angle of deviation remain reasonably close to 5 degrees. This will place the bottomhole location in the center of a 40-acre tract. Because these wells are commonly spaced on a 40-acre basis, all spacing units within 0.25 miles of the outer boundary of the lease can be tested. Wells between 6,000 and 11,000 feet deep can also be deviated up to 0.25 miles. This will place the bottomhole location of the well the maximum allowable distance from the lease line for a well of this depth. Because these wells are spaced on a 160-acre basis, all spacing units within 0.5 miles of the exterior boundary of the lease can be tested.

The oil wells in Montana, with a total depth greater than 11,000 feet are normally spaced on a 320-acre basis. These wells can be deviated up to 0.25 miles using the above criteria. Using this distance, all spacing units within 0.5 miles of the outer boundaries of an affected lease can be tested. An NSO stipulation has a greater effect in areas of blocked ownership than in scattered tracts because much of the blocked areas remain

inaccessible from off-lease well locations. Usually four-blocked sections with NSO stipulations result in an inaccessible area of 640 acres. The area around the 640 acres would be accessible by directional drilling.

SUBSURFACE AREA ACCESSIBLE TO DRILLING

The angle of approach will result in a bottomhole location below the production horizon. The wellbore deviation concept would allow access to deeper production horizons via directional drilling. Directional drilling will not allow all of the acreage covered by an NSO stipulation to be properly tested under the above conditions. In many cases, the most favorable location in a spacing unit will not be available for testing because it will not be economically or technologically possible to reach it through directional drilling from outside the lease. The best way to economically test a spacing unit is to allow surface occupancy to provide opportunities for vertical wellbores. Because it will be more expensive to explore a tract covered by NSO stipulations, some companies may not offer to lease these lands.

SPLIT ESTATE

Part of the planning area contains lands known as split estate lands. These are lands where the surface ownership is different from the mineral ownership. On split estate lands, the BLM places lease stipulation in accordance to the land use plan and necessary restrictions and requirements or permit COAs in cooperation with the surface owner. The BLM has established policies for the management of federal oil and gas resources in accordance with federal laws and regulations.

Federal laws, regulations, and BLM policy directives give BLM the authority and direction for administering the development of federal oil and gas resources beneath privately owned surface. The BLM does not have the legal authority to regulate how private surface is managed, but does have the statutory authority to require measures by lessees to avoid or minimize adverse impacts that may result from federally authorized mineral lease activities. These measures, in the form of lease stipulations or permit COAs, are intended to protect or preserve the privately owned resources and prevent adverse impacts to adjoining lands, not to dictate management to the surface owner. The resource impacts and mitigation measures are identified in accordance to the NEPA review process. See *Bonding* section above for process and requirements for bonding on privately owned lands.

The term split estate can also refer to lands where the surface ownership is federal and the mineral ownership is private. In this situation, the BLM is the surface owner and works in cooperation with the proponent and the state regulatory agency that approves private mineral applications. The BLM has responsibilities under the previously mentioned statutes; however, it does not have the authority to approve or disapprove the mineral owner's actions. The mineral estate owner usually has the right to enter the land and use the surface that is necessary and reasonable for mineral development through either a reserved or an outstanding right contained in the deed.

UNDESIRABLE EVENTS

Operators of onshore Federal and Indian oil and gas leases shall report all spills, discharges, or other undesirable events in accordance with the requirements of this NTL-MSO-1-92. All such events which occur on State or private land leases within Federally-supervised unit or communitized areas must likewise be reported in accordance with the requirements of the Notice. However, compliance with the Notice does not relieve an operator from the obligation of complying with the applicable rules and regulations of any State or any other Federal agencies regarding notification and reporting of undesirable events. Major undesirable events are defined as those incidents listed below in subsections A through F. These incidents, when occurring on a lease supervised by the BLM, must be reported to the appropriate AO as soon as practical, but within a maximum of 24 hours:

A. Oil, saltwater, and toxic liquid spills, or any combination thereof, which result in the discharge (spilling) of 100 or more barrels of liquid. However, discharges of such magnitude, if entirely

contained within the facility firewall, may be reported only in writing pursuant to Section III of this Notice;

B. Equipment failures or other accidents which result in the venting of 500 or more MCF of gas;
C. Any fire which consumes the volumes as specified in I.A and I.B above;
D. Any spill, venting, or fire, regardless of the volume involved, which occurs in a sensitive area, e.g., areas such as parks, recreation sites, wildlife refuges, lakes, reservoirs, streams, and urban or suburban areas;
E. Each accident which involved a fatal injury; and
F. Every blowout (loss of control of any well) that occurs.

A written report shall be submitted, in duplicate, to the AO no later than 15 days following all major undesirable events identified in Section I. When required by the AO, interim reports will be submitted until final containment and cleanup operations have been accomplished. The final written report for each such event shall, as appropriate, provide:

A. The date and time of occurrence, and the date and time reported to the BLM;
B. The location where the incident occurred, including surface ownership and lease number;
C. The specific nature and cause of the incident;
D. A description of the resultant damage;
E. The action taken and the length of time required for control of the incident, for containing the discharged fluids, and for subsequent cleanup;
F. The estimated volumes discharged and the volumes lost;
G. The cause of death when fatal injuries are involved;
H. Actions that have been or will be taken to prevent a recurrence of the incident;
I. Other Federal or State agencies notified of the incident; and
J. Other pertinent comments or additional information as requested by the AO.

Other-than-major undesirable events, as identified below in subsections A through D, do not have to be reported orally within 24 hours. However, a written report, as required for major undesirable events in Section II of this Notice, must be provided for the following incidents:

A. Oil, saltwater, and toxic liquid spills, or any combination thereof, which result in the discharge (spilling) of at least 10 but less than 100 barrels of liquid in non-sensitive areas, and all discharges of 100 or more barrels when the spill is entirely contained by the facility firewall;
B. Equipment failures or other accidents which result in the venting of at least 50 but less than 500 MCF of gas in non-sensitive areas;
C. Any fire which consumes volumes in the ranges specified in III.A and III.B above; and
D. Each accident involving a major or life-threatening injury.

Spills or discharges in non-sensitive areas involving less than 10 barrels of liquid or 50 MCF of gas do not require an oral or written report. However, the volumes discharged or vented as a result of all such minor incidents must be reported in accordance with Section V of the Notice.

GEOTHERMAL

The BLM has the delegated authority to issue geothermal leases on federal mineral estate, such as that underlying lands administered by the USFS in accordance to 43 CFR 3200. A geothermal lease is for the earth's heat resource where there is federal mineral estate. Leasing geothermal resources by the BLM vests with the lessee a non-exclusive right to future exploration and an exclusive right to produce and use the geothermal resources within the lease area subject to existing laws, regulations, formal orders, and the terms, conditions, and stipulations in or attached to the lease form or included as COAs in permits. Lease issuance alone does not authorize any ground disturbing activities to explore for or develop geothermal resources without site specific approval for the intended operation. Such approval could include additional environmental reviews and permits.

The potential for geothermal resources in the planning area was identified in a Programmatic Environmental Impact Statement (EIS) that amended several RMPs, including Big Dry and Powder River (BLM 2008h). A

more current evaluation of geothermal resources in the 2013 Draft Miles City Draft RMP/EIS recognized the development of geothermal resources as being very limited and likely to not occur with the planning area (See Draft RMP/EIS page 4-264).

Because the development potential for the resource is minimal to non-existent and because there is no quantitative analysis contained in the Draft RMP/EIS, geothermal development is considered but not analyzed in detail in the PRMP/FEIS. Since it is not analyzed in detail in the PRMP/FEIS, any future proposals for geothermal development received will require an amendment in order to consider the proposal. See Chapter 1 under "Planning Process" for discussion on circumstances for amending plans.

LEASE STIPULATIONS

Certain resources in the planning area require protection from impacts associated with oil and gas activities. The specific resource and the method of protection are contained in lease stipulations. Lease stipulations are usually NSO, CSU, or Timing Limitation (Seasonal Restriction). A notice may also be included with a lease to provide guidance regarding resources or land uses.

NO SURFACE OCCUPANCY

Use or occupancy of the surface land for fluid mineral extraction or development is prohibited in order to protect identified resource values. The NSO stipulation includes stipulations which may have been worded as “No Surface Use and Occupancy,” “No Surface Disturbance,” “Conditional No Surface Occupancy” and “Surface Disturbance or Occupancy Restriction (by location).”

CONTROLLED SURFACE USE

Use or occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. A CSU stipulation is used for operating guidance, not as a substitute for the NSO or Timing stipulations.

TIMING LIMITATION (SEASONAL RESTRICTION)

Surface use is prohibited during specified times to protect identified resource values. 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.

LEASE NOTICE

Additional information can be provided to the lessee in the form of a lease notice. This notice does not place restrictions on lease operation, but does provide information about applicable laws and regulations and the requirements for additional information to be supplied by the lessee.

IMPLEMENTATION OF WAIVERS, EXCEPTIONS, OR MODIFICATIONS

To ensure leasing decisions remain appropriate in light of continually changing circumstances and new information, the BLM develops and applies lease stipulation WEM criteria. WEMs provide an effective means of applying adaptive management techniques to multiple use activities to meet changing circumstances in land use planning. The goals and objectives for approval of WEMs are supported either by the NEPA analysis in the RMP planning process or by site-specific environmental review.

- A **waiver** is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

- An **exception** is a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.
- A **modification** is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Applying a Waiver, Exception, or Modification to a Stipulation on an Existing Lease or Project

Once the lease or project is issued, the following process is used if:

- the WEM criteria were analyzed and are specified in the RMP;
- the criteria have been met; and
- there is no significant new information bearing on the environmental effects (see BLM H-1790-1, Chapter III, Using Existing Environmental Analysis; and 2007 Onshore Oil and Gas Order Number 1, XI. Waivers, Exceptions, or Modifications [BLM and USFS 2007a]).

The AO generally requires the project proponent to submit a written request for a WEM as well as information demonstrating that:

- the factors leading to the inclusion of the stipulation have changed sufficiently to make the protection provided by the management stipulation no longer justified; or
- the proposed operation would not cause unacceptable impacts. Requests from the operator should contain, at a minimum, a plan (including related on- or off-site mitigation efforts) to adequately protect affected resources; data collection and monitoring efforts; and timeframes for initiation and completion of construction, drilling, and completion operations. The operator's request may be included in an APD, NOS, Sundry Notice, or letter. The BLM may also proactively initiate the process.

During the review process, BLM coordination with other state or federal agencies will be undertaken, as appropriate, and documented. For example, it may be appropriate to coordinate the review of wildlife WEMs with the local office of the state wildlife agency. The BLM will also consult with the federal surface management agency (if it is an agency other than the BLM).

In areas where oil and gas development may conflict with other resources, the areas may be closed to leasing in accordance with decisions made from this document. Regulations at part 43 CFR 3100.0-3(d); the Secretary's general authority to prevent the waste and dissipation of public property; and the Attorney General's Opinion of April 2, 1941 (Vol. 40 Op. Atty. Gen 41) allow the BLM to lease lands that are otherwise unavailable for leasing if oil and gas is being drained from such lands. If the unavailable lands were under the jurisdiction of another agency, leasing of such lands would only occur following consultation, and consent if necessary, from the surface management agency.

Unavailable lands for this RMP (see Table 2-1 in Chapter 2) would be leased only if a state or private well is proposed or completed within the same spacing unit, or if the lands are within a unit agreement. These lands would be leased with an NSO stipulation without WEM provisions. There would only be a paper transaction with no physical impacts on the unavailable lands. There would be no exploration or development (drilling or production) within the unavailable lands. After issuance of a lease, the lease would be committed to a communitization agreement or unit agreement and the United States would then receive revenue according to terms of the agreement.

In addition to the resource-specific stipulations under each alternative (e.g., wildlife, recreation), stipulations recommended by the United States Bureau of Reclamation or Army Corps of Engineers would be used on Bureau of Reclamation or Army Corps of Engineers lands (see *Leasing Process and Stipulations*).

The BLM will analyze and document how the WEM is in conformance with the land use plan and identify the plan decision (including goals, objectives, or desired outcomes) supported by the proposed WEM. If existing NEPA analysis does not support the WEM, the BLM must conduct the appropriate environmental review and

NEPA analysis. If the proposed WEM is not in conformance with the land use plan or that document does not disclose the conditions under which such proposed change would be allowed, BLM must either amend the plan or deny the WEM.

The applicant is then provided with a written notification of the decision. Decisions on WEMs are subject to administrative review by the State Director and thereafter may be appealed to the IBLA pursuant to 43 CFR Part 4. However, decisions on WEMs submitted by the operator after drilling has commenced are final for the Department of the Interior and not subject to administrative review by the State Director or appeal pursuant to 43 CFR Part 4.

After the project has commenced, the BLM may consider verbal requests for, and grant verbal approvals of, WEMs. However, the operator must submit a written notice within 7 days following the verbal request. The BLM must also confirm verbal approvals in writing. For minerals, this requirement is provided for in Onshore Oil and Gas Order No. 1 (BLM and USFS 2007a).

Adding, Deleting, or Modifying an Existing Leasing Decision or Stipulation in the Land Use Plan

It may be necessary to add, delete, or modify management stipulations in the RMP as a result of lease parcel reviews, statewide lease stipulation consistency reviews, plan amendments, changed circumstances on the ground, or changed resource protection priorities. This is accomplished and documented through either the plan maintenance or the plan amendment process, which are explained below.

Management stipulations changed through plan maintenance do not generally require public notification. Plan maintenance is easily documented in a RMP Plan Maintenance Tracking Log or other tracking system. Changes made through the more involved RMP amendment process require public notification as part of the plan amendment process. Public review of at least 30 days must also be provided for any waiver or modification of a management stipulation within the RMP that involved an issue of major concern to the public.

The guidance provided in the Land Use Planning Handbook H-1601-1, Section VI (H), Maintenance and Section VII (B), Amendment, further explains how and when management stipulations may be added, deleted, or modified in the RMP.

PUBLIC NOTIFICATION

Public notification (30-day public review) is generally not required for exceptions because exceptions are seldom a substantial modification or waiver of a lease term or management stipulation (43 CFR 3101.1-4), particularly if the exception criteria is outlined in the lease or the land use plan. Public review is not required for waivers or modifications that the AO determines not to be substantial and do not substantially waive or modify the terms of the lease. “Substantial” in this case would include the waiver or modification having a “substantial” effect on the environment that was not previously considered. However, the applicable land use plan may contain additional notification requirements. The public notice, if required, should include identification of the modified lease terms and a description or map of the affected lands.

When public notice is appropriate, the procedures described below may apply.

- For approval of a WEM with the APD, Sundry Notice, or NOI approval:
    - a notice describing the modified lease terms, when required, may be posted for 30 days in the BLM office;
    - posted on the BLM website;
    - posted in a local paper as a legal notice or incorporated into a newspaper article; or
    - the notice may be included as part of the NEPA document’s public review (if the NEPA document is offered for review).

- For approval after the APD, Sundry Notice, or NOI has been approved:
    - public notice, if required, may take the form of a 30-day posting on the BLM website;
    - a legal notice or article in the newspaper; or
    - a notice and associated public review conducted as part of the public review of a NEPA document.

Unless specified in the RMP, it is unlikely public notification would be necessary for approval after project action or mineral drilling has commenced.

The process for adding, deleting, or modifying an existing leasing decision or management stipulation in the land use plan does not usually require a public review if the change occurs through the maintenance; however, the process might include a public review if the change occurs through amendment. The guidance provided in the Land Use Planning Handbook H-1601-1, Section VI (H), Maintenance, and Section VII (B), Amendment, further explains how and when leasing decisions or stipulations may be added, deleted, or modified in the RMP.

PROPOSED STIPULATIONS BY ALTERNATIVE

The following lease stipulations and notices would be included with leases issued in the planning area. This section is organized into Management Common to all Alternatives followed by Alternatives A through E.

MANAGEMENT COMMON TO ALL ALTERNATIVES

NO SURFACE OCCUPANCY

Resource – Makoshika State Park

- Stipulation – Surface occupancy and use is prohibited within Makoshika State Park.
- Objective – To maintain the recreation, visual, sensitive soil, paleontological, and cultural values within the area.
- Exception – None
- Modification – None
- Waiver – None

Resource – Coal

- Stipulation – Surface occupancy and use is prohibited within existing coal leases with approved mining plans.
- Objective – To protect existing coal leases with approved mining plans.
- Exception – An exception may be granted by the AO if the operator submits a plan of operations (PO) that is compatible with existing or planned coal mining operations and approved by all affected parties.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area are not needed for existing or planned mining operations or where mining operations have been completed and the modification is approved by all affected parties.
- Waiver – This stipulation can be waived by the AO if it is determined that all coal lease operations within the leasehold have been completed or the lease is terminated, canceled, or relinquished.

Resource – Visual Resource Management (VRM) Class I

- Stipulation – Surface occupancy and use is prohibited in VRM Class I areas (for example, wild and scenic rivers or WSAs).
- Objective –To preserve the existing character of the landscape.
- Exception – None.
- Modification – None.

- Waiver – None.

Resource – Cultural Areas of Critical Environmental Concern (ACECs)

- Stipulation – Surface occupancy and use is prohibited within designated ACECs, including the Big Sheep Mountain, Hoe, Jordan Bison Kill, Powder River Depot, and Seline cultural ACECs.
- Objective – To protect those cultural properties for which the site or area was designated (including the Big Sheep Mountain, Hoe, Jordan Bison Kill, Powder River Depot, and Seline Cultural ACECs).
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan that demonstrates that the cultural resource values that formed the basis for designation will not be affected or that adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated site or area can be occupied without adversely affecting the cultural resource values for which the site or area was designated.
- Waiver – This stipulation can be waived if the AO determines that all designated sites or areas within the leasehold can be occupied without adversely affecting the cultural resource values for which such sites or areas were designated or all designated sites or areas within the leasehold are allocated for other uses.

Resource – Paleontological ACECs

- Stipulation – Surface occupancy and use is prohibited within designated paleontological localities (including the Ash Creek Divide, Hell Creek, Sand Arroyo, and Bug Creek ACECs).
- Objective – To protect significant paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan that demonstrates that the paleontological resource values that formed the basis for designation are not affected or adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated locality can be occupied without adversely affecting the paleontological resource values for which the locality was designated or the boundaries of the designated locality are changed.
- Waiver – This stipulation can be waived if the AO determines that all designated localities within the leasehold can be occupied without adversely affecting the paleontological resource values for which the localities were designated or all designated localities within the leasehold are allocated for other uses.

Resource – Finger Buttes ACEC

- Stipulation – Surface occupancy and use is prohibited in the Finger Buttes ACEC.
- Objective – To help control the visual impacts of activities and facilities and to help meet the visual quality objectives for the area.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan where BLM determines the scenic values for which the area was designated are not affected or adverse impacts can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of designated area can be occupied without adversely affecting the scenic values for which the area was designated.
- Waiver – This stipulation can be waived if the AO determines that areas within the leasehold can be occupied without adversely affecting the scenic values for which the area was designated.

Resource – Smoky Butte ACEC

- Stipulation – Surface occupancy and use is prohibited in the Smoky Butte area.
- Objective – To protect the local and regional scenic values, historic values, and unique geologic values and to protect the special geologic values of the area.

- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified by the AO if the boundaries of the ACEC are changed.
- Waiver – This stipulation can be waived by the AO if the area can be occupied without adversely affecting the scenic, historic, and cultural values.

LEASE NOTICE

Resource - Cultural Resources and Tribal Consultation

This lease may be found to contain historic properties or resources protected under NHPA, the American Indian Religious Freedom Act (42 U.S.C. 1996), Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.), Executive Order 13007 (May 24, 1996), or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., state historic preservation officer and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Resource - 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. Guidance for application of this requirement can be found in NTL-MSO-85-1. This notice would be consistent with present Montana guidance for cultural resource protection related to oil and gas operations (NTL-MSO-85-1).

Resource – Paleontological Resources

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 meet the criteria for class 3, 4 and/or 5 as set forth in the Potential Fossil Yield Classification System, WO 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 WO IM 2008-009 dated October 15, 2007, and WO IM 2009-011 dated October 10, 2008.

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, the lessee or project proponent will complete the inventory subject to the following:

- the project proponent must engage the services of a qualified paleontologist, acceptable to the BLM, to conduct the inventory;
- 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; and
- paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by WO IM 2009-011.

Resource – Sprague's Pipit Habitat

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 APD and environmental review processes, consistent with lease rights.

If the USFWS lists the Sprague's pipit as threatened or endangered under the ESA, the 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 could result from the consultation process.

ALTERNATIVE A

NO SURFACE OCCUPANCY

Resource – Riparian and Water

- Stipulation – Surface occupancy and use is prohibited within riparian areas, 100-year floodplains of major rivers, and on waterbodies and streams.
- Objective – To protect the unique biological and hydrological features associated with riparian areas, 100-year floodplains of major rivers, and waterbodies and streams.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include riparian areas, floodplains, or waterbodies.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include riparian areas, floodplains, or waterbodies.

Resource – Grouse Leks

- Stipulation – Surface occupancy and use is prohibited within 0.25 miles of grouse leks.
- Objective – To protect sharp-tailed and sage-grouse lek sites necessary for the long-term maintenance of grouse populations in the area.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area can be occupied without adversely affecting grouse lek sites.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold can be occupied without adversely affecting grouse lek sites or grouse lek sites within 0.25 miles of the leasehold have not been used for 5 consecutive years.

Resource – Bighorn Sheep Range

- Stipulation – Surface occupancy and use is prohibited in the designated Bighorn Sheep Range.
- Objective – To protect the limited area of bighorn sheep habitat in southeastern Montana.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area may be modified if the AO determines that portions of the area no longer contain bighorn sheep habitat.
- Waiver – This stipulation may be waived if the AO determines that the entire leasehold no longer contains bighorn sheep habitat.

Resource – Bald Eagles

- Stipulation – Surface occupancy and use is prohibited within 0.50 miles of known bald eagle nest sites active within the past 7 years and within bald eagle nesting habitat in riparian areas.
- Objective – To protect bald eagle nesting sites and nesting habitat in accordance with the ESA, the Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994), and the Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 2010).
- Exception – An exception may be granted by the AO if the operator submits a plan demonstrating that the proposed action will not affect the bald eagle or its habitat. If the AO determines that the action can

affect the bald eagle or its habitat, consultation with the USFWS will be required prior to final determination on the exception.

- Modification – The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.
- Waiver – This stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold can be occupied without adversely affecting bald eagle nest sites or nesting habitat or the bald eagle is declared recovered and no longer protected under the ESA of 1973.

Resource – Ferruginous Hawk

- Stipulation – Surface occupancy and use is prohibited within 0.50 miles of known ferruginous hawk nest sites active within the past 2 years.
- Objective – To maintain the production potential of ferruginous hawk nest sites. Ferruginous hawks are sensitive to disturbance and have been identified as a Category 2 species under the ESA.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that the impacts from the proposed action will not adversely affect the ferruginous hawk or its habitat. Seasonal exceptions can be allowed from August 1 to March 1 (the non-breeding season) if the AO determines that the proposed activity will not disturb the production potential of ferruginous hawk nest sites.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area can be occupied without adversely affecting the production potential of ferruginous hawk nest sites.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the production potential of ferruginous hawk nest sites or the ferruginous hawk is downgraded from any protective category.

Resource – Peregrine Falcon

- Stipulation – Surface occupancy and use is prohibited within 1 mile of identified peregrine falcon nesting sites.
- Objective – To protect the habitat of the peregrine falcon, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the operator submits a plan demonstrating that the proposed action will not affect the piping plover or its habitat. If the AO determines that the action can affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the piping plover.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the piping plover or the piping plover is declared recovered and no longer protected under the ESA.

Resource – Piping Plover

- Stipulation – Surface occupancy and use is prohibited within 0.25 miles of wetlands identified as piping plover habitat.
- Objective – To protect the habitat of the piping plover, a threatened species under the ESA.
- Exception – An exception may be granted by the AO if the operator submits a plan demonstrating that the proposed action will not affect the piping plover or its habitat. If the AO determines that the action can affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the piping plover.

- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the piping plover or the piping plover is declared recovered and no longer protected under the ESA.

Resource – Piping Plover ACEC

- Stipulation – Surface occupancy and use is prohibited in the Piping Plover ACEC.
- Objective – To protect the habitat of the piping plover, a threatened species under the ESA.
- Exception – An exception may be granted by the AO if the operator submits a plan demonstrating that the proposed action will not affect the piping plover or its habitat. If the AO determines that the action may affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with USFWS, determines that portions of the area are no longer essential to the piping plover.
- Waiver – The stipulation can be waived if the AO, in consultation with United States Fish and Wildlife Service (USFWS), determines that the entire leasehold no longer contains habitat essential to the piping plover or the piping plover is declared recovered and is no longer protected under the ESA of 1973.

Resource – Interior Least Tern

- Stipulation – Surface occupancy and use is prohibited within 0.25 miles of wetlands identified as least tern habitat.
- Objective – To protect the habitat of the least tern, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the operator submits a plan demonstrating that the proposed action will not affect the least tern or its habitat. If the AO determines that the action can affect the least tern or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the least tern.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the least tern or the least tern is declared recovered and no longer protected under the ESA.

Resource – Reservoirs with Fisheries

- Stipulation – Surface occupancy and use is prohibited within 0.25 miles of designated reservoirs with fisheries.
- Objective – This stipulation is intended to protect the fisheries and recreational values of reservoirs.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area can be occupied without adversely affecting the fisheries and recreational values of the reservoir.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold can be occupied without adversely affecting the fisheries and recreational values of the reservoir.

Resource – Recreation

- Stipulation – Surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

- Modification – The boundaries of the stipulated area can be modified by the AO if the recreation area boundaries are changed
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Resource – Cultural Resources

- Stipulation – Surface occupancy and use is prohibited within sites or areas designated for conservation use, public use, or socio-cultural use.
- Objective – To protect those cultural properties (including the Battle Butte Battlefield ACEC and Reynolds Battlefield ACEC) identified for conservation use, public use, and socio-cultural use (see definitions for use categories in BLM Manual 8110.
- Exception – An exception to this stipulation can be granted by the AO if the lessee or operator submits a plan demonstrating that the cultural resource values for which the area was designated are not affected or adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated site or area can be occupied without adversely affecting the cultural resource values for which the site or area was designated.
- Waiver – This stipulation can be waived if the AO determines that all designated sites or areas within the leasehold can be occupied without adversely affecting the cultural resource values for which such sites or areas were designated, or all designated sites or areas within the leasehold are allocated for other uses.

NOTE: Compliance with Section 106 of NHPA is required for all actions that can affect cultural properties eligible for the NRHP.

Resource – Paleontological Resources

- Stipulation – Surface occupancy and use is prohibited within designated paleontological localities (including the Flat Creek, Garbani, and Harbicht localities).
- Objective – To protect significant paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan demonstrating that the paleontological resource values forming the basis for designation are not affected or adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated locality can be occupied without adversely affecting the paleontological resource values for which the locality was designated, or the boundaries of the designated locality are changed.
- Waiver – This stipulation can be waived if the AO determines that all designated localities within the leasehold can be occupied without adversely affecting the paleontological resource values for which the localities were designated, or if all designated localities within the leasehold are allocated for other uses.

<u>CONTROLLED SURFACE USE</u>

Resource – Soils, Slopes

Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface disturbance on slopes over 30 percent, an engineering and reclamation plan must be approved by the AO. The plan must demonstrate how the following will be accomplished:

- site productivity will be restored;
- surface runoff will be adequately controlled;
- off-site areas will be protected from accelerated erosion, such as rilling, gullying, piping, and mass wasting;
- water quality and quantity will be in conformance with state and federal water quality laws;
- surface-disturbing activities will be prohibited during extended wet periods; and

  - construction will be prohibited when soils are frozen.

- Objective – To maintain soil productivity; provide necessary protection to prevent excessive soil erosion on steep slopes; and avoid areas with excessive reclamation problems or those subject to slope failure, mass wasting, or piping.
- Exception – None
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include slopes over 30 percent.
- Waiver – This stipulation can be waived by the AO if it is determined that no part of the leasehold includes slopes over 30 percent.

Resource – Potential black-footed ferret habitat (prairie dog colonies and complexes 80 acres or more in size not designated as black-footed ferret reintroduction areas).

- Stipulation – Surface occupancy or use is subject to the following special operating constraints: prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the presence or absence 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. The lessee or operator may, at their own option, conduct an examination to determine the presence or absence of black-footed ferrets. This examination must be done by or under the supervision of a qualified resource specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency documenting the presence or absence of black footed ferrets and identifying the anticipated effects of the proposed action on the black-footed ferret and its habitat.
- Objective – To ensure compliance with the ESA by locating and protecting black-footed ferrets and their habitat.
- Exception – An exception may be granted by the AO for surface-disturbing activities determined to have no adverse effect on black-footed ferrets or black-tailed prairie dogs and their habitats.
- Modification – The boundaries of the stipulated area may be modified by the AO if portions of the leasehold are cleared based on current or past black-footed ferret surveys.
- Waiver – This stipulation may be waived if the black-footed ferret is declared recovered and no longer subject to the ESA or if the entire leasehold is block cleared, permanently cleared based on current or past black-footed ferret surveys, or is no longer black-footed ferret habitat.

Resource – Prairie dog towns within potential black-footed ferret reintroduction areas determined to be essential for black-footed ferret recovery, such as the Black-footed Ferret Reintroduction Area of Environmental Concern (ACEC).

- Stipulation – Surface occupancy and use is subject to the following special operating constraints: the *Draft Guidelines for Oil and Gas Activities in Prairie Dog Ecosystems Managed for Black-footed Ferret Recovery* (USFWS 1990a) will be used to develop site-specific COAs to protect black-footed ferret reintroduction and recovery areas. Specific COAs will depend on type and duration of proposed activity and its proximity to occupied black-footed ferret habitat and other site-specific conditions.
- Objective – To maintain the integrity of designated black-footed ferret reintroduction area habitat for reintroduction and recovery of black-footed ferrets.
- Exception –An exception may be granted by the AO for activities determined, through coordination with the Black-footed Ferret Coordination Committee, to have no adverse impacts on reintroduction and recovery of black-footed ferrets.
- Modification – The boundaries of the stipulated area may be modified if the AO, in coordination with the Black-footed Ferret Coordination Committee, determines that portions of the area are no longer essential for black-footed ferret reintroduction and recovery or a portion of the area no longer contains habitat considered suitable for black-footed ferrets.
- Waiver – This stipulation may be waived if the AO, in coordination with the Montana Black-footed Ferret Committee, determines that the entire leasehold no longer contains habitat essential for reintroduction and recovery of the black-footed ferret or the species is removed from protection under the ESA.

Resource – VRM Class II

- Stipulation – Surface occupancy and use is subject to the following special operating constraints: all surface-disturbing activities and semi-permanent and permanent facilities in VRM Class II areas may require special design, including location, painting, and camouflage, to blend with the natural surroundings and meet the visual quality objectives for the area.
- Objective – To control the visual impacts of activities and facilities within acceptable levels.
- Exception – None
- Modification – None
- Waiver – None

TIMING LIMITATION

Resource – Crucial Winter Range

- Stipulation – Surface use is prohibited within crucial winter range for wildlife during the following time period: December 1 to March 31. This stipulation does not apply to the operation and maintenance of production facilities.
- Objective – To protect white-tailed deer, mule deer, elk, antelope, moose, bighorn sheep, and sage-grouse crucial winter range from disturbance during the winter use season, and to facilitate long-term maintenance of wildlife populations.
- Exception – An exception to this stipulation can be granted by the AO if the operator submits a plan that demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area no longer contain crucial winter range for wildlife. The dates for the timing restriction can be modified if new wildlife use information indicates that the December 1 to March 31 dates are not valid for the leasehold.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold no longer contains crucial winter range for wildlife.

Resource – Grouse Nesting Zone

- Stipulation – Surface use is prohibited in grouse nesting habitat within 2 miles of a lek during the following time period: from March 1 to June 15. This stipulation does not apply to the operation and maintenance of production facilities.
- Objective – To protect sharp-tailed and sage-grouse nesting habitat from disturbance during spring and early summer in order to maximize annual production of young and to protect nesting activities adjacent to nesting sites for the long-term maintenance of sharp-tailed and sage-grouse populations in the area.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area no longer contain sharp-tailed or sage-grouse nesting habitat within 2 miles of a lek. The dates for the timing restriction can be modified if new information indicates that the March 1 to June 15 dates are not valid for the leasehold.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold no longer contains sharp-tailed or sage-grouse nesting habitat within 2 miles of a lek.

Resource – Raptor Nests

- Stipulation – Surface use is prohibited within 0.50 miles of raptor nest sites active within the past 2 years during the following time period: from March 1 to August 1. This stipulation does not apply to the operation and maintenance of production facilities.
- Objective – To protect nest sites of raptors that have been identified as species of special concern in Montana.

- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer within 0.50 miles of raptor nest sites active within the past 2 years. The dates for the timing restrictions can be modified if new information indicates that the March 1 to August 1 dates are not valid for the leasehold.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold no longer is within 0.50 miles of raptor nest sites active within the past 2 years.

LEASE NOTICE

Resource - Endangered Species Act, Section 7, Consultation

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA, as amended, 16 U.S.C. 1531 et seq., including completion of any required procedure for conference or consultation.

ALTERNATIVE B

NO SURFACE OCCUPANCY

Resource – Soils, Sensitive

- Stipulation – Surface occupancy and use is prohibited on sensitive soils.
- Objective – To maintain the chemical, physical, and biotic properties of soils; maintain soil productivity; provide a recovery mechanism for the entire ecosystem; provide necessary protection to prevent excessive soil degradation; and avoid areas with excessive reclamation problems.
- Exception – None
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include sensitive soils.
- Waiver – This stipulation can be waived by the AO if it is determined that no part of the leasehold or area includes sensitive soils.

Resource – Badlands, Rock Outcrop

- Stipulation – Surface occupancy and use is prohibited on badlands and rock outcrop.
- Objective – To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource – 100-year Floodplains

- Stipulation – Surface occupancy and use is prohibited within 100-year floodplains.

- Objective – To protect the unique biological and hydrological features and functions associated with floodplains.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternatives exist and the activity can be adequately mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit floodplains.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include floodplains.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include floodplains.

Resource – Waterbodies and Streams

- Stipulation – Surface occupancy and use is prohibited within waterbodies and streams.
- Objective – To protect water quality and the unique biological and hydrological features and functions associated with waterbodies and streams.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternatives exist and the activity can be adequately mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit waterbodies and streams.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include waterbodies and streams.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include floodplains.

Resource – Source Water Protection Areas

- Stipulation – Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.
- Objective – To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to human health. This stipulation would protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include Source Water Protection Areas.

Resource – Big Game Crucial Winter Range

- Stipulation – Surface occupancy and use is prohibited in crucial winter range.
- Objective – To facilitate long-term maintenance of wildlife populations and protect white-tailed deer, mule deer, elk, and antelope crucial winter ranges from disturbance during the winter use season.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the area no longer contain crucial winter range.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains crucial winter range.

Resource – Bighorn Sheep Habitat

- Stipulation – Surface occupancy and use is prohibited in bighorn sheep habitat.
- Objective – To protect bighorn sheep habitat in southeastern Montana.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the area no longer contain bighorn sheep habitat.
- Waiver – This stipulation may be waived if the AO determines the entire leasehold no longer contains bighorn sheep habitat.

Resource –Raptor Nest Sites

- Stipulation – Surface occupancy and use is prohibited in and within 0.50 miles of raptor nest sites active within the past 7 years.
- Objective – To protect nest sites of burrowing owl golden eagle, Ferruginous hawk, Swainson's hawk, prairie falcon, and northern goshawk.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the leasehold are no longer within 0.50 miles of raptor nest sites active within the past 7 years.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold is no longer within 0.50 miles of raptor nest sites active within the past 7 years.

Resource – Bald Eagles

- Stipulation - Surface occupancy and use is prohibited within 0.50 mile of bald eagle nest sites active within the preceding 5 years.
- Objective – To protect nest sites and nesting activities of bald eagles, BLM priority species for management.
- Exception – The AO may grant an exception, subject to coordination with the USFWS, if the action will not to result in nest territory abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of bald eagle nest sites active within the past 5 years.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of bald eagle nest sites active within the past 5 years or if the habitat has been altered to an extent, future use by nesting bald eagles is unlikely.

Resource – Piping Plover Habitat

- Stipulation – Surface occupancy and use is prohibited in and within 0.25 miles piping plover habitat.
- Objective – To protect the habitat of the piping plover, a threatened species under the ESA.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the piping plover or its habitat. If the AO determines the action may affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 mile of piping plover habitat.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of piping plover habitat.

Resource – Interior Least Tern Habitat

- Stipulation – Surface occupancy and use is prohibited in and within 0.25 mile least tern habitat.

- Objective – To protect the habitat of the least tern, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the least tern or its habitat. If the AO determines the action may affect the least tern or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 miles of least tern habitat.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of least tern habitat.

Resource – Black-tailed Prairie Dogs

- Stipulation – In the absence of black-footed ferrets, surface occupancy and use is prohibited in and within 0.50 mile of prairie dog colonies.
- Objective – To protect prairie dogs, burrowing owls, mountain plover, and other associated species that utilize prairie dog towns for nesting and breeding habitats.
- Exception – An exception may be granted by the AO for activities not detrimental to the prairie dog, associated species, or their habitats.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the area are not within 0.50 mile of prairie dog habitat.
- Waiver – The stipulation may be waived if:
    - the AO determines the entire leasehold is not within 0.50 mile of prairie dog colonies;
    - the habitat is not likely to be reoccupied; or
    - the prairie dog habitat occurs on surfaces managed by an entity other than the BLM, the surface owner requests the activity take place on the prairie dog town, and threatened or endangered species will not be negatively affected through this action.

Resource – Black-footed Ferrets

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of black-footed ferret habitat (complex of prairie dog towns within 1.5 km of each other comprising a total of at least 1,500 acres).
- Objective – To protect habitat for the federally endangered black-footed ferret.
- Exception – The AO, subject to consultation with the USFWS, may grant an exception if the action will not impair the function or suitability of the black-footed ferret habitat.
- Modification - The AO, subject to confirmation from the USFWS, may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of current or potential black-footed ferret habitat.
- Waiver – The AO, subject to consultation with the USFWS, may waive this stipulation, if the entire leasehold is no longer within 0.25 mile of current or potential black-footed ferret habitat.

Resource – Pallid Sturgeon Habitat

- Stipulation – Surface occupancy and use is prohibited in and within 0.50 mile of river and stream centerline identified as pallid sturgeon habitat.
- Objective – To protect the habitat of the pallid sturgeon, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the pallid sturgeon or its habitat. If the AO determines the action may affect the pallid sturgeon or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.50 mile of pallid sturgeon habitat.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.50 mile pallid sturgeon habitat.

Resource – Sage-grouse Habitat – Restoration Areas

- Stipulation – Surface occupancy and use is prohibited within 1 mile of a lek in sections that contain 3 or fewer wells.
- Objective – To maintain integrity of the existing sage-grouse habitat and maximize restoration efforts while allowing for the permitted uses.
- Exception – An exception to this stipulated area may be granted, if the AO, in consultation with MFWP, determines portions of the area can be occupied without adversely affecting sage grouse populations or if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with MFWP, determines portions of the leasehold are no longer sage grouse habitat or the leasehold is not within 1 mile of a lek.
- Waiver – The stipulation may be waived if the AO, in consultation with MFWP, determines the entire leasehold is no longer sage-grouse habitat, or the leasehold is not within 1 mile of a lek, or sage grouse are no longer a BLM special status species.

Resource – Designated Sport-fish Reservoirs

- Stipulation – Surface occupancy and use is prohibited in and within 0.50 mile of designated sport-fish reservoirs.
- Objective – To protect ecosystem functionality, fisheries, and recreational values of sport-fish reservoirs.
- Exception – An exception to this stipulation may be granted by the AO if the authorized activity will not compromise the fisheries habitat or recreational experience of those using the reservoir.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the leasehold no longer are within 0.50 mile of sport-fish reservoirs.
- Waiver – This stipulation may be waived if the AO determines that the reservoir is no longer capable of supporting a sport fishery.

Resource – Lands with Wilderness Characteristics

- Stipulation: Surface occupancy and use is prohibited within areas that are managed to protect wilderness characteristics.
- Objective: To protect wilderness characteristics as a priority over other multiple uses.
- Exception: None
- Modification: None
- Waiver: None

Resource – Recreation

- Stipulation – Surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified by the AO if the recreation area boundaries are changed.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Resource – Cultural Resources, NRHP-eligible Properties and Districts, and Traditional Cultural Properties (TCPs)

- Stipulation – Surface occupancy and use is prohibited in site boundaries and within 0.50 mile of the boundaries of:
    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP;
    - the boundaries of TCPs, or sites or areas designated as such, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use); or
    - the boundaries of TCPs; sites designated for traditional use; or cultural properties determined to be of particular importance to American Indian groups. (Such properties include, but are not limited, to burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)
- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and the settings in which they occur; and those properties determined to be of particular importance to American Indian groups.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or project proponent submits a plan demonstrating that:
    - adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the 0.50-mile buffer area; and
    - the project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, and so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the 0.50-mile buffer area).
- Modification – None
- Waiver – None

Resource – Paleontological Resources

- Stipulation – Surface occupancy and use is prohibited in and within 0.50 mile of significant paleontological localities or localities that meet the criteria for significant as such.
- Objective – To preserve and protect significant vertebrate fossils and paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or project proponent submits a plan demonstrating that:
    - adverse impacts to the paleontological resource can be avoided by project redesign or relocation within the 0.50-mile buffer area; and
    - the project is located so that it and any associated surface disturbance will not alter the characteristics of the paleontological resource that designate it significant by diminishing the integrity of the resource's location, setting, or association; and without causing any destruction, damage, or alteration to all or part of the paleontological resource.
- Modification – None
- Waiver – None

CONTROLLED SURFACE USE

Resource – Air Resources

- Stipulation – Surface occupancy and use is subject to the requirement that each diesel-fueled non-road engine with greater than 200 horsepower design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet USEPA nitrogen oxide (NO_x) emission standards for Tier 4 non-road diesel engines, or (2) the engine emits NO_x at rates less than or equal to USEPA emission standards for Tier 4 non-road diesel engines.
- Objective – To protect air resources and meet the 1-hour nitrogen dioxide (NO_2) National Ambient Air Quality Standard (NAAQS).
- Exception – An exception may be granted by the AO if air quality modeling, air quality monitoring, or other information demonstrates compliance with the NO_2 NAAQS.
- Modification – This stipulation may be modified if the USEPA or the MDEQ adds, deletes, or revises NO_x emission standards for drill rig, completion rig, or non-road engines.
- Waiver – The stipulation may be waived if new information demonstrates that compliance with the NO_2 NAAQS will be achieved consistently throughout the lease area. The stipulation may also be waived if the NO_2 NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Resource – Sharp-tailed Grouse Leks and Nesting Habitat

- Stipulation – Surface occupancy and use is allowed within 4 miles of sharp-tailed grouse leks with design features to maintain the functionality of sharp-tailed grouse nesting habitat and lek sites.
- Objective – To maintain the functionality of sharp-tailed grouse nesting habitat and lek sites.
- Exception – The AO may grant an exception if the action will not to result in nest abandonment or decrease productivity, by substantially interfering with normal breeding, nesting, feeding, or brooding behavior.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 4 miles of a sharp-tailed grouse lek.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 4 mile of a sharp-tailed grouse lek.

Resource – Sage-grouse Habitat – General Habitat Areas

- Stipulation – Surface occupancy and use is allowed within 4 miles of leks with design features to maintain the functionality of sage-grouse habitat.
- Objective – To maintain sage-grouse habitat functionality.
- Exception – The AO may grant an exception if the action, as proposed or stipulated, will meet the goals and objectives for sage-grouse habitat and will not compromise the long-term functionality of habitat.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 4 miles of a lek.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined the lease area has been altered and there is no reasonable likelihood of functional habitat being restored; or
    - the entire leasehold is no longer within 4 miles of a lek; or
    - sage-grouse are no longer a BLM Special Status Species.

Resource – Sage-grouse Habitat –Restoration Areas

- Stipulation – Surface occupancy and use is allowed within 1 mile of leks in sections that contain 4 or more wells with design features to maintain the functionality of sage-grouse habitat.
- Objective – To maintain sage-grouse habitat functionality.

- Exception – The AO may grant an exception if the action, as proposed or stipulated, will meet the goals and objectives for sage-grouse habitat and will not compromise the long-term functionality of habitat.
- Modification – The AO may modify the boundaries of the stipulated area if a portion of the lease area is determined not to be sage-grouse habitat or is not within 1 mile of a lek.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined the lease area has been altered and there is no reasonable likelihood of functional habitat being restored; or
    - the entire lease area is no longer within 1 mile of a lek; or
    - sage-grouse are no longer a BLM Special Status Species.

Resource – VRM Classes II

- Stipulation – In order to retain the existing character of the landscape (VRM Class II Objective), oil and gas development activities will be located, designed, constructed, operated, and reclaimed within 2 years from initiation of construction so that activities should not attract attention of the casual observer. This stipulation does not apply to operation and maintenance activities.
- Objective – To protect visual resource values while allowing energy development and related activities to occur which have been mitigated to retain the existing character of the landscape.
- Exception – None
- Modification – None
- Waiver – None

LEASE NOTICE

Resource - Air Resource Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

Resource - Special Status Species

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 ESA as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.

Resource - Migratory Bird Treaty Act

The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures; a) avoidance by timing; ground disturbing activities will not occur from April 15 to July 15, b) habitat manipulation; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the year and area scheduled for activities between April 15 and July 15 of that year to deter nesting, or c) survey-buffer-monitor; surveys will be conducted by a BLM approved biologist within the area of the proposed action and a 300 foot buffer from

the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the appropriate BLM Office.

Resource - Black-footer Ferret Surveys

Surface occupancy or use is subject to the following special operating constraints: prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the presence or absence 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. The lessee or operator may, at their own option, conduct an examination to determine the presence or absence of black-footed ferrets. This examination must be done by or under the supervision of a qualified resource specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency documenting the presence or absence of black footed ferrets and identifying the anticipated effects of the proposed action on the black-footed ferret and its habitat.

ALTERNATIVE C

NO SURFACE OCCUPANCY

Resource – Bald Eagles

- Stipulation - Surface occupancy and use is prohibited within 0.50 mile of bald eagle nest sites active within the preceding 5 years.
- Objective – To protect nest sites and nesting activities of bald eagles, BLM priority species for management.
- Exception – The AO may grant an exception, subject to coordination with the USFWS, if the action will not to result in nest territory abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of bald eagle nest sites active within the past 5 years.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of bald eagle nest sites active within the past 5 years or if the habitat has been altered to an extent, future use by nesting bald eagles is unlikely.

Resource – Black-footed Ferrets

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of black-footed ferret habitat (complex of prairie dog towns within 1.5 km of each other comprising a total of at least 1,500 acres).
- Objective – To protect habitat for the federally endangered black-footed ferret.
- Exception – The AO, subject to consultation with the USFWS, may grant an exception if the action will not impair the function or suitability of the black-footed ferret habitat.
- Modification - The AO, subject to confirmation from the USFWS, may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of current or potential black-footed ferret habitat.
- Waiver – The AO, subject to consultation with the USFWS, may waive this stipulation, if the entire leasehold is no longer within 0.25 mile of current or potential black-footed ferret habitat.

Resource – Black-tailed Prairie Dogs

- Stipulation – In the absence of black-footed ferrets, surface occupancy and use is prohibited in and within 0.25 mile of black-tailed prairie dog colonies.
- Objective – To protect black-tailed prairie dogs, burrowing owls, mountain plover, and other associated species that utilize prairie dog towns for nesting and breeding habitats.

- Exception – An exception may be granted by the AO for activities not detrimental to the prairie dog or associated species or their habitats.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the leasehold are not within 0.25 mile of prairie dog habitat.
- Waiver – The stipulation may be waived if:
    - the AO determines the entire leasehold is no longer 0.25 mile of prairie dog habitat;
    - the habitat is not likely to be reoccupied; or
    - the prairie dog habitat occurs on surfaces managed by an entity other than the BLM, the surface owner requests the activity take place on the prairie dog town, and threatened or endangered species will not be negatively impacted through this action.

Resource – Pallid Sturgeon Habitat

- Stipulation – Surface occupancy and use is prohibited in and within 0.50 mile of river and stream centerline identified as pallid sturgeon habitat.
- Objective – To protect the habitat of the pallid sturgeon, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the pallid sturgeon or its habitat. If the AO determines the action may affect the pallid sturgeon or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.50 mile of pallid sturgeon habitat.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.50 mile pallid sturgeon habitat.

Resource – Designated Sport-fish Reservoirs

- Stipulation – Surface occupancy and use is prohibited in and within 0.25 mile of sport-fish reservoirs.
- Objective – To protect ecosystem functionality, fisheries, and recreational values of sport-fish reservoirs.
- Exception – An exception may be granted by the AO if the authorized activity will not compromise the fisheries habitat or recreational experience of those using the reservoir.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the leasehold are no longer within 0.25 mile of sport-fish reservoirs.
- Waiver – This stipulation may be waived if the AO determines the reservoir is no longer capable of supporting a sport fishery.

Resource – Recreation

- Stipulation – Surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified by the AO if the recreation area boundaries are changed.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold or area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Resource – National Historic Trails

- Stipulation: Surface occupancy and use is prohibited within the National Trail Management Corridor of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.
- Objective: To protect the nature and purpose; trail resources, qualities, values, and associated settings; and primary use or uses of the historic trail, in accordance with National Trail System Act.
- Exception: An exception to this stipulation may be granted by the AO if the lessee or project proponent completes a comprehensive trail inventory, as outlined in Manual 6280, and presents a proposal which demonstrates resource values are not affected or that adverse impacts can be adequately mitigated to prevent impact to:

    - The nature and purposes of the National Trail.
    - National Trail resources, qualities, values, and associated settings.
    - National Trail primary use or uses.
    - The National Trail from the cumulative or trail-wide perspective.

- Modification: None
- Waiver: None

Resource – Cultural Resources, NRHP-eligible Properties and Districts, and TCPs

- Stipulation – Surface occupancy and use is prohibited in and within 300 feet of the boundaries of:

    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP; and
    - the boundaries of TCPs, or sites or areas designated, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use) if an associated surface-disturbing activity would impact or have an effect on the quality and setting of the site or area. Activity is prohibited in or within 300 feet of the boundaries of cultural properties determined to be of particular importance to American Indian groups, TCPs, or sites designated for traditional use. (Such properties include, but are not limited to, burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)

- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; and those properties determined to be of particular importance to American Indian groups, designated TCPs, or those designated for traditional use and the settings in which they occur.
- Exception – An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area.
    - The project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource’s visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).

  - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy in the area will be prohibited.
  - The lessee or operator submits a plan demonstrating that operations will be designed or located in such a manner as to have a minimal impact to the natural setting and characteristics of the immediate area and demonstrating that adverse impacts to TCPs can be mitigated in consultation with, and to the satisfaction of, affected American Indian Tribes or American Indian groups.

- Modification – None
- Waiver – None

Resource – National Historic Landmarks (NHLs) and Historic Battlefields

- Stipulation – Surface occupancy and use is prohibited within the visible area within a 3.5-mile radius of the Fort Union Historic Site NHL and a 300 feet radius of the boundaries of NHLs and historic battlefields.
- Objective – To protect NHLs and historic sites eligible for the NRHP and the setting or viewshed in which they occur.
- Exception – An exception to this stipulation may be granted by the AO if the conditions described below are met.

  - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area; or the project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).
  - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy in the area will be prohibited.

- Modification – None
- Waiver – None

Resource – Paleontological Resources

- Stipulation – Surface occupancy and use is prohibited in and within 300 feet of significant paleontological localities or localities that meet the criteria for significance as such.
- Objective – To preserve and protect significant vertebrate fossils and paleontological localities.
- Exception – An exception may be granted by the AO if the lessee or project proponent submits a plan demonstrating that the adverse impacts paleontological localities can be mitigated through data recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area will be prohibited.
- Modification – None
- Waiver – None

Resource – Battle Butte Battlefield, Reynolds Battlefield, Cedar Creek Battlefield, Flat Creek Paleontological Area, Long Medicine Wheel, Walstein, and Yonkee ACECs

- Stipulation – Surface occupancy and use is prohibited in site boundaries and within 0.5 miles of the boundaries of:

    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP;
    - the boundaries of TCPs, or sites or areas designated as such, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use); or
    - the boundaries of TCPs, sites designated for traditional use, or cultural properties determined to be of particular importance to American Indian groups. (Such properties include, but are not limited to, burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)

- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and the settings in which they occur; and those properties determined to be of particular importance to American Indian groups.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or project proponent submits a plan demonstrating that:

    - adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the 0.5-mile buffer area; and
    - the project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, and so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the 0.5-mile buffer area).

- Modification – None
- Waiver – None

Resource – Powderville ACEC

- Stipulation – Surface occupancy and use is prohibited within significant paleontological localities.
- Objective – To protect significant paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan demonstrating that the paleontological resource values forming the basis for designation are not affected or adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated locality can be occupied without adversely affecting the paleontological resource values for which the locality was designated or the boundaries of the designated locality are changed.
- Waiver – This stipulation can be waived if the AO determines that all significant localities within the leasehold can be occupied without adversely affecting the paleontological resource values for which the localities were designated or all designated localities within the leasehold are allocated for other uses.

CONTROLLED SURFACE USE

Resource – Air Resources

- Stipulation – Surface occupancy and use is subject to the requirement that each diesel-fueled non-road engine with greater than 200 horsepower design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet USEPA NO_x emission standards for Tier 4 non-road diesel engines, or (2) the engine emits NO_x at rates less than or equal to USEPA emission standards for Tier 4 non-road diesel engines.
- Objective – To protect air resources and meet the 1-hour NO_2 NAAQS.
- Exception – An exception may be granted by the AO if air quality modeling, air quality monitoring, or other information demonstrates compliance with the NO_2 NAAQS.
- Modification – This stipulation may be modified if the EPA or the Montana Department of Environmental Quality (MDEQ) adds, deletes, or revises NO_x emission standards for drill rig, completion rig, or nonroad engines.
- Waiver – The stipulation may be waived if new information demonstrates that compliance with the NO_2 NAAQS will be achieved consistently throughout the lease area. The stipulation may also be waived if the NO_2 NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Resource – Soils, Sensitive

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use, prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the administrative officer. Sensitive soils are determined using a combination of slope and soil erodibility. The plan must demonstrate the following:
    - no other practicable alternatives exist for relocating the activity,
    - the activity will be located to reduce impacts to soil and water resources,
    - site productivity will be maintained or restored,
    - surface runoff and sedimentation will be adequately controlled,
    - on- and off-site areas will be protected from accelerated erosion,
    - that no areas susceptible to mass wasting would be disturbed, and
    - surface-disturbing activities will be prohibited during extended wet periods.
- Objective – To maintain the chemical, physical, and biotic properties of soils, which includes maintaining soil productivity, soil stability, and soil biotic properties. This will prevent excessive erosion, potential mass wasting, and improve the likelihood of successful reclamation..
- Exception – The administrative officer may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not contribute to degradation of the soil resource (e.g. excessive soil erosion, mass wasting, and/or lost productivity) or downslope resource conditions (e.g. reduced water quality due to sedimentation).
- Modification – The administrative officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not contain sensitive soils.
- Waiver – The administrative officer may waive this stipulation if it is determined that the entire leasehold does not contain sensitive soils.

Resource – Badlands, Rock Outcrop

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use on badlands or rock outcrop, a plan must be approved by the AO that demonstrates effects from the proposed action can be adequately mitigated. The plan must demonstrate that no other practicable alternatives exist for relocating the activity. The plan must include a detailed description of how the activity would:

  - control wind and water erosion,
  - control surface runoff,
  - minimize sediment production,
  - maintain site productivity, and
  - complete reclamation.

- Objective – To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource –100-year Floodplains

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use in 100-year floodplains, a plan must be approved by the AO that demonstrates that no other practicable alternative exists and demonstrates how the following will be accomplished:

  - adverse impacts to the unique biological and hydrological features associated with floodplains will be minimized;
  - adverse impacts to the natural and beneficial values of floodplains will be minimized;
  - human safety, health, and welfare associated with the risk of flood loss will not be adversely affected;
  - floodplains, streambanks, streambeds, waterbodies, and streams will be managed to minimize accelerated erosion and sedimentation;
  - water quality and quantity will be at acceptable levels and in conformance with state and federal laws;
  - native vegetation (including woody species) will be protected or restored in areas where appropriate;
  - surface-disturbing activities will be prohibited during extended wet periods;
  - soil compaction will be minimized; and
  - the areal extent of surface-disturbing activities and native vegetation removal will be minimized.

- Objective – To protect the unique biological and hydrological features and functions associated with floodplains.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternative exists and the activity can be adequately mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit floodplains.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include floodplains.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include floodplains.

Resource –Waterbodies and Streams

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use in waterbodies and streams, a plan must be approved by the AO that demonstrates that no other practicable alternative exists and demonstrates how the following will be accomplished:

  - adverse impacts to the unique biological and hydrological features associated with waterbodies and streams will be minimized;
  - floodplains, streambanks, streambeds, waterbodies, and streams will be managed to minimize accelerated erosion and sedimentation;
  - water quality and quantity will be at acceptable levels and in conformance with state and federal laws;
  - native vegetation (including woody species) will be protected or restored in areas where appropriate;
  - surface-disturbing activities will be prohibited during extended wet periods; and
  - the areal extent of surface-disturbing activities and native vegetation removal will be minimized.

- Objective – To protect water quality and the unique biological and hydrological features and functions associated with waterbodies and streams.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternative exists and the activity can be adequately mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit waterbodies and streams.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include waterbodies and streams.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire surface-disturbing activity does not include waterbodies and streams.

Resource – Source Water Protection Areas

- Stipulation – Surface occupancy and use within State-designated Source Water Protection Areas is subject to the following operating constraints: prior to surface occupancy or use of lands within Source Water Protection Areas, a plan shall be prepared by the proponent as a component of the APD, Sundry Notice, etc. and approved by the AO. The plan must demonstrate to the AO's satisfaction that the proposed action will comply with all requirements of the State-approved Source Water Protection Plan, if available. If a State-approved Source Water Protection Plan is not available, the plan must:

  - provide an inventory of all potential sources of contamination associated with the proposed action,
  - determine the susceptibility of the public water supply to those contaminant sources,
  - identify procedures to follow and any equipment needed to respond to a release of contaminants, and
  - identify the method that would be used to communicate with water users in the event of a release of contaminants.

- Objective – To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to human health. This stipulation would protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.
- Waiver – This stipulation may be waived by the AO if it is determined that the entire leasehold does not include Source Water Protection Areas.

Resource – Riparian and Wetland Areas

- Stipulation – Surface occupancy and use is subject to the following operating constraints: activities, including permanent facilities and linear underground facilities, will avoid riparian and wetland areas.

If avoidance is not possible, activities will be authorized within riparian and wetland areas but subject to approved design features (stabilization, location and timing) demonstrating how the following will be accomplished to improve or maintain proper functioning condition in riparian and wetland areas:

- the unique biological and hydrological features associated with riparian and wetland areas will be protected or restored;
- surface-disturbing activities will be prohibited during extended wet periods;
- riparian and wetland areas, streambanks, streams, and waterbodies will be protected from accelerated erosion (such as rilling, gullying, piping, and mass wasting) and sedimentation;
- water quality and quantity will be kept to acceptable levels and conformance with state and federal water quality laws; and
- native, woody species will be protected or restored where appropriate.

- Objective – To protect the unique biological and hydrological features associated with riparian and wetland areas.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts can be adequately mitigated to improve or maintain PFC.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include riparian and wetland areas. The area affected by this stipulation can be modified if the AO determines that the surface-disturbing or disruptive activity, permanent facility, and linear underground facility will not adversely affect riparian and wetland resources.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include riparian or wetland areas. This stipulation can be waived if the AO determines that the surface-disturbing or disruptive activity, will not adversely affect riparian and wetland resources.

Resource – Big Game Crucial Winter Range

- Stipulation – Surface occupancy and use is subject to the following operating constraint: prior to surface occupancy and use within crucial winter ranges for big game wildlife, a plan must be approved by the AO that maintains the functionality of habitat.
- Objective – To facilitate long-term maintenance of big game wildlife populations and protect white-tailed deer, mule deer, elk, and antelope crucial winter ranges from disturbance during winter use season.
- Exception – None
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the leasehold no longer contain crucial winter range for big game wildlife.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains crucial winter range for big game wildlife.

Resource – Sharp-tailed Grouse Leks and Nesting Habitat

- Stipulation – Surface occupancy and use would be allowed within 2 miles of sharp-tailed grouse leks with design features to maintain the functionality of nesting habitat and lek site.
- Objective – To protect sharp-tailed grouse lek sites and nesting habitats.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating how the activity can proceed without negatively impacting the lek and the birds associated with the lek, or it demonstrates impacts will be adequately mitigated.
- Modification – The boundaries of the stipulated areas can be modified if the AO determines portions of the leasehold are no longer within 2 miles of sharp-tailed grouse lek sites.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold is no longer within 2 miles of a lek.

Resource – Colonial Nesting Waterbirds

- Stipulation – Surface occupancy and use would be allowed in waterbird nesting colonies with design features to minimize disturbance to colonial nesting waterbirds.
- Objective – To protect waterbird nesting colonies from disturbance during spring and early summer to maximize annual production of young and to protect nesting activities adjacent to nesting sites for the long-term maintenance of colonial waterbird populations.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the area no longer contain waterbird nesting colonies.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains waterbird nesting colonies.

Resource – Bighorn Sheep Habitat

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use on bighorn sheep habitat, a plan must be approved by the AO that maintains the functionality of the habitat.
- Objective – To protect and maintain the functionality of bighorn sheep habitat and minimize habitat loss.
- Exception – None
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the area no longer contain bighorn sheep habitat.
- Waiver – This stipulation may be waived if the AO determines the entire leasehold no longer contains bighorn sheep habitat.

Resource –Raptor Nest Sites

- Stipulation – Surface occupancy and use is allowed in and within 0.50 mile of raptor nest sites active within the past 7 years with design features to minimize disturbance to nest site and maintain functionality of the habitat.
- Objective – To protect nest sites of raptors identified as species of special concern (burrowing owl, golden eagle, ferruginous hawk, Swainson's hawk, prairie falcon, and northern goshawk).
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the area are no longer within 0.50 mile of raptor nest sites active within the past 7 years.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold is no longer within 0.5 miles of raptor nest sites active within the past 7 years.

Resource – Piping Plover Habitat

- Stipulation – Surface occupancy and use is allowed within 0.25 mile of piping plover habitat with design features to maintain the functionality of the habitat.
- Objective – To protect piping plover habitat.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the piping plover or its habitat. If the AO determines the action may affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated areas may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 mile of piping plover habitat.
- Waiver – This stipulation may be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of piping plover habitat.

Resource – Interior Least Tern Habitat

- Stipulation – Surface occupancy and use is allowed within 0.25 mile of interior least tern habitat with design features to maintain the functionality of the habitat.
- Objective – To protect interior least tern habitat.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the interior least tern or its habitat. If the AO determines the action may affect the interior least tern or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated areas may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 mile of interior least tern habitat.
  Waiver – This stipulation may be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of interior least tern habitat.

Resource – Sage-grouse Habitat – General Habitat Areas

- Stipulation – Surface occupancy and use is allowed within 3.1 miles of leks with design features to maintain the functionality of the habitat.
- Objective – To maintain the integrity of sage-grouse habitat and promote movement and genetic diversity to support sustainable sage-grouse populations.
- Exception – The AO may grant an exception if the action, as proposed or specified, will meet the goals and objectives for sage-grouse habitat and will maintain the functionality of the habitat.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 3.1 miles of a sage-grouse lek.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined the lease area has been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of functional habitat being restored;
    - sage-grouse are no longer a BLM Special Status Species; or
    - no reasonable alternative development scenario effectively mitigating the impacts is possible.

Resource – Sage-grouse Habitat – Priority Areas

- Stipulation – Surface occupancy and use is subject to the following operating constraints: to minimize the impacts of surface-disturbing activities or disruptive activities, no more than 1 surface disturbance per 640 acres, with a cumulative, direct, and indirect disturbance of no more than 3 percent of the sagebrush habitat in the 640-acre area from the point of the disturbance, can be authorized at a time, as long as functional sage-grouse habitat and the associated populations are maintained at the same levels as trend areas. Disturbed areas will have to be fully reclaimed to pre-disturbance conditions or a desired plant community before additional disturbance could be approved.
- Objective – To maximize the integrity of the habitat to support maximum sage-grouse populations.
- Exception – The AO may grant an exception if the action, as proposed or specified, will meet the goals and objectives for sage-grouse habitat and will not compromise the functionality of the habitat.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer sage-grouse habitat.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined the entire leasehold has been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of functional habitat being restored; or
    - sage-grouse are no longer a BLM Special Status Species.

Resource – Sage-grouse Habitat – Restoration Areas

- Stipulation – Surface occupancy and use would be allowed with design features to maintain functionality of the habitat.
- Objective – To maintain integrity of the existing sage-grouse habitat and maximize restoration efforts while allowing for the permitted uses.
- Exception – The AO may grant an exception to this stipulation if the action, as proposed or stipulated, will meet the goals and objectives for sage-grouse habitat and will maintain functionality of the habitat.
- Modification – The AO may modify the boundaries of the stipulated area, if a portion of the leasehold is determined not to be sage-grouse habitat.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined significant portions of the leasehold have been altered and there is no reasonable likelihood of functional habitat being restored;
    - sage-grouse are no longer a BLM Special Status Species; or
    - no reasonable alternative development scenario effectively mitigating impacts is possible.

Resource – VRM Classes II

- Stipulation – In order to retain the existing character of the landscape (VRM Class II Objective), oil and gas development activities will be located, designed, constructed, operated, and reclaimed within 2 years from initiation of construction so that activities should not attract attention of the casual observer. This stipulation does not apply to operation and maintenance activities.
- Objective – To protect visual resource values while allowing energy development and related activities to occur which have been mitigated to retain the existing character of the landscape.
- Exception – None
- Modification – None
- Waiver – None

Resource – Lands with Wilderness Characteristics

- Stipulation: Surface occupancy and use is subject to the following operating constraints: all surface disturbing activities and semi-permanent and permanent facilities would require special design and location placement to blend with the natural surroundings and meet objectives within areas that are managed to protect wilderness characteristics.
- Objective: To protect wilderness characteristics as a priority over other multiple uses.
- Exception: An exception may be granted if the project proponent, BLM, and where necessary, other affected interests, negotiate compensation or mitigation that satisfactorily offsets anticipated impacts to wilderness characteristics in the affected area.
- Modification: None
- Waiver: None

LEASE NOTICE

Resource - Air Resource Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

Resource - Special Status Species

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 ESA as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.

Resource - Migratory Bird Treaty Act

The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures; a) avoidance by timing; ground disturbing activities will not occur from April 15 to July 15, b) habitat manipulation; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the year and area scheduled for activities between April 15 and July 15 of that year to deter nesting, or c) survey-buffer-monitor; surveys will be conducted by a BLM approved biologist within the area of the proposed action and a 300 foot buffer from the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the appropriate BLM Office.

Resource - Black-footer Ferret Surveys

Surface occupancy or use is subject to the following special operating constraints: prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the presence or absence 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. The lessee or operator may, at their own option, conduct an examination to determine the presence or absence of black-footed ferrets. This examination must be done by or under the supervision of a qualified resource specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency documenting the presence or absence of black footed ferrets and identifying the anticipated effects of the proposed action on the black-footed ferret and its habitat.

ALTERNATIVE D

NO SURFACE USE

Resource – Bald Eagles

- Stipulation - Surface occupancy and use is prohibited within 0.50 mile of bald eagle nest sites active within the preceding 5 years.
- Objective – To protect nest sites and nesting activities of bald eagles, BLM priority species for management.
- Exception – The AO may grant an exception, subject to coordination with the USFWS, if the action will not to result in nest territory abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of bald eagle nest sites active within the past 5 years.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of bald eagle nest sites active within the past 5 years or if the habitat has been altered to an extent, future use by nesting bald eagles is unlikely.

Resource – Black-footed Ferrets

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of black-footed ferret habitat (complex of prairie dog towns within 1.5 km of each other comprising a total of at least 1,500 acres).
- Objective – To protect habitat for the federally endangered black-footed ferret.
- Exception – The AO, subject to consultation with the USFWS, may grant an exception if the action will not impair the function or suitability of the black-footed ferret habitat.
- Modification - The AO, subject to confirmation from the USFWS, may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of current or potential black-footed ferret habitat.
- Waiver – The AO, subject to consultation with the USFWS, may waive this stipulation, if the entire leasehold is no longer within 0.25 mile of current or potential black-footed ferret habitat.

CONTROLLED SURFACE USE

Resource – Air Resources

- Stipulation – Surface occupancy and use is subject to the requirement that each diesel-fueled non-road engine with greater than 200 horsepower design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet USEPA NO_x emission standards for Tier 4 non-road diesel engines, or (2) the engine emits NO_x at rates less than or equal to USEPA emission standards for Tier 4 non-road diesel engines.
- Objective – To protect air resources and meet the 1-hour NO_2 NAAQS.
- Exception – An exception may be granted by the AO if air quality modeling, air quality monitoring, or other information demonstrates compliance with the NO_2 NAAQS.
- Modification – This stipulation may be modified if the EPA or the Montana Department of Environmental Quality (MDEQ) adds, deletes, or revises NO_x emission standards for drill rig, completion rig, or non-road engines.
- Waiver – The stipulation may be waived if new information demonstrates that compliance with the NO_2 NAAQS will be achieved consistently throughout the lease area. The stipulation may also be waived if the NO_2 NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Resource – Soils, Sensitive Soils

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use, prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the administrative officer. Sensitive soils are determined using a combination of slope and soil erodibility. The plan must demonstrate the following:

    - no other practicable alternatives exist for relocating the activity,
    - the activity will be located to reduce impacts to soil and water resources,
    - site productivity will be maintained or restored,
    - surface runoff and sedimentation will be adequately controlled,
    - on- and off-site areas will be protected from accelerated erosion,
    - that no areas susceptible to mass wasting would be disturbed, and
    - surface-disturbing activities will be prohibited during extended wet periods.

- Objective – To maintain the chemical, physical, and biotic properties of soils, which includes maintaining soil productivity, soil stability, and soil biotic properties. This will prevent excessive erosion, potential mass wasting, and improve the likelihood of successful reclamation..
- Exception – The administrative officer may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not contribute to degradation of the soil resource (e.g. excessive soil erosion, mass wasting, and/or lost productivity) or downslope resource conditions (e.g. reduced water quality due to sedimentation).

- Modification – The administrative officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not contain sensitive soils.
- Waiver – The administrative officer may waive this stipulation if it is determined that the entire leasehold does not contain sensitive soils.

Resource – Badlands, Rock Outcrop

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use on badlands or rock outcrop, a plan must be approved by the AO that demonstrates effects from the proposed action can be adequately mitigated. The plan must demonstrate that no other practicable alternatives exist for relocating the activity. The plan must include a detailed description of how the activity would:

    - control wind and water erosion,
    - control surface runoff,
    - minimize sediment production,
    - maintain site productivity, and
    - complete reclamation.

- Objective – To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource – 100-year Floodplains

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use in 100-year floodplains, a plan must be approved by the AO that demonstrates that no other practicable alternative exists and demonstrates how the following will be accomplished:

    - adverse impacts to the unique biological and hydrological features associated with floodplains will be minimized;
    - adverse impacts to the natural and beneficial values of floodplains will be minimized;
    - human safety, health, and welfare associated with the risk of flood loss will not be adversely affected;
    - floodplains, streambanks, streambeds, waterbodies, and streams will be managed to minimize accelerated erosion and sedimentation;
    - water quality and quantity will be at acceptable levels and in conformance with state and federal laws;
    - native vegetation (including woody species) will be protected or restored in areas where appropriate;
    - surface-disturbing activities will be prohibited during extended wet periods;
    - soil compaction will be minimized; and
    - the areal extent of surface-disturbing activities and native vegetation removal will be minimized.

- Objective – To protect the unique biological and hydrological features and functions associated with floodplains.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternative exists and the activity can be adequately

mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit floodplains.

- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include floodplains.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include floodplains.

Resource –Waterbodies and Streams

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use in waterbodies and streams, a plan must be approved by the AO that demonstrates that no other practicable alternative exists and demonstrates how the following will be accomplished:

    - adverse impacts to the unique biological and hydrological features associated with waterbodies and streams will be minimized;
    - floodplains, streambanks, streambeds, waterbodies, and streams will be managed to minimize accelerated erosion and sedimentation;
    - water quality and quantity will be at acceptable levels and in conformance with state and federal laws;
    - native vegetation (including woody species) will be protected or restored in areas where appropriate;
    - surface-disturbing activities prohibited during extended wet periods; and
    - the areal extent of surface-disturbing activities and native vegetation removal will be minimized.

- Objective – To protect water quality and the unique biological and hydrological features and functions associated with waterbodies and streams.
- Exception – An exception to this stipulation may be granted by the AO if the project initiator submits a plan that demonstrates that no other practicable alternative exists and the activity can be adequately mitigated. An exception to this stipulation may be granted by the AO if the entire surface-disturbing activity will benefit waterbodies and streams.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include waterbodies and streams.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire surface-disturbing activity does not include waterbodies and streams.

Resource – Source Water Protection Areas

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use of lands within Source Water Protection Areas, a plan must be approved by the AO that demonstrate to the AO's satisfaction that the proposed action will comply with all requirements of the State-approved Source Water Protection Plan, if available. If a State-approved Source Water Protection Plan is not available, the plan must:

    - provide an inventory of all potential sources of contamination associated with the proposed action,
    - determine the susceptibility of the public water supply to those contaminant sources,
    - identify procedures to follow and any equipment needed to respond to a release of contaminants, and
    - identify the method that would be used to communicate with water users in the event of a release of contaminants.

- Objective – To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public

water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to human health. This stipulation would protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.

- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.
- Waiver – This stipulation may be waived by the AO if it is determined that the entire leasehold does not include Source Water Protection Areas.

Resource – Riparian and Wetland Areas

- Stipulation – Surface occupancy and use is subject to the following operating constraints: surface-disturbing or disruptive activities will avoid riparian and wetland areas. If avoidance is not possible, surface-disturbing or disruptive activities will be authorized within riparian and wetland areas with approved design features (stabilization, location and timing) demonstrating how the following will be accomplished to improve or maintain riparian and wetland proper functioning condition:
    - the unique biological and hydrological features associated with riparian and wetland areas protected or restored (or both);
    - surface occupancy and use is prohibited during extended wet periods;
    - riparian and wetland areas, streambanks, streams, and waterbodies protected from accelerated erosion (such as rilling, gullying, piping, and mass wasting) and sedimentation;
    - water quality and quantity kept to acceptable levels and conformance with state and federal laws; and
    - native, woody species protected or restored (or both) where appropriate.
- Objective – To protect the unique biological and hydrological features associated with riparian and wetland areas.
- Exception – An exception to this stipulation may be granted by the AO if the operator submits a plan demonstrating that impacts can be adequately mitigated to improve or maintain PFC.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the area do not include riparian or wetland areas.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire leasehold does not include riparian or wetland areas. This stipulation can be waived if the AO determines that the surface-disturbing or disruptive activity, will not adversely affect riparian and wetland resources.

Resource – Big Game Crucial Winter Range

- Stipulation – Surface occupancy and use is subject to operating constraints: prior to surface occupancy and use within crucial winter ranges for big game wildlife, a plan must be submitted and approved by the AO that maintains the functionality of habitat.
- Objective – To facilitate long-term maintenance of big game wildlife populations and protect white-tailed deer, mule deer, elk, and antelope, crucial winter range from disturbance during the winter use season.
- Exception – None
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the leasehold no longer contain crucial winter range for big game wildlife.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains crucial winter range for big game wildlife.

Resource – Sharp-tailed Grouse Leks and Nesting Habitat

- Stipulation – Surface occupancy and use would be allowed within 2 miles of sharp-tailed grouse leks with design features to maintain the functionality of nesting habitat and lek site.
- Objective – To protect sharp-tailed grouse lek sites and nesting habitats.

- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating how the activity can proceed without negatively impacting the lek and the birds associated with the lek, or it demonstrates impacts will be adequately mitigated.
- Modification – The boundaries of the stipulated areas can be modified if the AO determines portions of the leasehold are no longer within 2 miles of sharp-tailed grouse lek sites.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold is no longer within 2 miles of a lek.

Resource – Colonial Nesting Waterbirds

- Stipulation – Surface occupancy and use would be allowed in waterbird nesting colonies with design features to minimize disturbance to colonial nesting waterbirds.
- Objective – To protect waterbird nesting colonies from disturbance during spring and early summer to maximize annual production of young and to protect nesting activities adjacent to nesting sites for the long-term maintenance of colonial waterbird populations.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the area no longer contain waterbird nesting colonies.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains waterbird nesting colonies.

Resource – Bighorn Sheep Habitat

- Stipulation – Surface occupancy and use would be subject to operating constraints: prior to surface occupancy and use within bighorn sheep habitat, a plan must be approved by the AO that maintains the functionality of habitat.
- Objective – To protect and maintain the functionality of bighorn sheep habitat and minimize habitat loss.
- Exception – None
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the area no longer contain bighorn sheep habitat.
- Waiver – This stipulation may be waived if the AO determines the entire leasehold no longer contains bighorn sheep habitat.

Resource –Raptor Nest Sites

- Stipulation – Surface occupancy and use would allowed within 0.50 mile of raptor nest sites active within the past 2 years with design features to minimize disturbance of the nest site and maintain functionality of the habitat.
- Objective – To protect nest sites of raptors identified as species of special concern (burrowing owl, golden eagle, ferruginous hawk, Swainson's hawk, prairie falcon, and northern goshawk).
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the area are no longer within 0.50 miles of raptor nest sites active within the past 2 years.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold is no longer within 0.50 miles of raptor nest sites active within the past 2 years.

Resource – Piping Plover Habitat

- Stipulation – Surface occupancy and use is allowed within 0.25 mile of piping plover habitat with design features to maintain the functionality of the habitat.
- Objective – To protect piping plover habitat.

- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the piping plover or its habitat. If the AO determines the action may affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated areas may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 mile of piping plover habitat.
- Waiver – This stipulation may be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of piping plover habitat.

Resource – Interior Least Tern Habitat

- Stipulation – Surface occupancy and use is allowed within 0.25 mile of interior least tern habitat with design features to maintain the functionality of the habitat.
- Objective – To protect interior least tern habitat.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the interior least tern or its habitat. If the AO determines the action may affect the interior least tern or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated areas may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.25 mile of interior least tern habitat.
- Waiver – This stipulation may be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.25 mile of interior least tern habitat.

Resource – Black-tailed Prairie Dogs

- Stipulation – In the absence of black-footed ferrets, surface occupancy and use are allowed within black-tailed prairie dog colonies with design features to maintain the functionality of the habitat.
- Objective – To protect black-tailed prairie dogs, burrowing owls, mountain plovers, and other associated species that utilize prairie dog towns for nesting and breeding habitats.
- Exception – The AO may grant an exception if the project proponent submits a plan demonstrating impacts from the proposed action will not affect prairie dogs or associated species.
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the leasehold are no longer contains prairie dog habitat.
- Waiver – This stipulation may be waived if any associated special status species are not observed or if the AO determines the entire leasehold no longer contains prairie dog habitat.

Resource – Pallid Sturgeon Habitat

- Stipulation – Surface occupancy and use would be allowed within 0.50 mile of rivers and streams identified as pallid sturgeon habitat with design features to maintain the functionality of the habitat.
- Objective – To protect the habitat of the pallid sturgeon, an endangered species under the ESA.
- Exception – An exception may be granted by the AO if the project proponent submits a plan demonstrating the proposed action will not affect the pallid sturgeon or its habitat. If the AO determines that the action may affect the pallid sturgeon or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
- Modification – The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines portions of the area are no longer within 0.50 mile of pallid sturgeon habitat.
- Waiver – The stipulation can be waived if the AO, in consultation with the USFWS, determines the entire leasehold is no longer within 0.50 mile of pallid sturgeon habitat.

Resource – Sage-grouse Habitat – General Habitat Areas

- Stipulation – Surface occupancy and use would be allowed within 2 miles of leks with design features to maintain the functionality of the habitat.

- Objective – To maintain the integrity of sage-grouse habitat and promote movement and genetic diversity to support sustainable sage-grouse populations.
- Exception – The AO may grant an exception if the action, as proposed or stipulated, will meet the goals and objectives for sage-grouse habitat and will not compromise the functionality of the habitat.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined a portion of the area is no longer sage-grouse habitat or within 2 miles of leks.
- Waiver – This stipulation may be waived if:
    - after consultation with MFWP, it is determined the leasehold has been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of functional habitat being restored;
    - sage-grouse are no longer a BLM Special Status Species; or
    - no reasonable alternative development scenario effectively mitigating impacts is possible.

Resource – Sage-grouse Habitat – Priority Areas

- Stipulation – To minimize the impacts of surface-disturbing and disruptive activities, one surface disturbance per 640 acres, with a cumulative disturbance of no more than 10 percent of the sagebrush habitat within the 640-acre area, can be authorized at a time. Disturbed areas will have to be fully reclaimed to pre-disturbance conditions or to a desired plant community before additional disturbance could be approved.
- Objective – To maximize the integrity of the habitat to support maximum sage-grouse populations.
- Exception – The AO may grant an exception if the action, as proposed or specified, will meet the goals and objectives for sage-grouse habitat and will not impair the functionality of the habitat.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined a portion of the leasehold no longer contains sage-grouse habitat.
- Waiver – This stipulation may be waived, if:
    - in consultation with MFWP, it is determined significant portions of the leasehold have been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of functional habitat being restored; or
    - sage-grouse are no longer a BLM Special Status Species.

Resource – Designated Sport-fish Reservoirs

- Stipulation – Surface occupancy and use would be allowed in and within 0.25 miles of sport-fish reservoirs with design features to minimize impacts.
- Objective – To protect fisheries habitat and recreational values of sport-fish reservoirs.
- Exception – An exception to this stipulation may be granted by the AO if the authorized activity will not compromise the fisheries habitat or recreational experience of those using the reservoir.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the leasehold or area no longer contain sport-fish reservoirs.
- Waiver – This stipulation may be waived if the AO determines the reservoir is not capable of supporting a sport fishery in the present or future.

Resource – VRM Classes II

- Stipulation – In order to retain the existing character of the landscape (VRM Class II Objective), oil and gas development activities will be located, designed, constructed, operated, and reclaimed within 2 years from initiation of construction so that activities should not attract attention of the casual observer. This stipulation does not apply to operation and maintenance activities.
- Objective – To protect visual resource values while allowing energy development and related activities to occur which have been mitigated to retain the existing character of the landscape.
- Exception – None
- Modification – None

- Waiver – None

Resource – Recreation

- Stipulation – Surface occupancy and use is subject to the following operating constraints: operations within developed and undeveloped recreation areas receiving concentrated public use 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 within these developed and undeveloped areas.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating that the impacts to recreation values and recreation users are acceptable or can be adequately mitigated.
- Modification – The area affected by this stipulation may be modified by the AO if the boundaries of the areas are changed.
- Waiver – None

Resource – National Historic Trails

- Stipulation: Surface occupancy and use is subject to the following operating constraints: all surface-disturbing activities and semi-permanent and permanent facilities in the National Trail Management Corridor of designated Lewis and Clark National Historic Trail would require design, including location, painting, and camouflage, to blend with the natural surroundings and meet the objectives for the area.
- Objective: To protect the nature and purposes; trail resources, qualities, values and associated settings; and primary use or uses of the historic trail, in accordance with the National Trails System Act.
- Exception: An exception may be granted where the operator completes a comprehensive trail inventory, as outlined in Manual 6280, and presents a proposal which demonstrates resource values are not affected or that adverse impacts can be adequately mitigated to prevent impacts to:

    - The nature and purposes of the National Trail;
    - National Trail resources, qualities, values, and associated settings;
    - National Trail primary use or uses;
    - The National Trail from the cumulative or trail wide perspective.

- Modification: None
- Waiver: None

Resource – Cultural Resources, NRHP-eligible Properties and Districts, and TCPs

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface disturbance, a SUPO and a cultural site mitigation plan for oil and gas activities must be approved by the AO for all activities in or within 300 feet of the boundaries of:

    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP; and
    - the boundaries of TCPs, or sites or areas designated, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use).

    Activity is prohibited in or within 300 feet of the boundaries of cultural properties determined to be of particular importance to American Indian groups, TCPs, or sites designated for traditional use. (Such

properties include, but are not limited to, burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)

- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; and those properties determined to be of particular importance to American Indian groups, designated TCPs, or those designated for traditional use and the settings in which they occur.
- Exception – An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area.
    - The project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).
    - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy in the area will be prohibited.
    - The lessee or operator submits a plan demonstrating that operations will be designed or located in such a manner as to have a minimal impact to the natural setting and characteristics of the immediate area and demonstrating that adverse impacts to TCPs can be mitigated in consultation with, and to the satisfaction of, affected American Indian Tribes or American Indian groups.

- Modification – None
- Waiver – None

Resource – National Historic Landmarks (NHLs) and Historic Battlefields

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface disturbance, a SUPO and a cultural site mitigation plan must be approved by the AO for all activities within the visible area of designated or NRHP-nominated NHLs and sites (including a 3.5-mile radius of the Fort Union Historic Site NHL and 300-foot radius of the boundaries of NHLs and historic battlefields).
- Objective – To protect national historic sites, NHLs, historic sites eligible for the NRHP, and the setting or viewshed in which they occur.
- Exception –An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area.
    - The project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).

    - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area will be prohibited.

- Modification – None
- Waiver – None

Resource – Paleontological Resources (including the Powderville, Flat Creek Paleontological Area, Long Medicine Wheel, and Walstein ACECs)

- Stipulation – Surface occupancy and use is subject to the following operating constraints: surface occupancy and use will be allowed as long as the activities will not impact or have an effect on the quality and setting of significant paleontological localities or areas that meet the criteria for designation as such. Prior to surface disturbance, a SUPO and a mitigation plan, which must be approved by the AO, will be required for all surface-disturbing activities in or within 300 feet of designated significant paleontological localities or locality boundaries if the activities will impact or have an effect on the significant paleontological localities for future paleontological localities or areas that meet the criteria for designation as such. Surface-disturbing activities will be avoided whenever possible. If the surface-disturbing activity cannot be avoided, approved mitigation measures will be applied to minimize the impact to the paleontological resource.
- Objective – To preserve and protect significant vertebrate fossils and paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or project proponent submits a plan demonstrating that the adverse impacts to paleontological localities can be mitigated through data recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the surface management agency, surface occupancy on that area must be prohibited.
- Modification – None
- Waiver – None

Resource – Battle Butte Battlefield, Cedar Creek Battlefield, and Reynolds Battlefield ACECs

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface disturbance, a SUPO and a cultural site mitigation plan must be approved by the AO for all activities within the visible area of designated or NRHP-nominated NHLs and sites.
- Objective – To protect national historic sites, NHLs, and historic sites eligible for the NRHP, and the setting or viewshed in which they occur.
- Exception –An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area.
    - The project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource’s visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).
    - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area will be prohibited.

- Modification – None
- Waiver – None

Resource – Yonkee ACEC

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface disturbance, a SUPO and a cultural site mitigation plan for oil and gas activities must be approved by the AO for all activities in or within 300 feet of the boundaries of:

    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP; and
    - the boundaries of TCPs, or sites or areas designated, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use).

  Activity is prohibited in or within 300 feet of the boundaries of cultural properties determined to be of particular importance to American Indian groups, TCPs, or sites designated for traditional use. (Such properties include, but are not limited to, burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)
- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; and those properties determined to be of particular importance to American Indian groups, designated TCPs, or those designated for traditional use and the settings in which they occur.
- Exception – An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area.
    - The project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).
    - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy in the area will be prohibited.
    - The lessee or operator submits a plan demonstrating that operations will be designed or located in such a manner as to have a minimal impact to the natural setting and characteristics of the immediate area and demonstrating that adverse impacts to TCPs can be mitigated in consultation with, and to the satisfaction of, affected American Indian Tribes or American Indian groups.

- Modification – None
- Waiver – None

<u>LEASE NOTICE</u>

Resource - Air Resource Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

Resource - Special Status Species

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 ESA as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.

Resource - Migratory Bird Treaty Act

The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures; a) avoidance by timing; ground disturbing activities will not occur from April 15 to July 15, b) habitat manipulation; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the year and area scheduled for activities between April 15 and July 15 of that year to deter nesting, or c) survey-buffer-monitor; surveys will be conducted by a BLM approved biologist within the area of the proposed action and a 300 foot buffer from the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the appropriate BLM Office.

Resource - Black-footer Ferret Surveys

Surface occupancy or use is subject to the following special operating constraints: prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the presence or absence 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. The lessee or operator may, at their own option, conduct an examination to determine the presence or absence of black-footed ferrets. This examination must be done by or under the supervision of a qualified resource specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency documenting the presence or absence of black footed ferrets and identifying the anticipated effects of the proposed action on the black-footed ferret and its habitat.

ALTERNATIVE E (Proposed Alternative)

NO SURFACE OCCUPANCY

Resource – Badlands, Rock Outcrop

- Stipulation – Surface occupancy and use is prohibited on badlands and rock outcrop.
- Objective – To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.
- Exception – The AO may not grant exceptions to this stipulation.

- Modification – The AO may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource – Streams, Waterbodies, Riparian, Wetland, and Floodplains

- Stipulation – Surface occupancy and use is prohibited within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.
- Objective – To protect the unique biological and hydrological features and functions associated with perennial and intermittent streams, lakes, ponds, reservoirs, floodplains, wetlands, and riparian areas.
- Exception – No exceptions would be allowed in streams, natural lakes, or wetlands. An exception may be granted by the AO for riparian areas, floodplains, and artificial ponds or reservoirs if the operator can demonstrate that:
    - there are no practicable alternatives to locating facilities in these areas,
    - the proposed actions would maintain or enhance resource functions, and
    - all reclamation goals and objectives would be met.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include these types of areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Resource – Source Water Protection Areas

- Stipulation – Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.
- Objective – To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to public health. This stipulation would protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.
- Exception – The AO may not grant exceptions to this stipulation.
- Modification – The AO may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.
- Waiver – The AO may waive this stipulation if it is determined that the entire leasehold does not include Source Water Protection Areas.

Resource –Colonial Nesting Waterbirds

- Stipulation – Surface occupancy and use is prohibited within 0.25 mile of waterbird nesting colonies.
- Objective – To protect nesting colonial-nesting birds identified as BLM priority species for management.
- Exception – The AO may grant an exception if the action will not result in colony abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of colonial nest bird sites.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.25 mile of nest sites historically used by colonial-nest birds or if the habitat has been altered to an extent, future use by colonial nesting birds is unlikely.

Resource – Raptors

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of raptor nest sites active within the preceding 7 years.

- Objective – To protect nest sites of raptors identified as BLM priority species for management (burrowing owl, golden eagle, ferruginous hawk, Swainson's hawk, prairie falcon, and northern goshawk).
- Exception – The AO may grant an exception if the action will not to result in nest territory abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of raptor nest sites active within the past 7 years.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.25 mile of raptor nest sites active within the past 7 years or if the habitat has been altered to an extent, future use by nesting raptors is unlikely.

Resource – Bald Eagles

- Stipulation - Surface occupancy and use is prohibited within 0.50 mile of bald eagle nest sites active within the preceding 5 years.
- Objective – To protect nest sites and nesting activities of bald eagles, BLM priority species for management.
- Exception – The AO may grant an exception, subject to coordination with the USFWS, if the action will not to result in nest territory abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of bald eagle nest sites active within the past 5 years.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of bald eagle nest sites active within the past 5 years or if the habitat has been altered to an extent, future use by nesting bald eagles is unlikely.

Resource – Piping Plover

- Stipulation – Surface occupancy and use is prohibited in and within 0.25 mile of piping plover habitat.
- Objective – To protect the nesting habitat of the federally threatened piping plover.
- Exception – The AO, subject to consultation with the USFWS, grant an exception if the action will not result in nest territory abandonment or decrease productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior.
- Modification – The AO may modify the boundaries of the stipulated areas if portions of the leasehold are no longer within 0.25 mile of piping plover habitat.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.25 mile of piping plover nesting habitat.

Resource – Interior Least Tern

- Stipulation – Surface occupancy and use is prohibited in and within 0.25 mile of interior least tern habitat.
- Objective – To protect the nesting habitat of the federally endangered interior least tern habitat.
- Exception – The AO, subject to consultation with the USFWS, grant an exception if the action will not result in nest territory abandonment or decrease productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior.
- Modification – The AO may modify the boundaries of the stipulated areas if portions of the leasehold are no longer within 0.25 mile of interior least tern habitat.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.25 mile of interior least tern nesting habitat.

Resource – Black-footed Ferrets

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of black-footed ferret habitat (complex of prairie dog towns within 1.5 km of each other comprising a total of at least 1,500 acres).
- Objective – To protect habitat for the federally endangered black-footed ferret.

- Exception – The AO, subject to consultation with the USFWS, may grant an exception if the action will not impair the function or suitability of the black-footed ferret habitat.
- Modification - The AO, subject to confirmation from the USFWS, may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.25 mile of current or potential black-footed ferret habitat.
- Waiver – The AO, subject to consultation with the USFWS, may waive this stipulation, if the entire leasehold is no longer within 0.25 mile of current or potential black-footed ferret habitat.

Resource – Pallid Sturgeon Habitat

- Stipulation - Surface occupancy and use is prohibited within 0.25 mile of the water's edge of the Missouri and Yellowstone Rivers.
- Objective - To protect the habitat of the federally endangered pallid sturgeon.
- Exception– The AO, subject to consultation with the USFWS, may grant an exception if the action will not impair habitat of the pallid sturgeon.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are not within 0.25 mile of the water's edge of the Yellowstone or Missouri Rivers.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.25 mile of the water's edge of the Yellowstone or Missouri Rivers.

Resource – Sage-grouse Habitat – Priority Areas, West Decker Restoration Area, South Carter Restoration Area

- Stipulation – Surface occupancy and use is prohibited within sage-grouse priority areas.
- Objective – To maintain and enhance the most important of habitats needed by priority sage-grouse populations.

  (i) No waivers or modifications to a fluid mineral lease no-surface occupancy stipulation will be granted. The Authorized Officer may grant an exception to a fluid mineral lease no-surface occupancy stipulation only where the proposed action would not have direct, indirect, or cumulative effects on GRSG or its habitat; or,
  (ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and would provide a clear conservation gain to GRSG.

Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP revision. Exceptions based on conservation gain must also include measures, such as enforceable institutional controls and buffers, sufficient to allow the BLM to conclude that such benefits will endure for the duration of the proposed action's impacts.

Any exceptions to this lease stipulation may be approved by the Authorized Officer only with the concurrence of the State Director. The Authorized Officer may not grant an exception unless the applicable state wildlife agency, the USFWS, and the BLM unanimously find that the proposed action satisfied (i) or (ii). Such finding shall initially be made by a team of one field biologist or other GRSG expert from each respective agency. In the event the initial finding is not unanimous, the finding may be elevated to the appropriate BLM State Director, USFWS State Ecological Services Director, and state wildlife agency head for final resolution. In the event their finding is not unanimous, the exception will not be granted. Approved exceptions will be made publically available at least quarterly.

Resource – Sage-grouse Habitat – General Habitat

- Stipulation – Surface occupancy and use is prohibited within 6/10 mile of the perimeter of sage-grouse leks.
- Objective – To maintain the integrity of general sage-grouse habitat and promote movement and genetic diversity to support sustainable sage-grouse populations.

- Exception – The AO, may grant an exception if the action will not result in sage-grouse lek abandonment.
- Modification – The AO, may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 6/10 mile of the perimeter of an active lek, or a portion of the habitat has been altered to the point sage-grouse no longer occupy the site and there is no likelihood of habitat capable of supporting sage-grouse being restored.
  Waiver – The AO, may waive this stipulation if: the entire leasehold is no longer within 6/10 mile of the perimeter of a lek, it is determined sage-grouse are no longer a BLM special status species or federally threatened or endangered, no reasonable alternative development scenario exists, or the habitat has been altered to the point sage-grouse no longer use the site and there is little likelihood of habitat capable of supporting sage-grouse being restored.

Resource – Recreation

- Stipulation – Surface occupancy and use is prohibited within developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified by the AO if the recreation area boundaries are changed.
- Waiver – This stipulation can be waived if the AO determines that the entire leasehold or area no longer contains developed recreation areas or undeveloped recreation areas receiving concentrated public use.

Resource – Lands with Wilderness Characteristics

- Stipulation: Surface occupancy and use is prohibited within areas that are managed to protect wilderness characteristics.
- Objective: To protect wilderness characteristics as a priority over other multiple uses.
- Exception: None
- Modification: None
- Waiver: None

Resource – National Historic Trails

- Stipulation: Surface occupancy and use is prohibited within the National Trail Management Corridor of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail and the Nez Perce Trail.
- Objective: To protect the nature and purpose; trail resources, qualities, values, and associated settings; and primary use or uses of the historic trail, in accordance with National Trail System Act.
- Exception: An exception to this stipulation may be granted by the AO if the lessee or project proponent completes a comprehensive trail inventory, as outlined in Manual 6280, and presents a proposal which demonstrates resource values are not affected or that adverse impacts can be adequately mitigated to prevent impact to:
  - The nature and purposes of the National Trail.
  - National Trail resources, qualities, values, and associated settings.
  - National Trail primary use or uses.
  - The National Trail from the cumulative or trail-wide perspective.
- Modification: None
- Waiver: None

Resource – Significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs

- Stipulation – Surface occupancy and use is prohibited in the site or within the area surrounding the site where an undertaking's area of potential effect (APE) could have a potential effect on the site's setting in:

    - sites or areas designated or sites or areas that meet the criteria for allocation for designation for scientific use, conservation use, traditional use (socio-cultural use), public use, and experimental use;
    - the boundaries of sites or districts eligible for or included on the NRHP; and
    - the boundaries of TCPs, or sites or areas designated as such, or sites or areas that meet the criteria for allocation for designation for traditional use (socio-cultural use).

  Activity is prohibited in cultural properties determined to be of particular importance to American Indian groups, TCPs, or sites designated for traditional use. (Such properties include, but are not limited to, burial locations, pictograph and petroglyph sites, vision quest locations, plant-gathering locations, and areas considered sacred or used for religious purposes.)
- Objective – To protect and avoid disturbance and inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and the settings in which they occur; and those properties determined to be of particular importance to American Indian groups.
- Exception – An exception to this stipulation may be granted by the AO if the conditions described below are met.

    - The lessee or project proponent submits a plan demonstrating that adverse impacts or effects to the cultural property can be avoided by project redesign or relocation within the buffer area; or the project is located so that it and any associated surface disturbance will not alter the characteristics of the cultural or historic property by diminishing the integrity of the property's location, design, setting, materials, workmanship, feeling, or association; or so that there will be no destruction, damage, or alteration to all or part of the cultural resource's visual, atmospheric, or audible elements that could diminish the integrity of the property's significant historic features (e.g., project placed behind a hill or screened from view or by some other method within the buffer area).
    - The lessee or project proponent submits a plan demonstrating that the adverse impacts to cultural properties can be mitigated through data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the BLM, surface occupancy in the area will be prohibited.
    - The lessee or operator submits a plan demonstrating that operations will be designed or located in such a manner as to have a minimal impact to the natural setting and characteristics of the immediate area and demonstrating that adverse impacts to TCPs can be mitigated in consultation with, and to the satisfaction of, affected American Indian Tribes or American Indian groups.

- Modification – None
- Waiver – None

Resource – Paleontological Resources

- Stipulation – Surface occupancy and use is prohibited in significant paleontological localities.
- Objective – To preserve and protect significant vertebrate fossils and paleontological localities.
- Exception – An exception may be granted by the AO if the lessee or project proponent submits a plan demonstrating that the adverse impacts to paleontological localities can be mitigated through data recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the BLM, surface occupancy on that area will be prohibited.

- Modification – None
- Waiver – None

Resource – Cultural ACECs

- Stipulation – Surface occupancy and use is prohibited within sites or areas designated for scientific use, conservation use, public use, or socio-cultural use.
- Objective – To protect those cultural properties identified for scientific use, conservation use, public use, and socio-cultural use, including the Battle Butte Battlefield, Reynolds Battlefield, Cedar Creek Battlefield, Long Medicine Wheel and Walstein ACECs.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan demonstrating that the cultural resource values forming the basis for designation will not be affected or that adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated site or area can be occupied without adversely affecting the cultural resource values for which the site or area was designated.
- Waiver – This stipulation can be waived if the AO determines that all designated sites or areas within the leasehold can be occupied without adversely affecting the cultural resource values for which such sites or areas were designated or all designated sites or areas within the leasehold are allocated for other uses.

Resource – Paleontological ACECs

- Stipulation – Surface occupancy and use is prohibited within significant paleontological localities, such as the Flat Creek, and Powderville ACECs (and the paleontological component of the Long Medicine Wheel and Walstein ACECs).
- Objective – To protect significant paleontological localities.
- Exception – An exception to this stipulation may be granted by the AO if the lessee or operator submits a plan demonstrating that the paleontological resource values forming the basis for designation of the area are not affected or adverse impacts are acceptable or can be adequately mitigated.
- Modification – The boundaries of the stipulated area can be modified if the AO determines that portions of the designated area can be occupied without adversely affecting the paleontological resource values for which the area was designated or the boundaries of the designated area are changed.
- Waiver – This stipulation can be waived if the AO determines that all localities within the leasehold can be occupied without adversely affecting the paleontological resource values for which the area was designated or all localities within the leasehold are allocated for other uses.

Resource – National Historic Landmarks (NHLs) and Historic Battlefields and the Lewis and Clark National Historic Trail

- Stipulation – Surface occupancy and use and surface disturbance is prohibited within NHLs and Historic Battlefield including the following historic properties: Wolf Mountains Battlefield NHL and Battle Butte Battlefield ACEC; Reynolds Battlefield site and Reynolds Battlefield ACEC; Cedar Creek Battlefield site and Cedar Creek Battlefield ACEC; and the Long Medicine Wheel ACEC, and all significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs, NHLs and Historic Battlefields and the Lewis and Clark National Historic Trail.
- Objective – To protect inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and those properties determined to be of particular importance to American Indian groups, and NHLs and historic sites eligible for the NRHP and the setting or viewshed in which they occur.
- Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a more than a weak contrast rating. The Plan may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.

- Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on negative or positive monitoring results from similar proposed actions on similar sites. The modification may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.
- Waiver: The BLM authorized officer determines that the entire lease area does not contribute to the setting of a historic property, the waiver may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.

Resource – National Historic Landmarks (NHLs) and Historic Battlefields and the Lewis and Clark National Historic Trail

- Stipulation – Surface occupancy and use and surface disturbance is prohibited within the visible area also called the Setting Consideration Zone where the integrity of the setting is a contributing element of NRHP significance of a property, for NHLs and Historic Battlefields including the following historic properties: Wolf Mountains Battlefield NHL and Battle Butte Battlefield ACEC; Reynolds Battlefield site and Reynolds Battlefield ACEC; Cedar Creek Battlefield site and Cedar Creek Battlefield ACEC; and the Long Medicine Wheel ACEC, and all significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs, NHLs and Historic Battlefields and the Lewis and Clark National Historic Trail.
- Objective – To protect inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and the settings in which they occur; and those properties determined to be of particular importance to American Indian groups, and NHLs and historic sites eligible for the NRHP and the setting or viewshed in which they occur.
- Exception: The BLM authorized officer may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a more than a weak contrast rating. The Plan may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.
- Modification: The BLM authorized officer may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on negative or positive monitoring results from similar proposed actions on similar sites. The modification may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.
- Waiver: The BLM authorized officer determines that the entire lease area does not contribute to the setting of a historic property, the waiver may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.

CONTROLLED SURFACE USE

Resource – Air Resources

- Stipulation – Surface occupancy and use is subject to the requirement that each diesel-fueled non-road engine with greater than 200 horsepower design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet USEPA NO_x emission standards for Tier 4 non-road diesel engines, or (2) the engine emits NO_x at rates less than or equal to USEPA emission standards for Tier 4 non-road diesel engines.
- Objective – To protect air resources and meet the 1-hour NO_2 NAAQS.
- Exception – An exception may be granted by the AO if air quality modeling, air quality monitoring, or other information demonstrates compliance with the NO_2 NAAQS.
- Modification – This stipulation may be modified if the EPA or the Montana Department of Environmental Quality (MDEQ) adds, deletes, or revises NO_x emission standards for drill rig, completion rig, or non-road engines.
- Waiver – The stipulation may be waived if new information demonstrates that compliance with the NO_2 NAAQS will be achieved consistently throughout the lease area. The stipulation may also be waived if the NO_2 NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Resource – Soils, Sensitive Soils

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use, prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the administrative officer. Sensitive soils are determined using a combination of slope and soil erodibility. The plan must demonstrate the following:

    - no other practicable alternatives exist for relocating the activity,
    - the activity will be located to reduce impacts to soil and water resources,
    - site productivity will be maintained or restored,
    - surface runoff and sedimentation will be adequately controlled,
    - on- and off-site areas will be protected from accelerated erosion,
    - that no areas susceptible to mass wasting would be disturbed, and
    - surface-disturbing activities will be prohibited during extended wet periods.

- Objective – To maintain the chemical, physical, and biotic properties of soils, which includes maintaining soil productivity, soil stability, and soil biotic properties. This will prevent excessive erosion, potential mass wasting, and improve the likelihood of successful reclamation..
- Exception – The administrative officer may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not contribute to degradation of the soil resource (e.g. excessive soil erosion, mass wasting, and/or lost productivity) or downslope resource conditions (e.g. reduced water quality due to sedimentation).
- Modification – The administrative officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not contain sensitive soils.
- Waiver – The administrative officer may waive this stipulation if it is determined that the entire leasehold does not contain sensitive soils.

Resource – Riparian, Wetlands

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use within 300 feet of riparian and/or wetland areas, a plan must be approved by the AO with design features that demonstrate how all actions would maintain and/or improve the functionality of riparian/wetland areas. The plan would address:

    - potential impacts to riparian and wetland resources,
    - mitigation to reduce impacts to acceptable levels (including timing restrictions),
    - post-project restoration, and
    - monitoring (the operator must conduct monitoring capable of detecting early signs of changing riparian and/or wetland conditions).

- Objective – To protect the unique biological and hydrological features associated with riparian and wetland areas. Disturbances adjacent to riparian and/or wetland areas (including road use) can adversely impact these sensitive areas. This stipulation would protect these features from indirect effects produced within the adjacent ground. This would also encompass the floodplain along most first to third order streams.
- Exception – The AO may grant and exception to this stipulation if the operator can demonstrate that the proposed action would not adversely impact wetland or riparian function or associated water quality.
- Modification – The area affected by this stipulation can be modified by the AO if it is determined that portions of the lease area do not contain wetlands or riparian areas.
- Waiver – This stipulation can be waived by the AO if it is determined that the entire lease area does not contain wetlands or riparian areas.

Resource – Big Game Crucial Winter Range

- Stipulation – Surface occupancy and use is subject to the following operating constraint: prior to surface occupancy and use within crucial winter ranges for big game wildlife, a plan must be approved by the AO that maintains the functionality of habitat.
- Objective – To facilitate long-term maintenance of big game wildlife populations and protect white-tailed deer, mule deer, elk, and antelope crucial winter ranges from disturbance during winter use season.
- Exception – None
- Modification – The boundaries of the stipulated area can be modified if the AO determines portions of the leasehold no longer contain crucial winter range for big game wildlife.
- Waiver – This stipulation can be waived if the AO determines the entire leasehold no longer contains crucial winter range for big game wildlife.

Resource – Sharp-tailed Grouse Leks and Nesting Habitat

- Stipulation – Surface occupancy and use is subject to design features on or within 2 miles of sharp-tailed grouse lek sites to protect breeding, nesting, and brood-rearing habitats at a level capable of supporting the long-term populations associated with the lek.
- Objective – To protect sharp-tailed grouse lek sites and nesting habitats.
- Exception – The AO, in coordination with MFWP, may grant an exception if the action will not result in nest abandonment or decrease productivity, by interfering with breeding, nesting, feeding, or brood rearing activities.
- Modification – The AO may modify the boundaries of the stipulated area in coordination with MFWP, if portions of the leasehold are no longer within 2 miles of a lek active within the past 5 years, or not considered sharp-tailed grouse habitat.
- Waiver – The AO may waive this stipulation in coordination with MFWP if the entire leasehold is no longer within 2 miles of a lek, active within the past 5 years.

Resource – Bighorn Sheep Habitat

- Stipulation – Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use a plan shall be prepared by the proponent and approved by the AO with confirmation from MFWP. The plan must demonstrate to the AO's satisfaction, the function and suitability of the habitat will not be impaired.
- Objective – To protect and maintain bighorn sheep and their habitats, a BLM priority species for management.
- Exception – The AO, in coordination with MFWP, may grant an exception if the action will not impair the function or suitability of the bighorn sheep habitat.
- Modification – The AO, in coordination with MFWP, may modify the boundaries of the stipulated area if portions are no longer bighorn sheep habitat.
- Waiver – The AO, in coordination with MFWP, may waive this stipulation if the entire leasehold is no longer bighorn sheep habitat.

Resource – Black-tailed Prairie Dogs

- Stipulation – Surface occupancy and use within black-tailed prairie dog colonies active within the past 10 years would be allowed with design features that maintain functionality of the habitat.
- Objective – To protect black-tailed prairie dog habitat, a BLM priority species for management, as well as obligate species.
- Exception – The AO may grant an exception if the action will not impair the function or suitability of the prairie dog habitat.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer prairie dog habitat active within the past 10 years.

- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within prairie dog colonies active within the past 10 years.

Resource – Sage-grouse General Habitat

- Stipulation – Surface occupancy and use within 2 miles of the perimeter of a lek active within the past 5 years may be restricted or prohibited. Prior to such activities, a plan to mitigate impacts to breeding or nesting sage-grouse; or breeding, nesting, or brood rearing habitat will be prepared by the proponent and implemented upon approval by the AO.
- Objective – To protect breeding, nesting and brood rearing activities and habitat.
- Exception – The AO may grant an exception if the action would not agitate or bother breeding, or nesting sage-grouse to a degree that causes or is likely to cause:
    - physical injury, or,
    - decrease productivity, by substantially interfering with normal breeding, feeding, nesting or brood rearing activities; or nest abandonment.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 2 miles of a lek, active within the past 5 years.
- Waiver – The AO may waive this stipulation if:
    - the entire leasehold is no longer within 2 miles of leks, active within the past 5 years,
    - it is determined sage-grouse are no longer a BLM special status species,
    - no reasonable alternative development scenario exists, or
    - the habitat has been altered to the point sage-grouse no longer use the site and there is little likelihood of habitat capable of supporting sage-grouse being restored.

Resource – Sage-grouse Habitat - Cedar Creek Restoration Area

- Stipulation – Surface occupancy and use would be allowed with design features to minimize disturbance to sage-grouse habitat.
- Objective – To minimize disturbance to sage-grouse habitat and maximize restoration efforts while allowing for the permitted uses.
- Exception – The AO may grant an exception if the proposed action will meet the goals and objectives for sage-grouse habitat.
- Modification – The AO, in coordination with MFWP, may modify the boundaries of the stipulated area if portions of the leasehold are no longer sage-grouse habitat and future use by sage-grouse is unlikely.
- Waiver – This stipulation may be waived if:
    - sage-grouse are no longer a BLM special status species,
    - no reasonable alternative development scenario exists, or
    - the habitat has been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of sage-grouse reoccupying the site.

Resource – Designated Sport-fish Reservoirs

- Stipulation – Surface occupancy and use would be allowed in and within 0.25 miles of sport-fish reservoirs with design features to minimize impacts.
- Objective – To protect fisheries habitat and recreational values of sport-fish reservoirs.
- Exception – An exception to this stipulation may be granted by the AO if the authorized activity will not compromise the fisheries habitat or recreational experience of those using the reservoir.
- Modification – The boundaries of the stipulated area may be modified if the AO determines portions of the leasehold or area no longer contain sport-fish reservoirs.
- Waiver – This stipulation may be waived if the AO determines the reservoir is not capable of supporting a sport fishery in the present or future.

Resource – VRM Classes II

- Stipulation – In order to retain the existing character of the landscape (VRM Class II Objective), oil and gas development activities will be located, designed, constructed, operated, and reclaimed within 2 years from initiation of construction so that activities should not attract attention of the casual observer. This stipulation does not apply to maintenance or workover activities.
- Objective – To protect visual resource values while allowing energy development and related activities to occur which have been mitigated to retain the existing character of the landscape.
- Exception – None
- Modification – None
- Waiver – None

Resource – Recreation

- Stipulation – Surface occupancy and use is subject to the following operating constraints: operations within developed and undeveloped recreation areas receiving concentrated public use 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 within these developed and undeveloped areas.
- Objective – To protect developed recreation areas and undeveloped recreation areas receiving concentrated public use such as the Strawberry Hill area.
- Exception – An exception to this stipulation may be granted by the AO if the project proponent submits a plan demonstrating that the impacts to recreation values and recreation users are acceptable or can be adequately mitigated.
- Modification – The area affected by this stipulation may be modified by the AO if the boundaries of the areas are changed.
- Waiver – None

Resource – Significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs, NHLs and Historic Battlefields

- Stipulation – Surface occupancy and use and surface disturbance is restricted within the Setting Consideration Zone where the integrity of the setting is a contributing element of NRHP significance of a property, for the following historic properties: Wolf Mountains Battlefield NHL and Battle Butte Battlefield ACEC; Reynolds Battlefield site and Reynolds Battlefield ACEC; Cedar Creek Battlefield site and Cedar Creek Battlefield ACEC; and the Long Medicine Wheel ACEC, and all significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs, NHLs and Historic Battlefields and the Lewis and Clark National Historic Trail. Prior to surface disturbance, occupancy or use within the Setting Consideration Zone of the identified historic properties a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the APD (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator may not initiate surface-disturbing activities unless the BLM AO has approved the Plan or approved it with conditions. (b) The Plan must demonstrate to the AO's satisfaction that the infrastructure will either not be visible or will result in a weak contrast rating and would not have an adverse effect on the setting of the historic properties, ensuring the setting of historic properties.
- Objective – To protect inadvertent impacts to significant cultural properties, districts, and their settings; NRHP-eligible properties and districts; TCPs or those designated for traditional use and the settings in which they occur; and those properties determined to be of particular importance to American Indian groups, and NHLs and historic sites eligible for the NRHP and the setting or viewshed in which they occur.
- Exception: The BLM AO may grant an exception if it is determined that the action is of a scale, sited in a location, or otherwise designed so that the action will not result in a more than a weak contrast rating. The Plan may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.

- Modification: The BLM AO may modify the area subject to the stipulation based on local evaluation. The stipulation may be modified based on negative or positive monitoring results from similar proposed actions on similar sites. The modification may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.
- Waiver: The BLM AO determines that the entire lease area does not contribute to the setting of a historic property, the waiver may be subject to consultation with Montana SHPO, applicable tribes, and other interested parties.

TIMING LIMITATION

Resource – Raptors

- Stipulation - Surface use is prohibited within 0.50 mile of active raptor nest sites from March 1 through July 31.
- Objective – To protect nesting activities associated with raptors identified as BLM priority species for management.
- Exception – The AO may grant an exception if the action will not to result in nest territory abandonment or decrease productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of an active raptor nest.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of an active raptor nest.

Resource – Colonial Nesting Waterbirds

- Stipulation - Surface use is prohibited within 0.50 mile of waterbird nesting colonies from April 1 through July 15.
- Objective – To protect nesting activities associated with colonial-nesting birds identified as BLM priority species for management.
- Exception – The AO may grant an exception if the action will not result in nest territory abandonment or decrease productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior.
- Modification – The AO may modify the boundaries of the stipulated area if portions of the leasehold are no longer within 0.50 mile of an active nesting colony.
- Waiver – The AO may waive this stipulation if the entire leasehold is no longer within 0.50 mile of an active colonial nesting bird colony.

LEASE NOTICE

Resource - Air Resource Analysis

The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

Resource - Special Status Species

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 ESA as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.

Resource - Migratory Bird Treaty Act

The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures; a) avoidance by timing; ground disturbing activities will not occur from April 15 to July 15, b) habitat manipulation; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the year and area scheduled for activities between April 15 and July 15 of that year to deter nesting, or c) survey-buffer-monitor; surveys will be conducted by a BLM approved biologist within the area of the proposed action and a 300 foot buffer from the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities would not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the appropriate BLM Office.

Resource - Black-footer Ferret Surveys

Surface occupancy or use is subject to the following special operating constraints: prior to surface disturbance, prairie dog colonies and complexes 80 acres or more in size will be examined to determine the presence or absence 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. The lessee or operator may, at their own option, conduct an examination to determine the presence or absence of black-footed ferrets. This examination must be done by or under the supervision of a qualified resource specialist approved by the surface management agency. An acceptable report must be provided to the surface management agency documenting the presence or absence of black footed ferrets and identifying the anticipated effects of the proposed action on the black-footed ferret and its habitat.

Resource - Cultural Resources Setting Consideration Zones

This lease is known to contain historic properties or resources protected under NHPA that contain a Setting Consideration Zone where the integrity of the setting is known to be an important contributing element of NRHP significance of the property, and applies to the following historic properties: Wolf Mountains Battlefield NHL and Battle Butte Battlefield ACEC; Reynolds Battlefield site and Reynolds Battlefield ACEC; Cedar Creek Battlefield site and Cedar Creek Battlefield ACEC; and the Long Medicine Wheel ACEC, and all significant Cultural Resources, NRHP-eligible Properties and Districts, and TCPs, NHLs and Historic Battlefields and the Lewis and Clark National Historic Trail.

Resource – Setback from Human Occupied Residences Requirement

The lease area may contain human occupied residences. Under Regulation 43 CFR 3101.1-2 and terms of the lease (BLM Form 3100-11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, which may require relocating proposed operations up to 200 meters, but not off the leasehold.

The setback requirement of 500 feet from human occupied residences has been established based upon the best information available. The following condition of approval may be applied as a result of the Application for Permit to Drill (APD) process during the on-site inspection and the environmental review unless an acceptable plan for mitigation of impacts is reached between the resident, lessee and BLM:

- **Facilities will not be allowed within 500 feet of human occupied residences.**

The intent of this Lease Notice is to provide information to the lessee that would help design and locate oil and gas facilities to preserve the aesthetic qualities around human occupied residences.

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR RESOURCE MANAGEMENT PLAN ALTERNATIVES

The BLM completed an RFD projection that technically analyzed the oil and gas resources known to occur and potentially occur within the planning area to project future development potential and activity levels for 2011 through 2030 (BLM, 2013). The RFD analysis for the planning area, including American Indian Reservation lands, makes a baseline projection that assumes all potentially productive areas are open to leasing under the standard lease terms and conditions. The RFD evaluation and projections presented below review and analyze past, present, and potential future exploratory, development, and production operations and activities. It also presents occurrence potential for oil and gas, CBNG, and deep oil and gas (at depths greater than 13,000 feet) within the planning area.

Operator and MBOGC feedback and data were compiled and in conjunction with USGS Assessments, current development, and resource expertise to help project locations and amounts of future drilling activity within the planning area. A review of available technical data was also conducted to help make these projections (BLM, 2013). Approximate acres and well numbers are used in RFD projections due to the scaling and precision parameters associated with the Geographic Information System (GIS). The method used to determine the number of new wells projected to be drilled during the life of the plan has been discussed in detail in the BLM RFD technical review document (BLM, 2013).

RFD BASELINE

Number of Wells Projected to be Drilled 2011 to 2030

For a baseline, unconstrained RFD projection (BLM, 2004) this RFD estimates that during the 20-year planning cycle of 2011 to 2030, approximately 7,524 wells would be drilled in the planning area (Table 2), of which 1,699 would be federally administered wells (Table 3). Of the 7,524 wells, up to 1,200 of these wells would be CBNG wells, with 100 wells located in the Williston Basin and 1,100 CBNG wells located in the Powder River Basin of Montana. Of the remaining 6,324 projected new wells to be drilled, 3,461 would be new oil wells and 2,863 would be new conventional gas wells. The projected number of wells to be drilled was estimated by county in Table 4. For BLM administered wells, the baseline RFD does not include projected well numbers for minerals privately owned, owned by the State of Montana, owned by local governments, or lands administered by other federal agencies.

TABLE 2.
NUMBER OF WELLS PROJECTED TO BE DRILLED
IN THE PLANNING AREA FOR THE BASELINE SCENARIO (2011 - 2030)

Development Potential	Planning Area Acres and Percentage (%)	Federal Oil and Gas Mineral Acres and Percentage (%)	Number of New Wells
High	6,043,000 (23%)	738,000 (15%)	3,720
Medium	6,655,000 (26%)	1,092,000 (22%)	2,390
Low	13,120,000 (51%)	3,178,000 (63%)	1,414
Total (approximate)	**25,818,000**	**5,008,000**	**7,524**

Source: BLM 2013

TABLE 3.
NUMBER OF WELLS PROJECTED TO BE DRILLED
FOR THE BASELINE BY DEVELOPMENT POTENTIAL AND WELL TYPE (2011 - 2030)

Development Potential	Oil Wells		Conventional Gas Wells		CBNG Wells		Total New Wells To Be Drilled	
	Total	Federal	Total	Federal	Total	Federal	Total	Federal
High	1,711	209	1,414	173	595	299	3,720	681
Medium	1,100	180	910	149	380	109	2,390	438
Low	650	157	539	131	225	25	1,414	313
Totals	**3,461**	**546**	**2,863**	**453**	**1,200**	**433**	**7,524**	**1,432**

Source: BLM 2013

TABLE 4.
NUMBER OF WELLS
PROJECTED TO BE DRILLED FOR THE BASELINE BY COUNTY (2011 - 2030)

	Baseline Total			Baseline Federal		
County	Oil Wells	Gas Wells	CBNG Wells	Oil Wells	Gas Wells	CBNG Wells
Big Horn	75	62	142	36	30	62
Carter	180	149	0	90	74	0
Custer	120	100	0	27	22	0
Daniels	236	195	0	3	3	0
Dawson	247	204	0	17	14	0
Fallon	128	106	0	18	15	0
Garfield	161	133	0	49	40	0
McCone	231	191	0	31	26	0
Powder River	432	357	734	176	146	323
Prairie	70	58	0	26	22	0
Richland	350	290	45	23	19	3
Roosevelt	429	355	55	4	4	1
Rosebud	215	178	224	34	28	44
Sheridan	305	252	0	5	4	0
Treasure	31	26	0	1	1	0
Valley	157	129	0	0	0	0
Wibaux	94	78	0	6	5	0
Totals	**3,461**	**2,863**	**1,200**	**546**	**453**	**433**

Source: BLM 2013

Projected Baseline Surface Disturbance 2011 to 2030

Tables 5 and 6 project short-term and long-term disturbance associated with existing wells and projected drilling activity for 2011 through 2030 from the projected well numbers listed in Table 3. Acres of disturbance associated with BLM-administered wells can be located on federally administered surface or on non-federally administered surface (split estate lands). The estimated acres of disturbance associated with the access road, utility corridor, and well pad for drilled and producing wells are based on the average disturbance of federally administered oil, gas, and CBNG wells permitted in the MCFO within the last five years. It is standard practice for oil and gas operations to combine the access road and pipeline/utility lines (oil/gas/CBNG, water, and power) within the same corridor to minimize surface disturbance. Surface disturbance associated with major transportation lines, processing production areas, produced water management areas may be permitted in association with another federal or nonfederal well permit; therefore, these acres are not included in the acres of surface disturbance per well or access road/utility corridor.

Table 5 shows the projected number of new exploratory wells (7,524 total wells with 1,432 BLM-administered wells) that could be drilled in the planning area from 2011 to 2030. There are an additional 5,168 existing active wells (1,112 gas; 1,064 CBNG; and 2,992 oil) (MBOGC, 2011). Of those 5,168 existing wells, 930 total wells (378 gas, 179 CBNG, and 373 oil wells) are BLM-administered wells. Table 5 also shows associated acres of total surface disturbance (short-term disturbance) directly associated with all new and existing wells. Approximately 18,503 acres of new and existing short-term surface disturbance (2,725 acres of disturbance associated with BLM-administered wells) would occur if all 7,524 projected wells were drilled.

TABLE 5.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR THE BASELINE SCENARIO (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Exploratory CBNG Wells	1,200	433	0.55	0.25	960	347
New Exploratory Gas Wells	2,863	453	0.55	0.50	3,006	476
New Exploratory Oil Wells	3,461	546	1.20	3.00	14,537	2,294
Total New Exploratory Wells	**7,524**	**1,432**			**18,503**	**3,117**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,692**	**2,362**	**Total Short-term Disturbance**		**23,848**	**3,914**

Source: BLM 2013

Table 6 estimates the projected number of new producing wells remaining in production after all new exploratory wells are drilled and all dry holes are abandoned and reclaimed (6,114 total new producing wells with 1,220 of those being BLM-administered wells). There are approximately 5,168 existing active wells of which 930 are active BLM-administered wells.

TABLE 6.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR THE BASELINE SCENARIO (LONG-TERM DISTURBANCE) 2011 - 2013

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Producing CBNG Wells	1,152	416	0.22	0.15	426	154
New Producing Gas Wells	2,262	358	0.22	0.25	1,063	158
New Producing Oil Wells	2,700	426	0.48	1.00	3,996	631
Total New Producing Wells	**6,114**	**1,626**			**5,485**	**943**
Existing CBNG	1,064	179	0.22	0.15	394	66
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**796**
Total Active Wells	**11,282**	**2,2,556**	**Total Long-term Disturbance**		**10,830**	**1,1,739**

Source: BLM 2013

Table 6 also estimates unreclaimed associated acres of total surface disturbance (long-term disturbance). Approximately 5,485 acres of new unreclaimed surface disturbance (862 acres of unreclaimed acres associated with BLM-administered wells) could remain in the long term. Total unreclaimed long-term surface disturbance (all well types) would be 10,830 acres, with 1,658 acres associated with BLM-administered wells.

RESOURCE MANAGEMENT PLAN ALTERNATIVES

The RMP contains five management alternatives. Each alternative contains management imposed restrictions that may negatively affect oil and gas development. These restrictions can effectively decrease the baseline estimated number of wells projected to be drilled within the planning area. For each alternative, the imposed restrictions have been analyzed and the estimated number of resulting wells to be drilled that could be reduced from the baseline total has been projected. For BLM administered wells, the RFD for each alternative does not include projected well numbers for minerals privately owned, owned by the State of Montana, owned by local governments, or for lands administered by other federal agencies.

For each alternative, GIS was used to calculate restricted acres within each development potential, the projected number of wells to be drilled within each development potential, short-term surface disturbance, and long-term surface disturbance. The restricted acres were based on management actions described in Chapter 2 Table 2-1.

Procedures Used to Determine Well Location Reductions

Well location reductions from the baseline RFD scenario for each alternative, are due to proposed management restrictions. Restrictions applied to each alternative can affect oil and gas development activities by not allowing leasing, not allowing surface occupancy, controlling surface use, or placing restrictive stipulations on COAs of federal applications to drill. Reduced oil and gas activities result in increased exploration and development costs, fewer drilled wells, and reduced production. For RFD scenario analysis purposes, the restrictions for the five alternatives analyzed were separated into four categories designated A, B, C, and D. Restrictions on drilling are progressively more limiting from restriction category A to restriction category D and are:

Restriction Category A **-** areas open to leasing. Restrictions are relatively minor and result in standard lease terms and conditions that are applied to every federal oil and gas lease sold in the planning area. These restrictions are considered to have little to no effect on the number of future well locations or production for any alternative.

Restriction Category B **-** areas open to leasing subject to relatively minor constraints. These restrictions are considered as CSU or Timing Limitation stipulations. These restrictions can have a moderate effect such as multiple, consecutive timing restrictions for protection of wildlife values (e.g., crucial winter range, raptor nesting habitat, or sage-grouse strutting grounds).

Restriction Category C **-** areas open to leasing subject to major constraints. These restrictions are considered as NSO stipulations. These restrictions can have a moderate to severe effect on the location of wells; such as NSO stipulations on an area more than 40 acres in size or requirements that viewsheds be protected, thus requiring that well locations and production facilities not be visible from areas such as historic trails. Overlapping minor constraints may also severely limit the future development of oil and gas resources.

Restriction Category D **-** areas closed to leasing. These are areas where a determination is made that other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations. Because areas are closed to leasing, this category has the most severe restrictions and would preclude future oil and gas activity and production.

Estimates of future reductions in well locations from the baseline reasonable foreseeable development projection were determined as described below:

An estimate of the number of well locations per township acres (average well density) that could be drilled in each development potential category over the 20-year life of the plan was made for conventional oil and gas development activity and for CBNG development activity.

The acres of federal oil and gas ownership for each area development potential were determined using GIS software. Acres of non-federal oil and gas minerals were not included because proposed RMP decisions will only apply to federal oil and gas minerals. It was assumed that development on non-federal minerals will occur as estimated in the baseline foreseeable development projection.

Next, the areas covered by each restriction category (B, C, or D) within the high, medium, or low development potential areas for oil, gas, and CBNG potential were calculated using GIS software. The area within category A was not calculated, because it was previously determined that this type of restriction would have no significant effect on the number of well locations for any alternative.

After the acres of federal oil and gas were calculated for each alternative in each restriction category, the percent reduction in well locations for each development potential in restriction Category C was estimated. This estimate is a percent of the well locations that would not be drilled in each area due to the specific category of restriction, Category C (NSO). The percent reduction for each development potential was based on the spatial layout of Category C (NSO) restriction, unleased federal oil and gas mineral, and existing federal leases (see Map 40) within each development potential area, and the feasibility to directionally/horizontally drill in the area. Based on the spatial layouts, it was estimated that 30 percent of the federal oil and gas wells in high development potential would not be drilled within Category C (NSO) acres, 40 percent for medium development potential, and 50 percent. Because CBNG development requires large contiguous areas to properly develop a plan of development area, the percent reduction was estimated to be 5 percent higher for each development potential.

The number of projected wells and acres were calculated using the method above for each alternative in Tables 7 to 26.

ALTERNATIVE A

TABLE 7.
ALTERNATIVE A RESTRICTIONS BY DEVELOPMENT POTENTIAL (ACRES)

Restriction	***High***	***Medium***	***Low***	***Total Acres***
Closed	0	0	86,664	86,664
NSO	206,849	357,120	909,407	1,473,375
CSU	349,662	597,450	1,476,296	2,423,409
Timing	211,855	486,967	1,149,647	1,848,469
Lease Terms	195,850	151,727	733,213	1,080,790

Source: BLM 2013

TABLE 8.
ALTERNATIVE A PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		**Gas Wells**		**CBNG Wells**		**Total Wells Drilled**		**Total Wells Not Drilled**
	Total	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Federal**
High	1,7697	195	1,403	162	574	278	3,674	635	46
Medium	1,079	159	893	132	367	96	2,339	387	51
Low	625	132	517	109	222	22	1,364	263	50
Totals	**3,401**	**486**	**2,813**	**403**	**1,163**	**396**	**7,497**	**1,285**	**147**

Source: BLM 2013

**TABLE 9.
DISTURBANCE ASSOCIATED
WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED
ACTIVE WELLS FOR ALTERNATIVE A (SHORT-TERM DISTURBANCE) 2011 - 2030**

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Exploratory CBNG Wells	1,163	396	0.55	0.25	959	317
New Exploratory Gas Wells	2,813	403	0.55	0.50	2,993	423
New Exploratory Oil Wells	3,401	486	1.20	3.00	14,482	2,041
Total New Exploratory Wells	**7,377**	**1,285**			**18,168**	**2,781**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,545**	**2,215**	**Total Short-term Disturbance**		**23,513**	**3,578**

Source: BLM 2013

**TABLE 10. DISTURBANCE ASSOCIATED WITH NEW
PRODUCING WELLS FOR ALTERNATIVE A (LONG-TERM DISTURBANCE) 2011 - 2030**

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Producing CBNG Wells	1,116	381	0.22	0.15	413	141
New Producing Gas Wells	2,222	318	0.22	0.25	1,044	150
New Producing Oil Wells	2,653	380	0.48	1.00	3,926	562
Total New Producing Wells	**5,991**	**1,079**			**5,383**	**853**
Existing CBNG	1,064	179	0.22	0.15	394	66
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**11,159**	**2,009**	**Total Long-term Disturbance**		**10,728**	**1,650**

Source: BLM 2013

ALTERNATIVE B

**TABLE 11. ALTERNATIVE B RESTRICTIONS BY DEVELOPMENT
POTENTIAL (ACRES)**

Restriction	*High*	*Medium*	*Low*	*Total Acres*
Closed	96,485	246,513	1,229,178	1,572,176
NSO	41,1084	556,589	1,127,143	2,094,816
CSU	185,677	252,273	704,843	1,142,793
Timing	0	0	0	0
Lease Terms	44,836	38,373	127,792	211,001

Source: BLM 2013

TABLE 12.
ALTERNATIVE B PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		Gas Wells		CBNG Wells		Total Wells Drilled		Total Wells Not Drilled
	Total	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Federal**
High	1,649	147	1,362	121	493	197	3,504	465	216
Medium	1,023	103	846	85	335	64	2,205	252	186
Low	562	69	465	57	216	16	1,243	142	171
Totals	**3,234**	**319**	**2,673**	**263**	**1,045**	**277**	**6,953**	**859**	**573**

Source: BLM 2013

TABLE 13.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR ALTERNATIVE B (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Exploratory CBNG Wells	1,045	277	0.55	0.25	836	222
New Exploratory Gas Wells	2,673	263	0.55	0.50	2,807	276
New Exploratory Oil Wells	3,234	319	1.20	3.00	13,583	1,340
Total New Exploratory Wells	**6,953**	**859**			**17,226**	**1,838**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,121**	**1,789**	**Total Short-term Disturbance**		**22,571**	**2,635**

Source: BLM 2013

TABLE 14.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR ALTERNATIVE B (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Producing CBNG Wells	1,003	266	0.22	0.15	371	98
New Producing Gas Wells	2,112	208	0.22	0.25	993	98
New Producing Oil Wells	2,523	249	0.48	1.00	3,734	369
Total New Producing Wells	**5,638**	**723**			**5,044**	**565**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**10,806**	**1,653**	**Total Long-term Disturbance**		**10,389**	**1,362**

Source: BLM 2013

ALTERNATIVE C

TABLE 15.
ALTERNATIVE C RESTRICTIONS BY DEVELOPMENT POTENTIAL (ACRES)

Restriction	*High*	*Medium*	*Low*	*Total Acres*
Closed	0	0	83,160	83,160
NSO	36,162	61,662	174,695	272,519
CSU	490,203	706,166	1,783,681	2,980,049
Timing	0	0	0	0
Lease Terms	211,269	324,117	1,139,892	1,675,278

Source: BLM 2013

TABLE 16.
ALTERNATIVE C PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		**Gas Wells**		**CBNG Wells**		**Total Wells Drilled**		**Total Wells Not Drilled**
	Total	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Federal**
High	1,708	206	1,411	170	589	293	3,708	669	12
Medium	1,096	176	907	146	374	102	2,378	425	13
Low	642	149	532	124	224	24	1,398	297	16
Totals	**3,446**	**531**	**2,850**	**440**	**1,188**	**420**	**7,484**	**1,391**	**41**

Source: BLM 2013

TABLE 17.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR ALTERNATIVE C (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	**Wells**		**Acres of Surface Disturbance**			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Exploratory CBNG Wells	1,188	420	0.55	0.25	950	336
New Exploratory Gas Wells	2,850	440	0.55	0.50	2,993	462
New Exploratory Oil Wells	3,446	531	1.20	3.00	14,473	2,230
Total New Exploratory Wells	**7,484**	**1,391**			**18,416**	**3,028**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,652**	**2,321**	**Total Short-term Disturbance**		**23,761**	**3,825**

Source: BLM 2013

TABLE 18.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR ALTERNATIVE C (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Producing CBNG Wells	1,140	403	0.22	0.15	422	149
New Producing Gas Wells	2,252	348	0.22	0.25	1,058	164
New Producing Oil Wells	2,688	414	0.48	1.00	3,978	613
Total New Producing Wells	**6,080**	**1,165**			**5,458**	**926**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**11,248**	**2,095**	**Total Long-term Disturbance**		**10,803**	**1,723**

Source: BLM 2013

ALTERNATIVE D

TABLE 19.
ALTERNATIVE D RESTRICTIONS BY DEVELOPMENT POTENTIAL (ACRES)

Restriction	*High*	*Medium*	*Low*	*Total Acres*
Closed	0	0	83,160	83,160
NSO	2,375	36,381	60,686	99,442
CSU	594,933	902,071	2,622,992	4,119,996
Timing	0	0	0	0
Lease Terms	142,071	417,672	155,421	715,163

Source: BLM 2013

TABLE 20.
ALTERNATIVE D PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		Gas Wells		CBNG Wells		Total Wells Drilled		Total Wells Not Drilled
	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Federal
High	1,711	209	1,414	173	595	299	3,720	681	7
Medium	1,098	178	909	148	377	106	2,384	432	6
Low	645	152	534	126	225	25	1,404	303	3
Totals	**3,454**	**539**	**2,857**	**447**	**1,197**	**430**	**7,508**	**1,416**	**16**

Source: BLM 2013

TABLE 21.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR ALTERNATIVE D (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Exploratory CBNG Wells	1,197	430	0.55	0.25	957	344
New Exploratory Gas Wells	2,857	447	0.55	0.50	2,999	469
New Exploratory Oil Wells	3,454	539	1.20	3.00	14,509	2,266
Total New Exploratory Wells	**7,507**	**1,415**			**18,466**	**3,079**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,675**	**2,345**	**Total Short-term Disturbance**		**23,811**	**3,876**

Source: BLM 2013

TABLE 22.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR ALTERNATIVE D (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Producing CBNG Wells	1,150	417	0.22	0.15	426	153
New Producing Gas Wells	2,257	356	0.22	0.25	1,783	166
New Producing Oil Wells	2,602	425	0.48	1.00	3,851	623
Total New Producing Wells	**6,009**	**1,198**			**6,060**	**941**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**11,177**	**2,128**	**Total Long-term Disturbance**		**11,405**	**1,738**

Source: BLM 2013

ALTERNATIVE E

TABLE 23.
ALTERNATIVE E RESTRICTIONS BY DEVELOPMENT POTENTIAL (ACRES)

Restriction	*High*	*Medium*	*Low*	*Total Acres*
Closed	0	0	83,160	83,160
NSO	163,857	464,371	1,324,026	1,952,253
CSU	483,875	565,675	1,449,137	2,498,686
Timing	1,313	796	4,877	6,986
Lease Terms	91,649	63,906	328,231	483,786

Source: BLM 2013

TABLE 24.
ALTERNATIVE E PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		Gas Wells		CBNG Wells		Total Wells Drilled		Total Wells Not Drilled
	Total	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Federal**
High	1,697	195	1,402	161	576	280	3,675	636	**80**
Medium	1,070	150	885	124	376	96	2,322	370	**68**
Low	614	121	508	100	224	24	1,346	245	**33**
Totals	**3,381**	**466**	**2,795**	**385**	**1,167**	**400**	**7,343**	**1,251**	**181**

Source: BLM 2013

TABLE 25.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR ALTERNATIVE E (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Exploratory CBNG Wells	1,167	400	0.55	0.25	934	320
New Exploratory Gas Wells	2,795	385	0.55	0.50	2,935	404
New Exploratory Oil Wells	3,381	466	1.20	3.00	14,200	1,957
Total New Exploratory Wells	**7,343**	**1,251**			**18,069**	**2,681**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Active Gas Wells	1,112	378	0.22	0.25	523	178
Existing Active Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**12,511**	**2,181**	**Total Short-term Disturbance**		**23,412**	**3,478**

Source: BLM 2013

TABLE 26.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR ALTERNATIVE E (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Producing CBNG Wells	1,120	384	0.22	0.15	414	142
New Producing Gas Wells	2,208	305	0.22	0.25	1,038	143
New Producing Oil Wells	2,558	364	0.48	1.00	3,786	538
Total New Producing Wells	**5,886**	**1,053**			**5,238**	**824**
Existing CBNG	1,064	179	0.22	0.15	394	67
Existing Gas Wells	1,112	378	0.22	0.25	523	178
Existing Oil Wells	2,992	373	0.48	1.00	4,428	552
Total Existing Wells	**5,168**	**930**			**5,345**	**797**
Total Active Wells	**11,054**	**1,983**	**Total Long-term Disturbance**		**10,583**	**1,621**

Source: BLM 2013

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO FOR THE PROPOSED CARTER MLP AREA

Projections for the proposed Carter MLP RFD were extracted from the MCFO RFD baseline projected well numbers described above. However, as the location of the MLP area is many miles from CBNG development potential areas in the MCFO, no CBNG wells are projected to be developed in the MLP area.

The proposed MLP area is located in Carter County and lies within the MCFO RFD area (Table 27). The MLP area has approximately 57,545 acres in high development potential, approximately 140,343 acres in medium development potential, and approximately 198,770 acres in low development potential. The area contains approximately 396,658 surface (all ownership) acres, or which 283,162 acres are federal oil and gas mineral acres. The proposed MLP is proposed as part of Alternative C (see Table 2-5); therefore, an RFD was projected only for Alternative C using the MLP baseline scenario.

TABLE 27. PROJECTED BASELINE OF NEW WELLS TO BE DRILLED IN THE CARTER MLP BY DEVELOPMENT POTENTIAL 2011 - 2030

Development Potential	Oil Wells		Conventional Gas Wells		Total New Wells To Be Drilled	
	Total	Federal	Total	Federal	Total	Federal
High	16	10	13	8	29	18
Medium	23	19	19	15	42	34
Low	10	7	8	6	18	13
Totals	**49**	**36**	**40**	**29**	**89**	**65**

Source: BLM 2013

The RFD projects up to 89 total wells (40 gas wells and 49 oil wells) to be drilled within the MLP. Of these wells, 65 (29 gas wells and 36 oil wells) would be BLM-administered wells drilled (Table 28). Of the 65 BLM-administered wells drilled, 51 would be producing wells (23 gas wells and 28 oil wells) (Tables 29 and 30).

The number of wells projected for Alternative C was calculated using the same methods applied above (Table 31 to Table 34). Acres of disturbance were calculated using the same acres and methods as described above for short-term and long-term disturbance.

TABLE 28.
DEVELOPMENT POTENTIAL ACRES WITHIN THE CARTER MLP

Development Potential	MLP Area Acres and Percentage of Total	BLM-administered Surface Acres	BLM-administered Mineral Acres
High	57,545 (14%)	8,509	35,556
Medium	140,343 (35%)	59,051	112,264
Low	198,770 (51%)	71,349	135,342
TOTAL	**396,658**	**138,909**	**283,162**

Source: BLM 2013

TABLE 29. DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR THE BASELINE SCENARIO IN THE CARTER MLP (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Exploratory Gas Wells	40	29	0.55	0.50	42	30
New Exploratory Oil Wells	49	36	1.20	3.00	206	151
Total New Exploratory Wells	**89**	**65**			**246**	**181**
Existing Active Gas Wells	1	0	0.22	0.25	0.50	0
Existing Active Oil Wells	0	0	0.48	1.00	0	0
Total Existing Wells	**1**	**0**			**0.50**	**0**
Total Active Wells	**90**	**65**	**Total Short-term Disturbance**		**42.50**	**181**

Source: BLM 2013

TABLE 30. DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR THE BASELINE SCENARIO IN THE CARTER MLP (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	BLM-administered	Road/Utility Corridor	Well Pad	Total	BLM-administered
New Producing Gas Wells	32	23	0.22	0.25	15	11
New Producing Oil Wells	38	28	0.48	1.00	56	41
Total New Producing Wells	**70**	**51**			**71**	**52**
Existing Gas Wells	1	0	0.22	0.25	0.50	0
Existing Oil Wells	0	0	0.48	1.00	0	0
Total Existing Wells	**1**	**0**			**0.50**	**0**
Total Active Wells	**71**	**51**	**Total Long-term Disturbance**		**71.50**	**52**

Source: BLM 2013

ALTERNATIVE C

TABLE 31. ALTERNATIVE C CARTER MLP RESTRICTIONS BY DEVELOPMENT POTENTIAL (ACRES)

Restriction	*High*	*Medium*	*Low*	*Total Acres*
Closed	0	0	0	0
NSO	0	130	1,915	2,045
CSU	35,556	112,264	135,342	283,162
Timing	0	0	0	0
Lease Terms	0	0	0	0

Source: BLM 2013

TABLE 32. ALTERNATIVE C CARTER MLP PROJECTED NUMBER OF WELLS TO BE DRILLED 2011 - 2030

	Oil Wells		Gas Wells		Total Wells Drilled		Total Wells Not Drilled
	Total	**Federal**	**Total**	**Federal**	**Total**	**Federal**	**Federal**
High	16	10	13	8	29	18	0
Medium	23	19	19	15	42	34	0
Low	10	7	8	6	18	13	0
Totals	**49**	**36**	**40**	**29**	**89**	**65**	**0**

Source: BLM 2013

TABLE 33.
DISTURBANCE ASSOCIATED WITH NEW DRILLED WELLS, EXISTING WELLS, AND PROJECTED ACTIVE WELLS FOR ALTERNATIVE C SCENARIO IN THE CARTER MLP (SHORT-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Exploratory Gas Wells	40	29	0.55	0.50	42	30
New Exploratory Oil Wells	49	36	1.20	3.00	206	151
Total New Exploratory Wells	**89**	**65**			**246**	**181**
Existing Active Gas Wells	1	0	0.22	0.25	0.50	0
Existing Active Oil Wells	0	0	0.48	1.00	0	0
Total Existing Wells	**1**	**0**			**0.50**	**0**
Total Active Wells	**90**	**65**	**Total Short-term Disturbance**		**246.50**	**181**

Source: BLM 2013

TABLE 34.
DISTURBANCE ASSOCIATED WITH NEW PRODUCING WELLS FOR ALTERNATIVE C SCENARIO IN THE CARTER MLP (LONG-TERM DISTURBANCE) 2011 - 2030

Type	Wells		Acres of Surface Disturbance			
	Total	**BLM-administered**	**Road/Utility Corridor**	**Well Pad**	**Total**	**BLM-administered**
New Producing Gas Wells	32	23	0.22	0.25	15	11
New Producing Oil Wells	38	28	0.48	1.00	56	41
Total New Producing Wells	**70**	**51**			**71**	**52**
Existing Gas Wells	1	0	0.22	0.25	0.50	0
Existing Oil Wells	0	0	0.48	1.00	0	0
Total Existing Wells	**1**	**0**			**0.50**	**0**
Total Active Wells	**71**	**51**	**Total Long-term Disturbance**		**71.50**	**52**

Source: BLM 2013

SOLID MINERALS

COAL

BIG DRY RMP AREA

<The following is from the Big Dry RMP (BLM 1996) and pertains to the coal decisions that would be carried forward for the Big Dry RMP area in this RMP.>

Introduction

This summary is intended to aid in understanding the federal coal management process as it applies to the planning area. The basic requirements of coal management are detailed under the guidance in 43 CFR 3400.

The objectives in managing the federal coal resource in this area are (1) to provide for the development of Federal coal in an orderly and timely manner, consistent with the federal coal management program and policies, environmental integrity, and national energy needs; and (2) to identify federal coal that is acceptable for further consideration for leasing. This resource management plan and environmental impact statement provides the basis for tract specific analysis of areas considered for new competitive federal coal leasing, lease modification, exchange, and license issuance.

Coal Planning Process

The planning area is within the Fort Union Coal Region and competitive leasing is subject to oversight by the Regional Coal Team. At this time the region is decertified and not subject to regional coal sales. Individual leases can be sold without a region-wide analysis. However, tract specific analyses are required and the coal team can review the sale and determine that there is enough cumulative regional interest to justify recertifying the coal region. If this decision is made, consideration of the lease sale will become part of a regional analysis.

There are four basic types of coal management actions that can be taken in the planning area: lease by application, lease modification, exchange, and license issuance. Since there is no indication of an immediate request for any of these actions, coal activity is not a major issue in this plan. Coal in the Big Dry Resource Area has low potential for underground mining. Therefore, coal planning is based on surface mining only.

In each of the procedures there is a point at which an environmental impact statement or environmental assessment is prepared. The decision as to what level of study is appropriate hinges on the sensitivity and perceived impact of the action. The environmental study conducted for coal actions will include passing the tract through the four screens identified in 43 CFR 3420.1-4. The screens are: identification of areas with coal development potential, the application of unsuitability criteria identified in 43 CFR 3461.1 (which are primarily on-site concerns), multiple land use decisions, and landowner consultation.

The off-site impacts of coal development will be addressed as needed when identified in the scoping process for specific lease activity planning. This includes concerns about impacts on the agricultural community, area socioeconomics, air quality, and regional transportation.

Identification of Coal Development Potential

The first step in making coal development potential determinations is the gathering of all available geologic data for the study area. The primary data sources are published and unpublished drill hole reports. This includes drilling by the U.S. Geological Survey, the BLM, the Montana Bureau of Mines and Geology, the Bureau of Reclamation, and several coal companies. The government data is available in published reports and publicly accessible files held by the various agencies. The company data is mainly confidential and comes from exploration licenses, mine plan files, and drilling on privately owned coal. The drilling by federal agencies is on federally held coal.

There are several publications on the coal geology of eastern Montana. These provide coal outcrop maps, coal elevations and thicknesses, and identify many areas where coal has been burned in-place. Much information is found in the records of old mines and company interest areas. This often includes coal thicknesses, depths, and quality analyses. Once the coal data has been assembled, the coal beds shown in the drilling records and maps are identified and correlated. Then coal thickness (isopach) and overburden thickness maps are prepared for each coal bed of interest.

The final step preparatory to identifying coal development potential is the comparison of the overburden maps to the coal isopach maps. This results in a stripping ratio (feet of overburden to feet of coal) map. The stripping ratio is the chief parameter in the identification of the development potential of any parcel of land. The classification of development potential falls into four categories:

High - coal at least 5 feet thick, overburden no greater than 150 feet thick, and stripping ratio no more than 10:1.
Moderate - coal at least 5 feet thick, overburden no greater than 200 feet thick, and stripping ratio no more than 20:1.
Low - coal present but does not meet the criteria for high or moderate development potential.
None - no coal present.
It should be noted that a major factor in development potential categorization is the availability of data. As further data becomes available the ranking of any given area can change, usually upwards. This is especially true of areas ranked as having low potential as they might be better classified as “unknown.”

The potential for a section is the highest rank of any portion of that section. If any part of the section has high potential, the entire section is ranked high. This is done because a section is the smallest practical unit for classification and study at a scale suitable for the whole planning area. If specific activity planning is done in an area, more detailed investigation will be done at that time.

Fort Union Region coal is ranked as lignite. The lignite heating value ranges from 5,000 to 7,500 British thermal units per pound. Eastern Montana coal typically has high moisture, and low ash and sulfur content (see Table 55).

The coal resources identified in the planning area shown in coal development potential maps total 19.276 billion tons (of which 47.5 percent or 9.164 billion tons is federal) (Table 56). The coal bearing Fort Union formation covers the eastern two-thirds of the planning area. There are doubtless many areas of high and moderate potential coal which have not been identified to date. There are also areas which have been identified but are considered insignificant or inadequately understood and were left out of this study. The acquisition of new data will make for refinements in this estimate.

The remaining three screening steps are applied to the coal areas identified through this first screen.

TABLE 55. COAL BED DATA IDENTIFIED HIGH AND MODERATE COAL AREAS

Name	Average Thickness (feet)	Moisture Percent	Ash Percent	Volatile Matter Percent	Fixed Carbon Percent	Sulfur Percent	Btu/lb
CREEK							
Pust	23.9	38.61	8.02	26.52	26.81	0.72	6,182
CIRCLE							
Pust	15.0	38.61	8.02	26.52	26.81	0.72	6,182
P	6.0	NA	NA	NA	NA	NA	
Rogers	10.0	NA	6.10	NA	NA	0.40	7,410
R	5.0	NA	NA	NA	NA	NA	NA
Haugins	7.0	33.10	5.30	26.55	35.05	0.45	7,455
S	12.0	26.50	7.50	26.50	34.90	0.27	7,223
CUSTER CREEK							
R	6.8	NA	NA	NA	NA	NA	NA
U	20.3	25.60	18.80	25.60	30.00	0.30	6,430

Name	Average Thickness (feet)	Moisture Percent	Ash Percent	Volatile Matter Percent	Fixed Carbon Percent	Sulfur Percent	Btu/lb
L	7.0	NA	NA	NA	NA	NA	NA
GIRARD							
Prittegurl	7.5	39.85	7.10	25.65	27.40	0.75	6,470
Breugger	5.0	43.20	5.80	29.00	24.00	0.30	5,999
Elvirio	14.0	38.40	6.73	25.67	29.20	0.70	6,667
D	6.7	34.90	7.60	27.10	30.40	0.50	6,790
KNOWLTON							
Upper Dominy	28.0	38.80	5.72	24.64	30.78	0.39	6,663
Middle Dominy	8.5	37.67	5.60	26.07	30.67	0.43	6,788
Lower Dominy	9.0	36.20	7.72	25.85	30.23	0.41	6,645
LAME JONES CREEK							
A	6.0	NA	NA	NA	NA	NA	NA
Lame Jones	7.5	38.40	10.46	25.98	25.60	0.61	6,235
PENNEL CREEK							
A	11.5	32.40	8.90	28.10	30.10	0.51	6,819
B	11.0	NA	NA	NA	NA	NA	NA
SCOBEY							
E	3.0	NA	NA	NA	NA	NA	NA
D	8.0	29.83	13.67	27.25	29.26	0.64	6,418
C	3.0	NA	NA	NA	NA	NA	NA
WEST GLENDIVE							
Kolberg Ranch	8.0	NA	NA	NA	NA	NA	NA
Peuse	112.0	35.68	7.44	26.86	29.87	0.32	6,723
Poverty Flats	8.0	NA	NA	NA	NA	NA	NA
Newton Ranch	9.5	30.90	13.45	24.76	30.89	0.37	6,507
WIBAUX-BEACH							
Harmon	15.0	38.71	9.13	25.30	26.86	0.88	6,079
Hansen	9.0	36.43	11.40	25.00	27.17	1.60	6,077

KEY: Btu/lb. = British thermal unit per pound
NA = not applicable

TABLE 56. HIGH AND MODERATE DEVELOPMENT POTENTIAL TONS AND ACRES FOR IDENTIFIED COAL AREAS

Coal Area	Total Tons Recoverable (x1,000,000)	Total Acres	Federal Tons Recoverable (x1,000,000)	Federal Acres
Burns Creek	5,813	267,500	2,595	118,828
Circle	6,238	599,500	2,589	253,617
Custer Creek	459	30,000	342	27,191
Girard	1,534	235,500	1,342	201,924
Knowlton	661	34,000	280	14,176
Lame Jones Creek	299	34,500	120	12,685
Pennel Creek	474	52,000	243	25,923
Scobey	911	132,000	526	74,035
West Glendive	1,903	243,000	799	102,477
Wibaux-Beach	982	46,000	328	16,524
TOTAL	19,276	1,674,500	9,164	847,379

NOTE: Tonnage estimates prepared by BLM.

Application of Coal Unsuitability Criteria

A total of 263,608 federal coal acres were found unacceptable for further consideration for coal leasing through application of the coal unsuitability screen. This screening is preliminary and will be reviewed and completed when a specific coal tract proposal is made. Those applications that can be made for the unsuitability criteria as follows:

Criterion 1 - Federal Land System: Lands totaling 22,852 federal coal acres were identified as unsuitable as part of the Lewis and Clark National Historic Trail system.

Criterion 2 - Federal Lands within Rights-of-way or Easements, or Surface Leases for Residential, Commercial, Industrial, or Other Public Purposes: No lands were found unsuitable under this criterion. This criterion will be applied if specific coal activity proposals are made.

Criterion 3 - Buffer Zones along Road Rights-of-way and Adjacent to Communities, Public Schools, Occupied Dwellings, Churches, Public Parks, and Cemeteries: No lands were found unsuitable under this criterion. This criterion will be applied if specific coal activity proposals are made.

Criterion 4 - Wilderness Study Areas: The Terry Badlands Wilderness Study Area includes 15,630 acres within the Custer Creek coal area. Consequently, 14,166 federal coal acres were found unsuitable for further consideration.

Criterion 5 - Scenic Areas: The Terry Badlands Wilderness Study Area is a Class I visual resource management area. Under this criterion, the same acreage as that identified under Criterion 4 (14,166 federal coal acres) was found unsuitable.

Criterion 6 - Land Used for Scientific Study: There are no federal lands within the coal areas used for scientific study.

Criterion 7 - Historic Lands and Sites: There are no lands within the coal areas that are on the National Register of Historic Places. There are 2,524 federal coal acres overlain by sites considered eligible but not submitted to the register. These coal lands have been declared unsuitable under this criterion.

Criterion 8 - Natural Areas: There are no designated natural areas or national natural landmarks within the coal areas.

Criterion 9 - Federally Designated Critical Habitat for Threatened and Endangered Species: Under Alternative A, there is no identified area for this criterion. Under Alternatives B and C, 853 acres in the Black-footed Ferret Area of Critical Environmental Concern would overlap the Custer Creek coal area and would be designated unsuitable. Under Alternative D, 3,840 acres in the Black-footed Ferret Area of Critical Environmental Concern would overlap the Custer Creek coal area and would be designated unsuitable under this criterion. The 16 acre piping plover site is also designated unsuitable.

Criterion 10 - State Listed Threatened and Endangered Species: No areas were listed as unsuitable under this criterion.

Criterion 11 - Bald and Golden Eagle Sites: Four eagle nest sites were identified in the coal areas resulting in 2,040 acres declared unsuitable under this criterion.

Criterion 12 - Bald and Golden Eagle Roost and Concentration Areas: Eagle roosting and concentration areas were identified along the Missouri and Yellowstone rivers in the Girard and Custer Creek coal areas, resulting in 5,503 federal coal acres declared unsuitable under this criterion.

Criterion 13 - Falcon Nesting Sites: Prairie falcon sites were identified in the Burns Creek and Circle coal areas. A total of 4,080 federal coal acres were designated unsuitable under this criterion.

Criterion 14 - Migratory Birds of High Federal Interest: No additional migratory birds of high federal interest (besides eagles) were identified in the coal areas.

Criterion 15 - Habitat for Species of State Interest: A total of 213,098 federal coal acres are unsuitable under this criterion. The habitat consists of critical winter ranges for white-tailed and mule deer, antelope, and grouse leks.

Criterion 16 - 100 Year Floodplains: A total of 6,300 federal coal acres were found within the Burns Creek, Custer Creek, and Girard coal areas and designated unsuitable.

Criterion 17 - Municipal Watersheds: No areas were identified as unsuitable under this criterion. There have been no municipal watersheds designated by the surface management agency within the coal areas.

Criterion 18 - Natural Resource Waters: No areas were identified as unsuitable under this criterion. There are no natural resource waters designated within the coal areas.

Criterion 19 - Alluvial Valley Floors: No areas were identified as unsuitable under this criterion. The State of Montana has the lead in designation of alluvial valley floors. It will make the designation when there is a specific coal action proposal including a mine plan.

Criterion 20 - State Proposed Criteria: The State of Montana has proposed no unsuitability criteria.

Multiple Land-Use Decisions

There are no unsuitability conflicts that necessitate multiple use or mitigative measures.

Coal mining and oil and gas production can conflict. Present management practice is to allow the companies involved the opportunity to negotiate a private settlement. BLM policy is being drafted for the situation when the coal and oil and gas lease are federal. The proposal is to work on a first-come, first-served basis. The second lease issued will include the stipulation that the lessee must be prepared to hold operations in abeyance or cease permanently in favor of the prior lease.

Surface Owner Consultation

BLM is required by Section 714 of the Surface Mining Control and Reclamation Act to consult with “qualified” surface owners of split estate lands (privately owned surface over federally held coal) where surface mining of the federal coal is under consideration.
“Qualified” surface owners are asked to state their opinion for or against coal mining on their land. In areas of significant surface owner opposition, federal coal is removed from consideration for surface mine leasing. This screen involves only split estate lands remaining after the other three screens have been applied.

Surface owner consultation has not been conducted for this resource management plan and environmental impact statement. At present there are no active proposals for new coal leasing in the planning area. Since landownership and owner qualifications will change through time, this screen will be applied when actual lease proposals are contemplated. This is in order to respond to the current landowner feelings at the moment of lease activity planning.

Coal Development Scenario Generic Mine and End-use Facility Description and Impacts

The purpose of this discussion is to present assumptions and impacts for coal development. The uncertainty of the location and size of the mine and end-use facility will limit this to a general discussion. This is not meant to be a substitute for a detailed site-specific analysis and environmental impact statement that may come later in response to an application for the permit to build and operate a mine and end-use facility. Nor will it preclude any federal, state, local, or private decisions concerning actual end-use, facility siting, or end-use restrictions.

The following is based on the detailed analysis presented in the Draft Fort Union Regional Coal Draft Environmental Impact Statement (USDI, BLM 1982c) and related logical mine size tract site-specific analyses and the Draft North Dakota Resource Management Plan and Environmental Impact Statement (USDI, BLM 1986a).

Mine

The generic mine considered is a 5.5 million ton per year surface mine with a 40-year mine life. Mine operation is expected to disturb land at a rate of 340 acres per year or 14,000 acres over 40 years. It would take approximately 10 to 13 years for completion of the full cycle from initial disturbance through mining, reclamation, and bond release for each acre. In full production, the total area out of production in any year would be 3,400 to 4,400 acres. Soils would be continuously replaced on mined-out areas and brought back into production during the life of the mine.

The low energy value and high water content of lignite coal constrains transportation of lignite. Therefore, it is assumed that an end-use facility would be near the mine.

Facility

A generic coal-fired electric power generation plant would consist of two 500 megawatt units located near a lignite coal source. The facility has an average operation factor of 0.90 and a load factor of 0.85. It would be capable of delivering a maximum of approximately 900 megawatts to the existing transmission system. The facility would consist of the following units: (l) coal preparation, storage, and handling; (2) power generation; (3) pollution control and waste disposal; and (4) utility and transportation corridors. The total land area dedicated to the facility would be approximately 600 acres.

Coal Preparation, Storage, and Handling

Lignite coal would be transported from a nearby mine to a 3-day storage pile or a 60-day storage pile. From the 3-day storage pile, the coal would be sent by conveyor to be crushed before being transferred to the plant silos for intermediate storage. Finally, coal would be reconditioned before introduced into the furnace for ignition. A generic plant would burn approximately 800 tons of coal per hour or about 5.5 million tons per year.

Power Generation

The crushed coal is combined with air supplied by forced-draft fans and then ignited and burned in the boiler furnaces. The combustion in the boiler furnace produces heat that creates steam from feed water entering the boiler heat-exchange system. After releasing energy through expansion in the high-pressure section of the turbine, steam is returned to the boiler for reheating. After being reheated, steam is returned to the intermediate section and subsequently to the low-pressure section of the turbine. Spent steam passes through the condenser where waste heat is removed, and the condensed liquid is returned to the boiler feed water system. Combustion gases from the furnace are exhausted to the atmosphere through the pollution control devices. Steam energy is converted to mechanical energy by the turbine and subsequently transformed into electrical energy by the generator. Generated power is routed through the main transformer for voltage step-up and then to a switchyard and transmission line system for distribution.

The water for the power plant systems would come from a nearby river or impounded water source. Demineralization of the filtered water for boiler makeup will be necessary to provide water of the required quality for the steam generation system. The treated water would then be stored for use. There will be several holding ponds included at the facility to store recoverable water.

The cooling system for the electric power facility would be mechanically induced draft wet-type cooling towers. Cooling tower blowdown would be sent to a holding pond to be used for ash sluicing, scrubbers or coal dust suppression.

Pollution Control and Waste Disposal

Burning lignite in the boiler produces gaseous emissions, fly ash, and bottom ash. The gas from the boiler passes through a fabric filter baghouse and a sulphur dioxide dry scrubber, and is dispersed by a 600-foot stack.

Bottom ash from the main boiler, pyrite rejected from the pulverizer, and ash discharged from the hoppers would be hydraulically conveyed to dewatering bins. The ash would then be loaded into trucks and transported to the adjacent mine for disposal.

The plant would include a dry scrubbing system to absorb sulphur dioxide from the flue gas. The scrubber product would be treated prior to disposal with dry fly ash. The flyash and scrubber product would be blended with water for dust control and stabilization. Emission of nitrogen oxides would be controlled by designing the boiler for proper mixing and flame quenching. The quantity of wastes produced by the power facility would be approximately 80 tons per hour of fly-ash and scrubber product and 10 tons per hour of bottom ash.

The air emissions would depend primarily on: (l) the conversion process, the emission control technology used at the facility, and the level of control used; (2) the sulfur, ash, and water content of the lignite; and (3) whether or not the facility produces its own electric power. For this discussion, it is assumed that the facility would produce electric power with coal-fired boilers and steam turbines.

Utility and Transportation Corridors

Water would be pumped from the water source to a surge pond. The water pipelines would require a rights-of-way probably consisting of a 100-foot-wide construction easement and a 50-foot-wide permanent easement. The surge pond would have a water surface area of approximately 42 acres and would contain 1,050 acre-feet of water. Transportation corridors would be required for roads and a railspur. The transmission line leaving an electric power facility would be a 500 kilovolt line with a ROW 150 feet wide connecting with an existing system.

<End of Big Dry RMP>

POWDER RIVER RMP AREA

<The following is from the Powder River RMP, Appendix D Federal Coal Lands Review Process (BLM 1985c) and pertains to the coal decisions that would be carried forward for the Powder River RMP area in this RMP.>

Call for Coal Resource Information

Calls for expression of interest were sent to 34 companies on July 13, 1981. There were seven replies.

Identification of Coal with Development Potential

The resource Evaluation Branch of the Minerals Management Service, Billings, Montana (now the BLM Branch of Solid Minerals, MSO, BLM) evaluated the Powder River Resource Area to determine areas with coal development potential.

Criteria for the determination are:

- Maximum 15:1 stripping ratio
- Maximum 500 feet overburden
- Coal at least 5 feet thick.

If an area met all three criteria it was classified as having development potential. These parameters were used for coal with over 7,000 BTU per pound. Most of the coal in the resource area is in this category. But coal in the

Pine Hills area east of Miles City has lower heating values. For the purposes of this RMP, however, all coal was delineated based on the above parameters, because of the small acreage of coal below 7,000 BTU per pound. These criteria result in a greater tonnage of coal over a given area than the currently recognized maximum economic stripping limits used by surface miners in the region (generally limited to 6.5:1 maximum stripping ratio, 200 feet maximum overburden, and coal for purposes of the RMP screening analysis the beds greater than 20 feet thick).

For purposes of the RMP screening analysis the legal subdivision (required for possible leasing) was used to describe the acreage rather than the free-flowing, and somewhat smaller, actual boundary of the coal resources. Tonnage figures used in the RMP were based on the actual acreage X thickness of coal X 1770 tons per acre foot and denote the actual tonnage of coal with development potential within the legal subdivision.

Application of Unsuitability Criteria

The unsuitability criteria in 43 CFR 3461 provide that coal lands shall be considered unsuitable for all or certain stipulated methods of coal mining if they fall within any of 20 categories listed in this Appendix.

In conformance with this requirement, all 1,123,600 acres of federal coal with development potential in new planning were assessed to see what unsuitability criteria applied. As a result, 61,615 acres containing 4.8 billion tons of coal were found unsuitable without exception for coal leasing, as shown in Table 2-7 of the main text. An additional 39,713 acres, as shown in Table 2-8, were identified as containing unsuitability criteria where an exception has been made or may be applied in the future, and carried forward for further leases or exchange consideration with stipulations. Also identified were 856 stream miles of preliminarily identified alluvial valley floors on both federal and private minerals. Because wildlife inventories were incomplete over much of the coal region, 522,500 acres in alternative B and 589,200 acres in Alternative C were identified as acceptable for further lease or exchange consideration pending further wildlife studies.

Methods

From January to March 1983, the Resource Area staff identified locations where unsuitability criteria applied within the areas of coal with development potential. Overlays showing application of the individual criteria were compiled at 1:100,000 scale for six quadrangles covering the coal area (Birney, Broadus, Lame Deer, Powderville, Miles City, and Forsyth). Composite overlays were constructed showing application of the unsuitability criteria, and areas needing further study. These overlays are available for inspection at the Miles City District Office. Unsuitability determinations were made by legal subdivision. The minimum acreage deleted was a quarter of a quarter section (40 acres) or an individual lot. Only in the case of floodplains was acreage deleted on other than a legal subdivision and discussed by criterion and county in the coal Management Situation Analysis on file at the Miles City District Office.

Results

The following is a summary of results obtained for each criterion. In general, Criteria 1, 2, 3, and 6 refer to land status; Criteria 4, 5, and 8 refer to recreational and natural values; Criterion 7 refers to cultural resources; Criteria 9 through 15 refer to wildlife; Criteria 16 through 19 refer to watershed; and Criterion 20 refers to issues proposed by the State.

Lands

Criterion 1-Federal Land Systems

Two tracts totaling 331 acres were identified as unsuitable without exception. Both are withdrawn by the United State Forest Service for administrative purposes.

Criterion 2-Rights-of-Way Easements

A 100-foot wide ROW along roads on federal surface was identified as unsuitable. Such rights-of-way totaled 257 acres. An exception could be applied at a future date if all parties involved agreed to a relocation plan.

Criterion 3-Buffer Zones along Road Rights-of-Way and Adjacent to Communities, Public Schools, Occupied Dwellings, Churches, Public Parks, and Cemeteries

One public park-Woodruff Park in the Pine Hills east of Miles City-containing 76 acres, one cemetery containing one are, and five schools and buffer zones containing 35 acres, were identified as unsuitable for mining without exception.

Road rights-of-way (100 feet) plus a buffer of 100 feet outside each side of the ROW (a total of 300 feet) are unsuitable for mining. A total of 12,837 acres of road rights-of-way and buffers were identified. Land under occupied dwellings and within a 300-foot buffer is unsuitable for mining. A total of 1,489 acres of dwellings and buffers were identified. An exception could be applied to dwellings and rights-of-way in the future if all parties involved agree to a relocation plan.

Criterion 6-Land Used for Scientific Study

No areas were identified as unsuitable under this criterion.

Recreational and Natural Values

Criterion 4-Wilderness Study Areas

Two Wilderness Study Areas (WSAs) were found unsuitable without exception. A total of 8,438 acres covering the entire Zook Creek WSA were deleted from further lease consideration. This acreage is slightly larger than the actual acreage of the WSA, because deletions were made on legal subdivisions. A total of 5,933 acres were deleted for Buffalo Creek WSA. This acreage differs slightly from actual WSA acreage because of legal subdivisions and also because a small part of the WSA lies outside the high and moderate coal area. If the WSAs were dropped from Wilderness consideration, the areas could be screened further for leasing consideration.

Criterion 5-Scenic Areas

Because WSAs are designated Class 1 scenic areas in Visual Resource Management, the 8,438 acres in Zook Creek and 5,933 acres in Buffalo Creek have also been deleted as unsuitable without exception under Criterion 5 as well as 4.

Criterion 8-Natural Areas

No areas were identified as unsuitable under this criterion.

Cultural Resources

Criterion 7-Historic Lands and Sites

Reynolds Battlefield in Powder River County, containing 1,404 acres, and Rosebud Battlefield in Big Horn County containing 5,051 acres, have been identified as unsuitable without exception. These areas would lose nearly all value if the original surface were modified.

An additional 6,776 acres, containing known significant historic and prehistoric sites eligible for or on the NRHP, were identified as unsuitable. However, if the Advisory Council on Historic Preservation and the State Historic Preservation Officer determine that the action will have no significant adverse effect on the properties,

an exception may be applied. Pending such determinations, the exceptions have been applied to the eligible sites and submitted to the review agencies for comment.

Criterion 7 was revised on January 6, 1984 and was reapplied which resulted in no changes.

Wildlife

Recommendations for Criteria 9 through 15 were developed in cooperation with personnel from the Montana Fish, Wildlife and Parks and the United States Fish and Wildlife Service. References to source material used to develop overlays are listed in the MSA for coal.

Wildlife-related unsuitability criteria were only applied on the acreage where inventory was complete. Known sites in areas with incomplete wildlife inventory were identified on the overlays but not tallied in the acreage tabulations. Areas lacking inventory have been identified as acceptable for further lease consideration pending further study. A reasonable timetable for conducting remaining wildlife studies in the areas pending further study is listed in the coal MSA.

All buffer zones were established using legal subdivisions encompassing recognizable appropriate land forms on quad maps.

Data used were those available as of February 18, 1983. Wildlife survey data does become outdated. For any proposed coal tract, a wide variety of updated information may be required for a particular activity plan.

Criterion 9-Federally Listed Endangered Species

No areas were identified as unsuitable under this criterion.

Criterion 10-State Listed Endangered Species

No areas were identified as unsuitable under this criterion.

Criterion 11-Bald and Golden Eagle Nest Sites

Seventeen golden eagle nests and buffer zones, totaling 6,840 acres, were the only unsuitable habitat found. No exception was applied under this criterion.

Criterion 12-Bald and Golden Eagle Roost and Concentration Areas

Bald eagle winter concentration areas along the Tongue River, totaling 2,020, acres, were the only unsuitable habitat found. No exception was applied under this criterion.

Criterion 13-Falcon Cliff Nesting Sites

Fourteen prairie falcon nests and appropriate buffer zones, totaling 4,540 acres, were the only unsuitable habitat found. No exception was applied under this criterion.

Criterion 14-Migratory Birds of High Federal Interest

No areas were identified as unsuitable under this criterion.

Criterion 15-State Resident Fish and Wildlife

A variety of habitat associated with seven wildlife species were identified as unsuitable. On some of the Criterion 15 acreage “a lease may be issued if, after consultation with the State, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected” (43 CFR 3461.[o][1]). These mitigatable acreages consist mainly of sharp-tailed

grouse and sage-grouse leks with buffer zones, and sage –grouse wintering areas. Habitat recovery and replacement plan requirements are detailed in the coal MSA. Most of the critical mule deer, white-tailed deer, antelope, and bighorn sheep winter range as well as critical turkey wintering areas were identified as unsuitable without exceptions. One area of overlapping mule deer and antelope winter range consisting of 1062 acres north of Decker was identified as suitable for lease consideration with stipulations in order to avoid a bypass situation.

Wildlife acreage identified as unsuitable without exception includes:

- 22,141 acres of mule deer winter range;
- 7,689 acres of antelope winter range;
- 3,720 acres of overlapping mule deer and antelope winter range;
- 960 acres of white-tailed deer winter range;
- 3,374 acres of turkey wintering areas; and
- 318 acres of bighorn sheep winter range.
- 35,482 total acres unsuitable without exception*

Wildlife acreage identified as unsuitable with exceptions includes:

- 5,421 acres within 16 sage-grouse leks and buffer zones;
- 21,594 acres within 96 sharp-tailed grouse leks and buffer zones; and
- 4,081 acres of sage-grouse winter habitat.
- 27,086 total acres unsuitable with exceptions.*

*Totals are slightly smaller than the sum of the various categories due to overlap among habitat of different species.

Watershed

Criterion 16-Floodplains

Floodplains defined as unsuitable without exception contain 3,215 acres along the Tongue River and 2,966 acres along the Powder River. There are large developed acreages along these two rivers. Criterion 16 requires that mining on floodplains could not take place if there would be substantial threat of loss of life or property. Floodplains of lesser streams were not deleted because mining was not identified as posing a substantial threat of loss of life or property.

Criterion 17-Municipal Watersheds

No areas were identified as unsuitable under this criterion.

Criterion 18-Natural Resource Waters

No areas were identified as unsuitable under this criterion.

Criterion 19-Alluvial Valley Floors (AVFs)

No acreage was deleted at this time due to alluvial valley floors. However, 856 stream miles within the coal with development potential area were identified as preliminarily alluvial valley floors based on color infrared air photo interpretation by BLM staff and comparison with 1:100,000 scale reconnaissance maps of AVFs in the northern Powder River Basin, prepared by Earth Resource Associated in 1983 for the Office of Surface Mining. The miles identified were over private as well as federal coal. Final determination and deletion of alluvial valley floors would be made at the mine planning stage.

State Concerns

Criterion 20-State Proposed Criteria

No areas were identified as unsuitable under this criterion.

Surface Owner Consultation Process

According to Public Law 95-87, the 1977 Surface Mining Control and Reclamation Act (SMCRA), all comprehensive land use plans involving potential coal leasing shall consult with qualified private surface owners over federal coal with development potential, and ask the surface owner to state his/her preference for or against the offering of the deposit under his/her land for lease. In conformance with this requirement, letters were sent out on January 19-21, 1983, to all 454 private surface owners over the 943,000 acres of coal with development potential in the Resource Area not considered in previous planning. (See the end of this Appendix.) The new planning areas contain an additional 183,000 acres of public surface over public minerals. Surface owners were requested to respond within 30 days; however, late responses were accepted for planning purposes until March 4, 1983. The letter did not ask for surface owner consent; rather, it requested views to help BLM decide which coal lands in the Powder River Basin should and should not be considered further for possible leasing. Areas with significant negative surface owner views were dropped from further consideration for leasing in this RMP; all other areas were carried forward as acceptable for further consideration. The decision on which specific coal lands will be leased will be made in a separate process, called activity planning, which is beyond the scope of the RMP.

Surface Owner Response Analysis

Of the 454 letters sent out, 246 were returned, for a 54 percent response rate. The responses covered 569,000 acres, or 60 percent of the total 943,000 acres included in the mailing. Tables D-1 and D-2 show number and acreage of responses by county.

The figures in the tables show that the response was greatest in Big Horn County, where 80 percent of the landowners responded. Response was lowest (below 50 percent) in Powder River and Treasure counties. In general, landowners closer to existing mining operations or proposed developments (concentrated in Big Horn and Rosebud counties) were more responsive than those far away from coal activity. Large landowners were slightly more responsive than small landowners. (The 54 percent response rate covered 60% of the acreage.)

In the letter, owners were asked to show themselves as: 1) in favor of, 2) against, or 3) undecided about leasing of Federal coal underneath their surface. They were also asked to state: 4) if their surface was already under lease by a coal company and 5) whether they met the requirements as a qualified surface owner under SMCRA. The number and acreage of responses, by county, in these five categories are listed in Tables D-3 and D-4.

TABLE D-1.
CONSULTATION SUMMARY AND NUMBER OF RESPONSES

County	Total Letters Sent	Total Response Received	Response/Total = %
Big Horn	90	72	80
Rosebud	84	43	51.2
Powder River	223	103	46.2
Custer	51	26	51
Treasure	6	2	33.3
Total	454	246	54.2

TABLE D-2.
ACREAGE REPRESENTED BY RESPONSE

County	Letters Sent (Acres)	Response Received (Acres)	Response / Total = %
Big Horn	273,526	215,789	78.9
Rosebud	170,113	114,167	67.1
Powder River	446,401	210,608	47.2
Custer	48,543	26,934	55.5
Treasure	3,978	1,858	46.7
Total	942,561	569,356	60.4

TABLE D-3.
BREAKDOWN OF RESPONSES BY NUMBER

County	Favor		Against		Undecided		Leased		Unqualified	
Big Horn	28	39%	19	26%	7	10%	8	11%	10	14%
Rosebud	7	16%	20	46%	6	14%	5	12%	5	12%
Powder River	27	26%	29	28%	27	26%	9	9%	11	11%
Custer	2	8%	12	46%	8	31%	0	0%	4	15%
Treasure	0	0%	1	50%	1	50%	0	0%	0	0%
Total	64	26%	81	33%	49	20%	22	9%	30	12%

TABLE D-4.
BREAKDOWN OF RESPONSES REPRESENTED BY ACREAGE

County	Favor		Against		Undecided		Leased		Unqualified	
Big Horn	127,799	59%	31,256	15%	10170	5%	13,517	6%	33,047	15%
Rosebud	26,733	23%	39,024	32%	5,381	5%	22,850	20%	20,139	18%
Powder River	50,711	24%	44,548	21%	74,924	36%	30,248	14%	10,177	5%
Custer	1,487	6%	8,274	31%	7,073	26%	0	0%	10,100	37%
Treasure	0	0%	1,520	82%	338	18%	0	0%	0	0%
Total	206,770	36%	124,622	22%	97,886	17%	66,615	12%	73,463	13%

The figures show that opinions about coal leasing vary significantly by county. In the following discussion, both "favor" and "leased" views are counted as "favor." Views of unqualified owners are not counted; however, it should be noted that unqualified owners include the State of Montana as well as coal companies and private individuals. In Big Horn County, views heavily favor coal leasing (58 percent of response, 77 percent of acreage). Only 31 percent of views (17 percent of acreage) oppose leasing, and few people (11 percent) are undecided. In contrast, a majority of views in Rosebud County oppose coal leasing (53 percent of response, 42 percent of acreage). Only 32 percent are in favor, and 15 percent are undecided. However, those in favor have 53 percent of the acreage surveyed in Rosebud County. In Powder River County, views are split more evenly;

39 percent are in favor, 32 percent against, and 29 percent undecided. However, the acreage held by undecided landowners (37 percent) is almost as great as the acreage held by those in favor (40 percent). Views against leasing hold only 23 percent of the acreage. In Custer County, views are mainly against (55 percent) or undecided (36 percent). Only 9 percent are in favor of leasing. These figures are fairly close to the acreage of owners against (49 percent), undecided (42 percent) and in favor (9 percent). The two responses received from Treasure County are too few a number to reach statistically significant conclusions.

The high percentage of undecided views in Powder River and Custer counties may reflect the fact that these counties are further away from coal development. People may be less personally affected by development and have not formed strong opinions.

The figures also show that large landowners tend to be more in favor of coal development than small landowners. The tables consistently show that the percentage of acreage in favor is greater than the percentage of landowners in favor. Overall, 55 percent of the acreage is in the "favor" category while only 40 percent of the landowners are in favor; 38 percent of the landowners are against leasing, but they only control 25 percent of the acreage. This pattern may be due to large ranchers being more able to afford part of their land being taken out of production for coal development. In contrast, small ranchers must depend on all their land to have a viable operation.

Deletions Due to Negative Surface Owner Views

As a result of surface owner consultation, over 98,543 acres of private surface over 4.62 billion tons of coal with development potential were deleted from further consideration for coal leasing due to negative surface owner views. By county, the acres and tonnages deleted are shown in Table 57.

Significant negative views satisfied one or more of the following criteria:

- They covered several sections in a solid pattern;
- They blocked up checkerboard federal coal ownership in a patter to preclude mine development;
- They were in addition to significant negative surface owner views expressed from the same owner in previous coal planning efforts;
- They covered a significant area adjacent to Custer National Forest; and/or
- They overlapped with or were adjacent to large areas deleted due to unsuitability criteria.

Some areas of federal coal without negative views were deleted where surrounded by or sandwiched between negative views in a pattern which would probably have prevented establishment of logical mining areas. In other cases, negative surface owner views covering only a small isolated area were not deleted.
Overlays showing application of the surface owner screens are available for inspection at the Miles City District Office.

Multiple Use Conflict Analysis

Coal planning regulation 43 CFR 3420.1-4e (3) states that "multiple land use decisions shall be made which may eliminate additional coal deposits from further consideration for leasing, to protect resource values of a locally important or unique nature not included in the unsuitability criteria."

Coal areas leased and cleared in previous planning were already analyzed for multiple use conflicts in the existing MFPs (Decker-Birney, South Rosebud, and Coalwood). These MFPs were determined to meet principles of multiple use/sustained yield as required by Section 103(c) and (h) of FLPMA. For this RMP, multiple use conflicts were considered only on the 964,700 acres of Federal coal in new planning which had passed through the unsuitability and surface owner screens. BLM requested information regarding religious sites from the Northern Cheyenne Tribe in compliance with the American Indian Religious Freedom Act. No information was received.

Factors in Analysis

Twelve resource categories and factors were defined which could be significantly affected by mining. These were:

- Negative surface owner views which were not deleted by the surface owner consultation screen;
- Soils in USDA Soil Conservation Service land capability classes VII and VIII. These are soils and landforms with questionable reclaimability due to the chemical and physical properties of the soils. Factors such as steep slopes, sodium content, and depth to bedrock, for example, influence this determination;
- Cropland in preliminarily identified AVFs and in areas of negative surface owner views defined in Category 1. Lands currently being used as cropland are delineated in the Conservation Districts' Long Range Program for Resource Conservation, published by the USDA Soil Conservation Service;
- Wildlife values, including white-tailed deer, mule deer, and antelope winter range and all-season use, and turkey raptor, and grouse habitat. Known potentially unsuitable wildlife values in areas where inventory was incomplete were also delineated as multiple use conflicts;
- Power plants and associated facilities;
- Areas of significant hunting or other recreations use, and Class II or higher VRM areas;
- Buffer zones around townsites;
- Forested areas, as defined on public surface by a BLM survey of commercial and noncommercial forest land conducted in the mid-1960s, and on private surface by shading on 1:100,000 scale USGS topographic maps;
- Oil and gas fields defined by the Montana Oil and Gas Commission and Known Geologic Structures defined by BLM;
- Cultural resource sites eligible for the NRHP but suitable for leasing with stipulations under the unsuitability criteria;
- Existing Allotment Management Plans;
- Areas preliminarily identified as AVFs by BLM staff. Color infrared aerial photography was analyzed as well as reconnaissance maps of alluvial valley floors in the Montana portion of the Powder River Basin, prepared by Earth Resources Associated in 1983 for the Office of Surface Mining. Consideration of AVFs for multiple use conflict purposes is in addition to the requirement under unsuitability Criterion 19 that alluvial valley floors be deleted at min plan stage. Some of these areas also contain riparian wildlife habitat.

Methods

Transparent overlays for each of the twelve multiple use categories were stacked onto 1:100,000 scale base maps for each of the six quadrangles with coal potential in the Resource Area (Birney, Broadus, Lame Deer, Powderville, Miles City, and Forsyth). While one multiple use conflict by itself was generally considered not enough to drop an areas from further coal leasing consideration, having several overlapping multiple use conflicts over a single area was considered significant. In general, areas with four or more overlapping multiple uses were deleted from further lease consideration. However, the actual number of overlaps needed varied. Power plants and townsite buffer zones were deleted whether or not there were additional overlaps. Areas containing very thick coal close to the surface and near current or proposed mining may have needed more than four multiple use conflicts to be deleted because the high coal potential of the area was weighted as an additional multiple use consideration. Some areas having fewer than four conflicts were deleted where they were wedged between large blocks of land with four or more overlapping conflicts.

Because of the large number of overlapping multiple uses in the Broadus and Birney quadrangles, two groups of BLM staff independently deleted areas from further leasing consideration. These two sets of maps were then compared and the final areas deleted, reflecting a compromise between the two groups. Areas were deleted based on legal subdivisions. Transparent overlays at 1:100,000 scale showing application of multiple use conflicts and areas deleted due to multiple use conflicts are available at the Miles City District Office for inspection.

Multiple use analysis was based on resource information available as of mid-1983.

Results

A total of 95,100 acres over 4.51 billion tons of federal coal with development potential were deleted due to multiple use conflicts. Most areas deleted due to multiple use conflicts are concentrated in corridors within a few miles of the Tongue and Powder rivers. These areas have soil, forest, wildlife, recreational, agricultural, and watershed characteristics which make them less environmentally desirable for mining. Other areas deleted due to multiple use conflicts lie near Rosebud, Otter, and Pumpkin creeks. The remaining areas are scattered throughout the rest of the coal area.

Areas deleted due to multiple use conflicts are summarized in Table D-5.

TABLE D-5.
AREAS DELETED DUE TO MULTIPLE USE CONFLICTS

County	Acres	Tons (billions)
Big Horn	5,400	0.71
Rosebud	36,500	2.24
Powder River	0	0.00
Custer	6,600	0.00
Treasure	46,600	1.34
Total	95,100	4.51

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Miles City District Office
P. O. Box 940
Miles City, Montana 59301

IN REPLY
REFER TO:

1608-PRRMP

Dear Landowner:

The Bureau of Land Management (BLM) is screening federal coal areas for potential leasing suitability in accordance with the Department of the Interior's coal management regulations. The screening is part of the process of preparing a resource management plan for public lands and federal minerals in the Powder River Resource Area.

Our review of federal and county records shows that you own the surface of lands in which the United States has retained ownership of the coal. On the enclosed consultation form you will find the legal description of these lands.

The Surface Mining Control and Reclamation Act of 1977 gives certain types of protection to surface owners who qualify under the law (see attached Public Law 95-87). The law contains both a consent requirement and a consultation requirement. If you qualify, the BLM cannot issue a coal lease and authorize a company to surface mine the coal under your land unless you agree to let that mining take place (the consent requirement). The surface mining law also requires BLM to consult with surface owners as part of the planning process and ask whether they favor or oppose leasing of coal under their land (the consultation requirement). A listing of surface owners who are being consulted within this planning project is available for review in the District Office.

The purpose of this letter is to consult with you and to give you a chance to tell us whether you favor or oppose leasing the coal under your land. The BLM is not now proposing to lease the coal under your land. Also, we are not asking for your consent to leasing and mining. The resource management plan we are preparing will help us decide which coal lands in the Powder River Basin should and should not be considered further for possible leasing. The decision on which specific coal lands will be leased will be made in a separate process after planning is completed.

The reason for this consultation with you and with other surface owners in your area is to give the BLM an opportunity to understand your feelings about surface mining of coal under your land. The coal under your land might be included in a tract which we would offer for federal leasing. However, if a significant number of qualified surface owners in your area are opposed to surface mining of coal under their land, we may decide to refrain from leasing any federal coal in that area for surface mining. If this is the case, receiving your views at this early stage of planning can allow us to avoid unnecessary work in making specific plans for coal leasing in your area.

Views Expressed During Consultation Not Binding

The views you express in this consultation are not binding, either on you or on the BLM. Here is what your views will do and what they will not do:

1. If you state at this time that you favor leasing, you may still stop surface mining at any time before a lease is issued by withholding your consent to mining. This will prevent the BLM from leasing the coal. However, if you have already given written consent to allow surface coal mining on your land, you may have already given your right to stop leasing and mining.

2. If you express a preference for leasing, the BLM is under no obligation to offer the coal under your land for lease. Analyses may indicate the coal should not be leased because of environmental problems, that other lands contain better coal and should be leased first, or that there is no need to lease the coal under your land because sufficient coal lands are already available for mining.

3. If you express a preference against surface coal mining under your land and a significant number of other surface owners in your area are opposed to leasing a part of or the whole area may be eliminated from consideration for leasing. However, the BLM will consider other matters, such as the availability of other coal land for leasing, in making the decision whether or not to issue leases in the area.

The Consent Requirement vs. The Consultation Requirement

The two protections of the surface mining law for surface owners are very different.

The consent requirement concerns each surface owner's authority to prevent surface mining or coal under his land. The BLM will not at any time seek consent from you directly. If a coal company wants to surface mine the coal under your land, the company will have to negotiate with you to try to get your consent to mine. If a qualified surface owner refuses to grant consent for surface coal mining, BLM is required to withhold the coal from leasing. Your decision to give consent or refuse consent does not need to be made until a later time when BLM is making specific coal leasing activity plans.

The consultation requirement of the law concerns the ability of a group of surface owners to influence coal leasing plans in their area. The BLM has to decide during the planning process whether to make lands eligible for coal leasing or to eliminate lands from leasing consideration within the life of the Resource Management Plan. If there are a significant number of surface owners opposed to leasing for surface mining and if other acceptable areas are available for leasing, the BLM may decide not to lease lands in the area for surface coal mining. Your preferences, along with those of neighboring surface owners, will be taken into consideration now, during planning.

The Effect of Significant Opposition to Leasing

If a significant number of surface owners in your area oppose leasing for surface coal mining, the BLM may issue no leases in the area, even though some surface owners do favor surface coal mining under their land. Just how many surface owners would amount to a "significant number" cannot be answered at this time. This will have to be determined on a case-by-case basis for each planning area. The exact effect of a significant number of surface owners stating a preference against leasing for surface coal mining is this: the area would be considered acceptable for leasing only for underground mining. However, if there are no other acceptable leasing areas, coal may be leased for surface mining in your area, even over the opposition of a significant number of surface owners in the area. But, in no case will the coal under your land be leased without your consent if you are a qualified surface owner.

Qualified Surface Owners

The protections of the surface mining law apply only to surface owners defined by the law. The law defined surface owners as a person or persons who:

(1) hold legal or equitable title to the land surface;

(2) have their principal place of residence on the land; or personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface coal mining operations; or receive directly a significant portion of their income, if any, from such farming or ranching operations; and,

(3) have met the conditions of paragraphs (1) and (2) for a period of at least three years prior to the granting of consent.

Unless you have already given consent, the third provision does not apply to you at this time. That is, you qualify as a surface owner under the law if you meet the first two criteria.

If you meet the requirements of the law listed above, you can help insure that your preferences are considered in the BLM planning process by letting us know that you meet each of the requirements. If you do not meet the requirements, please let us know this also.

If Consent to Mine has Already Been Given

If you have already given your consent to a coal company or someone else to surface mine the coal under your land, it is important that the BLM know about this in preparing its land use plans. Please send us a copy of any written consent you have given. If you do not have a written copy, please describe any consent you have given and attach this description to the enclosed consultation form you return to this office.

If you have already given your consent to surface coal mining on your land, the BLM will consider you to be in favor of mining those tracts to which the consent agreements apply [according to BLM regulations 43 CFR 3420.2-3(e)(2)].

Outside Advice

You may want to seek the advice of someone outside the federal government (for example, neighboring surface owners, a lawyer, or someone familiar with surface coal mining operations) before you answer this letter.

Time for Answering

For us to fully consider your views, we need to have your response by February 22, 1983. If we determine that you are a qualified surface owner, we will consider your attitude toward coal mining on your land as we plan for public resource uses in your area. You may use the enclosed form to express your views. It is designed so that you may respond individually to each separate parcel under consideration. The extra form is a duplicate for you to fill out and save so that you will have a record of your response. If we do not receive a response from you, your land will be carried forward in the planning process as acceptable for further coal leasing consideration.

If you have questions concerning consultation or any other aspect of the planning process, please feel free to call Jay Guerin or Ed Heffern at (406) 232-4331.

Sincerely yours,

Ray Brubaker

District Manager

Enclosures

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PLEASE RESPOND BY FEBRUARY 22, 1983

I am expre my views concerning possible leasing of federal coal under my surface lands. I understand that my views are not legally binding as consent for leasing and that BLM is not proposing to lease any of my lands for surface mining of coal at this time. I also understand that my views may be used in the co pletion of the BLM land use plans and will be available for public review.

Please mark an x in the column which shows , lew on leasing. A mark should be made next to each parcel listed.

1. I am in favor of leasing.
2. I am against leasing.
3. I am undecided whether I favor or oppose leasing.
4. I have already given written consent for surface mining.

	1	2	3	4

Please Check One: ☐ I am authorized to express my views as a qualified surface owner, having met the following requirements for at least the past 3 years (or less if I have given written consent): I hold legal or equitable title to this land surface. I have my principal residence on this land, or I personally farm or ranch on this land, or I receive a significant portion of my income from farm or ranch operations on this land. I have met the requirements since _____.

☐ I do not meet these requirements (please explain on reverse side).

Date: _____

Signature: _____

SURFACE OWNER PROTECTION

30 USC 1304.

SEC. 714. (a) The provisions of this section shall apply where coal owned by the United States under land the surface rights to which are owned by a surface owner as defined in this section is to be mined by methods other than underground mining techniques.

(b) Any coal deposits subject to this section shall be offered for lease pursuant to section 2(a) of the Mineral Lands Leasing Act of 1920, as amended.

30 USC 201.

Consent.

(c) The Secretary shall not enter into any lease of Federal coal deposits until the surface owner has given written consent to enter and commence surface mining operations and the Secretary has obtained evidence of such consent. Valid written consent given by any surface owner prior to the enactment of this Act shall be deemed sufficient for the purposes of complying with this section.

(d) In order to minimize disturbance to surface owners from surface coal mining of Federal coal deposits and to assist in the preparation of comprehensive land-use plans required by section 2(a) of the Mineral Lands Leasing Act of 1920, as amended, the Secretary shall consult with any surface owner whose land is proposed to be included in a leasing tract and shall ask the surface owner to state his preference for or against the offering of the deposit under his land for lease. The Secretary shall, in his discretion but to the maximum extent practicable, refrain from leasing coal deposits for development by methods other than underground mining techniques in those areas where a significant number of surface owners have stated a preference against the offering of the deposits for lease.

"Surface owner."

(e) For the purpose of this section the term "surface owner" means the natural person or persons (or corporation, the majority stock of which is held by a person or persons who meet the other requirements of this section) who—

(1) hold legal or equitable title to the land surface;

(2) have their principal place of residence on the land; or personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface coal mining operations; or receive directly a significant portion of their income, if any, from such farming or ranching operations; and

(3) have met the conditions of paragraphs (1) and (2) for a period of at least three years prior to the granting of the consent.

In computing the three-year period the Secretary may include periods during which title was owned by a relative of such person by blood or marriage during which period such relative would have met the requirements of this subsection.

(f) This section shall not apply to Indian lands.

(g) Nothing in this section shall be construed as increasing or diminishing any property rights by the United States or by any other landowner.

<End of Powder River RMP

LOCATABLE MINERALS AND MINERAL MATERIALS

LOCATABLE MINERALS DISPOSAL ACTIONS

Locatable minerals are governed by the federal Mining Law of 1872, as amended. This law provides for the exploration, discovery, and mining of metallic and certain nonmetallic minerals on federal lands. The Mining Law of 1872, as amended, has five elements: discovery of a valuable mineral deposit, location of mining claims, recordation of mining claims, maintenance of mining claims, and mineral patenting. The BLM manages the last three elements.

DISCOVERY

Federal statutes do not describe what constitutes a valuable mineral deposit. Several judicial and administrative decisions over the years have shaped a definition. A principal part of the definition is the "prudent man rule." This rule holds that the statutory requirements for a discovery have been met if a person of ordinary prudence will be justified in expending labor and costs to develop a mine. Departmental decisions require a discovery on each claim with physical exposure of the valuable mineral within the claim boundaries, and each 10 acres on a placer claim must be "mineral in character." Mineral in character is a discovery based on geologic inference, not necessarily on actual exposure.

LOCATION

Any U.S. citizen or corporation organized under state laws can locate a mining claim. A claimant can hold a number of mining claims. A mining claim is located on federal mineral estate with valuable deposits of locatable minerals. There are two types of mining claims (lode and placer) and two types of mineral entries (mill and tunnel sites).

Lode claims include classic vein deposits with well-defined boundaries, which include deposits such as gold and silver. Placer claims are those not subject to lode claims, which include bedded deposits such as bentonite. Both placer and lode claims have been filed for uranium. Placer claims are located by legal land subdivision, where practical. The maximum size of a placer claim is 20 acres per claim.

A mill site is a parcel of public land of a non-mineral character and is used to support mining claim operations. The mill site must include the erection of a mill or reduction works incident to mining. The maximum size of a mill site is 5 acres. Tunnel sites are plots of land where a tunnel is used to develop a vein. There is no known need for tunnel sites in the planning area.

Claimant rights include access to the claim across federal surface; use of timber on the claim for the mining operation; construction of fences and gates to protect the area of operations and equipment; and construction of structures for storing equipment, housing employees, and testing and processing facilities. Mining claims are real property and interests in mining claims can be bought or inherited.

RECORDATION

Claims and sites must be recorded with both the county and BLM. Location notices contain the date of location, the locator's name, the name of the claim or site, the type of claim or site, the acreage claimed, and a description of the parcel claimed.

FLPMA of 1976 requires claimants to file a copy of the notice or certificate of location with the BLM. Maps and other documents filed under state law must accompany the copy of the official record. Federal regulations (43 CFR 3833) specify the information required. Amendments and transfers of ownership must be filed with the BLM.

MAINTENANCE

To maintain an interest in a claim, the claimant must pay a rental fee of $100 per claim each year. There is a provision for fee exemptions for claimants who qualify by producing between $1,500 and $800,000 under an active notice plan with less than 10 acres disturbance on 10 claims or fewer nationwide.

Exploration and mining activity on BLM-administered lands are subject to the regulations in 43 CFR 3809. These regulations require an operator to prevent unnecessary and undue degradation of the land. There is no requirement to notify the BLM of casual use activities (negligible disturbance). Actions that are proposed to disturb less than 5 acres requires the filing of an NOI. This includes activities that involve use of earth-moving equipment or blasting. The BLM reviews the NOIs to ensure that unnecessary and undue degradation would not occur. However, the BLM has no approval authority for NOIs.

Activities involving more than 5 acres of disturbance require the preparation of a Plan of Operations and a reclamation plan. Special category lands defined in 43 CFR 3809.1-4 always require a Plan of Operations, regardless of the size of the disturbance area. These include areas of ACECs, wilderness areas, and areas designated as closed to OHV use. Both Notice level of activity and Plans of Operation require a financial guaranty that covers 100 percent of the cost to reclaim the proposed disturbance. Claim operations (whether casual, under a notice, or by a Plan of Operations) shall be reclaimed (43 CFR 3809.1-1).

In certain cases, lands might be withdrawn from operation under the public land laws; in certain cases this law will be the Mining Law of 1872, as amended. A withdrawal of public lands from location of mining claims under the Mining Law of 1872, as amended would be subject to valid existing rights. Therefore valid existing claims would still be subject to operations under 43 CFR 3809 et seq. and 43 CFR 3715 et seq. Upon receipt of a Notice or Plan of Operations pursuant to 43 CFR 3809.100 BLM would require a validity examination to determine whether the claims upon which operations are proposed were valid before the time of withdrawal and remain valid. Operations would only be authorized upon claims determined to be valid. The withdrawal would prohibit the location of new claims within the withdrawal area.

MINERAL PATENTS

A patented mining claim is one for which the federal government has passed its title to the claimant, making it private land. A person can mine and remove minerals from a mining claim without a mineral patent. In most cases, a mineral patent gives the owner exclusive title to the locatable minerals and title to the surface and other resources. Patenting requires discovery of a valuable deposit that meets the prudent man rule and marketability tests. A federal mineral examiner examines the claim to verify its validity. Because issuance of new mineral patents was prohibited by a special moratorium issued by Secretary of the Interior Bruce Babbitt in 1994, they are no longer issued.

MINERAL MATERIALS DISPOSAL ACTIONS

The BLM issues mineral material (sand and gravel, scoria, and other materials) sales contracts to companies and individuals as well as free use permits to local governments. The sales and permits are discretionary and only issued where the use is in compliance with the RMP and is compatible with other resource values and uses. The permits are also stipulated for protection of other resource values. A pit is typically on a gravel source located by the permittee. A BLM representative is shown the site during an inspection and a NEPA document is prepared. A typical permit operation begins with removal of the topsoil and its storage on location. The storage site is selected for the protection and stability needed to maintain the soil over the lifetime of the operation. Backfill will be consolidated to match the original material as much as possible. Natural vegetation will establish some protection from erosion. The pit is excavated by bulldozers and front-end loaders and the material hauled away with trucks. In operations where large rocks are in the deposit, a portable rock crusher is used to reduce them to usable sizes.

An average pit in the planning area is excavated to 10 feet in depth. At the end of operations, BLM stipulations require reduction of vertical exposures to a slope ratio of 3 to 1 (horizontal to vertical) and the topsoil spread on the surface. A conventional seed mixture is prescribed for reclaiming abandoned material extraction sites.

SOLID MINERALS RFD

ASSUMPTIONS

Various assumptions were made to facilitate the RFD analysis of potential impacts from solid mineral development. These assumptions were based on historical events and the experience of BLM personnel and their knowledge of solid mineral resource development activity in the planning area.

General

Decisions and implementation of actions from any of the RMP alternatives would be in compliance with all valid existing rights, federal regulations, bureau policies, and other requirements.

The establishment of RFD boundaries and other numerical values used in this analysis are approximate and were used only for comparison and analytic purposes. Readers should not infer that they reflect exact values or accurate projections. Where an RMP alternative supports solid mineral development or use, the assumptions described below were applied.

COAL

The coal leasing decisions made in the Big Dry and Powder River RMPs (BLM 1996 and 1985c) are being carried forward (adopted) in this planning document and include areas identified as acceptable for further consideration for coal leasing. Therefore, the lands considered acceptable for further consideration for coal leasing that are described in the aforementioned documents should be taken into consideration solely for the purpose of presenting potential impact analyses related to future coal development in the planning area. The coal screening process will be applied on a case-by-case basis in response to individual coal lease applications. The explanation of the coal leasing process can be found in the previous RMP decision appendices and is further explained in the coal section of this document's appendix.

Previous planning efforts identified approximately 62.20 billion tons of coal available for further consideration for coal leasing (not including coal that was leased at the time) in the Powder River RMP area and 6.18 billion tons of coal were found acceptable for further consideration for leasing in the Big Dry Resource Area RMP. The total amount of coal considered available for further consideration for coal leasing in both RMPs combined is approximately 68.38 billion tons.

It is assumed that future applications to lease coal would be made for areas in and around existing mines to sustain those operations and that coal leasing for potential new mine developments (not associated with existing mines) would also be applied for via the lease by application process. A description of a generic mine operation was developed for the Big Dry RMP (BLM 1995). That generic mine plan is located in the *Minerals Appendix* of the Big Dry RMP and can be referred to for a general description of the characteristics relating to the development of a new mine in the planning area. It is also possible that future coal leasing activity could occur to support coal conversion technologies such as in-situ gasification or coal to liquids projects.

There are five permitted coal mines within or adjacent to the Field Office Planning Area. The active Absaloka Mine is located just outside of but adjacent to the western boundary of the field office. It currently contains 7,110 permitted acres and is included in this discussion because our RFD indicates that future expansion would include lands within the field office planning area. The Big Sky Mine includes 7,633 permitted acres; however, the Big Sky Mine is not included in any future RFD projections because it has been fully reclaimed and all facilities have been removed. The following mines are currently mining coal; Decker 11,718 permitted acres, Rosebud 16,288 permitted acres, Savage 1,293 permitted acres, and Spring Creek 9,115 permitted acres.

According to the Office of Surface Mining and Enforcement (OSM), since 1999, approximately 39,831 cumulative acres in Montana have been disturbed as a result of surface coal mining, and of this area, approximately 20,003 acres have been fully reclaimed. A portion of this reclamation exists at the Absaloka and Big Sky mines (USDI, OSM, 2013).

Cumulatively, since 1970, about 801.4 million tons of federal coal has been produced by the Rosebud, Spring Creek, Big Sky, Decker and Savage mines and about 442.8 million tons of federal recoverable coal reserves are currently under lease at these mines. In 2012, these mines produced a total of 21,625,846 tons of federal coal (USDI, BLM 2013, Personal Communication (Data Source ONRR Reports)).

Since 1990, the BLM has leased about 218.99 million tons of federal coal in Montana via the lease modification and lease by application processes to sustain production at existing mines. Leasing proposals in the planning area that are pending at the BLM comprise about 229.5 million tons of in place coal representing 2,242 acres (see Table 42).

TABLE 42.
PENDING COAL LEASING APPLICATIONS

	Short Tons	Acres
Spring Creek	206.1	1772
Rosebud	5.9	160
Decker	17.5	310
Total	**229.5**	**2242**

According to the U.S. Energy Information Administration (EIA) *Annual Energy Outlook 2013*, the demand for coal in the United States would decrease in the near term as a result of flat demand for electricity, increasing share of electricity generated from renewables, low natural gas prices and high coal prices. The EIA *Annual Energy Outlook 2013* also forecasts that new requirements to control emissions of mercury and acidic gases will result in shutting down some coal fired power plants which will contribute to the suppression of near term demand for coal. However, after 2016, EIA forecasts that coal production will increase about 0.6 percent per year through 2040, as a result of increased coal exports and an increased demand for domestic coal for electricity generation due to increasing natural gas prices.

Consequently, based on the above information, it is assumed that production at operating mines in the planning area (Spring Creek, Decker, Rosebud, Absaloka and Savage) will require additional coal as existing reserves are consumed. It is assumed that most mines will either continue current production rates or adjust accordingly to meet changes in market demand in accordance with the EIA *Annual Energy Outlook 2013* forecast. Applying the increased production forecast of 0.6 percent per year to each mine beginning after 2016 is shown in Table 43. The source for the 2012 production data for each mine was obtained from the MDEQ, website for Historical Energy Statistics, Energy Source Workbooks, Coal Tables Workbook - 2012 Update, Table C4. Coal Production by Company, 1980-2012 (short tons), (http://deq.mt.gov/Energy/HistoricalEnergy/default.mcpx).

The BLM has developed RFD areas that approximate where future mining activity might occur. The estimate of in-place coal reserves (Table 44 includes existing leased and unleased coal reserves within individual mine plan boundaries as well as coal that is outside the mine plan boundaries but within the RFDs which are shown on maps 35 through 39. These estimates indicate that the reserves within the RFDs are sufficient to sustain production at the Spring Creek/Decker (see Map 34), Absaloka (see Map 31) and Savage (see Map 33) mines at the rates shown in Table 59 through the year 2040, and the Rosebud Mine (see Map 32) through year 2038. It is likely that most new lease applications would be located within the RFDs. However, it is possible that a minority of lease proposals could be located outside of the RFD boundaries. Short term is defined as mining and exploration activity being conducted from the present to 2019 and long term includes this activity out to 2040.

The BLM has also prepared an estimate of surface disturbance (Table 45) resulting from the production estimates shown above in Table 42. The disturbance estimate assumes that production would increase slightly on a yearly basis as described above. Also, the disturbance acres represent only the area above the coal projected to be mined. It doesn't include associated disturbances for features such as pit layback, roads and facilities. The disturbance figures are for analysis purposes only and do not precisely represent the exact disturbance which would occur at any given mine due to a multitude of variables which are not possible to predict

TABLE 43.
COAL MINE PRODUCTION FORECAST*

Year	Decker East Decker	Decker West Decker	Cloud Peak Spring Creek	Westmoreland Savage	Westmoreland Rosebud	Westmoreland Absaloka
2012	2,247,873	484,570	17,200,109	296,454	8,010,495	2,714,063
2013	2,247,873	484,570	17,200,109	296,454	8,010,495	2,714,063
2014	2,247,873	484,570	17,200,109	296,454	8,010,495	2,714,063
2015	2,247,873	484,570	17,200,109	296,454	8,010,495	2,714,063
2016	2,247,873	484,570	17,200,109	296,454	8,010,495	2,714,063
2017	2,261,360	487,477	17,303,310	298,233	8,058,558	2,730,347
2018	2,274,928	490,402	17,407,130	300,022	8,106,909	2,746,729
2019	2,288,578	493,345	17,511,572	301,822	8,155,551	2,763,210
2020	2,302,309	496,305	17,616,642	303,633	8,204,484	2,779,789
2021	2,316,123	499,283	17,722,342	305,455	8,253,711	2,796,468
2022	2,330,020	502,278	17,828,676	307,288	8,303,233	2,813,247
2023	2,344,000	505,292	17,935,648	309,131	8,353,053	2,830,126
2024	2,358,064	508,324	18,043,262	310,986	8,403,171	2,847,107
2025	2,372,213	511,374	18,151,521	312,852	8,453,590	2,864,190
2026	2,386,446	514,442	18,260,430	314,729	8,504,312	2,881,375
2027	2,400,764	517,529	18,369,993	316,618	8,555,337	2,898,663
2028	2,415,169	520,634	18,480,213	318,517	8,606,669	2,916,055
2029	2,429,660	523,758	18,591,094	320,428	8,658,309	2,933,551
2030	2,444,238	526,900	18,702,641	322,351	8,710,259	2,951,153
2031	2,458,903	530,061	18,814,856	324,285	8,762,521	2,968,859
2032	2,473,657	533,242	18,927,746	326,231	8,815,096	2,986,673
2033	2,488,499	536,441	19,041,312	328,188	8,867,987	3,004,593
2034	2,503,430	539,660	19,155,560	330,157	8,921,194	3,022,620
2035	2,518,450	542,898	19,270,493	332,138	8,974,722	3,040,756
2036	2,533,561	546,155	19,386,116	334,131	9,028,570	3,059,000
2037	2,548,762	549,432	19,502,433	336,136	9,082,741	3,077,354
2038	2,564,055	552,729	19,619,448	338,153	9,137,238	3,095,819
2039	2,579,439	556,045	19,737,164	340,182	9,192,061	3,114,393
2040	2,594,916	559,381	19,855,587	342,223	9,247,214	3,133,080
Total	**69,426,912**	**14,481,666**	**514,035,623**	**8,859,706**	**239,398,471**	**81,111,408**

*** Short tons**

TABLE 44.
RFD ESTIMATED COAL RESERVES LEASED AND UN-LEASED (MILLIONS OF SHORT TONS)

Spring Creek	539	Absaloka	177
Decker	218	Savage	20
Rosebud	212		

TABLE 45.
PROJECTED ADDITIONAL ACRES OF COAL MINE DISTURBANCE

	Decker*	Decker*	Cloud Peak*	West-moreland*	*Big Horn	West-moreland	West-moreland
	East	West	Spring		County	Savage	Rosebud
Year	Decker	Decker	Creek	Absaloka	Total	Richland County	Rosebud County
2012	28.1	6.1	128.4	66.2	228.7	9.9	228.9
2013	28.1	6.1	128.4	66.2	228.7	9.9	228.9
2014	28.1	6.1	128.4	66.2	228.7	9.9	228.9
2015	28.1	6.1	128.4	66.2	228.7	9.9	228.9
2016	28.1	6.1	128.4	66.2	228.7	9.9	228.9
2017	28.3	6.1	129.1	66.6	230.1	9.9	230.2
2018	28.4	6.1	129.9	67.0	231.5	10.0	231.6
2019	28.6	6.2	130.7	67.4	232.9	10.1	233.0
2020	28.8	6.2	131.5	67.8	234.2	10.1	234.4
2021	29.0	6.2	132.3	68.2	235.7	10.2	235.8
2022	29.1	6.3	133.0	68.6	237.1	10.2	237.2
2023	29.3	6.3	133.8	69.0	238.5	10.3	238.7
2024	29.5	6.4	134.7	69.4	239.9	10.4	240.1
2025	29.7	6.4	135.5	69.9	241.4	10.4	241.5
2026	29.8	6.4	136.3	70.3	242.8	10.5	243.0
2027	30.0	6.5	137.1	70.7	244.3	10.6	244.4
2028	30.2	6.5	137.9	71.1	245.7	10.6	245.9
2029	30.4	6.5	138.7	71.6	247.2	10.7	247.4
2030	30.6	6.6	139.6	72.0	248.7	10.7	248.9
Total	**552.0**	**112.9**	**2,393.5**	**1,234.3**	**4,264.7**	**184.3**	**4,267.7**

Note: the data presented in the above table was calculated by dividing the approximate tons per acre value (Decker 80,000 tons/acre, Spring Creek 134,000 tons / acre, Absaloka 41,000 tons/acre, Savage 30,000 tons/acre and Rosebud 35,000 tons/acre by the mine production forecast values presented in Table 58 (Personal Communication, 12-4-13, BLM Solid Minerals Staff, MSO).

DECKER MINE

In accordance with the EIA *Annual Energy Outlook 2013* forecast, it is assumed that the Decker Mine (Map 34) will produce coal at the 2012 production rate until about 2016. After 2016, the mine is projected to increase production at a rate of 0.6% per year until 2040. At that rate, the Decker Mine (East and West) would require about 83.9 million tons of coal reserves to achieve this production forecast to 2040. There are an estimated 218 million tons of leased and un-leased, in-place coal reserves within the mine plan and RFD boundaries. The production forecast for future production at Decker may be conservative, but the existing reserves represent about 2.5 times the EIA forecast.

SPRING CREEK MINE

In accordance with the EIA *Annual Energy Outlook 2013* forecast, it is assumed that the Spring Creek Mine (Map 34) will produce coal at the 2012 production rate until about 2016. After 2016, the mine is projected to increase production at a rate of 0.6% per year until 2040. At that rate, the Spring Creek Mine would require about 514 million tons of coal reserves to achieve this production forecast to 2040. There are an estimated 539 million tons of leased and un-leased, in-place coal reserves within the mine plan and RFD boundaries.

ROSEBUD MINE

In accordance with the EIA *Annual Energy Outlook 2013* forecast, it is assumed that the Rosebud Mine will produce coal at the 2012 production rate until about 2016. After 2016, the mine is projected to increase production at a rate of 0.6% per year until 2040. At that rate, the Rosebud Mine would require about 239.3 million tons of coal reserves to achieve this production forecast f to 2040. There are an estimated 212 million tons of leased and un-leased, in-place coal reserves within the mine plan and RFD boundaries which would be depleted about the year 2038.

NORTH ASHLAND RFD

The federal coal leases that existed within the North Ashland RFD have been relinquished. Therefore, the North Ashland RFD has been removed from further consideration as an RFD, as any potential development there would be considered highly speculative.

SAVAGE MINE

In accordance with the EIA *Annual Energy Outlook 2013* forecast, it is assumed that the Savage Mine (Map 33) will produce coal at the 2012 production rate until about 2016. After 2016, the mine is projected to increase production at a rate of 0.6% per year until 2040. At that rate, the Savage Mine would require about 8.8 million tons of coal reserves to achieve this production forecast to 2040. There are an estimated 20 million tons of leased and un-leased, in-place coal reserves within the mine plan boundary. The coal production forecast for the Savage Mine may be optimistic given that this mine produces a lower grade coal (lignite) and has only 2 primary customers, located in Sidney, Montana.

ABSALOKA MINE

Westmorland Resources operates the Absaloka Mine (Map 31) which is located adjacent to, but just outside of the planning area in Big Horn County, Montana. The mine produces from Indian coal leases held in trust for the Crow Tribe by the federal government. Westmoreland Resources has recently acquired private coal located east of the Absaloka Mine and has recently conducted exploratory drilling on those properties. Therefore, BLM staff has determined that it would be reasonable to assume that future leasing requests for federal coal in the area where the private coal leases are located would be submitted in the future. Therefore, an RFD was developed for that area.

In accordance with the EIA Annual Energy Outlook 2013 forecast, it is assumed that the Absaloka Mine (Map 31) will produce coal at the 2012 production rate until about 2016. After 2016, the mine is projected to increase production at a rate of 0.6% per year until 2040. At that rate, the Absaloka Mine would require about 81.1 million tons of coal reserves to achieve this production rate to 2040. There is an estimated 177 million tons of leased and un-leased, in-place coal reserves within the mine plan and RFD boundaries.

OTHER POTENTIAL FUTURE COAL DEVELOPMENT AREAS

Three sites in the planning area (the proposed Otter Creek and Youngs Creek Mines, and an exploration area located on the Crow Indian Reservation have been identified as possible new development areas. However, the BLM does not anticipate the need for any federal coal from these areas within the long term. There are no federal coal reserves within the proposed Otter Creek Mine, and the coal deposits on the Crow Indian Reservation and the proposed Young's Creek Mine (located south of the Montana/Wyoming border) are not subject to decisions resulting from this RMP; subsequently, development of an RFD for those areas was not necessary. Other potential projects such as in-situ gasification of deep coal seams occurring in the planning area was considered speculative and an RFD was not prepared for this type of development.

COAL EXPLORATION

Coal exploration usually involves drilling activity to obtain information about the subsurface and coal zones of interest. In the planning area, this usually involves relatively shallow drill holes less than 800 feet deep. Typical

coal exploratory drilling equipment would include a drill truck similar to a water well drilling truck, a water truck, crew truck and possibly a truck-mounted geophysical logging unit.

Most drill sites are accessed via existing two-track trails with possible segments of off-road access. Road construction is usually not required but does occur on occasion but only short segments and only where absolutely necessary.

Usually one or two holes are drilled at each location depending on the data needs of the company and the confidence in existing data. If a core sample of the coal is needed then a company might drill a pilot hole through the coal zone. They would then probe the drill hole with geophysical equipment to determine the exact top of the coal seam. The drill would then move a short distance away and drill a second hole to just above the top of the coal seam and then take a core sample for analysis.

The drill holes are usually plugged to within two feet of the surface with a bentonite chips unless artesian conditions are encountered, then the bore hole must be cemented to surface. The drill cuttings are then scattered on the surface of the site to less than ½ inch thick hauled off to a disposal area or buried in the mud pit if one was used. Most coal exploration bore holes are drilled with a mixture of air, water and a foaming agent

Sites usually do not require any surface disturbing preparation as the drill trucks are self-leveling. Commonly, the only surface disturbance at the drill site is the borehole itself. However, some operators do use a small dug pit to contain cuttings and any drilling fluids.

NON-ENERGY LEASABLE MINERALS

Non-energy, leasable minerals include gypsum, sodium, and phosphate. They would also include minerals that are normally classified as locatable, but only on lands acquired under the Bankhead Jones Act. While some typical non-energy leasable minerals do occur in the planning area, they occur at great depth, which makes them uneconomical to recover. However, there is one known deposit that contains minable reserves of sodium sulfate, which is located within the confines of Brush Lake and Westby B Lake in Sheridan County. The BLM administers only 16 surface and mineral acres at the Westby B Lake, and it is unlikely that leasing of these minerals would occur. In addition, it is also unlikely that mineable deposits of locatable minerals such as bentonite and uranium occur within the limits of Bankhead Jones lands administered by the MCFO; subsequently, an RFD scenario was not developed for these minerals.

LOCATABLE MINERALS

Locatable minerals are those minerals for which a mining claim can be staked. Although, there is very low potential for locatable minerals such as gold, chromium, titanium, zeolite, and associated minerals such as copper, lead, and zinc in the planning area, there is high potential for bentonite and uranium.

Although gold placer mining took place in the gravels of the Yellowstone River as far downstream as Miles City in the early 20th century, there is no record of the quantity of the gold that was recovered. Even though gold reportedly occurs in the Yellowstone River, it appears that the occurrence is highly sporadic, not well defined, and so limited in scope, that it represents only a recreational interest. Moss agates also occur in the gravels of the Yellowstone River and it is assumed that the recreational collection of gold and agates would continue.

Most mineral commodities are currently at high monetary values when compared with values over the last 25 years. It is assumed that commodity prices would fluctuate around current price levels or increase modestly over both the short and long term periods. It is assumed that sustained or increasing prices would generate interest in exploration and development of locatable mineral properties.

Activities that qualify as casual use (e.g., staking claims, prospecting with hand tools) can be conducted without notification or approval by BLM. However, casual users must observe the rules for Limited OHV areas.

Operators must submit a Notice for exploration actions above casual use 43 CFR 3809.21 that would disturb less than 5 acres and do not meet the requirements of 43 CFR 3809.11. A NEPA analysis is not conducted for Notices, which do not constitute a federal action and are not subject to federal approval. If the proposed action would not cause unnecessary or undue degradation as defined in 434 CFR 3809.5 and addressed in 43 CFR 3809.415, the Notice is accepted by the BLM. Although Notices in the planning area would include exploratory drilling activity, they could include small-scale sampling of less than 1,000 tons.

Any mining operations or proposed exploration that causes surface disturbance greater than 5 acres, a disturbance of any size proposed within a special management area (such as an ACEC), any bulk sampling that removes 1,000 tons or more of presumed ore for testing, or any surface-disturbing operations within lands or waters known to contain federally proposed or listed threatened or endangered species or their habitat requires a Plan of Operations be submitted to the BLM for approval. A detailed operations and reclamation plan is required and a NEPA analysis and public review of the Plan of Operations or environmental document would be conducted. As a result, resource values and impacts are studied and documented and comprehensive reclamation plans that satisfy BLM requirements are incorporated into the Plan of Operations.

Activities, conditions, or practices that fail to comply with the performance standards found in 43 CFR 3809.420, the terms and conditions of an approved Plan of Operations described in a complete Notice, or other state and federal laws related to environmental protection and the protection of cultural resources would constitute unnecessary and undue degradation. For example, if threatened and endangered species were present and the proposed actions caused impacts to species that could not be mitigated, the action would potentially be denied. Proposed activities under Notices and POs cannot cause unnecessary or undue degradation. The BLM would consult with American Indian Tribes on proposed POs, as required. If the proposed action would not cause unnecessary or undue degradation the Plan of Operations would be approved.

However, federal regulations allow reasonable and necessary disturbance. In the absence of requirements imposed by state or federal laws pertaining to the subject resource, such as threatened or endangered species or cultural resources, it may not be possible to deny operations. It would, however, be possible to impose reasonable mitigation measures to reduce impacts. These mitigation measures are limited to the prevention of UUD, as defined in 43 CFR 3809.5 and addressed in 43 CFR 3809.415. These mitigation measures would subject the claimant or operator to delays, additional expense, possible loss of revenue, and alteration of mining plans.

Mitigation measures as defined in 43 CFR 3809.5 and addressed in 43 CFR 3809.415 are developed based on a site-specific review of the Notice or Plan of Operations and must be implemented by the operator. Although mitigation is not expected to eliminate all (or even most impacts), it is required to address potential impacts that would otherwise constitute unnecessary or undue degradation without mitigation.

The definition of mitigation includes elimination of the action or parts of an action. However, for operators exercising their rights under the Mining Law of 1872, as amended the BLM can only stipulate mitigation requiring that the operator eliminate the action or part of the action necessary to eliminate what would otherwise constitute unnecessary or undue degradation.

In most situations, ROWs and land use authorizations would not be needed because an operator is entitled access to his operation; however, access must be built or utilized in accordance with the surface management regulations found in 43 CFR 3809.420.
Because both NOIs and POs are required to be inspected on a regular basis, monitoring would occur. All operations under NOIs and POs are bonded by BLM for 100% of the cost of reclamation. The surface management regulations only apply to the BLM-administered surface estate and some lands patented under the Stock Raising Homestead Act, under certain conditions. The surface management regulations do not apply to acquired lands such as those acquired under the Bankhead-Jones Act. Mining claims cannot be located on acquired lands; subsequently, the minerals are administered as a non-energy leasable mineral.

Operators would be required to control invasive species on BLM-administered lands in their area of operations. Operators would be required to submit a pesticide use proposal for authorization to control invasive species on BLM-administered surfaces, which would cause additional expense for the operator.
Coal, oil, or gas conflicts with locatable mineral resource needs would not be anticipated under all alternatives. The planning area's primary locatable mineral development zone, as portrayed in the RFD, is not located within an area with coal development potential (see the *Minerals Appendix*). The zone is, however, located in an area with high potential for oil and gas development. If a conflict developed with coal, oil, or gas leasing, resolution of the conflict would be left primarily to the claimant, coal leaseholders, and oil and gas developers. The BLM would assist in conflict resolution if needed. Where allowed, the BLM would continue to process, within the scope of all pertinent rules and regulations, NOIs and POs for locatable mineral exploration and development and strive to ensure that those activities were conducted in an environmentally responsible manner. Conflict resolution would subject the claimant or operator to additional expense and delays.

BENTONITE

Bentonite is a locatable mineral that has an extensive presence in the planning area, and it is mined in Carter County by two mining companies; subsequently, it is the most likely locatable mineral to have potential for additional development within the planning area. Both operating mines will expand mining operations to meet demand as existing reserve areas are mined out.

The bentonite mining RFD area lies within a mining region in which two companies, American Colloid Company and Bentonite Performance Minerals operate (Map 36). The area is subdivided into the Alzada North and Alzada South areas. Most of the mining activity in the Alzada North area is north of the Ridge Road, within the Willow Creek watershed. The other mining activity within the region is the Alzada South mine area, which is located south of the Ridge Road and within the Thompson Creek watershed.

There is also an estimated 252 acres of un-reclaimed, previously mined bentonite lands located in the Alzada South area, which were mapped by the State of Montana Abandoned Mine Land program in 1988. Bentonite Performance Minerals re-disturbed about 53 acres of this pre-reclamation law mined area and has reclaimed about 46 acres.

The combined American Colloid Company and Bentonite Performance Minerals permitted acreage in Alzada North and South areas is about 17,025 acres, of which, about 6,222 have been disturbed by mining (Table 46). Much of the acreage that has been disturbed by mining has been reclaimed. About 2,619 acres have been fully reclaimed and released from bond liability and about 799 acres have been reclaimed but are still bonded and permitted.

TABLE 46.
DISTRIBUTION OF PERMITTED
ACREAGE IN BENTONITE RFD AREAS IN THE PLANNING AREA

Area	Total Permitted Acres	Permitted BLM-administered Acres	Permitted Private Acres	Total Disturbed Acres (includes Reclaimed Acres)
Alzada North	8,748	4,709	4,039	3,366
Alzada South	8,277	500	7,777	2,856
Total	**17,025**	**5,209**	**11,816**	**6,222**

In addition, American Colloid Company (J. Pharr, personal communication, September 28, 2009) has indicated that mining permits could be sought within the RFD area over the next 20 years, which includes about 21,545 mixed public and private acreage. In the RFD area, there are about 12,325 acres of federal surface on which the BLM would administer permits (about 57.2 percent of the RFD areas area). Therefore, it is assumed that mining and reclamation could occur on about 50 percent, or up to 10,772 acres of land, in the RFD area. These acreage values represent a rough estimate, "best guess" scenario based on limited exploratory drilling.

URANIUM

There has been a recent resurgence of interest regarding the development of in-situ uranium mining operations nationwide. There are several known sandstone hosted, roll front type uranium deposits located in Carter County, Montana, and a uranium exploration company showed some interest in exploring these deposits in 2008 to determine the economic viability of developing a uranium in-situ recovery operation. According to this company, their project consisted of 25,000 acres of mining claim blocks and leases located west of Alzada, Montana in Carter County. The company believes it may have sufficient reserves of uranium ore in at least three deposits in the area. However, additional exploratory drilling is required to confirm or expand the reserves in these areas.

A uranium RFD area has been developed for analysis purposes (Map 37). It is important to note that the Surface Management Regulations used to manage locatable mineral development only applies to BLM-administered surface lands. Although the BLM generally does not regulate locatable mineral actions on private surface, there is one exception: cases where the private surface owner of land patented under the Stockraising Homestead Act does not give permission to the mining claimant to conduct surface-disturbing operations. In that circumstance, the claimant must file a Plan of Operations with the BLM for approval. However, for the purpose of this analysis, the BLM will assume that only BLM-administered lands within the RFD area are subject to mineral location, exploration, and development. The total area within the RFD comprises about 69,521 acres. The BLM-administered land within the RFD area consists of approximately 34,154 acres.

It is assumed that exploratory drilling will occur sometime within the Uranium RFD area either in the short and long term periods. Drill trucks that are similar to water-well drilling rigs would conduct drilling in these areas with support equipment consisting of a water truck, electric (geophysical) logging vehicle, and crew support vehicle (pickup truck). The drill holes could range from 500 to 2,000 feet deep. It is not known if related surface disturbances such as road construction or pits to accommodate drilling fluids would occur. Although the number of exploratory sites that would be drilled is unknown, it could be several hundred.

It is assumed that an in-situ leaching facility for uranium extraction will be constructed in the long term period. Since the uranium deposits in this area are relatively deep (500 to 2,000 feet), it is likely that the in-situ leaching method of removing the ore would be employed if they were to be developed. It is also assumed that the in- situ leaching facilities would be within the range identified in the *Generic Environmental Impact Statement for In situ Uranium Leach Milling Facilities* (USNRC and Wyoming Department of Environmental Quality [WDEQ] 2009) (2,500 to 16,000 acres).

As the principal federal licensing agency, the Nuclear Regulatory Commission has evaluated the impacts associated with construction and operation of an in-situ uranium recovery operation in the *Generic Environmental Impact Statement for In situ Uranium Leach Milling Facilities* (GEIS, USNRC and WDEQ 2009). The document provides a good description of a generic in-situ leaching operation as well as the impacts associated with such a development. An excerpt follows:

> "A commercial ISL [in situ leaching] facility consists of both an underground and a surface infrastructure. The underground infrastructure includes injection and production wells drilled to the uranium mineralization zone, monitoring wells drilled to the surrounding ore body aquifer and to the adjacent overlying and underlying aquifers, and perhaps deep injection wells to dispose of liquid wastes. ISL [in situ leaching] facilities in the uranium milling regions considered in this GEIS (i.e., Wyoming West, Wyoming East, Nebraska-South Dakota-Wyoming, and Northwestern New Mexico) are commonly exposed to freezing conditions during winter months. Therefore, pipelines to transfer

groundwater extracted from the well fields to the uranium processing circuit are buried to avoid freezing and thus are considered to be part of the underground infrastructure.
ISL [in situ leaching] facilities also include a surface infrastructure that supports uranium processing. The surface facilities can include a central uranium processing facility, header houses to control flow to and from the well fields, satellite facilities that house ion-exchange columns and reverse osmosis equipment for groundwater restoration, and ancillary buildings that house administrative and support personnel. Surface impoundments such as solar evaporation ponds may be constructed to manage liquid effluents from the central processing plant and the groundwater restoration circuit (Figure 2.1-3).

The surface extent of a full-scale (i.e., commercial) ISL [in situ leaching] facility includes a central processing facility and supporting surface infrastructure for one or more well fields (sometimes called mine units) and encompasses about 1,000 to 6,000 ha [2,500 to 16,000 acres] (NRC, 1992, 1997a) (see Section 2.11). However, the total amount of land disturbed by such infrastructure and ongoing activities at any one time is much smaller, and only a small portion around surface facilities is fenced to limit access (Figures 2.1-3 and 2.1-4). Well fields typically are not enclosed by fencing.

NRC establishes the total flow rates and the maximum amount of uranium that can be produced annually at a commercial ISL [in situ leaching] facility using license conditions. NRC-licensed flow rates typically range from about 15,100 to 34,000 L/min [4,000 to 9,000 gal/min], and licensed maximum limits on annual uranium production range from about 860,000 to 2.5 million kg/yr [1.9 million to 5.5 million lb/yr] of yellowcake (NRC, 1995, 1998a, b, 2006, 2007). Actual production rates are generally somewhat lower than these limits (EIA, 2008) (USNRC and WDEQ 2009, pages 2–4 and 2–5)."

Please consult the above-cited document for a detailed explanation of the in-situ leaching process and associated impacts.

MINERAL MATERIALS

Generally within the planning area, the demand for mineral materials, such as clinker, sand, and gravel (primarily used for road construction) with lesser amounts of petrified wood, agate, and building stone, would increase at a moderate but steady rate over the short and long term. However, regional development of other resources such as the development of the oil fields which produce from the Bakken formation would cause a localized increase in demand for surfacing material where deposits of mineral materials are located within the vicinity of the oil development areas. This demand could be met by making federally owned mineral materials available by competitive sale where competitive interest exists.

It is assumed that five mineral materials permits (most likely for sand or gravel) would be issued per year over both the short and long term. Each mineral material site would operate for approximately 5 years, disturb about 5 acres, and yield about 50,000 cubic yards of material.

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MITIGATION MEASURES AND CONSERVATION ACTIONS APPENDIX

MITIGATION MEASURES AND CONSERVATION ACTIONS APPENDIX

INTRODUCTION

The following Mitigation Measures and Conservation Actions are a compilation of Best Management Practices (BMPs) and/or operating procedures used by the BLM to meet statutory requirements for environmental protection and comply with resource specific Goals and Objectives set forward in this land use plan. The BLM will apply mitigation measures and conservation actions to modify the operations of authorized lands uses or activities to meet these obligations. Additional direction regarding mitigation can be found in the Interim Policy, Draft - Regional Mitigation Manual Section - 1794 (IM 2013-142) or subsequent decision documents.

These measures and actions will be applied to avoid, minimize, rectify, reduce, and compensate for impacts if an evaluation of the authorization area indicates the presence of resources of concern which include, but are not limited to air, water, soils, cultural resources, national historic trails, recreation values and important wildlife habitat in order to reduce impacts associated with authorized land uses or activities such as road, pipeline, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities. The mitigation measures and conservation actions for authorizations will be identified as part of the National Environmental Policy Act (NEPA) process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate impacts from those authorizations. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

Because of site-specific circumstances and localized resource conditions, some mitigation measures and conservation actions may not apply to some or all activities (e.g., a resource or conflict is not present on a given site) and/or may require slight variations from what is described in this appendix. The BLM may add additional measures as deemed necessary through the environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Application of mitigation measures and conservation actions is subject to valid existing rights, technical and economic feasibility.

Implementation and effectiveness of mitigation measures and conservation actions would be monitored to determine whether the practices are achieving resource objectives and accomplishing desired goals. Timely adjustments would be made as necessary to meet the resource goals and objectives.

The list included in this appendix is not limiting, but references the most frequently used sources. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because mitigation measures and conservation actions change or are modified, based on new information, the guidelines will be updated periodically. As new publications are developed; the BLM may consider those BMPs. In addition, many BLM handbooks (such as BLM Manual 9113-Roads and 9213-Interagency Standards for Fire and Aviation Operation) also contain BMP-type measures for minimizing impacts. These BLM-specific guidance and direction documents are not referenced in this appendix. The EIS for this RMP does not decide or dictate the exact wording or inclusion of these mitigation measures and conservation actions. Rather, they are used in the RMP and EIS process as a tool to help demonstrate at the Land Use Plan scale how they will be applied in considering subsequent activity plans and site-specific authorizations. These mitigation measures and conservation actions and their wording are matters of policy. As such, specific wording is subject to change, primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these mitigation measures and conservation actions and any

development of program-specific standard procedures will be handled in another forum, including appropriate public involvement and input.

GENERAL MITIGATION MEASURES AND CONSERVATION ACTION RESOURCES

Air Resource BMPs
Developed by: Bureau of Land Management
Publication reference: BLM/WO Updated May 9, 2011
Available from: Online at:
http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/technical_information.html
Description: Identifies a range of typical Best Management Practices for protecting air resources during oil and gas development and production operations.

Erosion and Sediment Control Practices: Field Manual
Developed by: Prepared for the Montana Department of Transportation
Publication reference: FHWA/MT-030003/8165
Available from: National Technical Information Service, Springfield, VA 21161
Description: The Erosion and Sediment Control Best Management Practices Construction Field Manual was developed to assist in design, construction, and post-construction phases of MDT projects. This manual provides background to concepts of Erosion and Sediment Control. Most of MDTs Best Management Practices are listed within the manual based on application categories. Each BMP is described; its applications and limitations are listed, as well as its design criteria. Construction phase and post-construction phase BMPs are described. This manual is a field guide and condensed version of the Erosion and Sediment Control Design Construction Best Management Practices Manual. For more detailed discussion on topic found within, refer to the Erosion and Sediment Control Construction Best Management Practices Manual.

Erosion and Sediment Control Practices: Reference Manual
Developed by: Prepared for the Montana Department of Transportation
Publication reference: FHWA/MT-030003/8165
Available from: National Technical Information Service, Springfield, VA 21161
Description: The Erosion and Sediment Control Construction Best Management Practices Manual was developed to assist in the design, construction, and post-construction phases of Montana Department of Transportation (MDT) projects. This manual provides background to State and Federal regulations associated with erosion and sediment control practices including a general overview of the erosion and sediment processes. Best management practices are listed within the manual based on application categories. Each BMP is described; its applications and limitations are listed, as well as its design criteria. The design phase includes development of construction plans, notice of intent (NOI), and stormwater pollution prevention plan (SWPPP). Construction phase includes the finalization of the SWPPP, NOI, and the implementation of BMPs. Post-construction phase includes monitoring, maintenance, and removal activities.

Fluid Minerals BMPs
Developed by: Bureau of Land Management
Publication reference: BLM/WO/ST-06/021+3071
Available from:
Online at: http://www.blm.gov/bmp/
Online at: http://www.mt.blm.gov/oilgas/operations/goldbook/goldbook1.html
Online at: http://www.mt.blm.gov/oilgas/operations/goldbook/Stand_Enviro_Color.pdf \
Online at: http://www.mt.blm.gov/oilgas/operations/color.pdf
Description: BMPs for oil and gas demonstrate practical ideas which may eliminate or minimize adverse impacts from oil and gas development to public health and the environment, landowners, and natural resources; enhance the value of natural and landowner resources; and reduce conflict. The publication reference is to the "Gold Book" which is formally titled "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development." In addition, the first internet citation is to a location maintained by the Washington Office of the BLM containing general and technical information on the use and application of BMPs. The second

location refers the reader directly to an online version of the "Gold Book." The third and fourth locations refer the reader to color charts for use in selecting paint colors for oil and gas facilities.

Montana Guide to the Streamside Management Zone Law
Developed by: Montana Department of Natural Resources and Conservation Service Forestry Bureau, in cooperation with Montana Department of Environmental Quality, Montana Logging Association, Montana Wood Products Association, Plum Creek Timber LP, USDA Forest Service, USDI Bureau of Land Management
Publication reference: Revised August 2002
Available from: Montana Department of Natural Resources and Conservation, 2705 Spurgin Road, Missoula MT 59801-3199, (406)542-4300, or local MT DNRC field office.
Description: The Montana Guide to the Streamside Management Zone Law is a field guide to compliance with State of Montana Law 77-5-301[1] MCA.) Complementary BMPs are found in the Water Quality BMPS for Montana Forests (also referenced in this appendix). Provides definitions, stream classifications, and guidelines on the seven forest practices prohibited by Montana law in SMZs (broadcast burning, operation of wheeled or tracked vehicles except on established roads, the forest practice of clear-cutting, the construction of roads except when necessary to cross a stream or wetland; the handling, storage, application, or disposal of hazardous or toxic materials in a manner that pollutes streams, lakes, or wetlands, or that may cause damage or injury to humans, land, animals, or plants; the side casting of road material into a stream, lake, wetland, or watercourse; and the deposit of slash in streams, lakes, or other water bodies.

Montana Non-Point Source Management Plan
Developed by: Montana Department of Environmental Quality, Water Quality Planning Bureau, Watershed Protection Section
Publication reference: 2007
Available from: Montana Department of Environmental Quality, Water Quality Planning Bureau, Watershed Protection Section, P.O. Box 200901, Helena, MT 59620-0901.
Online at: http://www.deq.state.mt.us/wqinfo/nonpoint/2007NONPOINTPLAN/Final/NPSPlan.pdf
Description: This document describes the Montana Department of Environmental Quality's (DEQ) updated strategy for controlling nonpoint source (NPS) water pollution, which is the state's single largest source of water quality impairment. NPS pollution is contaminated runoff from the land surface that can be generated by most land use activities, including agriculture, forestry, urban and suburban development, mining, and others. Common NPS pollutants include sediment, nutrients, temperature, heavy metals, pesticides, pathogens, and salt. The purpose of the Montana NPS Pollution Management Plan (Plan) is: 1) to inform the state's citizens about NPS pollution problems; and 2) to establish goals, objectives, and both long-term and short-term strategies for controlling NPS pollution on a statewide basis. The goal of Montana's NPS Management Program is to protect and restore water quality from the impacts of non-point sources of pollution in order to provide a clean and healthy environment.

Montana Placer Mining BMPs
Developed by: Montana Bureau of Mines and Geology
Publication reference: Special Publication 106, October 1993
Available from: Montana Bureau of Mines and Geology, Main Hall, Montana College of Mineral Science and Technology, Butte MT 59701
Description: Provides guidelines for planning, erosion control, and reclamation in arid to semi-arid, alpine, and subalpine environments, to prevent or decrease environmental damage and degradation of water quality.

Water Quality BMPs for Montana Forests
Developed by: Montana State University Extension Service
Publication reference: Logan, R. 2001. Water Quality BMPs – Best Management Practices for Montana Forests. EB158, MSU Extension Forestry, Missoula, MT. 58 pp.
Available from: MSU Extension Forestry, 32 Campus Dr., Missoula MT 59812, OR MSU Extension Publications, PO Box 172040 Bozeman MT 59717
Description: Discusses methods for managing forest land while protecting water quality and forest soils. Intended for all forest land in Montana, including non-industrial private, forest industry, and state or federally-owned forests. These are preferred (but voluntary) methods that go beyond Montana State Law (Streamside

Management Zones). Includes definitions, basic biological information, and BMPs for Streamside Management Zones; road design, use, planning and locating, construction, drainage, and closure; stream crossings, soil, timber harvesting methods, reforestation, winter planning, and clean-up.

Wind Energy BMPs
Developed by: Bureau of Land Management
Publication reference: Wind Energy Development Programmatic EIS
Available from: FEIS Chapter 2 (section 2.2.3.2) at http://windeis.anl.gov/
Description: As part of the proposed action, BLM developed BMPs for each major step of the wind energy development process, including site monitoring and testing, plan of development preparation, construction, operation, and decommissioning. General BMPs are available for each step, and certain steps also include specific BMPs to address the following resource issues: wildlife and other ecological resources, Visual resources, Roads, Transportation, Noise, Noxious Weeds and Pesticides, Cultural/Historic Resources, Paleontological Resources, Hazardous Materials and Waste Management, Storm Water, Human Health and Safety, monitoring program, air emissions and excavation and blasting activities.

Communication Tower BMPs
Developed by: United States Fish and Wildlife Service
Publication reference: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers
Available from: http://www.fws.gov/habitatconservation/com_tow_guidelines.pdf
Description: These guidelines were developed by Service personnel from research conducted in several eastern, mid-western, and southern States, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers.

- Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (e.g., billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.
- If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level, using construction techniques which do not require guy wires (e.g., use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.
- If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.
- If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., State or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.
- If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.
- Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison

Electric Institute, Washington, DC., 78 pp, and Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices/or Raptor Protection on Power Lines. Edison Electric Institute by Raptor Research Foundation, Washington, D. C; 128 pp. Copies can be obtained via the Internet at http://www.eei.org/resources/pubcat/enviro/. or by calling 1-800/334-5453).

- Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint." However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.
- If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.
- In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.
- Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.
- If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.
- Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

Grazing Management BMPs (Guidelines)

Guidelines for grazing management are the types of grazing management methods and practices determined to be appropriate to ensure that rangeland health standards can be met or significant progress can be made toward meeting the standards. Guidelines are best management practices (BMP), treatments, and techniques and implementation of range improvements that will help achieve rangeland health standards. Guidelines are flexible and are applied on site specific situations. Standards for Rangeland Health and Guidelines for Livestock Grazing Management for the Miles City Field Office can be found at: http://www.blm.gov/mt/st/en/prog/grazing.html

BLM BMPs

The website below provides an introduction to BLM BMPs with links to BLM contacts, General BMP Information, BMP Frequently Asked Questions, BMP Technical Information, Oil and Gas Exploration—The Gold Book, Specific Resource BMPs, and, other BLM links.

- http://www.blm.gov/bmp/

Visual Resources

The website below provides numerous design techniques that can be used to reduce the visual impacts from surface-disturbing projects. The techniques described here should be used in conjunction with BLM's visual resource contrast rating process wherein both the existing landscape and the proposed development or activity are analyzed for their basic element of form, line, color, and texture.

- http://www.blm.gov/pgdata/content/wo/en/prog/Recreation/recreation_national/RMS.html

Renewable Energy Development

The following resources provide information on BMPs related to renewable energy development.

- Wind Energy Development Programmatic Environmental Impact Statement: http://windeis.anl.gov/documents/fpeis/index.cfm

- BLM Instruction Memorandum 2009-043, Rights-of-Way, Wind Energy: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2009/IM_2009-043.htm.
- Solar Energy Development Programmatic Environmental Impact Statement: http://www.solareis.anl.gov/

Healthy Watersheds
The website below provides conservation approaches and tools designed to ensure healthy watersheds remain intact. It also provides site-specific examples.

- http://www.epa.gov/owow/nps/

Storm Water BMPs
The website below provides BMPs designed to meet the minimum requirements for six control measures specified by the EPA's Phase II Stormwater Program.

- http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm

Pasture, Rangeland, and Grazing Operations BMPs
The website below provides BMPs compiled by the EPA to prevent or reduce impacts associated with livestock grazing.

- http://www.epa.gov/oecaagct/anprgbmp.html

National Range and Pasture Handbook
The website below provides procedures in support of NRCS policy for the inventory, analysis, treatment, and management of grazing land resources.

- http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/rangepasture/?cid=stelprdb1043084

Montana Nonpoint Source Management Program
The website below provides links to information on funding for implementing nonpoint source controls, examples of control projects, and Montana's current Nonpoint Source Management Plan. This plan identifies and provides details for BMPs to improve and maintain water quality.

- http://www.deq.mt.gov/wqinfo/nonpoint/nonpointsourceprogram.mcpx

THE FOLLOWING WOULD BE APPLIED, IF WARRANTED, TO ANY BLM AUTHORIZED ACTIVITY

- The total disturbance area would be minimized and to the extent possible.
- Surface disturbances would be co-located in areas of previous or existing disturbance to the extent technically feasible.
- Linear facilities would be located in the same trenches (or immediately parallel to) and when possible, installed during the same period of time.
- Plans of development would be required for major ROWs, renewable energy and minerals development. Such plans would identify measures for reducing impacts.
- Where the federal government owns the surface and the mineral estate is in nonfederal ownership, the BLM would apply appropriate fluid mineral BMPs to surface development.
- Remove facilities and infrastructure when use is completed.
- Vegetation would be removed only when necessary. Mowing would be preferred. If mowed when possible work would be performed when vegetation is dormant.
- Two-track (primitive) roads would be used when possible.
- Utilization of the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (i.e., The Gold Book) shall be utilized for the design of roads, utilities, and oil and gas operations.

- Directional drilling, drilling multiple wells from the same pad, co-mingling, recompletion, or the use of existing well pads would be employed to the extent technically feasible to minimize surface impacts from oil and gas development.
- Utilities would be ripped or wheel-trenched whenever practical.
- Remote telemetry would be used to reduce vehicle traffic to the extent technically feasible (e.g., monitoring oil and gas operations).
- Perennial streams would be crossed using bore crossing (directional drill) or other environmentally sound method.
- For activities resulting in major surface-disturbance as determined by the AO, a mitigation monitoring and reporting strategy would be developed and implemented (see the Reclamation Appendix for further guidance).
- Operations would avoid sensitive resources including riparian areas, wetlands, floodplains, waterbodies and areas subject to erosion and soil degradation.
- The BLM would, on a case-by-case basis, use temporary or permanent enclosures (e.g., in woody draw or riparian areas) to promote species diversity, recruitment, and structure.
- Accelerated erosion, soil loss, and impacts to water quality would be reduced by diverting stormwater and trapping sediment during activity.
- Pitless or aboveground closed-loop drilling technology would be used to the extent technically feasible. Recycle drilling mud and completion fluids for use in future drilling activities.
- Where needed, pits would be lined with an impermeable liner. Pits would not be placed in fill material or natural watercourses, and pits may not be cut or trenched.
- Fertilizer would not be applied within 500 feet of wetlands and waterbodies.
- Vehicle and equipment servicing and refueling activities would take place 500 feet from the outer edge of riparian areas, wet areas, and drainages.
- Activity may be restricted during wet or frozen conditions. Mechanized equipment use would be avoided if the equipment causes rutting to a depth of 4 inches or greater.
- Vehicle wash stations would be used prior to entering or leaving disturbance to reduce the transport and establishment of invasive species.
- Invasive species plant parts would not be transported off site without appropriate disposal measures.
- Use alternative energy (solar or wind power) to power new water source developments.
- Overhead power lines, where authorized would follow the recommendations in the most recent guidance from the Avian Power Line Interaction Committee (1994, as amended 2006, 2012).
- Weed management prescriptions would be included in all new treatment projects and incorporated into existing contracts, agreements, task forces, designated weed-free management areas, and land use authorizations that resulted in ground-disturbing activities.
- Whenever possible, ROWs would be constructed within or next to compatible ROWs, such as roads, pipelines, communications sites, and railroads.
- The operator shall be responsible for locating and protecting existing pipelines, power lines, communication lines, and other related infrastructure.
- Modify or adapt livestock water pipelines and natural springs, where practical, to create small wet meadows to provide wildlife habitat.
- Authorize new water development resulting from diversion from spring or seep source only when wildlife habitat would benefit from the development. This includes new water sources for livestock as part of an AMP/conservation plan to improve wildlife habitat.
- Analyze spring, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within wildlife habitats. Make modifications where necessary, considering impacts to other water uses when such considerations are neutral or beneficial to wildlife.
- If portions of existing fences or other structures are found to pose a significant threat to wildlife as strike sites, raptor perches, connectivity barriers, etc. mitigate effects through removal, moving or modification; increase visibility of the fences by marking, or through the use of “take-down” fences.
- Evaluate ecological consequences of using pesticides to control grasshoppers or other insects, unless NEPA analysis documents benefits to avian species and their habitat.
- Design new structural range improvement and locate supplements (salt or protein blocks) to conserve or enhance wildlife habitat. Structural range improvements in this context include, but not limited to: cattleguards, fences, exclosures, corrals, or other livestock handling structures; pipelines; troughs; storage

tanks (including moveable tanks used in livestock water hauling); windmills; ponds or reservoirs; and spring developments.

- During drought periods, prioritize evaluating effects of the drought in priority wildlife habitat areas relative to their needs for food and cover.

MONITORING APPENDIX

PLANNING AREA

INTRODUCTION

For each resource, there are a series of items that will be monitored. Each item is evaluated by location, technique for data gathering, unit of measure, frequency, remedial action threshold, and management option (Table 1). The monitoring and evaluation plan states the event that will be evaluated and lists the key resources that will be managed in the planning area. If an adverse impact can be corrected by a management action within the scope of this plan, the change will be implemented. If the adverse impact can be corrected only by a management action that is outside the scope of this plan, the management change will be a formal amendment.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
AIR RESOURCES AND CLIMATE							
Air Resources and Climate	Gaseous and particulate regulated air pollutants and air quality related values (AQRVs), such as acid deposition, lake acidification, and visibility	Area-wide	Air quality photochemical grid modeling	Micrograms/cubic meter (µg/m$^{3)}$ and parts per million (ppm) concentrations (as µg/m^3)	Modeling will be performed when adequate data are available to validate model performance (see the *Air Resources and Climate Appendix*)	Predicted exceedances of National Ambient Air Quality Standards (NAAQS) or Montana Ambient Air Quality Standards (MAAQS) or unacceptable impacts to AQRVs	Implement additional emission controls or operating limits
	Gaseous and particulate regulated air pollutants	Sidney, Birney, and Broadus area	Continued automated sampling and analysis	µg/m^3 and ppm concentrations (as µg/m^3)	Continuous	Measured exceedances of NAAQS or MAAQS	Implement additional emission controls or operating limits
	Climate indicators including temperature, precipitation, precipitation timing and intensity, snowfall, snow pack, albedo, greenhouse gas (GHG) concentrations	Area-wide	Analysis of existing climatic data and climate change data available from the National Oceanic and Atmospheric Administration, the Western Regional Climate Center, United States Environmental	Degrees Fahrenheit (°F), degrees Celsius (°C), inches, feet, unitless (albedo), ppm, parts per billion	Annual	None (actions triggered based on resource-specific concerns)	Provide annual updates summarizing recent climate trends to BLM resource management personnel

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
			Protection Agency (USEPA), and other reliable sources of information				
SOILS							
Soils	Soil erosion, uplands	Area-wide where management activities are occurring or expected to occur	Visual observation, photo point, rangeland health assessment, surface aggregate stability test, silt fence, and surveyed erosion pins	Soil loss in tons per acre	Site will be visually examined quarterly. Where erosion is considered excessive, measurements of site characteristics will be taken to determine rate of soil loss.	Visual evidence of pedestal, wind scour, rill greater than 3 inches, active headcutting gully, or sheet erosion. Soil or site stability indicators are not similar to reference rangeland health conditions. Change in surface aggregate stability to a lower class. Loss of soil exceeding 10 tons per acre per year	Report exceedance to the BLM, Montana Department of Environmental Quality (MDEQ), or USEPA. Enforcement action would be taken.
Soils (cont'd)	Soil erosion, streambanks, riparian areas,	Area-wide along rivers and tributaries	Visual observation, photo point,	Area affected in square feet or acres	Site would be visually examined	Visual evidence of active	Report exceedance to the BLM, MDEQ, or USEPA. Enforcement

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
	and floodplains	where management activities are occurring or expected to occur	rangeland health or proper functioning condition (PFC) assessments, silt fence, and surveyed erosion pins		quarterly. Where streambank erosion is considered excessive, measurements of site characteristics will be taken to determine soil loss.	headcutting, channelization beyond natural conditions, or bank slump. PFC rated functional-at-risk with a downward trend or nonfunctional. A 10% increase in streambank loss.	action would be taken.
	Soil salinization and sodification	Area-wide where management activities were occurring or expected to occur	Visual observation, measurement of soil characteristics such as (electrical conductivity (EC), sodium adsorption ratio (SAR), exchange sodium percentage, and pH	Area affected in square feet or acres	Site would be visually examined quarterly. Where impacts to soil or vegetation were observed, measurements of site characteristics would be taken to determine salinity and sodicity levels.	A 20% increase in levels in EC, SAR, or exchange sodium percentage (EC greater than 8, SAR greater than 8, exchangeable sodium percentage greater than 10, or pH greater than 8.5)	Report exceedance to the BLM, MDEQ, or USEPA. Enforcement action would be taken.
Soils (cont'd)	Compaction	Area-wide where management	Visual inspection, penetrometer, or	Lbs. per square inch, mass per volume	Site would be visually examined 1 to 2	When an area has a 10% increase in	Decompact or close access to compacted site until area recovers

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
		activities were occurring or expected to occur	ratio of penetration resistance or bulk density to that of the reference area		times yearly; where compaction is considered excessive, measurements would be taken.	density or ratio of penetration resistance or bulk density to that of the reference area greater than 1 and the compacted area exceeds 10% of surface disturbance	from compaction
	Rutting	Area-wide where management activities were occurring or expected to occur	Visual observation and measured depth of rut	Inches	Site would be visually examined 1 to 2 times yearly. Where rutting is considered excessive, measurements would be taken.	Ruts exceed 4 inches in depth	Close access to rutted site until soil conditions are not susceptible to rutting and are repaired.
Soils (cont'd)	Subsidence of fill material	Areas where management activities required fill material	Visual observation and measured depth of subsidence	Feet	Site would be visually examined 1 to 2 times yearly. Where slumping or piping is considered excessive, measurements would be taken.	10% increase in slumping or piping depth	Close access to site until area is reclaimed
WATER							

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
Water	Surface water quality and quantity	In watersheds expected to be affected, potentially affected, or down gradient from coal bed natural gas (CBNG) surface discharge points or regionally at the monitoring stations identified by the interagency working group (refer to *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans* [FSEIS]).	As determined by the interagency working group (refer to the FSEIS) or water quality parameters, temperature, and discharge or stage measurements	As determined by the interagency working group (refer to the FSEIS) or feet, cubic feet per second (cfs), and standard quantitative measurements of water quality (e.g., milligrams per liter [mg/L], pH, µS/cm, and °C)	As determined by the interagency working group or based on activity plan schedule (refer to the FSEIS)	Exceedance of any parameter above the State of Montana surface water quality standards or identified BLM thresholds (refer to the FSEIS)	Report exceedances to the MDEQ, which would determine cause and take appropriate actions If monitoring indicates that BLM thresholds were met or exceeded, untreated discharge of CBNG water from federal wells would no longer be allowed upstream from that station. Previous approvals may be modified.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
		Note that the 10% of 7Q10 criteria for untreated CBNG water would apply unless stations upstream and downstream from proposed outfalls are monitored (refer to the FSEIS).					
Water (cont'd)	Groundwater drawdown	Regionally at locations determined by the interagency working group (refer to the FSEIS)	Monitoring wells would be finished in bedrock units; especially coal seams expected to be developed for CBNG.	Depth to water reported in hundredths of feet	Depth to water measurements would be made approximately monthly to establish an initial baseline. Measurements would be made approximately quarterly thereafter unless a greater frequency was determined to be necessary. Monitoring would continue until at least 80% recovery of static water level was achieved.	A 20-foot decrease in static water level from seasonally adjusted mean static water level (determined from baseline data) (refer to the FSEIS)	If falling water levels were determined to be caused by CBNG activity, operators must offer water well mitigation agreements to all landowners with water sources in the defined drawdown area (20 feet or greater drawdown) of their development. Hydrologic barriers, such as injection wells, may be an option in some cases to prevent drainage of American Indian gas and water resources.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
Water (cont'd)	Groundwater quality and quantity	Alluvial groundwater would be monitored in stream valleys topographically down gradient from CBNG surface discharge points. Since discharge to ephemeral streams would not be allowed, these wells would be along larger streams (refer to the FSEIS).	Monitoring wells would be finished in the alluvium. Depth to water measurements and water quality parameters, including (but not limited to) pH, EC, water temperature, common ions (Sodium (Na), Magnesium (Mg), Calcium (Ca), Potassium (K), bicarbonate (HCO_3), Sulfate (SO_4)) would be obtained.	Standard quantitative measurements of water quality and static water level (mg/L, °C, µS/cm, and hundredths of feet)	Depth to water measurements would be made approximately monthly to establish an initial baseline. Depth to water would then be collected approximately quarterly thereafter. Water quality samples would be taken approximately annually unless more frequent monitoring is needed. Monitoring would continue until at least 80% recovery of static water level was achieved.	A change in groundwater chemistry that affects its class of use or rise in static groundwater levels of 5 feet or more that may cause impacts at the ground surface (refer to the FSEIS)	If impacts were determined to result from CBNG development, direct discharge of CBNG water into waterways in the watershed may be discontinued until modified water management plans were submitted and approved (refer to the FSEIS).
Water (cont'd)	Groundwater quality and quantity	Operators would install monitoring wells adjacent to impoundments (refer to the FSEIS).	A monitoring well would be installed within the first permeable unit and within the first groundwater encountered (up to 50 feet total	Depth to water (feet to water reported in hundredths of feet). Water quality samples would be collected if rises in groundwater were observed or	Wells would be gauged monthly for the first year and quarterly thereafter unless a rise was observed. If a rise were observed, monitoring	A rise of 1 foot or more in static water levels above seasonally adjusted mean water levels (determined from the first year of data)	Any change in class of use would be reported to the MDEQ. Operators may be required to install additional monitoring wells further downgradient, or discharge into impoundments may be

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
			depth) to determine effectiveness of infiltration; if evaporation basins were leaking, a water quality sample of the first groundwater (if encountered) would be collected to determine class of use.	if water were observed in a previously dry zone.	would be monthly. Water quality samples would be collected whenever the water level is above baseline. Monitoring would continue at least until the end of CBNG water discharge into the impoundment.	or a change in the class of use in the groundwater (refer to the FSEIS).	required to cease until a revised water management plan is submitted and approved (refer to the FSEIS)
Water (cont'd)	Springs	A network of springs determined to be fed by the regional flow system would be identified along coal outcrops in the CBNG development area (refer to the FSEIS)	Spring discharge and water quality parameters, including (but not limited to) pH, EC, water temperature, and common ions (Na, Mg, Ca, K, HCO_3, SO_4), would be determined from existing springs.	Discharge cubic feet per second (cfs), pH, EC (µS/cm), and water temperature (°C) would be determined in the field. Standard quantitative measurements of water quality also would be used (mg/L).	Field measurement of discharge, pH, EC, and water temperature would be determined approximately quarterly. An initial water quality sample would be collected; additional samples would be analyzed if substantial changes in the field parameters were observed.	A 50% decrease in spring discharge below seasonally adjusted mean (determined in the first 3 years) or a significant change in water quality that affects its beneficial use (refer to the FSEIS).	If decreased spring discharges or water quality were determined to result from CBNG activity, operators must offer spring mitigation agreements to landowners who use the spring. If the affected spring were identified as important wildlife habitat, adaptive management practices would be used at the landscape level to improve spring ecosystems. Hydrologic barriers, such as injection wells, may be an option in some cases to prevent drainage of

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
							American Indian gas and water resources (refer to the FSEIS).
Water (cont'd)	Streambank or channel alteration	Any federal area-wide action in which potential impacts from management activities are occurring or expected to occur	Monumented cross sections, longitudinal profile, visual inspection, photo point, PFC, surveyed erosion pins, and any suitable methods as described in *Grazing Management Processes and Strategies for Riparian-wetland Areas* (Wyman et al. 2006), *Bureau of Land Management Prairie Stream Surveys: Study Plan* (BLM 2010k), and *Stream Channel Reference Sites: An Illustrated Guide to Field Technique* (Harrelson, Rawlins, and Potyondy	Area affected in square feet or acres	Based on activity plan schedule and a minimum of once every 10 years	Trend away from objective, a 10% increase in streambank or channel alteration, exceedance of any parameter above the State of Montana surface water quality standards for sediment, total suspended solids, or turbidity without a variance.	Activities would be required to be altered or discontinued in order to provide environmental factors for increasing functionality or conditions of the streams. Exceedance would be reported to BLM, MDEQ, or USEPA and enforcement action would be taken.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
			1994).				
Water (cont'd)	Surface water quality and quantity	Any federal area-wide action in which potential impacts from management activities are occurring or expected to occur	Water quality parameters, temperature, discharge, or stage measurements	Feet, cfs, or standard quantitative measurements of water quality (e.g., mg/L, pH, µS/cm, °C)	Based on activity plan schedule	Exceedance of any parameter above the State of Montana surface water quality standards	Activities would be required to be altered or discontinued. Exceedance would be reported to BLM, MDEQ, or USEPA and enforcement action would be taken.
Water, Indian trust	Groundwater	Adjacent to the Northern Cheyenne and Crow Indian Reservations	Sampling of dedicated monitoring wells in the zones of extraction and zones above and below the expected activity; wells are to be placed in the affected areas to areas unaffected by management activities	Standard quantitative measurements of water quality and measurement of depth in feet	Field measurements six times annually prior to production activities and continued throughout the activity period and for the duration of 95% of the recovery of pre-development conditions	Where site-specific studies show a potential to affect Reservation groundwater, the tribe would be consulted as to appropriate protection measures and where continuous monitoring showed a drawdown of groundwater attributed to CBNG production.	The BLM would require the operators to modify federal CBNG production. Mitigation options would include reducing production rates, shutting in the well or wells, establishing a hydrologic barrier, or providing compensation to the affected tribe.

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
Water, Indian trust	Groundwater	Adjacent to the Northern Cheyenne and Crow Reservations	Monitoring wells would be established near the mouth of streams containing alluvium	Measurements of depth in feet	Water level measurements would be taken monthly prior to production activity and during development and water quality measurements would be taken 4 times per year	A 20% rise in the water table above its seasonally adjusted elevation, or a 2-unit increase in the SAR value	Discontinue CBNG evaporative ponds in that watershed or require ponds to be lined
VEGETATION							
Trees and shrubs	Functional habitat within desired conditions	Site-specific and landscape-level	Visual observation, photos, utilization, browse-evaluation, trend	Cover, diversity, and composition.	Varies and designed to address objectives	Failure to meet Rangeland Health Standards. Trend moving away from management objectives.	Change in livestock season-of-use, timing, intensity, frequency, and duration
Herbaceous	Functional habitat within desired conditions.	Site-specific and landscape-level	Utilization, visual observation, photos, and trend	Cover, diversity, and composition.	Varies and designed to address objectives	Failure to meet Rangeland Health Standards or trend moving away from management objectives	Change in livestock season-of-use, timing, intensity, frequency, and duration

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
Riparian and Wetland	Functional rating and trend	Priority allotments with allotment management plans and areas rated as non-functional or functional-at risk with downward trend	Lotic and lentic standard PFC checklist and multiple indicators monitoring techniques (see *Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas*, Technical Reference (TR) 1737-15 [Prichard 1998] and *Riparian Area Management A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas*, TR 1737-16 [Prichard et al. 1999])	Miles or acres based on functional rating and trend	Once every 5 to 10 years based on priority of non-functional and functional-at risk with downward trend areas	Trend away from objective or when no improvement occurs in areas rated as non-functional and functional-at risk with downward trend	Management changes would address causes of degradation. If impacts to management changes did not maintain or improve riparian and wetland functionality, additional monitoring or project revision would be required. Oil and gas operators would be required to alter activities in order to provide environmental factors for maintaining or improving functionality of riparian and wetland areas.
Invasive	Infestations	Inventoried	Photo points,	Infestation size,	Annually or	Expansion of	Change in control

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
Species		infestations	geographic information systems data, mapping, and National Invasive Species Information Management System	presence or absence	every 3 to 5 years and prioritized by species location and treatment method.	weeds, Early Detection Rapid Response, new infestations in areas of high public use, and public accessible areas	method or combine multiple control methods and strategies
Fish, Aquatic and Wildlife Habitat, Including Special Status Species							
Fisheries and aquatic wildlife in prairie streams	Habitat conditions and index of biological integrity	All locations within Miles City Field Office (MCFO) prairie stream survey protocol and locations as needed due to degraded habitat, allotment inspections, pre- and post-development, or as other needs arise	*Bureau of Land Management Prairie Stream Surveys: Study Plan* (BLM 2010k) and index of biological integrity approach following *Development and evaluation of a fish assemblage index of biotic integrity for Northwestern Great Plains streams* (Bramblett, Johnson, Zale, and Heggem 2005) and *Fish*	300 meter stream study reaches	Every 5 years (all sites or streams) As needed: as determined by a decrease in riparian conditions (e.g. declining PFC rating), water quality or water resource parameters indicate a decline in habitat conditions, or land-use or development plans indicate a potential for deleterious impacts to habitat	Decrease in index of biological integrity score, habitat parameters, decreased riparian function, or allotment failing to meet Standards for Rangeland Health	Management changes would address causes of degradation. If impacts to management changes did not maintain or improve prairie stream aquatic wildlife habitat, additional monitoring or project revision would be required. Oil and gas operators would be required to alter activities in order to provide environmental factors for maintaining or improving prairie stream aquatic wildlife habitat.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
			and Habitat Sampling Protocol for Prairie Streams (Bramblett 2003)				
Fisheries and aquatic wildlife in sport-fish reservoirs	Habitat conditions and surveys by MFWP	Designated sport-fish reservoirs	Gill netting and trapping conducted by MFWP	Acres of reservoir	1 to 5 years or determined by MFWP	Decrease in population sizes due to factors related to resource use	Management changes would address causes of degradation. If impacts of management changes did not maintain or improve sport-fish reservoir habitat, additional monitoring or project revision would be required. Oil and gas operators would be required to alter activities to provide environmental factors for maintaining or improving sport-fish reservoir habitat.

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
Upland game birds and migratory bird species (except sage-grouse - see beginning of appendix)	Use and trend	Sharp-tailed leks or winter grounds and migratory bird species habitats	Field inspect leks/breeding bird surveys and strategies outlined in the Wildlife Appendix	Number of males/numbers and species of migratory birds	Monitoring will be tied to yearly (varies per species, 1-5 years for migratory bird species) planning with MFWP or based upon project specific need or existing requirements	Varies and is project-specific (i.e., downward trend in lek attendance)	Extension of timing or project location or re-location, stipulations or Conditions of Approval (COAs), and off-site mitigation
Threatened and endangered species and other special status wildlife species habitat	Habitat use and trends	Black-tailed prairie dog colonies, interior least terns, and special status species raptor nests	Field surveys that include aerial, boat, or ground survey methodologies	Acres and number of prairie dog colonies, least tern numbers and nesting sites, and raptor nest site surveys	Monitoring will be tied to yearly planning with MFWP or based upon project-specific need or existing requirements	Varies and is project-specific	Extension of timing or project location re-location; stipulations or COAs; off-site mitigation
Sharp-tailed grouse	Habitat condition or baseline data collection	Sharp-tailed grouse habitats	Methodologies such as line point intercept and other methodologies	Existing habitat conditions, height of residual vegetation, cover, species diversity, and potential habitat trends	Monitoring will be tied to grazing permit renewals, existing conditions, and allotments that contain a high percentage of BLM-administered lands and other	Varies and is project-specific	Mitigate potential effects of habitat conditions or loss or require changes to livestock season-of-use

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
					actions that cause direct or indirect habitat loss		
Wildland Fire Management and Ecology							
Wildland Fire Management and Ecology	Fire Regime and Condition Class (FR/CC)	Area-wide	FR/CC Standard Landscape Worksheet	Composition of departure and condition classes compared to reference conditions	Field measurements evaluated on a 10-year cycle	A change in the direction of trend away from management	Implement additional vegetation or habitat treatments
CULTURAL RESOURCES							
Areas of Critical Environmental Concern (ACECs)	See *Special Designation Areas* in this table.						
Cultural Resources (cont'd)	National Historic Trails	Lewis and Clark National Historic Trail	Area inspection to look for vandalism, resource abuse, and to install photo points	Site condition	Annually	User conflicts, resource degradation, or safety hazards	Signing; site mitigation or restoration/remediation; restrict or limit surface disturbing activities
	Random sample of 10 sites	Area-wide	Site inspection	Site, surrounding area	Annually	Any noticeable trend indicating increased disturbance, natural or human-caused	Halt activity affecting sites, increase frequency and monitoring of nearby sites, evaluate damage, apply mitigation or restoration/remediation
	Site degradation caused by human activity	Significant cultural sites, area-wide	Inspection of area disturbed	Site, surrounding area	Annually	Any noticeable trend indicating	Closure of areas surrounding site to prevent further disturbance to

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
Cultural Resources (cont'd)						increased human caused disturbance , such as excavations	significant cultural resources, halt activity affecting sites, increase frequency and monitoring of nearby sites, evaluate damage, apply mitigation or restoration/remediation and possible civil or criminal action
Cultural Resources (cont'd)	Environmental or naturally caused degradation, such as erosion or trampling	Significant cultural sites, area-wide	Inspection of displaced or disturbed area	Site, surrounding area	Annually	Naturally occurring accelerated loss or damage to significant cultural material	Closure of areas surrounding site to prevent further disturbance to significant cultural resources, halt activity affecting sites, increase frequency and monitoring of nearby sites, evaluate damage, apply mitigation or restoration/remediation
PALEONTOLOGICAL RESOURCES							
ACECs	See *Special Designation Areas* in this table.						
Paleontological Resources	Significant paleontological localities	Area-wide	Inspection of disturbed area	Degradation caused by human or natural activities that lead to loss of significant fossil resources	Annually	Loss or damage to significant fossil resources	Closure of areas surrounding site to prevent further disturbance to significant fossil resources; require reclamation/remediation and possible civil or criminal action
	Random	Area-wide	Inspection of	Degradation	Annually	Loss or	Closure of areas

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
	sample of 5 sites		disturbed area	caused by human or natural activities that lead to loss of significant fossil resources		damage to significant fossil resources	surrounding site to prevent further disturbance to significant fossil resources; initiate reclamation/remediation actions
	Locality degradation caused by human activity	Significant paleontological localities	Inspection of area disturbed	Percentage of locality	Annually	Any noticeable trend indicating increased human caused disturbance such as excavations	Closure of areas surrounding site to prevent further disturbance to significant fossil resources; require reclamation/remediation and possible civil or criminal action
Paleontological Resources (cont'd)	Environmental or naturally caused degradation, such as erosion or trampling	Significant paleontological localities	Inspection of displaced or altered area	Number of fossils	Annually	Naturally occurring accelerated loss or damage to significant fossils	Closure of areas surrounding site to prevent further disturbance to significant fossil resources; initiate reclamation/remediation actions
VISUAL RESOURCE MANAGEMENT (VRM)							
VRM I	(see *Wilderness* in this table)						
VRM II	VRM II	See VRM	Field visit and key observation points	Photo points; Visual Contrast Rating Form	Once every 1 to 5 years	Unanticipated or unacceptable effects or conflicts occurring	Require mitigation; signing; increase enforcement visits; restrict or limit surface disturbing activities; require reclamation/remediation
VRM III/IV	Large scale-surface	Planning area	Field visit and key observation	Photos points; Visual Contrast	As the need arises	Large-scale surface-	Require mitigation

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
	disturbing project		points	Rating Form		disturbing project on landscape	
LANDS WITH WILDERNESS CHARACTERISTICS							
LWCs	MCFO LWCs	Devils Creek	Flight, vehicle, and foot review	Surface disturbance	Once every year	Unauthorized actions	Require reclamation/remediation or possible civil or criminal action and public notification
FORESTRY AND WOODLAND PRODUCTS							
Forestry and Woodland Products (cont'd)	Reforestation	MCFO	Site inspection and stocking surveys	Trees per acre and visual evaluation of tree vigor	Initial survey 10 years after harvest or wildfire; subsequent survey after 15 years to determine if artificial regeneration is necessary	Less than 150 trees per acre; trees greater than 4.6 inches diameter at breast height	Planting of nursery stock or broadcast seeding
	Silvicultural treatments	MCFO	Site inspection	Trees per acre; basal area per acre; volume per acre (thousand board feet per acre); and size classes; visual evaluation of forest health	Pre- and post-treatment	Obtain current stand data information and evaluate effects of treatments	Stocking surveys, stand exams, forest inventory, permanent plots, and photo points
	Forest health	MCFO	National Agricultural Imagery Program photography,	Visual evaluation	Annually	Evaluate insect and disease damage and tree mortality	Silvicultural treatments, sanitation harvest, chemical application (e.g., verbenone, carbaryl)

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
			aerial detection surveys, site visits			levels	
	Roads	MCFO	Site Inspection	Visual Evaluation	Pre- and post-treatment	Damage to road surface (e.g., rutting, erosion, sediment delivery, or culvert washouts)	Culvert replacement or installation, rolling dips, proper drainage and road placement, reconstruction, cut and fill slope stabilization, surface blading, grass seeding, armoring, road closures, timing restrictions, and other activities *(see Best Management Practices Appendix.)*
MINERALS							
Coal	Exploration license	Area-wide	Site inspection	Exploration license	The regulations at 43 CFR 3480.06(d)(4) require inspections of exploration and production as frequently as necessary, but at least quarterly. Exploration license areas must be inspected for compliance with site-specific stipulations, terms and	Non-compliance with the terms and conditions of the exploration license, or operating regulations; poor reclamation; or environmental degradation	Require compliance with terms and conditions of the license, require appropriate reclamation, and eliminate environmental degradation

TABLE 1. MONITORING TABLE

Element	Item	Location	Technique	Unit of Measure	Frequency and Duration	Remedial Action Threshold	Management Options
					conditions of the license, and reclamation success prior to bond release. Because exploration licenses expire after 2 years license areas are typically inspected after expiration of the license but prior to bond release (or sooner if requested by the proponent).		
Oil, Gas, and Geothermal	Geophysical notice of intent (NOI)	Area-wide	Line or area inspection	Operations conducted in compliance with NOI	Minimum of once during operations	Violation of regulations, change from approved NOI	Issue certified letter with corrective action and timeframe; bond release cannot occur until violations are corrected
Oil, Gas, and Geothermal (cont'd)	Geophysical notice of completion	Area-wide	Line or area inspection	Operations conducted in compliance with notice of completion	Minimum of once during operations, once after reclamation	Violation of regulations, change from approved notice of completion	Issue certified letter with corrective action and timeframe; bond release cannot occur until violations are corrected
	Application for permit to drill operations (surface and technical inspections)	Area-wide	Site inspection	Operations conducted in compliance with applications for permit to drill	Surface Inspections: construction, drilling, and production – Minimum of	Violations of regulations, change from approved applications for permit to	Issue a written order or an incident of non-compliance with timeframe to correct violations or shut in operations

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
					once and as necessary Interim and final reclamation – minimum of once and until reclamation is complete Technical inspection: drilling and production – minimum of once and as necessary	drill	
Oil, Gas, and Geothermal (cont'd)	Sundry notice	Area-wide	Site inspection	Operations conducted in compliance with approved sundry notice	As necessary	Violations of regulations, change from approved sundry notice	Issue a written order or an incident of non-compliance with timeframe to correct or shut in operations
	Oil and gas drainage	Area-wide	Drainage evaluation	Radius of drainage	As necessary	The BLM determines that federal oil or gas is being drained (physically removed) by an off-lease well.	Notify lessee of drainage situation. Require lease protection, compensatory royalty, or relinquishment
	Produced water disposal	Area-wide	Site inspection	Operations conducted in compliance with permit	Minimum of once annually or as necessary	Violation of regulations or change from approved permit	Issue a written order or an incident of non-compliance with timeframe to correct or shut in operations

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
	Spill	Area-wide	Site inspection	Spill area cleaned up and reclaimed	Minimum of once after event and as necessary	Violation of regulations or change from approved permit	Issue a written order or an incident of non-compliance with timeframe for correction
Oil, Gas, and Geothermal (cont'd)	Plugging operations	Area-wide	Site inspection	Operations conducted in compliance with permit	Minimum of once during operations and as necessary	Violation of regulations or change from approved permit	Issue a written order or an incident of non-compliance with timeframe for correction or shut in operations
Locatable Minerals	NOIs	Area-wide	Site inspection	NOI	At least four times each year, the responsible field office would inspect an operation if the operator uses cyanide or other leachates or where there is significant potential for acidic or deleterious drainage(43 CFR 3809.600(b). active notices and plans that do not involve leachates should be inspected at least two times	Non-compliance with the terms and conditions of the NOI or Plan of Operations, surface management regulations, poor reclamation, or environmental degradation	Require compliance with the terms and conditions of the NOI or Plan of Operations, surface management regulations, and require that reclamation was appropriately completed and environmental degradation did not occur.

TABLE 1. MONITORING TABLE							
Element	**Item**	**Location**	**Technique**	**Unit of Measure**	**Frequency and Duration**	**Remedial Action Threshold**	**Management Options**
					per year. These inspection frequencies are minimums; field offices are encouraged to conduct inspections on a more frequent basis where it is deemed necessary. MCFO currently has no plans or notices that use leachates.		
Mineral Materials	Permits and contracts	Area-wide	Site visit	Permits and contracts	Inspections are required at least once per year for sales less than 5,000 cubic yards and twice per year for sales larger than 5,000 cubic yards.	Non-compliance with the terms and conditions of the permit or contract, regulations, poor reclamation, or environmental degradation	Require compliance with the terms and conditions of the permit or contract, regulations, and require that reclamation was appropriately completed and environmental degradation did not occur.

RECREATION							
Recreation (cont'd)	General recreation use	Area-wide with emphasis on dispersed use of undeveloped recreational sites (extensive recreation management areas)	Area inspection to look for vandalism and resource abuse and to install photo points	Site condition	Twice a year (e.g., once in June and once in October) and photograph annually	User conflicts, resource degradation, or safety hazards	Signing, fencing or other mitigation measures
	Concentrated recreation use and demand	Special recreation management areas and sites with recreation facilities	Visitor registration, traffic counters, estimates, and photo points	Visitor days and site condition	Visitor registration boxes and counters checked once monthly (at the minimum) and weekly or biweekly during heavy use periods; photograph annually	Increased visitor use per year or sustained use that requires additional or improved facilities	Monitor more frequently and signing, fencing, or other mitigation measures
		Area-wide commercial and competitive activities (special recreation permits)	Administrative review and site inspection or reviews for permittees with permit stipulations	Permit stipulations, resource condition, and success of reclamation	On site during competitive events, periodic site inspection for commercial operations, and administrative review annually	Violation of permit stipulations, irreparable resource damage, and compromised visitor safety and recreation experience	Monitor more frequently and signing, fencing, or other mitigation measures
RENEWABLE ENERGY							
Renewable Energy (cont'd)	ROWs	Area-wide	Site inspection	ROW	Minimum of once during or for construction within 5 years of issuance, then in the 20th year after issuance and every 10 years thereafter; before release or collection of a bond; before renewal	Nonuse of the ROW or violation of ROW grant stipulations,	Require compliance with ROW grant stipulations,

					termination or relinquishment acceptance; or as required by specific terms and conditions in the ROW grant or the plan of development (POD) or regulations	the terms of the POD, or regulations	POD terms, or regulations with possible suspension or termination for non-compliance or nonuse
TRAVEL MANAGEMENT AND OHV AND BACK COUNTRY BYWAYS							
Travel Management and OHV and Back Country Byways	Track progress on implementation or planning signing, and mapping	Planning-area-wide	Field trips and localized public meetings	Verify minimized resource damage, user conflicts, and new user-created roads	Annual	Effects not anticipated in EIS or unacceptable effects	Require further mitigation or reclamation; restrict or limit surface disturbing activities
LANDS AND REALTY							
Lands and Realty	ROWs	Area-wide	Site inspection	ROW	Minimum of once during or for construction within 2 years of issuance for Mineral Leasing Act reviews and within 5 years of issuance for Federal Land and Policy Management Act reviews, then in the 20th year after issuance and every 10 years thereafter; before release or collection of a bond; before renewal termination or relinquishment acceptance; or as required	Nonuse of the ROW or violation of ROW grant stipulations, the terms of the POD, or regulations	Require compliance with ROW grant stipulations, POD terms, or regulations with possible suspension or termination for non-compliance or nonuse

					by specific terms and conditions in the ROW grant or the POD or regulations		
Lands and Realty (cont'd)	2920 Land Use Permits and Leases	Area-wide	Site inspection	Lease or Permit	Minimum of once during or for construction within 2 years of issuance; before release or collection of a bond; before renewal termination or relinquishment acceptance; or as required by specific terms and conditions in the lease or permit or the POD or regulations	Nonuse of the lease or permit or violation of lease or permit stipulations, the terms of the POD, or regulations	Require compliance with lease or permit stipulations, POD terms, or regulations with possible suspension or termination for non-compliance or nonuse
	Other Land Use Authorizations	Area-wide	Site inspection	Use Authorization	Minimum of once during or for construction; before release or collection of a bond; before renewal termination or relinquishment acceptance; or as required by specific terms and conditions in the authorization or the POD or regulations	Nonuse of the authorization or violation of authorization stipulations, the terms of the POD, or regulations	Require compliance with authorization stipulations, POD terms, or regulations; with possible suspension or termination for non-compliance or nonuse

SPECIAL DESIGNATION AREAS							
ACECs	MCFO ACECs	All	Site inspection	Site, surrounding area	Annually	Any noticeable trend indicating increased disturbance, natural or human-caused	Increase frequency of monitoring to ensure ACEC values were not being impaired; require reclamation/remediation or possible civil or criminal action
Wilderness Study Areas	MCFO WSAs	All WSAs	Flight, vehicle, and foot review	Surface disturbance	Once per month if the area is accessible unless an alternate schedule is approved by the State Director	Unauthorized actions	Require reclamation/remediation or possible civil or criminal action and public notification

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PUBLIC COMMENTS APPENDIX

INTRODUCTION

This appendix contains public and agency substantive comments received on the Draft RMP/EIS and the BLM's response. For more information, see Chapter 5 of the PRMP/FEIS.

TABLE 1.
SUBSTANTIVE COMMENTS AND BLM'S RESPONSE

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
DR-MTDK-MC-13-0188-4	By changing the land to "No Surface Occupancy" on the BLM land that was acquired under the Bankhead-Jones Act, deprives Valley County of the opportunity to capitalize on the 6.25% royalty, that was part of the selling price when the land was sold to the United State Government in 1937. It could also have far reaching effects on the roads that cross this property, as well as the public utilities and easements that cross these lands.	A lease stipulation is a condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or at certain locations or by mitigating unacceptable impacts, to an extent greater than standard lease terms or conditions. Lease stipulations further implement the BLM's regulatory authority to protect resources or resource values. Impact analysis to the resources and resources uses from the proposed action is conducted in accordance to NEPA in the PRMP/FEIS.
DR-MTDK-MC-13-0171-12	How will existing oil/gas pipelines be managed as the energy industry grows in these areas? How will new pipelines, power lines, compressor stations, pump stations and other associate facilities be managed so these habitats are not degraded?	After the ROD is issued, all proposed actions must meet the goals and objectives for resources in the RMP.
DR-MTDK-MC-13-0176-6	Strawberry Hill Recreation Area. This recreation area has seen a three-fourfold increase in use over the last ten years. Users include hikers, runners, mountain bikers, equestrians, picnickers, ATV users, cross-country skiers etc. The increase and diverse use of this site has developed a safety issue regarding "target shooting". Currently there is no designated shooting area. Develop or designate a safe area to restrict shooting or eliminate shooting with the exception of hunting during a licensed season by a licensed hunter.	After the ROD is issued, a Recreation Plan would be done for the area where the BLM would consider proposing the designation of shooting areas or the elimination of shooting with the exception of hunting during a licensed season. Planning will take place with public input during implementation planning for the Strawberry Hill Recreation Area.
DR-MTDK-MC-13-0146-20	Pg. 2-101, Action 6. How often would the Rogers Allotment mentioned in Action 6 be grazed and at what season? I would like to see the words, Dormant season grazing would be considered, added here. Grazing when cheatgrass is green and trees have not yet leafed out would be of great value 2 out of 3 years. Also, fall grazing after the first hard frost in alternate years could be beneficial.	After the ROD is issued, season of use will be considered when an implementation plan is prepared with public input.
DR-MTDK-MC-13-	Will wildlife (all species) be included and given priority in any vegetative community management decisions?	Consideration of a wildlife species is included in any proposed management decision, particularly Special Status Species.

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
0171-4		
DR-MTDK-MC-13-0177-12	The BLM had a duty to consult with local governments regarding historic property. 16 U.S.C. § 470. The BLM failed to comply with its legal duty.	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-MC-13-0177-14	The BLM had a duty to respect the roles of state, local and tribal governments, to seek input and to harmonize the federal action with the local governments. Executive Order 12866. The BLM failed to comply with its legal duty.	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-MC-13-0177-4	BLM had a duty to cooperate with State and local governments to the fullest extent possible. 40 C.F.R. § 1506.2. The BLM failed to comply its legal duty in particular by denying the local governments' request for additional time for public comment and by not following required process and policies to incorporate the necessary information and analysis.	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-MC-13-0177-7	The BLM had a duty to cooperate with the local conservation districts. 16 U.S.C.§ 2003. The BLM failed to comply with its legal duty.	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-MC-13-0177-8	The BLM had a duty to coordinate the Draft RMP/EIS planning with local governments. 43 U.S.C.A. § 1712. The BLM failed to comply with its legal duty.	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-	The BLM had a duty to consider and preserve historic and cultural heritage. The BLM also was required to use all practicable important historic, cultural	At the outset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
MC-13-0177-9	and natural aspects of our national heritage and maintain an environment which supports diversity and variety of individual choice. 42 U.S.C.A. § 4331(b); 40 C.F.R. § 1502.S, 1502.16, 150S.27(b)(3)(8). The BLM failed to comply with its legal duty, by not incorporating this discussion and using the special expertise of local government in doing so.	collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies pursuant to the requirements of NEPA and its implementing regulations. The cooperating agencies provided input in the development of the Draft RMP/EIS. See Chapter 5 for more details on the consultation process.
DR-MTDK-MC-13-0049-2	In order to facilitate our review of the planning documents, we request a copy of the Shape Files BLM has compiled during the planning process that depict where all oil and gas lease stipulations and restrictions would be applied by alternative. This information will significantly aid in our comprehensive review of the proposed RMP.	Available Draft RMP/EIS shapefiles may be accessed via the RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html
DR-MTDK-MC-13-0142-12	Would "best available data" be comprised of studies and information conducted on BLM-administered land only or would information collected on other private, state, or federally-administered land (through other single or cooperative public or private efforts) be pooled so that a broader analysis of the success or failure of habitat mitigation could be conducted?	Best available data can include data from any credible entity as determined by BLM specialists.
DR-MTDK-MC-13-0104-2	BLM also failed to comply with the Energy Policy and Conservation Act requirements to use the least restrictive stipulations necessary for oil and gas exploration and development activities.	BLM included an examination of least restrictive measures that would still protect the resource within the range of alternatives in the RMP/EIS. To the degree possible, the proposed alternative (E) includes the least restrictive measures while still meeting BLM's obligations to protect other resources as dictated by law and policy.
DR-MTDK-MC-13-0121-5	Compensatory mitigation directly conflicts with EPCA language which requires BLM to evaluate the extent and nature of any restrictions or impediments to the development of resources.	BLM included an examination of least restrictive measures that would still protect the resource within the range of alternatives in the RMP/EIS. To the degree possible, the proposed action includes the least restrictive measures while still meeting BLM's obligations to protect other resources as dictated by law and policy.
DR-MTDK-MC-13-0151-2	Chapter 2, pg. 49, Action 23 states existing structural improvements would be evaluated and may need to be removed, modified or marked. Who evaluates these structures? If these fences are moved grazing permits need changes, livestock water is a concern and access may be affected.	Dependent on location of structure, evaluation could occur by the BLM or project proponent. Also, see Chapter 2; Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for revisions.
DR-MTDK-MC-13-0169-20	Careful review of the various alternatives reveals there are very few differences between the various options. All alternatives, for instance, set aside large areas for oil and gas development with many of the same lease stipulations and conditions of approval. Every alternative with the exception of Alternative B, opens up 5.4 million acres for oil and gas. And, Alternative B " which is supposed to be the most environmentally friendly alternative " designates 3.3	Five alternatives are presented in Chapter 2 of the PRMP/FEIS for managing the MCFO, to meet the purpose and need for doing the plan and management goals, and to address the issues discussed in Chapter 1.

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
	million acres as open for oil and gas development. Notably, none of the alternatives explore various conditions of approval for existing and future leases. Nor do the alternatives explore various ways to provide protections and mitigation for wildlife during the leasing or permitting process, i.e., incentives to protect large blocks of undeveloped land for wildlife habitat and wilderness values, clustering development, using timing restrictions and limitations (either as a lease stipulation or at the time of permitted), and incorporating detailed reclamation plans. A one-size-fits all approach to oil and gas development is not a reasonable range of alternatives.	
DR-MTDK-MC-13-0098-11	BLM has proposed monitoring based-mitigation measures in which monitoring data may trigger enhanced mitigation measures that are beyond Best Available Control Technology (BACT) and New Source Performance Standards. Under CAA authority, DEQ is required to take into account environmental benefit and economic and technical feasibility prior to requiring similar measures.	If monitoring-based measures are needed to address air quality concerns, the BLM will work closely with MDEQ to identify mitigation measures that can be applied under the CAA to federally authorized and non-federally authorized oil and gas activity. In some cases, where MDEQ does not have sufficient legal authority to implement needed mitigation measures, the BLM may impose mitigation measures on BLM-authorized activities only.
DR-MTDK-MC-13-0134-13	In BLM's Alternatives section of the Miles City RMP, one coal management plan is common to all alternatives (pg. 2-81). BLM opts, under Action 3, to carry forward all areas identified in past RMPs as acceptable for further consideration for leasing. Rather than extending a determination made in 1985, BLM needs to reassess lands these lands up for consideration. Surface ownership has changed, as have wildlife populations, not to mention individual water users and the constraints placed upon water resources. BLM needs to take a hard look at where coal leasing may not be in the regional or national interest.	In accordance with 43 CFR 3420.1-5, BLM must hold a public hearing on the proposed land use plan or land use analysis if it involves the potential for coal leasing if such a hearing is requested by any person who is or may be adversely affected by adoption of the plan. Additional environmental analysis in accordance with NEPA and the coal leasing regulations would be conducted in response to leasing requests. The coal screening process would be re-evaluated and re-applied as necessary during the site-specific NEPA analysis in response to new data or changes in resources or conditions that have occurred since the original coal planning was conducted. Also, 43 CFR 3425.4 requires BLM to hold a public hearing on the environmental assessment or environmental impact statement prepared for a lease sale application prior to conducting the lease sale. See the Minerals Appendix for more explanation.
DR-MTDK-MC-13-0108-14	BLM has not revisited the four coal screens identified in 43 C.F.R. § 3420.1-4 (coal development potential, unsuitability criteria, multiple land use decisions, and landowner consultation) for the Big Dry RMP area since 1996 and for the Powder River RMP area since 1985. Because some of the information to be considered during the screening process may have changed in the intervening years (including landowner consent), BLM should not treat areas that were	In accordance with 43 CFR 3420.1-5. BLM must hold a public hearing on the proposed land use plan or land use analysis if it involves the potential for coal leasing if such a hearing is requested by any person who is or may be adversely affected by adoption of the plan. Additional environmental analysis in accordance with NEPA and the coal leasing regulations would

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
	identified as not suitable under the 1996 and 1985 RMPs as automatically closed to leasing. Rather, as the Draft RMP notes, the coal screening process should be applied anew on a case-by-case basis to each individual coal lease application, regardless of the previous results of the screening process.	be conducted in response to leasing requests. The coal screening process would be re-evaluated and re-applied as necessary during the site-specific NEPA analysis in response to new data or changes in resources or conditions that have occurred since the original coal planning was conducted. Also, 43 CFR 3425.4 requires BLM to hold a public hearing on the environmental assessment or environmental impact statement prepared for a lease sale application prior to conducting the lease sale. See the Minerals Appendix for more explanation.
DR-MTDK-MC-13-0130-14	Federal coal may not be leased (or added to an existing lease through a Lease Modification) unless the lands containing the coal have been included in a comprehensive land use plan under the agency's land use planning regulations, with opportunities for public review and comment, and subject to stipulations, guidelines or standards set out in the plan. The lands in question must have been found suitable for further consideration for leasing, including application of screens including the unsuitability criteria set out at Subpart 3461, other multiple land use decisions, and surface owner consultation. BLM must also hold a public hearing on the proposed plan if it involves the potential for coal leasing.	In accordance with 43 CFR 3420.1-5. BLM must hold a public hearing on the proposed land use plan or land use analysis if it involves the potential for coal leasing if such a hearing is requested by any person who is or may be adversely affected by adoption of the plan. Additional environmental analysis in accordance with NEPA and the coal leasing regulations would be conducted in response to leasing requests. The coal screening process would be re-evaluated and re-applied as necessary during the site-specific NEPA analysis in response to new data or changes in resources or conditions that have occurred since the original coal planning was conducted. Also, 43 CFR 3425.4 requires BLM to hold a public hearing on the environmental assessment or environmental impact statement prepared for a lease sale application prior to conducting the lease sale. See the Minerals Appendix for more explanation.
DR-MTDK-MC-13-0130-2	The Draft RMP carries forward land use planning decisions from previous resource management plans without new analysis or application of coal leasing screens as required by BLM's coal management regulations.	In accordance with 43 CFR 3420.1-5. BLM must hold a public hearing on the proposed land use plan or land use analysis if it involves the potential for coal leasing if such a hearing is requested by any person who is or may be adversely affected by adoption of the plan. Additional environmental analysis in accordance with NEPA and the coal leasing regulations would be conducted in response to leasing requests. The coal screening process would be re-evaluated and re-applied as necessary during the site-specific NEPA analysis in response to new data or changes in resources or conditions that have occurred since the original coal planning was conducted. Also, 43 CFR 3425.4 requires BLM to hold a public hearing on the environmental assessment or environmental impact statement prepared for a lease sale application prior to conducting the lease sale. See the

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		Minerals Appendix for more explanation.
DR-MTDK-MC-13-0134-12	Given the Northern Cheyenne reservation's Class I air quality standards, BLM needs to analyze the impacts of potential coal development on Northern Cheyenne air quality, and make new acceptability determinations. More broadly, in its analysis of Air Resources and Climate (Chapter 4, pg. 20), the Draft RMP states that coal mining is expected to continue at rates similar to those experienced in the past. This would seem to ignore the potential for large-scale new coal development at Otter Creek, as well as other new or expanded mine projects being considered. In seeking to assess future impacts on air quality, BLM needs to look at what increased coalmining at Otter Creek and elsewhere would mean, and change its overall leasing considerations accordingly.	In accordance with 43 CFR 3420.1-5. BLM must hold a public hearing on the proposed land use plan or land use analysis if it involves the potential for coal leasing if such a hearing is requested by any person who is or may be adversely affected by adoption of the plan. Additional environmental analysis in accordance with NEPA and the coal leasing regulations would be conducted in response to leasing requests. The coal screening process would be re-evaluated and re-applied as necessary during the site-specific NEPA analysis in response to new data or changes in resources or conditions that have occurred since the original coal planning was conducted. Also, 43 CFR 3425.4 requires BLM to hold a public hearing on the environmental assessment or environmental impact statement prepared for a lease sale application prior to conducting the lease sale. BLM considers the proposed Otter Creek Mine to be speculative at this time. Also, there is no Federal coal included in the proposed Otter Creek Mine. See the Minerals Appendix for more explanation.
DR-MTDK-MC-13-0123-5	Russian olive, an invasive tree especially on the Yellowstone and Big Horn rivers, is taking over riparian ecosystems, displacing native cottonwoods and willows. The BLM should work to restore riparian areas that are being taken over by Russian olive. If we lose cottonwood habitat along our rivers and streams, an important part of Montana's wildlife habitat will also be lost.	Management of Russian olive will be pursued on a project-specific basis to improve the health of riparian areas and wildlife habitat.
DR-MTDK-MC-13-0098-7	DEQ is concerned about the use of air quality modeling at the planning stage. Without project specific information several assumptions must be made to complete the modeling which results in a quantitative analysis based on assumptions rather than an informed scientific evaluation.	Modeling at the planning stage requires assumptions. However, the Air Quality Oil and Gas MOU requires modeling and/or mitigation for every future oil and gas EIS that may potentially have a significant impact on air quality or AQRVs.
DR-MTDK-MC-13-0121-57	Are the categories of Federal Mineral Estate and Oil and Gas Lease intended to represent the same classification?	No. Federal Mineral Estate refers to all leased and unleased federal minerals. Oil and Gas Leases refers only to the leased oil and gas minerals.
DR-MTDK-MC-13-0001-2	Reconsider the assessment of Wrangler Creek. The agency dropped the area from consideration as a land with wilderness characteristics because "you can see imprints of man (town of Broadus within 5 miles), so it is not considered outstanding." Whether an area has wilderness characteristics is determined by what is within the boundaries of the unit - not outside.	Per BLM Manual 6310, human impacts can be noted in the area description and evaluated for direct effects on the area. Sights and sounds from outside the inventory area can be considered if they are pervasive and omnipresent.
DR-	BLM apparently dropped a number of areas from LWC consideration due to	Per BLM Manual 6310, human impacts can be noted in the area

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MTDK-MC-13-0169-5	conditions that occur outside and away from the immediate area. BLM dropped Wrangler Creek from consideration as a land with wilderness characteristics because you can see imprints of man (town of Broadus within 5 miles) so it is not considered outstanding. But whether an area has wilderness characteristics is to be determined primarily by what exists within the boundaries of the unit - not outside.	description and evaluated for direct effects on the area. Sights and sounds from outside the inventory area can be considered if they are pervasive and omnipresent.
DR-MTDK-MC-13-0146-31	Pg. 2-119, Action 5. WSAs are more restrictive than limited OHV use. There are 50,000 plus acres of WSAs covered by this document that severely limit use.	Per BLM Manual 6330 - *Management of Wilderness Study Areas*, the use of motor vehicles or mechanical transport is restricted to those primitive routes in the WSA that are open to the general public. Also note, Congress has released the Buffalo Creek and Zook Creek WSAs from wilderness study. See Chapter 3, Wilderness, Wilderness Study Areas section for further discussion.
DR-MTDK-MC-13-0103-6	Please publish the Raptor Nest locations.	Raptor nest locations may be requested via the Montana Natural Heritage Program.
DR-MTDK-MC-13-0127-1	The current trends in recreational use in the planning area indicate a steady increase. And since demand for both motorized and non-motorized recreation access will likely continue to increase, 1a. Why is there a proposed reduction in OHV opportunities/acreage with the Short Pines OHV area and in general the RMP administered lands when the above statements indicate an increase will occur? More people using less acreage will certainly cause damage which will in turn cause a further agency reduction in opportunities for OHV use.	The BLM considered a range of alternatives for resource uses in the Miles City planning area, including, but not limited to OHV use. The PRMP/FEIS includes reductions in the acreage in the Short Pines because of access issues as explained in Chapter 4. The Record of Decision, anticipated to be issued in the summer of 2015, will generally explain the reasoning behind decisions regarding resource uses.
DR-MTDK-MC-13-0088-1	The Reasonably Foreseeable Development boundaries for the Spring Creek Mine in the Draft RMP (Map 75) reflect available information but those boundaries should be viewed as subject to subsequent updates and refinements.	RFD boundaries, acre figures and other numbers used in the analysis are approximate projections for comparison and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations.
DR-MTDK-MC-13-0126-17	Pg. SPE-6. Eriogonum visheri is a native plant found only in a small area of the Dakotas and adjacent Montana. The best known population of this plant in Montana is on BLM lands administered by MCFO. This globally rare species should be included in the Powderville ACEC and protected from surface disturbances cause by mining or paleontological research.	See BLM Manual 6840 - Special Status Species Management, for the objectives for managing special status plants. The plant is a BLM sensitive species and is included within the proposed ACEC boundary. Upon issuance of the RMP ROD, proposed projects must meet the approved goals and objectives for managing special status plants. Restrictions limiting surface disturbing activities in the proposed ACEC will help protect the plant.
DR-MTDK-	Chapter 1 Table 1-1. The math used is in error.	See Chapter 1, Introduction, Table 1-1 for corrections.

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DR-MTDK-MC-13-0089-29	In its NEPA analysis, BLM must address whether the development of resources, and in particular the development of oil and gas and coal, in the MCFO will affect any high quality waters or whether it will degrade any existing uses. BLM may not evade its NEPA duty to consider these impacts by asserting that other agencies may issue discharge permits. 40 C.F.R.§ 1502.14(f), 1502.16(h).	See Chapter 1, Laws section. It specifies BLM must comply with the Clean Water Act, the Montana Water Quality Act, and the National Environmental Policy Act of 1969 (NEPA). The effects to water from BLM's proposed actions are found in Chapter 4, Water Resources section. The analysis of impacts to particular waterbodies from oil, gas, and coal development is considered during site-specific, or implementation planning. The Clean Water Act and the Montana Water Quality Act require that BLM actions protect the beneficial uses of Montana's waters and follow Montana's nondegradation policy. Individual actions will continue to be analyzed through the NEPA process on a case-by-case basis to ensure they comply with these and all other applicable regulations and policies.
DR-MTDK-MC-13-0089-31	The MCFO is obligated to consider impacts before it proceeds with authorization of additional coal mining on BLM lands. Not only is BLM MCFO mandated to follow antidegradation and water quality standards under the CWA and state law, but it must also take a NEPA hard look at any impacts that maybe related to these water quality standards as well.	See Chapter 1, Laws section. It specifies the BLM will comply with the Clean Water Act, the Montana Water Quality Act, and the National Environmental Policy Act of 1969. When site-specific leasing is proposed for coal mining and related activities, the potential impacts are analyzed through the NEPA process and mitigation measures are discussed and prescribed on a case-by-case basis in order to protect the beneficial uses of water resources. The requisite level of information necessary to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decisions. As the PRMP/FEIS analyzes land use planning-level decisions, which by their nature are broad in scope, the requisite level of data and information is more generalized in order to apply a wide-ranging landscape perspective. Although the BLM realizes that more data and more site-specific data could always be gathered, the baseline data used in the EIS provides the necessary basis to make informed land use plan-level decisions.
DR-MTDK-MC-13-0167-1	In the Executive Summary, Air Quality Related Values should be briefly discussed along with air quality.	See Chapter 1, Management Concerns, Air Resources section, which include AQRVs.
	BLM did not include fluid minerals as an issue or management concern in the planning process and instead oil and gas resources appear to be a secondary	See Chapter 1, Scoping and Issues, Issues Addressed section, Issue 8; Chapter 2, Comparison of Alternatives Table 2-5,

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	concern to all other resources. Oil and gas exploration and development is a very important resource and needs to be considered as such.	Minerals, Oil and Gas section; and the Minerals Appendix, Fluid Minerals section. Oil and gas management is considered throughout the RMP.
DR-MTDK-MC-13-0097-1	The Purpose and Need statement on Draft RMP pgs. 1-2 and the "Issues Addressed" on pgs. 1-4 through 1-7 are incomplete. Other than addressing the development of Master Leasing Plans, these sections are silent regarding energy development.	See Chapter 1, Scoping and Issues, Issues Addressed section, Issue 8; Chapter 2, Comparison of Alternatives Table 2-5, Minerals; Oil and Gas section; and the Minerals Appendix, Fluid Minerals section. Oil and gas management is considered throughout the RMP. The Purpose and Need statement for the RMP, which has been revised for the PRMP/FEIS, is broad and overarching to encompass many resources and resource uses, including energy development.
DR-MTDK-MC-13-0121-3	None of the seven planning issues address the concerns raised in our March 4, 2005 scoping letter, which called for oil and natural gas resources to be fully considered during this planning process.	See Chapter 1, Scoping and Issues, Issues Addressed section, Issue 8; Chapter 2, Comparison of Alternatives Table 2-5, Minerals; Oil and Gas section; and the Minerals Appendix, Fluid Minerals section. Oil and gas management is considered throughout the RMP.
DR-MTDK-MC-13-0126-1	Chapter 1, pg. 6, Issue 5 Left out the word "critical" in the second paragraph	See Chapter 1, Scoping and Issues, Issues Addressed section, Issue 5 for correction.
DR-MTDK-MC-13-0123-4	The Riparian and Wetland Areas section, and Fish and Wildlife/Aquatics section propose interrelated actions particularly with regards to surface-disturbing and disruptive activities, energy development, and buffers. It is unclear which actions will take precedence with the resulting impacts.	See Chapter 2, “How To Read Table 2-5.” It states "if conflicting management actions are proposed for the same acreage (and the resources for that action are present) within an alternative, the most restrictive action would be implemented (unless a safety hazard was identified or the actions were to conflict with existing law and regulation)".
DR-MTDK-MC-13-0121-19	Pg. 2-122, Alternative E, Action 9 and pg. 4-359, Alternative E. BLM is inconsistent when describing how much acreage it would require to be avoided for ROW activities and must provide the correct figure.	See Chapter 2, “How To Read Table 2-5” for an explanation of the differences in acres in Chapters 2 and 4.
DR-MTDK-MC-13-0191-7	We did not find detailed discussion of, nor a proposed approach for, adaptive management application in the Draft RMP. The ability to adaptively manage and adjust action elements and conservation measures based on monitoring results is an extremely important component of Greater Sage-grouse conservation across the programs addressed in the RMP, and should be included in the Draft RMP.	See Chapter 2, Adaptive Management Strategy for GRSG Habitat Management section and the Greater Sage-Grouse (GRSG) Monitoring Framework Appendix for discussions on adaptive management based on monitoring.
DR-MTDK-	The Draft RMP/EIS declined to separately analyze the Sage-Grouse Recovery Alternative (www.sagebrushsea.org/land_recovery_alternative.htm), a	See Chapter 2, Alternatives Considered but Eliminated From Detailed Analysis, "Conservation Groups Alternative" for

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MC-13-0092-8	management alternative submitted by conservation organizations to conserve and recover sage-grouse populations. The BLM contends that components of the recovery alternative were substantially considered in the range of other alternatives analyzed in the Draft RMP/EIS. The plan also indicates that sage-grouse best management practices appended to the Draft RMP/EIS include management prescriptions similar to those in the recovery alternative (Draft RMP/EIS: 2-9). Neither contention is correct. The Sage-Grouse Recovery Alternative, though based on the NTT report recommendations, makes additional and stronger management prescriptions for a number of land uses and related effects in sage-grouse range, including livestock grazing, vegetation management, invasive plants, fire and wind energy development. The recovery alternative also recommends including all active sage-grouse leks in priority habitat (which is a significantly larger area than MFWP core areas (4-170)). These recommendations were not analyzed together or individually in the Draft RMP/EIS. Moreover, given that sage-grouse populations will probably continue to decline under the Draft RMP/EIS ”even under the conservation alternative (Alternative B) (4-169 “ 4-170)”the BLM should analyze the complete Sage-Grouse Recovery Alternative as a possible strategy to conserve and restore sage-grouse populations and potentially preclude the need to list the species under the ESA.	discussion on the alternative.
DR-MTDK-MC-13-0196-3	The Draft RMP/EIS declined to separately analyze the Sage-Grouse Recovery Alternative (www.sagebrushsea.org/land_recovery_alternative.htm), a management alternative submitted by conservation organizations to conserve and recover sage-grouse populations. The plan contends that components of the recovery alternative were substantially considered in the range of other alternatives analyzed in the Draft RMP/EIS. The plan also indicates that sage-grouse best management practices appended to the Draft RMP/EIS include management prescriptions similar to those in the recovery alternative (Draft RMP/EIS: 2-9). Neither contention is correct. The Sage-Grouse Recovery Alternative, though based on the NTT report recommendations, makes additional and stronger management prescriptions for a number of land uses and related effects, including livestock grazing, vegetation management, invasive plants, fire management and wind energy development. The recovery alternative also recommends including all active sage-grouse leks in priority habitat (which is even more than MFWP core areas (4-170). These recommendations were not analyzed together or individually in the Draft RMP/EIS. Moreover, given that sage-grouse populations may continue to decline even under the conservation alternative (Alternative B) in the Draft	See Chapter 2, Alternatives Considered but Eliminated From Detailed Analysis, "Conservation Groups Alternative" for discussion.

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	RMP/EIS (4-169 “ 4-170),the plan should analyze the complete Sage-Grouse Recovery Alternative as a possible strategy to conserve and restore sage-grouse populations and potentially preclude the need to list the species under the ESA.	
DR-MTDK-MC-13-0089-49	Air, Action 5: Methane emissions from proposed new or expanded coal mines would be estimated as part of project-level planning, and emission reduction measures would be considered. As stated, this Action is too conditional (would be considered) and too late in the BLM oil and gas development process.	See Chapter 2, Comparison of Alternatives Table 2-5, Air Resources and Climate section for revisions. The Action has been removed.
DR-MTDK-MC-13-0097-2	CO2 EOR should be added to the list of activities that would be prioritized by the BLM because CO2 EOR mitigates GHG emissions by permanently sequestering CO2. Draft EIS pg. 2-13: alter Action 6 to state: "Actions that reduced or mitigated GHG emissions by actions such as enhanced energy efficiency, use of lower GHG-emitting technologies, enhanced oil recovery operations using CO2 the capture or beneficial use of fugitive methane emissions would be prioritized."	See Chapter 2, Comparison of Alternatives Table 2-5, Air Resources and Climate section, Action 3 for additional text.
DR-MTDK-MC-13-0097-30	The EIS and RMP should support CO2 EOR because it is a technologically and economically feasible way to permanently sequester CO2 that would otherwise be vented to the atmosphere.	See Chapter 2, Comparison of Alternatives Table 2-5, Air Resources and Climate section, Action 3 for additional text.
DR-MTDK-MC-13-0051-2	Chapter 2, Alternatives, pg. 2-64, Action 7: Add National Historic Trails (NHTs) as a priority category for development of cultural resource management plans following issuance of a ROD. NHLs are listed twice as a priority category, so perhaps the intention was to include NHTs.	See Chapter 2, Comparison of Alternatives Table 2-5, Cultural Resources section. The statement has been deleted.
DR-MTDK-MC-13-0176-7	Development of federally owned minerals at Rosebud Battlefield, or within the view shed of the park would destroy the ambiance of the site that FWP is striving to preserve. Perhaps the BLM would consider withdrawing federally owned minerals from development consideration, exchange federally owned minerals in other areas of southeastern Montana or northern Wyoming for the privately owned minerals at the Rosebud Battlefield.	See Chapter 2, Comparison of Alternatives Table 2-5, Cultural Resources section. Under Alternative E, Action 3, the BLM proposes a No Surface Occupancy stipulation for historic battlefields. Also, see that section's goals for managing cultural resources.
DR-MTDK-MC-13-0191-14	Table 2-1, Greater Sage-grouse PPA Action 18. Permittee or Lessee monitoring may be acceptable, but only if they are qualified to conduct such monitoring. Language to that effect should be added, as should reference to required training.	See Chapter 2, Comparison of Alternatives Table 2-5, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas section. The statement has been removed .
DR-MTDK-MC-13-0171-3	How will sustainable forestry and range management (livestock grazing) be practiced and managed?	See Chapter 2, Comparison of Alternatives Table 2-5, Forestry and Woodland Products, and Livestock Grazing sections for BLM’s proposed actions. Meeting Standards for Rangeland Health provides for healthy, productive, and diverse native plant and animal populations and communities.
DR-	Do you have prescriptions for the management of noxious weeds?	See Chapter 2, Comparison of Alternatives Table 2-5, Invasive

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MTDK-MC-13-0171-5		Species section for proposed management of noxious weeds.
DR-MTDK-MC-13-0097-24	Are ROWs to be excluded on 45% or 80% of managed lands? Alternative E of the Draft RMP designates 1.3 million acres - or approximately 45% of managed lands as ROW "Avoidance" areas. See Draft RMP at pg. 1-121. Yet the Draft RMP states in Chapter 4 that, under Alternative E, ROWs would be avoided on "2.2 million of BLM administered acres in the planning area (80 percent)." Draft RMP at 4-359. Which number is correct?	See Chapter 2, Comparison of Alternatives Table 2-5, Lands and Realty, Rights-of-Way section for changes to the number of acres avoided under Alternative E. Also in Chapter 2, see the "How To Read Table 2-5" section for an explanation on the differences in acres between Chapters 2 and 4. As noted there, where acres are provided in Table 2-5, the data for that resource have been collected; where data are incomplete, an assumption is made regarding the acre numbers (and is found in the *Assumptions to the Analyses* section of Chapter 4).
DR-MTDK-MC-13-0030-2	Chapter 2 pg. 2-75 of Section 9 (Alternatives C, D & E). Closing a grazing allotment is in conflict with the goals listed in Chapter 1 pg. 1-9 of Vegetative Communities. This action is in conflict with Livestock Grazing Goals and Objectives in Chapter 2 pg. 2- 74, Table 2-1. Eliminating grazing has proven to increase invasive plants and weeds. Without grazing the BLM will be unable to properly manage vegetation communities.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0032-1	Have you bothered to tell the public that if they don't comply with your ideas within a 5 yr time frame - you'll jerk their livestock grazing permits?	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E , including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0094-3	As quoted in the Draft RMP: Preferred Alternative: Action 3 " The allotments in Table 1 (see the Livestock Grazing Appendix), in which the Standards for Rangeland Health were not met (including Sage-grouse Habitat), livestock grazing was a causal factor in the failure to meet these standards, and there was no progress towards meeting Standards for Rangeland Health in the allotments within 5 years of the initial determination would be eliminated and closed to livestock grazing." You should show solicitors opinion, regulation, or statute that allows you this authority.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, for changes made to Alternative E, Action 9 including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0102-21	Environmental assessments are prepared to assess the effects of alternatives developed to ensure that Rangeland Health Standards are met through grazing allotment goals and objectives. If livestock grazing levels or practices are a significant factor in failing to meet Rangeland Health Standards, the BLM has committed to take action no later than the start of the next grazing year to initiate progress toward meeting the Standards. Since such action must be taken quickly, we recommend that the Proposed RMP include a list of potential measures that could be implemented at the project level to meet Rangeland	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards. Also, the Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997c) lists the guidelines for grazing management. Implementing one or more of these guidelines can ensure standards are met or that significant

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	Health Standards.	progress can be made toward achieving the standards.
DR-MTDK-MC-13-0117-10	The Draft RMP provides for: Loss of 6,125 acres and up to 1,803 AUMs; The closing of allotments within 5 years for not meeting the Standards for Rangeland Health; The closing of allotments for not meeting water quality standards; The reduction of 3,125 acres and up to 1,257 AUMs in the SRMAs and the ACECs; and, the restrictions of grazing in WSAs. These reductions were not properly analyzed under NEPA, as to required indirect and direct effects of this action. Furthermore, when the BLM analyzed the economic and social impacts of the Draft RMP it did not use the actual, correct number in the plan for livestock grazing reductions.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0117-11	The Standards for Rangeland Health and Guidelines "provide the technical and scientific basis for measuring progress towards healthy and productive rangelands." Standards for Rangeland Health and Guidelines, Preamble. However, the Draft RMP requires the closing of allotments instead of making progress towards meeting the functions and conditions included within the Standards. Therefore, the Draft RMP is more restrictive than the Standards the Draft RMP is supposed to meet.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including a provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0117-9	Even though at first glance, the BLM indicates that grazing will continue at near current levels, a more detailed analysis indicates many instances where the BLM may negatively impact grazing under this Draft RMP. These instances include statements such as: "Allotments wholly located within sage grouse Habitat - Priority Area habitat would be considered for retirement where the base property owner relinquished their preference." Draft RMP at pg. 2-50. "The allotments in Table I (see the Livestock Grazing Appendix), in which the Standards for Rangeland Health were not met (including Sage-grouse Habitat), livestock grazing was a causal factor in the failure to meet these standards, and there was no progress towards meeting Standards for Rangeland Health in the allotments within 5 years of the ROD of the RMP, would be eliminated and closed to livestock grazing. Exhibit C -Standards for Rangeland Health and Guidelines. The lands would no long be chiefly valuable for grazing." Draft RMP at pg. 2-75. "BLM-administered lands would be closed to livestock grazing after wildfire, prescribed fire, or non-fire vegetative treatments until the area attained treatment or rehabilitation plan resource objectives." Draft RMP at pg. 2-77. Throughout the Draft RMP the BLM has committed itself to meeting PFC water quality standards and to manage for aquatic habitat. "Closing allotments within 5 years that did not meet Standards for Rangeland Health would increase water quality and watershed health but decrease water quality in the short term." Draft RMP at 2-193. Based on the Draft RMP,	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, for modifications made to Actions 6 and 9.

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	livestock grazing is not the reason for most issues related to water quality and watershed health. Therefore, closing allotments is not a solution Further, the Standards are meant to establish a process of analysis to progress towards meeting the Standards.	
DR-MTDK-MC-13-0146-23	Pg. 2-193, Alternative E states that allotments that did not meet Standards for Rangeland Health would be closed within 5 years. This is inconsistent with pg. 2-75, Action 9, which mentions that if livestock grazing was a causal factor and that if progress towards meeting Standards for Rangeland Health were not met, then the allotment would be closed.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0147-1	It is proposed that livestock grazing carrying capacity be calculated for yearling cattle at a rate of 1 AUM per yearling. In the past, a yearling has been pastured at 0.75 AUM. Raising this to 1 AUM would mean fewer cattle on the land, and the economic impacts and viability of ranches that go along with this reduction.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section. This alternative is no longer considered.
DR-MTDK-MC-13-0147-2	Only Congress may permanently exclude lands from grazing use. This is from US Dept of Interior - Office of the solicitor - WA. DC. 20240 reference M-37008 October 4, 2002. William G. Myers Not only is the RMP preferred alternative proposing to go against a BLM-solicitors opinion, it is proposing a reduction that will be very damaging to our communities and way of life.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0161-1	Action 3 “ The allotments in Table 1 (see the Livestock Grazing Appendix), in which the Standards for Rangeland Health were not met (including Sage-grouse Habitat), livestock grazing was a causal factor in the failure to meet these standards, and there was no progress towards meeting Standards for Rangeland Health in the allotments within 5 years of the initial determination would be eliminated and closed to livestock grazing." Please show solicitors opinion, regulation, or statute that allows you this authority.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section, Action 9 for changes made to Alternative E, including provision for reducing or cancelling grazing use because of failing rangeland health standards.
DR-MTDK-MC-13-0176-2	Action 24 (pg. 2-50). "Allotments wholly located within sage-grouse habitat - protection priority habitat would be considered for retirement where the base property owner relinquished their preference." It is well documented that grazing as a management technique can improve plant vigor and diversity, and that undisturbed grass stands may become degraded and undesirable for nesting and brood rearing birds. No doubt, overgrazing or poorly managed grazing can be detrimental to sage-grouse. However, a complete lack of rangeland management in perpetuity is not an ideal situation.	See Chapter 2, Comparison of Alternatives Table 2-5, Livestock Grazing section. The alternative has been modified to note that at the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM would consider whether the public lands should remain available for the livestock grazing or be used for the other resource management objectives (Action 6).
DR-MTDK-MC-13-0108-1	One of the coal management actions identified in the Draft RMP that is common to all alternatives is to manage the federal coal resource to provide for the development of federal coal in an orderly and timely manner and consistent with the federal coal management program and policies, environmental integrity, and national energy needs. Draft RMP at 2-81. However, the Draft	See Chapter 2, Comparison of Alternatives Table 2-5, Minerals, Coal section. The referenced goals and objectives statement has been removed from the table. The coal RFDs for the planning area have been re-evaluated using updated production and coal forecast data. See Chapter 4, Minerals, Coal, where the analysis

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	RMP contains neither the information nor the management direction necessary to implement that management action effectively. BLM has not considered new technologies, economics, improved environmental impact mitigation techniques, or information on coal development potential in the area and simply repeats the coal program as it was developed in the Powder River Basin RMP in 1985 and in the Big Dry RMP in 1996. In fact, the coal section of the Minerals Appendix merely contains excerpts from the previous RMPs with no attempt to evaluate current conditions.	indicates there are enough coal resources within the RFD areas to sustain current mines at the current and forecasted rate of growth. Discussion regarding the reason the BLM proposes to carry forward existing coal planning decisions may be found in the Minerals Appendix.
DR-MTDK-MC-13-0142-11	Include a discussion that clearly outlines how existing monitoring and adaptive management mechanisms currently in place as part of the BLM's 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans would be extended to management decisions proposed as part of the Proposed RMP.	See Chapter 2, Comparison of Alternatives Table 2-5, Minerals, Oil & Gas section, Action 9.
DR-MTDK-MC-13-0089-4	By proposing to offer all 5.4 million acres in the Miles City RMP as open for oil and gas development, Draft RMP at pg. 2-5 “which is one of the largest sources of VOCs, ozone, and sulfur dioxide emissions in the United States “ air quality, human health, and compliance or interference with the EPA's Regional Haze rules must be analyzed in greater detail in the Miles City RMP and EIS.	See Chapter 2, Comparison of Alternatives Table 2-5, Minerals; Oil and Gas section; for acres open to leasing. Also, see Chapter 4, Air Resources and Climate, Management Common to All Alternatives, AQRV Impacts section. CALPUFF modeling to assess visibility impacts at the Medicine Lake Wilderness Class I area was performed.
DR-MTDK-MC-13-0002-1	Outfitting: BLM should not issue any outfitting permit on BLM acreage that has public access by county road/highway/river. b. Is adjacent to other public land: State Land/Forest Service/US Fish and Wildlife Service, others. c. Is adjacent to or within the boundaries of a Block Management Agreement boundary. The justification for these acreage withdrawals from commercial outfitting is your multiple use mandate. The outfitting industry has numerous ranches leased in eastern Montana that hold landlocked BLM acreage which could be leased to an outfitter. This administrative method of handling commercial outfitting on BLM acreage insures the public that commercial outfitting will not conflict with the public's right to use BLM land.	See Chapter 2, Comparison of Alternatives Table 2-5, Recreation, Special Recreation Permits section, Action 2 for modifications to the alternative.
DR-MTDK-MC-13-0173-1	Outfitter leased lands was over 6 million acres two years ago and growing, and that does even not include land outfitted by landowners themselves. There are thousands of acres of public land surrounded on four sides by outfitter-leased lands that unavailable to the public but available for no cost to outfitters or landowners for commercial outfitting.	See Chapter 2, Comparison of Alternatives Table 2-5, Recreation, Special Recreation Permits section for modifications to the alternatives.
DR-MTDK-MC-13-	Short Pines OHV Recreation Area. The BLM has created a recreation spot that permits off road vehicle to use a large portion of Dawson County's rangelands. There are many trails, and new trails are created on a constant basis. The highly	See Chapter 2, Comparison of Alternatives Table 2-5, Recreation; SRMAs, ERMAs and Public Lands Not Designated; Glendive Short Pine OHV section, Action 9. The area would no

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0100-1	erodible soils are suffering, and now a new problem has been created. The rangelands in this area are being destroyed by erosion.	longer be open to OHVs.
DR-MTDK-MC-13-0100-2	The erosion is occurring on many of the 2000 plus acres that BLM is allowing the OHVs access to. In addition to the BLM land, many acres of private land are also being violated. The private land owners must pay for the grass that is destroyed. The numerous (too many to count) OHV tracks on the hills cause washouts, with new ones cropping up constantly. This causes the excess erosion to settle at the bottom of the hills, where the majority of the grass is found, and the silt ends up in the creek beds and coulees. The result is silt and erosion being deposited on private land, affecting the grazing and the watering of animals, and creating problems for hay crops.	See Chapter 2, Comparison of Alternatives Table 2-5, Recreation; SRMAs, ERMAs and Public Lands Not Designated; Glendive Short Pine OHV section, Action 9. The area would no longer be open OHVs.
DR-MTDK-MC-13-0131-1	The Glendive Short Pines OHV area. We are paying for the grass on these some 2000 acres that they are tearing up. This area is highly erodible, worst in Dawson County. Our cattle are run off these areas and away from watering places, also they are running our horses through fences and are getting cut up. The animals are being hit by vehicles and killed. It is way too much traffic.	See Chapter 2, Comparison of Alternatives Table 2-5, Recreation; SRMAs, ERMAs and Public Lands Not Designated; Glendive Short Pine OHV section, Action 9. The area would no longer be open to OHVs.
DR-MTDK-MC-13-0105-2	The RMP should discuss potential solar development areas. There are areas that would be suitable for solar or a combination of wind and solar that would make sense. A megaplant for solar energy is not the only way to produce power.	See Chapter 2, Comparison of Alternatives Table 2-5, Renewable Energy section. Solar development is part of the Renewable Energy section. See also Chapter 4, Renewable Energy, Assumption and Methodology for all Alternatives section for the potential for solar energy in the planning area.
DR-MTDK-MC-13-0102-20	Consider revising the 300 foot CSU setback for riparian and wetland areas to a 500 foot NSO setback for perennial, intermittent and ephemeral streams, lakes, ponds, reservoirs, riparian and wetland areas. Other BLM Field Offices have required a 500 foot setback to minimize potential deterioration of water quality and to maintain natural hydrologic function of stream channels, stream banks, floodplains, and riparian communities (e.g., see Grand Junction Field Office Draft RMP, NSO-1, Major River Corridors; NSO-2, Streams/Springs). We also recommend adding "springs" to the list of water resources protected by these stipulations in order to maintain proper function of these susceptible resources (e.g., see Grand Junction Field Office, NSO-4, Lentic Riparian Areas - which includes springs, seeps and fens). Further, given the large number of water bodies in the MCFO planning area that are impaired due to sedimentation and/or alteration in stream-side vegetative cover, we recommend a 750-foot NSO buffer for these impaired waters located in areas of high development potential (such as the Powder River and Williston Basins and the Cedar Creek Anticline).	See Chapter 2, Comparison of Alternatives Table 2-5, Riparian and Wetland Areas for modifications. Montana's EPA-approved 2012 Final Water Quality Integrated Report demonstrates the proposed lease stipulations are effective at maintaining water quality. In the report, only 2 waterbodies in the State are listed as impaired with a probable source being "Petroleum/Natural Gas Activities." Neither waterbody is located in the planning area. Additionally, no waterbodies are listed as impaired with a similar probable source in North or South Dakota (i.e., the other field offices of the BLM Eastern Montana/Dakotas District). In Chapter 2, Comparison of Alternatives Table 2-5, Riparian and Wetland Areas, Alternative E, oil and gas leasing would be offered with a CSU stipulation within 300 feet of riparian and wetland areas. Studies cited within the PRMP/FEIS indicate that a 300 foot buffer maintains water quality by significantly reducing concentrations of fecal coliform, nitrogen, phosphorus, sediment, and pesticides. The 300-foot buffer provides a high

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		level of protection by creating a buffer that extends from the boundary of the wetland or riparian area, not just the edge of the stream. Per EPCA, the CSU stipulation is the least restrictive stipulation that still protects the resource. See the Glossary for the definition of riparian; perennial springs exhibiting visible vegetation or physical characteristics reflective of permanent surface or subsurface water influence fall within the definition or riparian areas.
DR-MTDK-MC-13-0092-13	The Draft RMP falls short of addressing the need to manage some sufficient quantity of BLM lands for black-footed ferret reintroduction, as well as for the suite of other prairie dog dependent species.	See Chapter 2, Comparison of Alternatives Table 2-5, Special Designation Areas, ACEC section and the Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for modifications to the alternatives. BLM will work with the Montana Black-footed Ferret and Prairie Dog Working Groups to identify any potential black-footed ferret reintroduction sites in the planning area. Also, in the Special Designation Areas Appendix, ACEC section, the Black-footed Ferret ACEC is no longer recommended for ACEC designation.
DR-MTDK-MC-13-0162-9	We recommend that a second action be added for all alternatives that specifically addresses Objective 3. Focus treatment programs on reestablishment, recruitment, seedling and sapling survival, and achievement of a healthy and diverse community structure as follows: "Action 2 “ The BLM would expand the size and distribution of hardwood draws using, but not limited to, a combination of treatments, such as seeding, planting of seedlings and containerized trees and shrubs, fire suppression, and managed herbivory." We also recommend that a third action be added for all alternatives that is similar to an action listed for Riparian and Wetlands and Areas on pg. 2-23, as follows: "Action 3 “ The BLM would, on a case-by-case basis, use temporary or permanent enclosures in woody draws to promote species diversity, recruitment, and ecosystem functionality."	See Chapter 2, Comparison of Alternatives Table 2-5, Vegetation section; and the Riparian and Wetland Areas section for revisions.
DR-MTDK-MC-13-0146-1	Non-native haying should be encouraged and allowed to be done often to avoid wolfy stands of decadent, unhealthy stands of introduced grasses. Placing water tanks from pipelines in these patches of introduced grasses is an excellent idea. Perhaps a $5 per acre administrative fee could help cover costs. Haying non-native grasses is much better for air quality than burning it.	See Chapter 2, Comparison of Alternatives Table 2-5, Vegetation, Haying section, Alternative E for modifications. Harvesting nonnative hay would be allowed to meet fuels, vegetation or habitat objectives.
DR-MTDK-MC-13-0102-13	The EPA recommends setback stipulations, such as No Surface Occupancy (NSO), to minimize the potential for impacts to potential drinking water resources, including domestic water wells and public water supply wells.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section and the Minerals Appendix, Fluid Minerals, Lease Stipulations section. The alternatives were modified by adding a management action addressing surface-disturbing

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		activities and oil and gas leasing in Source Water Protection Areas. The majority of proposed oil and gas wells within 500 feet of private water wells would be located on non-federal surface, and well locations should be agreed upon by both the operator and the surface owner. Onshore Oil and Gas Order Number 1 allows for the movement of proposed wells by up to 660 feet, which may be used to move proposed well locations away from private wells when necessary.
DR-MTDK-MC-13-0102-19	We have several concerns and recommendations regarding the wording of the NSO stipulations, as follows: The use of "obligate wetland species or hydric soils" as indicators for intermittent streams results in an unnecessarily narrow definition of intermittent stream that would likely result in excluding many of these streams from protection. We recommend removing this clause from the NSO stipulation. Since the Draft RMP identifies 97% of stream miles in the planning area as intermittent or ephemeral, we recommend further clarification to the "streams" language by including ephemeral streams in the list of water resources to be protected by the NSO stipulation. We recommend clarifying the NSO language to be applicable to "100-year floodplains" in order to provide certainty for operators. In reviewing numerous oil and gas leasing stipulations contained in other BLM EISs, we have not seen an exception process to allow drilling within water bodies or wetlands. It is our understanding that a "no exceptions approach" within a water body or wetland is BLM's standard procedure. We recommend removing the exceptions clause from the MCFO NSO stipulations given the importance of preventing disturbance within water bodies and wetland areas.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section and the Minerals Appendix, Fluid Minerals, Lease Stipulations, Alternative E section. Alternative E and the stipulations related to “Water” and “Riparian and Wetland Areas” have been modified. Montana's EPA-approved 2012 Final Water Quality Integrated Report demonstrates the Miles City Field Office's project-level implementation of BMPs near ephemeral streams is effective at maintaining water quality. In the report, there are no waterbodies in the planning area listed as impaired with a probable source being "Petroleum/Natural Gas Activities."
DR-MTDK-MC-13-0102-24	In order to ensure public drinking water supply sources (e.g., surface water sources, including GWUDISW sources, and groundwater sources) are protected from potential impacts associated with oil and gas leasing, the following NSO language is recommended: Municipal Supply Watersheds(1) - NSO within any of the following areas, as deemed appropriate by the BLM: The entire watershed; or Local Source Water Protection Planning Areas where delineated in a Source Water Protection Plan; or Surface Water Spill Response Region or Groundwater Inventory Region defined by Source Water Assessments that have been delineated or evaluated by the State Surface Water Spill Response Regions are 1/2-mile-wide zones (on both sides of rivers or streams, upstream of drinking water intakes. They include the water body with the surface water intake and significant tributaries, for 10 miles upstream of the drinking water intake. For lakes and reservoirs, they include a 1/2-mile-wide	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section, and the Minerals Appendix, Fluid Minerals, Lease Stipulations section. The alternatives have been modified.

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	zone around the waterbody. Groundwater Inventory Regions are based on a three-year time of travel or a fixed radius of 1,000 feet (concentric buffer) around the public water supply well.	
DR-MTDK-MC-13-0102-26	For surface water sources, if the Municipal Supply Watersheds NSO stipulation is not deemed feasible by the BLM, then at a minimum we recommend a 1,000-foot NSO or CSU setback on both sides of the river or stream, for 10 miles upstream of the intake. For lakes and reservoirs, this would include a 1000-foot NSO or CSU setback around the water body.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section, and the Minerals Appendix, Fluid Minerals, Lease Stipulations section. The alternatives have been modified.
DR-MTDK-MC-13-0102-27	For groundwater and GWUDISW sources, if the Municipal Supply Watersheds NSO stipulation is not deemed feasible by the BLM, we recommend a minimum 1,000-foot CSU concentric buffer for these sources.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section, and the Minerals Appendix, Fluid Minerals, Lease Stipulations section. The alternatives have been modified.
DR-MTDK-MC-13-0102-28	We recommend the BLM include a commitment in the Proposed RMP and ROD to provide notice to lessees for drilling within Source Water Protection (SWP) Zones of public water supplies.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section. Alternative E, the Proposed Alternative, would prohibit oil and gas development (NSO) in source water protection areas.
DR-MTDK-MC-13-0134-17	Impoundments are discussed in the coal bed natural gas water management section of the Appendices (pg. BMP-5) and again in the preferred alternative (pg. 2-18) Action 9. Surface water impoundments would be allowed with measures designed to maintain the natural flow regime, water quality, and riparian and watershed functionality and resiliency. Per Diamond Cross Properties v. State of Montana, Pinnacle Gas Company et al. Civil Case No. DV-2005-27 and DV-2005-70, disposal of CBM groundwater in a manner without any recognized benefit from the water does not pass constitutional muster. All use of impoundments as a method of water disposal should be removed from the RMP.	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section, Action 4 and the Glossary. Surface water impoundments do not include impoundments of groundwater, water from wells, or produced water sources (e.g. water disposal pit).
DR-MTDK-MC-13-0190-5	How and when would "vegetated buffer zones" be established? How would BLM determine the appropriate width of these zones? What activities would be prohibited in the zones?	See Chapter 2, Comparison of Alternatives Table 2-5, Water Resources section. This management action has been removed from all alternatives. For a comparison of riparian and wetland area buffer alternatives, such as a 300 foot buffer in Alternative E, see Chapter 2, Comparison of Alternatives Table 2-5, Riparian and Wetland Areas.
DR-MTDK-MC-13-0092-14	There are four potential zones in the MCFO planning area containing one or more prairie dog complexes: 1) SE Powder River County (BLM and private land); 2) Dry Arm, eastern Garfield and SE McCone Counties (BLM, private, and U.S. Fish and Wildlife Service land); 3) Central Rosebud County (BLM and private); and 4) Custer/Prairie County (BLM and private-includes the current existing ferret ACEC).	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Black-tailed Prairie Dogs section. Management of Black-tailed prairie dogs would be subject to the Management Conservation Plan for Black and White-tailed Prairie Dogs in Montana (MT Prairie Dog Working Group 2002). The BLM would work with

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		the Montana Black-footed Ferret and Prairie Dog Working Groups to identify potential black-footed ferret reintroduction sites in the planning area. Also, the Black-footed Ferret ACEC is no longer recommended for ACEC designation.
DR-MTDK-MC-13-0104-10	BLM has failed to demonstrate why surface disturbing and disruptive activities will be avoided and future oil and gas leases will be offered with NSO stipulations within 0.25 miles of Interior Least Tern habitat, while surface disturbing and disruptive activities will be allowed and oil and gas leases will be offered with CSU stipulations within 0.25 miles of Piping Plover habitat.	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; and the Fish, Aquatic and Wildlife Habitat, Including Special Status Species Appendix, Special Status Species section for revisions.
DR-MTDK-MC-13-0121-18	Why are the Piping Plover and the Interior Least Tern, both listed as endangered under the ESA, receiving different levels of protection in the RMP?	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Piping Plover Habitat and the Interior Least Tern Habitat sections for revisions.
DR-MTDK-MC-13-0121-26	On pg. 2-58, Sage-Grouse Habitat Compensation (compensation would be for Sage-Grouse Habitat-General Habitat Areas, Protection Priority Areas, and Restoration Areas); Alternative E, indicates that Habitat compensation would not be required for Action 1. However, Action 1 under Management Common to all Alternatives on pg. 2-55 states: Where deemed effective, water developments would be managed to reduce the spread of West Nile virus (see Best Management Practices [BMPs] identified in the Fish and Wildlife Appendix).	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Compensation section for changes. Also, see the Greater Sage-Grouse (GRSG) Required Design Features Appendix for revisions.
DR-MTDK-MC-13-0121-60	Are the 2.5 million acres reported as sage-grouse habitat under BLM Administration(within the MCFO planning area) a summation of the Oil and Gas Lease acreages reported for the three main management categories reported in MCFO RMP Table 2.22? See summary in Table 1 (General Habitat Acres [800,000 acres], Protection-Priority Areas [1,403,000 acres] and Restoration Areas and Source Population Area [289,000 acres]).	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat section for acreage modifications.
DR-MTDK-MC-13-0142-2	The species habitat delineations in the Draft RMP are inconsistent with those identified by Montana Fish, Wildlife & Parks (FWP).	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat section. Alternative E includes MFWP's sage-grouse Core Areas.
DR-MTDK-MC-13-0146-35	Pgs. 2-213 and 2-214 ROWs and other Land Use Authorizations avoided or excluded lands and Realty Power Lines. The changes on these two pages from Alternative A to Alternative E is huge and costly, and this document acknowledges this. Is it necessary to prohibit all power lines, phone lines, and pipelines of all kinds? This might be the biggest economic hit of all.	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – General Habitat Areas section. Alternative E for surface-disturbing activities, such as ROWs, has been modified.
DR-MTDK-	Requested information for clarification: Difference in boundaries between the Garfield-Rosebud PPH (Map 7) proposed for Alternative B and the North	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species;

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MC-13-0150-1	Rosebud PPH (Map 4) proposed for Alternative E, both of which were originally based on the Rosebud Core Area. Depending on the reasoning, it may be appropriate to reduce the PPH to the boundaries proposed for Alternative E. Footnote #8, Draft RMP at pg. 2-189, needs clarification as to what habitat types these are associated with. In general, these sound like very sound protective measures. Clarification needed on what Creation of a Mitigation Trust Account would entail. Draft RMP at 2-189. Transparency and accountability are paramount. Appropriate mitigation must be selected and monitored for effectiveness? Request information on estimated number of leks (including size) within the boundaries of the Miles City RMP, as well as within each habitat type? Request information on status of genetic testing that was referenced on pg. 3-73 of Draft RMP.	GRSG Habitat section for GRSG habitat boundaries per alternative. Footnote #8 has been deleted. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse section for information on lek numbers and status. The genetics testing data gathering and results are not yet complete.
DR-MTDK-MC-13-0150-6	While winter range/concentration areas were referenced in the document (Draft RMP, pg. 2-47) with protective measures, winter habitat was neither spatially referenced/identified nor quantified.	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – General Habitat Areas and GRSG Habitat - Priority Areas sections. Winter concentration areas and other winter survey data locations are within the general or priority habitat areas.
DR-MTDK-MC-13-0171-6	Will fish and wildlife habitat be given priority within important areas within the RMP such as migration routes, nesting and calving areas and security habitat for wildlife?	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Alternative E. Important habitats such as calving and migration routes are unknown or non-existent in the planning area. Nests, particularly raptors and other migratory birds receive special management.
DR-MTDK-MC-13-0191-12	Table 2-1, Greater Sage-grouse PPA Action 7. Please clarify what is meant by "at a minimum".	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas section for revisions.
DR-MTDK-MC-13-0191-15	Table 2-1, Greater Sage-grouse PPA Action 18. Would range improvement structures not found to conserve, enhance, or restore Greater Sage-grouse habitat be removed? Please clarify.	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas section for revisions.
DR-MTDK-MC-13-0191-17	It is unclear from Table 2-1 and the Greater Sage-grouse BMP Appendix as to what specific actions would trigger mandatory compensatory Greater Sage-grouse mitigation under Alternatives B, C, and D. Does this apply to all surface-disturbing activities, including mining? Also, while the basis for calculation of the 5%, 3%, and 10% disturbance cap for Greater Sage-grouse habitat per section is clear, the basis for the accompanying 1 % cap for “sage-	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Compensation section for changes.

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	grouse habitat" is unclear. The basis for this 1 % calculation should be clarified.	
DR-MTDK-MC-13-0191-8	The proposed PPAs are not, under any of the alternatives, inclusive of all Montana Fish, Wildlife and Parks (FWP) mapped sage-grouse core areas and COT Report PACs in the Planning Area (FWP core areas and PACs are identical). Alternatives B and E do appear to include all such core PAC areas if proposed RAs are included along with PPAs. We recommend that PPAs be inclusive of all core areas PACs, or that clear rationale be provided as to how these proposed areas (PPAs plus RAs) are consistent with the core area PAC mapping and protection intent.	See Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat section. Alternative E includes MFWP's Sage-grouse Core Areas.
DR-MTDK-MC-13-0150-10	High voltage powerlines should be avoided within PPH, to the greatest extent possible. While they are allowed within General Habitat, they should avoid areas within 1 mile of a lek to minimize grouse avoidance behavior and increased predation pressure.	See Chapter 2, Fish, Aquatics and Wildlife, Greater Sage-grouse section. Actions limiting surface disturbing activities in the Priority Habitat include powerlines.
DR-MTDK-MC-13-0092-3	The plan should clearly document its analysis of the NTT report recommendations.	See Chapter 2, Greater Sage-Grouse (GRSG) Habitat Management section for discussion on the NTT report. As noted there, the NTT report recommendations are considered, as appropriate, in Alternative B.
DR-MTDK-MC-13-0121-25	At what point in the RMP process will specific information be developed to guide assessments of habitat functionality, monitoring, and compensatory mitigation for sage-grouse and other sensitive species?	See Chapter 2, Greater Sage-Grouse (GRSG) Habitat Management section and its subsections; the Greater Sage-Grouse (GRSG) Required Design Features Appendix; the Greater Sage-Grouse (GRSG) Monitoring Framework Appendix, the Mitigation Measures and Conservation Actions Appendix and the Monitoring Appendix for revisions.
DR-MTDK-MC-13-0076-8	As BLM is aware, the State of Montana has formed a Greater Sage-grouse Advisory Council to develop conservation measures by January 2014 to be enacted into law for protection of the sage-grouse and its habitat in Montana. APLIC recommends the BLM adopt the same conservation measures that the Montana Greater Sage-grouse Advisory Council is developing in order to maintain as much consistency with requirements for electric and gas distribution and transmission line as possible. The Montana conservation measures are expected to be developed for adequate protection of the species and to avert a final listing decision from USFWS. Applying the same conservation measures will avoid much confusion and will be much more efficient for industry to manage and implement.	See Chapter 2, Greater Sage-Grouse (GRSG) Habitat Management, BLM Proposed Plan for GRSG Management section for consideration of the Governor's plan. Also, see Chapter 2, Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat - Priority Areas section, Action 3, Alternative E for revisions.
DR-MTDK-MC-13-	There is no mention of some main reasons for loss of sage-grouse numbers. For example, mother nature (drought, flooding, west Nile virus), predators (cats, skunks, fox, coyotes, all raptors). We have no control over Mother Nature but a	See Chapter 2, Greater Sage-grouse (GRSG) Habitat Management, BLM Programs for Addressing GRSG Threats section and Table 2-1. See Chapter 3, Fish, Aquatic and Wildlife

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0111-2	predator program could be addressed.	Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Conservation Strategies and Participatory Efforts; Predation Relationship section for discussion.
DR-MTDK-MC-13-0191-19	Table 2-1, Fuels Management Prescribed Fire Action 3, Alternative B. This action states "Prescribed fire would not be allowed on approximately 2,500,000 acres and allowed in the remainder of the planning area." Does this prohibition area include sage-grouse PPAs? RAs? GH? Please clarify.	See Chapter 2, Greater Sage-grouse (GRSG) Habitat Management, BLM Proposed Plan for GRSG Management section for management of prescribed fire in Greater Sage-grouse habitat.
DR-MTDK-MC-13-0191-2	Threats to sage-grouse (including the inadequacy of regulatory mechanisms) as described in the most current USFWS 2010 Warranted But Precluded Finding are not, but should be, included. Discussion should also be added to the effect that the Greater Sage-grouse has been determined to warrant listing under the ESA, and a proposed rule or change in determination must be made by the end of fiscal year 2015 as a condition of a court approved settlement agreement. We also recommend that the most current literature be referenced in this section, including Knick et al. (2013).	See Chapter 2, Greater Sage-grouse (GRSG) Habitat Management, BLM Programs for Addressing GRSG Threats section and Table 2-1. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Conservation Strategies and Participatory Efforts section for revisions.
DR-MTDK-MC-13-0133-7	NWE encourages the BLM to consider mitigation banks and offsite mitigation as mechanisms to pool habitat conservation resources and target conservation efforts in highest priority areas. In the development of such mitigation banks, the potential for future energy delivery corridors should be considered. For unknown impacts of operating and maintaining gas production and delivery systems and power lines, NWE recommends that the BLM provide opportunities and incentives to conduct additional studies using the research protocols developed by Utah Wildlife in Need in 2012 and endorsed by the Western Association of Fish and Wildlife Agencies (WAFWA). As indicated by WAFWA, such research should be acceptable as a component of a mitigation package for unknown project impacts. In addition, NWE encourages the BLM to jointly identify potential sage-grouse incentives and partnerships with the electric and gas utility industry.	See Chapter 2, Greater Sage-Grouse Habitat Management section and its subsections and Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for revisions and mitigation considered.
DR-MTDK-MC-13-0104-19	Pg. BMP-37. "NEPA analysis would disclose the impact of the addition to the surface disturbance total for the local population within the priority sage grouse habitat. If that analysis shows anthropogenic disturbance crossing or above 3 percent for that area..." Wyoming has previously used a 5% factor. What is the scientific basis for this 3% factor?	See Chapter 2, Greater Sage-grouse Habitat - Priority Habitat Management Areas, Action 3 for a discussion on the percentages. See the Bibliography reference Knick, Hanser, Preston 2013. Ninety-nine percent of active leks were in landscapes with <3% developed and all lands surrounding leks were <14% developed.
DR-MTDK-	Wyoming has been effectively using the 5 percent factor with extensive experience. Upon what scientific evidence is this 3 percent disturbance factor	See Chapter 2, Greater Sage-grouse Habitat - Priority Habitat Management Areas, Action 3 for a discussion on the

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MC-13-0121-20	based?	percentages. See the Bibliography reference Knick, Hanser, Preston 2013. Ninety-nine percent of active leks were in landscapes with <3% developed and all lands surrounding leks were <14% developed.
DR-MTDK-MC-13-0125-5	Without exclusionary fencing of riparian communities, these areas will continue to be the most intensively grazed in any allotment. The Proposed RMP must specify immediate actions on all allotment management plans to assure grazing use is allowed only when riparian areas have been individually assessed and documented as in excellent condition.	See Chapter 2, Management Common to all Alternatives, Livestock Grazing section. The section specifies that the BLM would follow the 1997 *Record of Decision for Standards for Rangeland Health and Guidelines for Livestock Grazing Management Final Environmental Impact Statement for Montana and North and South Dakota*, which requires riparian areas to achieve or make significant progress toward Proper Functioning Condition and water quality to meet or make significant progress toward achieving Montana State standards. If these standards are not met, and livestock grazing is a significant causal factor, steps must be taken to ensure progress towards meeting standards within one grazing season.
DR-MTDK-MC-13-0121-43	Include a discussion that clearly outlines how existing monitoring and adaptive management mechanisms currently in place as part of the BLM's 2008 Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans would be extended to management decisions proposed upon implementation of the RMP.	See Chapter 2, Minerals, Oil and Gas, Action 9 for an explanation.
DR-MTDK-MC-13-0070-3	The Governor of Montana has set up a task force to study the Sage Grouse issue and formulate a plan to enhance their habitat and range. The Draft RMP states on pg. 4-414 : The mineral revenues distributed to the state would be reduced by approximately $1 million". The $1 million dollar reduction in revenue to the state of Montana is clearly an indication that the state has a very large stake in what the BLM does in their decision. For this reason the BLM should slow this process down and consider input into this plan from the recommendations of the task force set up by the Governor.	See Chapter 2; Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for actions if the State of Montana adopts a GRSG Habitat Conservation Program. The Governor's Advisory Council sage-grouse task force's recommendations have been reviewed in the preparation of the PRMP/FEIS.
DR-MTDK-MC-13-0088-5	The Montana Sage-grouse Habitat Conservation Advisory Council is in the process of developing state-specific approaches to greater sage grouse in the State. The results of that process, and potential alternative conservation measures and management actions to those listed in the Draft RMP, need to be taken into account by the final revisions to the RMP and the Proposed EIS.	See Chapter 2; Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas, Alternative E (Proposed) for actions if the State of Montana adopts a GRSG Habitat Conservation Program. The Governor's Advisory Council sage-grouse task force's recommendations have been reviewed in the preparation of the PRMP/FEIS.
DR-	The Governor of Montana has set up a task force to study the Sage Grouse	See Chapter 2; Comparison of Alternatives Table 2-5; Fish,

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MTDK-MC-13-0090-10	issue and formulate a plan to enhance their habitat and range. The Draft RMP states on pg. 4-414: The mineral revenues distributed to the state would be reduced by approximately $1 million." The $1 million dollar reduction in revenue to the state of Montana is clearly an indication that the state has a very large stake in what the BLM does in their decision. For this reason the BLM should slow this process down and consider input into this plan from the recommendations of the task force set up by the Governor.	Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas, Alternative E (Proposed) for actions if the State of Montana adopts a GRSG Habitat Conservation Program. The Governor's Advisory Council sage-grouse task force's recommendations have been reviewed in the preparation of the PRMP/FEIS.
DR-MTDK-MC-13-0097-29	The Draft RMP states on pg. 3-74 that the "BLM is an active participant in the Montana Sage Grouse Work Group." Montana Governor Bullock established the Greater Sage-grouse Habitat Conservation Advisory Council with Executive Order No. 2-2013. The EIS and RMP should explain how these state efforts will be incorporated into the RMP, and what the process for those future RMP revisions will be.	See Chapter 2; Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas, Alternative E (Proposed) for actions if the State of Montana adopts a GRSG Habitat Conservation Program. The Governor's Advisory Council input on Greater Sage-grouse was reviewed in the preparation of the PRMP/FEIS.
DR-MTDK-MC-13-0121-28	Will the Governor's sage-grouse advisory council supplant the Montana Sage Grouse Work Group or will both groups continue to address sage-grouse management? Clarify BLM's anticipated role in recognizing and/or adopting recommendations of the advisory council as part of revisions to the Draft RMP.	See Chapter 2; Comparison of Alternatives Table 2-5; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; GRSG Habitat – Priority Areas, Alternative E (Proposed) for actions if the State of Montana adopts a GRSG Habitat Conservation Program. The Governor's Advisory Council sage-grouse task force's recommendations have been reviewed in the preparation of the PRMP/FEIS.
DR-MTDK-MC-13-0098-6	The National Park Service and the United States Fish and Wildlife Service have asserted that all non-Class I areas under their jurisdiction should be considered to be sensitive Class II areas. The justification used to determine which areas should be considered sensitive Class II areas is unclear. Impacts to sensitive Class II areas would be modeled in the same manner as Class I areas; this is inconsistent with CAA requirements.	See Chapter 3, Air Resources and Climate, Air Quality Related Values section. Sensitive Class II areas are not afforded protection under the CAA.
DR-MTDK-MC-13-0089-55	Research indicates a strong correlation between oil and gas development and increased ozone concentrations, particularly in the summer when warm, stagnant conditions yield an increase in O3 from oil and gas emissions.	See Chapter 3, Air Resources and Climate, Air Quality section; and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources. Monitoring data from ozone monitors within the MCFO indicate ozone concentrations that are no more than 75 percent of the ozone NAAQS
DR-MTDK-MC-13-0089-17	BLM's quantitative assessment should account for methane's long-term (100-year) global warming impact and, also, methane's short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored.	See Chapter 3, Air Resources and Climate, Climate Change section, the global warming potential discussion. Also, see the Air Resource Technical Support Document available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.htm

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DR-MTDK-MC-13-0089-18	EPA's GHG Inventory - which BLM currently relies on in its analysis - assumes that methane is 21 times as potent as carbon dioxide (CO2) over a 100-year time horizon, a global warming potential (GWP) based on the Intergovernmental Panel on Climate Change's(IPCC) Second Assessment Report from 1996.2 As a Supplementary Information Report (SIR) prepared for BLM's oil and gas leasing program in Montana and the Dakotas explains, GWP accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere and provides a method to quantify the cumulative effect of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent (CO2e) for the GHGs. pg. AIR 1-2.25 However, substantial questions arise when you calibrate methane's GWP over the 20-year planning and environmental review horizon used in the SIR and, typically, by BLM, including the MCFO. See SIR at 4-1 thru 4-45 (discussing BLM-derived reasonably foreseeable development potential in each planning area). Over this 20-year time period, the IPCC has calculated that methane's GWP is 72 over three times as potent as otherwise assumed by the AIR-26. However, recent peer-reviewed science demonstrates that gas-aerosol interactions amplify methane's impact such that methane is actually 33 times as potent as carbon dioxide over a 100-year time period, and 105 times as potent over a twenty year time period. This information suggests that the near-term impacts of methane emissions have been significantly underestimated. See 40 C.F.R. § 1508.27(a) (requiring consideration of short and long term effects). Further, by extension, BLM is also significantly underestimating the near-term benefits of keeping methane emissions out of the atmosphere. 40 C.F.R. § 1502.16(e), (f); id. at 1508.27.	See Chapter 3, Air Resources and Climate, Climate Change section, the global warming potential discussion. Also, see the Air Resource Technical Support Document available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html.
DR-MTDK-MC-13-0089-7	The MCFO must consider not only the cumulative impact of the greenhouse gas emissions authorized by the revised RMP, it must also consider those emissions combined with other activity in the area.	See Chapter 3, Air Resources and Climate, Climate Change, Current Conditions section where state, national, and global GHG emission estimates are provided.
DR-MTDK-MC-13-0089-69	There is a vast amount of research and support that BLM has to draw from to address the issues of greenhouse gas pollution and methane waste. BLM is required to impose measures at the lease stage before it transfers rights, and thus commits of resources. The RMP is the appropriate place to address these measures to ensure consistency.	See Chapter 3, Air Resources and Climate, Climate Change, National Actions to Reduce GHGs section. Based on new information available from the USEPA, additional GHG emission data is provided. Also, see the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2 for additional information on GHG emission reductions and controls.

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DR-MTDK-MC-13-0134-9	In Montana, oil and gas wells can flare for an unlimited amount of time, if they produce less than 100,000 cubic feet of gas per day. This is extremely hazardous for the local air quality and contributes the larger threat of climate change. The RMP should limit the flaring and require green completion systems for all federal wells. According to a 2012 GAO report on natural gas emissions on federal lands, around 40 percent of natural gas estimated to be vented and flared on onshore federal leases could be economically captured with currently available control technologies.	See Chapter 3, Air Resources and Climate, Climate Change, National Actions to Reduce GHGs section. Also, see the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2 for additional information on GHG emission reductions and controls.
DR-MTDK-MC-13-0098-9	Monitoring information should be updated to reflect the current Air monitoring program. With the exception of the NCORE monitoring station, carbon monoxide monitoring was suspended throughout the state at the end of March 2011. All of the monitors at the Sidney, Birney, and Broadus monitoring stations are designated as State or Local Air Monitoring Station except for PM10 which is designated as a Special Purpose Monitor. The PM2.5 monitoring data for the Sidney, Birney, and Broadus monitoring stations appear to be mixed-up and referencing the wrong station.	See Chapter 3, Air Resources and Climate, Current Conditions section; and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, Table ARMP-1. Air quality monitoring data have been updated.
DR-MTDK-MC-13-0089-41	It is critical that the MCFO take a hard look at methods to reduce greenhouse gas (GHG) emissions and at how authorizations and management activities will ensure implementation of feasible GHG emission reduction strategies.	See Chapter 3, Air Resources and Climate, National Action to Reduce GHGs section for a summary of EPA's Greenhouse Gas Mandatory Reporting Rule (MRR) data. The BLM has taken a hard look at GHG emissions, based on new data from the USEPA's Greenhouse Gas Mandatory Reporting Rule. Methane emissions from many of the oil and gas potential sources of methane emissions were not reported by operators in the MCFO or were reported in quantities accounting for less than 1 percent of CO2e. MDEQ emission controls also reduce GHG emissions as explained in the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2.
DR-MTDK-MC-13-0089-42	Considerable information is available to the MCFO about methods to reduce methane emissions. If the MCFO is waiting to address GHG emissions at the APD stage to implement feasible GHG emission reduction strategies, this is a fatal flaw.	See Chapter 3, Air Resources and Climate, National Action to Reduce GHGs section for a summary of EPA's Greenhouse Gas Mandatory Reporting Rule (MRR) data. The BLM has taken a hard look at GHG emissions, based on new data from the USEPA's Greenhouse Gas Mandatory Reporting Rule. Methane emissions from many of the oil and gas potential sources of methane emissions were not reported by operators in the MCFO or were reported in quantities accounting for less than 1 percent of CO2e. MDEQ emission controls also reduce GHG emissions as explained in the Air Resources and Climate Appendix, Miles

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		City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2.
DR-MTDK-MC-13-0089-45	The EPA Natural Gas STAR measures are recognized as effective, and were developed with industry. There is no reason why BLM should not work to include these measures in the RMP process.	See Chapter 3, Air Resources and Climate, National Action to Reduce GHGs section for a summary of EPA's Greenhouse Gas Mandatory Reporting Rule (MRR) data. The BLM reviewed GHG emissions from oil and gas sources, based on new data from the USEPA's MRR. VOC and methane emissions from many of the oil and gas sources cited by the commenter were not reported by operators in the MCFO or were reported in quantities accounting for less than 1 percent of CO2e. MDEQ emission controls also reduce GHG emissions as explained in the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section section 1.5.2.
DR-MTDK-MC-13-0089-48	The Draft RMP should address how BLM/MCFO can use Subpart W data to identify methane emission sources, not only by identifying reported emissions from the planning area but also by using the GHGRP to become more familiar with significant emissions sources generally. The Draft RMP should also address how BLM/MCFO can use the EPA-prepared U.S. Inventory of GHG Emissions and Sinks to inform implementation of feasible GHG emission reduction strategies and to become more familiar with emissions sources.	See Chapter 3, Air Resources and Climate, National Action to Reduce GHGs section for a summary of EPA's Greenhouse Gas Mandatory Reporting Rule (MRR) data. Data acquired from the MRR is more helpful to the BLM for identifying feasible emission reduction strategies than data contained in the U.S. Inventory of GHG Emissions and Sinks.
DR-MTDK-MC-13-0098-4	The Draft RMP does not address smoke management for wildfires. We recommend incorporating information regarding the Montana-Idaho Interagency Smoke Management Coordination Strategy into the RMP.	See Chapter 3, Air Resources and Climate, Smoke Management section.
DR-MTDK-MC-13-0021-1	What statute and/or regulation directed BLM to manage Greater Sage-grouse habitat this aggressively? Show me where BLM is required by law, statute, regulation.	The Secretary's planning authority, exercised by the BLM, provides wide latitude to manage the public lands in a manner that, in some instances, may be quite protective of certain resources and values. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Conservation Strategies and Participatory Efforts section. WO Instruction Memorandum 2012-044 requires incorporation of conservation measures to reduce or remove the need to list sage-grouse under the ESA. BLM Manual 6840 addresses improving the condition of special status species and their habitats to a point where special status recognition is no longer warranted.

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DR-MTDK-MC-13-0103-10	Concerning the Sage Grouse issue, please refer to the study Landscape-Scale Factors Affecting Population Dynamics of Greater Sage-Grouse in North-Central Montana, 2001-2004 written by Brendan James Moynahan. The study goes into detail on many interesting points, including the fact that the main cause of nest failure was that of predators. We are asking that the option of controlling the number of predators be considered to increase the Sage-Grouse population.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Conservation Strategies and Participatory Efforts; Predation Relationship section for discussion. The BLM does not manage predators. Montana Fish, Wildlife and Parks manages wildlife species and harvest as well as potential transplants of any wildlife species, including predators.
DR-MTDK-MC-13-0104-12	Pg. 3-74 - "Sage-grouse populations decline by 2 percent annually (Connelly, Knick, Schroeder, Stiver, WAFWA 2004)." In the same paragraph the Montana-specific text indicates "The total number of males in these trend areas peaked in 2006 with 988 males. The number of males counted on trend areas declined from 2007 to 2009 but increased in 2010. The overall trend for sage-grouse in trend areas is stable (Beyer et al 2010)." Other cited data is also hard to interpret. Please clarify if the sage-grouse population in the planning area is stable or not.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Conservation Strategies and Participatory Efforts; Predation Relationship section for discussion. Montana's populations are relatively stable (Garton et al. 2011).
DR-MTDK-MC-13-0104-14	Pg. 3-76 - "Individual species have different thresholds of fragmentation tolerance; greater sage-grouse have large spatial requirements and eventually disappear from landscapes that no longer contain large patches of habitat while smaller birds like Sprague's pipit can persist in landscapes with smaller patches of habitat because their spatial requirements are smaller." The citation for this information is omitted. This needs to be provided, as the issue of fragmentation is extremely important in determining appropriate stipulations for sage-grouse.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Limiting Factors for Wildlife section for the reference “Davis 2004”.
DR-MTDK-MC-13-0104-15	Pg. 3-79 -"Greater sage-grouse and other sagebrush-obligate species are experiencing a "death by a thousand cuts.". BLM is required to present a balanced, unbiased document and statements like this are clearly inappropriate.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse section. This statement has been deleted.
DR-MTDK-MC-13-0104-17	BLM does not define what constitutes a sage-grouse "population." Are all the sage-grouse in the planning area considered to be part of one population?	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Planning Area Habitat Delineation and Management Classification section for discussion on population. The planning area is entirely within Management Zone 1 which includes the Yellowstone Watershed, Dakotas and Powder River Basin populations.
DR-MTDK-MC-13-	Pg. 4-130. The document seems to assume sage-grouse lek attendance is a reliable index of population numbers and trends. What is the scientific justification for this assumption?	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-

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0104-22		grouse; Planning Area Habitat Delineation and Management Classification section for discussion on population.
DR-MTDK-MC-13-0121-27	Please clarify whether (how) consanguinity affects management direction addressed in this Draft RMP. The Montana Sage Grouse Working Group (2005) indicates that Montana sage-grouse are representative of one population with good genetic diversity.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse section for a description on genetics and on-going research utilizing Greater Sage-grouse feather samples to determine consanguinity of birds.
DR-MTDK-MC-13-0121-33	Pg. 3-76. " Individual species have different thresholds of fragmentation tolerance; greater sage grouse have large spatial requirements and eventually disappear from landscapes that no longer contain large patches of habitat while smaller birds like Sprague's pipit can persist in landscapes with smaller patches of habitat because their spatial requirements are smaller." The source of the information (citation) regarding patch size thresholds for sage-grouse is not provided.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species, Limiting Factors for Wildlife section for reference Davis, 2004.
DR-MTDK-MC-13-0121-35	Pg. 3-79 " Greater sage-grouse and other sagebrush-obligate species are experiencing a death by a thousand cuts.". Metaphors such as death by a thousand cuts are grossly inappropriate and irresponsible as they can be variously interpreted.	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse section. This statement has been deleted.
DR-MTDK-MC-13-0121-37	Populations of sage-grouse are frequently mentioned in the cited reference and in the Draft RMP; however, there is no discussion of what constitutes a sage-grouse population. Are all of the sage grouse in the MCFO planning area one population?	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse; Planning Area Habitat Delineation and Management Classification section for discussion on population. The planning area is entirely within Management Zone 1 which includes the Yellowstone Watershed, Dakotas and Powder River Basin populations.
DR-MTDK-MC-13-0136-9	The NTT does not use Manual 6840 or ESA as a foundation upon which to build. In fact, it never even references Manual 6840 or the ESA, nor does it explain the need for an entirely new regulatory approach.	Refer to the NTT report for a description of its scope and status. The BLM considers many kinds of information in its planning process –both that provided by the public, and that provided by its staff and the staff of other agencies. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial) section; and the Fish, Aquatic and Wildlife Habitat, Including Special Status Species Appendix, where BLM Manual 6840 is referenced.
DR-MTDK-	Pg. 3-66 Correction (2nd to last paragraph): The black-footed ferret (Mustela frenata) was listed as an endangered species in 1967 under a precursor to the	See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian

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MC-13-0174-7	ESA. This should be Mustela nigripes, not frenata. Pg. 3-146 Correction (under ferret reintroduction): In order for the black-footed ferret to recover, it will be necessary to establish 10 separate self-sustaining populations (not colonies).	and Terrestrial); Special Status Species - Mammals, Black-footed Ferret section; and Special Designation Areas Appendix for changes made to the document.
	The BLM must fully identify and describe the "important resources" in the Carter MLP area. Additionally, the BLM should broaden the list of "important resources" to include all of the resources identified in the Montana State Office's MLP Assessment of November 2010. Resources identified in that assessment, but not explicitly accounted for in the analysis for the Carter MLP, include: "large intact landscapes" and "dispersed recreational uses." Montana State Office MLP Assessment (Nov. 2010).	See Chapter 3, for example, the Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Soils; and Vegetation sections for resources in the MLP. See Chapter 2, Comparison of Alternatives Table 2-5, Minerals, Oil and Gas, Proposed Carter MLP Area section for revisions. The MLP for the Carter area is no longer recommended.
DR-MTDK-MC-13-0110-1	Pg. 4-107. Who is going to keep the exclosure areas free of noxious weeds? Exclosures become infested with weeds to the point that the target species of plants are no longer viable.	See Chapter 3, Invasive Species. The BLM is responsible and prioritizes treatment areas by those areas of public access, riparian areas, emergency stabilization and rehab areas, and special status species habitat. Resource objectives determine when exclosures are treated.
DR-MTDK-MC-13-0188-7	No attempts have been made to explain the Bankhead-Jones acquired property, leaving the public believing that these properties are totally owned by the federal government, when they are not.	See Chapter 3, Lands and Realty section for a discussion on Bankhead-Jones lands.
DR-MTDK-MC-13-0112-2	Lands with Wilderness Characteristics are very limited. Adequate inventory and designation of these opportunities were not fully explored in the Miles City RMP. Lands with Wilderness Characteristics are very limited and once lost, can never be replaced. It is therefore emphasized that additional time and study be devoted to fully evaluating areas such as Dead Horse Badlands, Wild Horse Badlands, Powder River, Rough Creek, Wrangler Creek, and Buffalo Creek.	See Chapter 3, Lands with Wilderness Characteristics section. Section 201 of FLPMA under the policy of *6310 – Conducting Wilderness Characteristics Inventory on BLM Lands*, requires BLM maintain on a continuing basis an inventory of all public lands and their resources and other values, which includes wilderness characteristics. BLM performed data and on-site reviews as recently as the summer of 2013. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0001-1	Conduct wilderness inventories of Dead Horse Badlands, Corral Creek and Dry Creek, all near Ekalaka; Buck Creek in the Powder River Valley; and Wild Horse Badlands adjoining the C.M. Russell National Wildlife Refuge.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0109-1	New information about the BLM Wrangler Creek unit, demonstrates that Wrangler Creek has retained its wilderness characteristics.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013, including for the Wrangler Creek area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness

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		Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0109-2	The lands adjacent to the Buffalo Creek Wilderness Study Area appear to comply with the criteria for identifying lands with wilderness characteristics as explained in the BLM Manual 6310.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013. Lands adjacent to the Buffalo Creek WSA have been inventoried by the BLM. Based on the 2013 inventory, Chapter 3 was updated.
DR-MTDK-MC-13-0129-2	Wrangler Creek was disqualified by the BLM as a land with wilderness characteristics because it lacked solitude. In fact, there are ample opportunities for solitude with the trees and other vegetation, rough breaks, and coulees provide screening Opportunities also exist for primitive recreation like camping, hiking, rock hounding, and hunting. As a point of comparison, consider the findings for solitude in the Miles City Wrangler Creek Unit against any number of units within the Lower Sonoran field office. In the latter, the metropolitan area of Phoenix (population: 3.2 million) can be seen from various vantage points within a number of units, though these sights and sounds outside the unit do not create a "pervasive and omnipresent" impact.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013, including for the Wrangler Creek area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0169-2	Wild Horse Badlands adjacent to the C.M. Russell National Wildlife Refuge meets BLM' s criteria for lands with wilderness characteristics. Although less than 5,000 acres, it meets the size criteria because, as stated in the BLM Manual 6310, an area is of sufficient size if it is large enough to make practical its preservation and use in an unimpaired condition.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013, including for the Wild Horse Badlands area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0169-3	Deadhorse Badlands, Corral Creek, and Dry Creek near Ekalaka and Buck Creek in the Powder River Valley meet lands with wilderness characteristics criteria.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0169-7	Wrangler Creek area possesses wilderness character and should be managed as such. The area is over 5,000 acres in size with no public access for vehicles. In fact, the area is only accessed by foot via the Moorehead road. There are no roads within the area and the old mining sites have been restored. And, the forest stands, native vegetation, rough breaks, and coulees that make up the scenic landscape screen outside noises, provide outstanding opportunities for solitude, and primitive recreational opportunities. The ridges within Wrangler Creek also provide great views of the cottonwood lined Powder River valley. In short, its a great place to camp, hike, rock climb, and hunt.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013, including for the Wrangler Creek area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-	Deadhorse Badlands (MT-024-715): BLM's inventory form states that the area	See Chapter 3, Lands with Wilderness Characteristics. BLM

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MTDK-MC-13-0169-8	is not natural and fails to provide outstanding opportunities for solitude or primitive and unconfined recreation. But the man-made features that do exist on the landscape (stock ponds, fencing, two-tracks) are substantially unnoticeable as defined by BLM Manual 6310. BLM refers to one route in the area as a road, but the route does not show any signs of maintenance. And, even though the area does not provide a high amount of topographic or vegetative screening, the overall size of the area does permit opportunities for solitude.	performed data and on-site reviews as recently as the summer of 2013, including for the Deadhorse Badlands area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0169-9	Dry Creek (MT-024-709): BLM states this area does not provide outstanding opportunities for solitude, primarily due to the lack of vegetative screening. But the area is approximately 9,200 acres is size which means there is very little, if any, chance of coming into contact with other visitors on a frequent basis. According to BLM's Manual 6310, factors that influence solitude include size, configuration, topographic and vegetative screening, and the ability of the visitor to find seclusion.	See Chapter 3, Lands with Wilderness Characteristics. BLM performed data and on-site reviews as recently as the summer of 2013, including for the Dry Creek area. See Chapter 2, Comparison of Alternatives Table 2-5, Lands with Wilderness Characteristics section for areas BLM proposes to manage for wilderness characteristics.
DR-MTDK-MC-13-0105-6	The RMP states that oil and gas leases are only noticed in the BLM office in Billings. In the case of split estate, the surface owners deserve more respect and the lease sale should be noticed in a newspaper located in the county the development is proposed.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas section and the Minerals Appendix, Fluid Minerals, Leasing Process section regarding the 2010 leasing reform that includes public involvement at all stages.
DR-MTDK-MC-13-0162-6	The 2010 Energy Lease Reforms should be fully implemented; it is hard to tell if this RMP does that.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas section; and the Minerals Appendix, Fluid Minerals, Leasing Process section regarding the 2010 leasing reform, WO IM No. 2010-117.
DR-MTDK-MC-13-0097-19	Page MIN-100 states: "There are currently no active carbon dioxide EOR projects in the planning area .... " This statement is now outdated.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas, Conventional Oil and Gas section where the Bell Creek CO2 EOR project is included. See the Minerals Appendix, Fluid Minerals section for revisions.
DR-MTDK-MC-13-0097-11	The Draft RMP does not disclose the amount or location of existing oil and gas leases. This makes review and comment on the effect proposed management designations will have on existing lease development difficult.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas, Historical Drilling and Leasing Activity, Existing Leases section for the acres of existing oil and gas leases as of February 2014. Also, see several sections in the front of Chapter 2; for example, under the directions "How To Read Table 2-5" for discussion on valid existing rights.
DR-MTDK-MC-13-0104-4	BLM has failed to disclose data on the number of acres currently leased.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas, Historical Drilling and Leasing Activity, Existing Leases section for acres of existing oil and gas leases as of February 2014.
DR-	The RMP does not distinguish the difference between acres leased for minerals.	See Chapter 3, Minerals, Leasable Minerals, Oil and Gas,

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MTDK-MC-13-0105-4	It only states the acreage that will be offered for leasing. The Federal government retained many of the minerals under the lands in Montana. The surface is often owned by private individuals. The RMP should state how many minerals are under BLM land versus how many are under privately owned surface.	Historical Drilling and Leasing Activity, Existing Leases section for acres of existing oil and gas leases as of February 2014.
DR-MTDK-MC-13-0134-2	Through the RMP, the BLM should make sure that stronger casing and cementing standards are in place. These standards are currently included in the draft chemical disclosure and well stimulation rules just released by the BLM.	See Chapter 3, Minerals, Oil and Gas; and the Minerals Appendix, Fluid Minerals section for changes. All well casing and cementing operations that occur on Federal/Indian lands would be reviewed and approved by BLM and conducted in accordance with the applicable requirements specified in Onshore Oil and Gas Order No. 2, other BLM regulations, and the American Petroleum Institute (API) standards.
DR-MTDK-MC-13-0152-1	Any change in land management will cause significant socio-economic impacts to the State, County, and Local governments and to the oil and gas industry. A full economic analysis should be conducted and the economic impacts ($) by Alternative should be clearly outlined	See Chapter 3, Social and Economic section for the description of social, economic and environmental justice conditions and trends and the description of social, economic and environmental justice impacts in Chapter 4, Social and Economic, Economics section, which describes changes in employment, income, in various private sectors and changes to social conditions including effects from changes in anticipated oil and gas activity.
DR-MTDK-MC-13-0164-3	Include the economic impacts the Proposed RMP would have on small towns, local businesses, agriculture, and property values. Include an analysis of the impacts the RMP would have on private property rights, land values, land access, agricultural permitting, surface use and any other use of private property that may be inhibited as a result of this the Proposed RMP. Include the impacts of lost agricultural production as a result of the RMP, increases in unemployment rates, decreases in private sector job opportunities, and the negative impacts of additional restrictions on energy and natural resource development efforts.	See Chapter 3, Social and Economic section, for the description of social, economic and environmental justice conditions and trends; and their impacts in Chapter 4, same section.
DR-MTDK-MC-13-0090-8	On pg. 3-159 of the Draft RMP it states that jobs in agriculture make up 18 percent and on pg. 3-160 of the Draft RMP it states that employment in recreation and tourism make up another 42 percent of the jobs. This total of 60 percent shows the large majority of jobs in the planning area are from agriculture and recreation. On pg. 3-163 of the Draft RMP the matrix chart reflects the usage types for recreation. Your conclusion from this table reflects more than 60 percent of the use is driven by fish and wildlife. You use this determination to bolster your conclusion of the importance of wildlife and does not accurately reflect the importance of access. I believe your analysis of the information in the chart on pg. 3-163 is flawed.	See Chapter 3, Social and Economic section, Social and Economic, Economics for revisions.

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DR-MTDK-MC-13-0126-4	Chapter 3, pg. 45. Vegetation Hardwood draws are given their own section under vegetation in Chapter 2 but are not mentioned in Chapter 3.	See Chapter 3, Vegetation, Hardwood Draws section for added text.
DR-MTDK-MC-13-0126-6	Chapter 3, pg. 45, Shrublands Artemisia tridentata ssp. tridentata, A. tridentata vaseyana, A. nova, and Purshia tridentatado do not occur on the MCFO lands.	See Chapter 3, Vegetation, Plant Communities section for revisions.
DR-MTDK-MC-13-0117-8	In certain areas of the Draft RMP the BLM states that there are 2.8 million surface acres that it administers, but at pg. 3-45 of the Draft RMP , the BLM states that grasslands cover 3.6 million of BLM's administered acres. There seems to be an error.	See Chapter 3, Vegetation, Plant Communities section; the 3.6 million acre number has been removed.
DR-MTDK-MC-13-0146-2	Pg. 3-45, Plant Communities/Grasslands: this sentence states that there are 3.6 million acres administered in the planning area. Is this correct?	See Chapter 3, Vegetation, Plant Communities section; the 3.6 million acre number has been removed.
DR-MTDK-MC-13-0126-7	Chapter 3, pg. 47 Table 3-47 Astragalus aretioides, Cleomeluiea, Erigeron aliocotus, Grayia spinosa, and Sullivantia hapemanii do not occur in the MCFO area and are not likely to occur there.	See Chapter 3, Vegetation, Plant Species of Concern section for revisions.
DR-MTDK-MC-13-0126-3	Chapter 3, pg. 29, Surface water. There is no mention of the numerous stock pond impoundments that are present on BLM lands in eastern Montana. These impoundments trap surface water during spring runoff that would otherwise help to cause the downstream flooding that is necessary for the regeneration of cottonwood and willow habitats which, in turn, support numerous species of wildlife.	See Chapter 3, Water Resources, Surface Water section for discussion.
DR-MTDK-MC-13-0134-4	While the RMP thus affirms the importance of water, almost nowhere in the document are the impacts to water quantity from oil and gas development directly addressed and mitigated through the alternatives. The BLM has not yet documented the amount of water used for federal oil and gas drilling to date. This needs to be done. One resource that may be of use to the BLM is the draft USGS study on the availability of groundwater in the Williston and Powder River Basins.	See Chapter 3, Water Resources, tables showing the 2005 surface and groundwater withdrawals for counties in the planning area. These tables show the volume of water withdrawn from surface water and groundwater sources for all uses. The USGS is currently investigating the regional aquifers of the Williston and Powder River structural basins in order to evaluate different water-use and energy-development scenarios, but the results of these associated studies are not yet available. Although Onshore Oil and Gas Order Number 1 requires operators to disclose the source for all water anticipated for use in drilling the proposed well, operators are not required to disclose the volume of water used to drill the proposed well.

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DR-MTDK-MC-13-0190-8	There are numerous references to waters that are "impaired," "threatened," "on the 303(d) list," and "on the 305(b) list." In some cases, it may be simpler to just refer to waters that are on "Montana's 2012 List of Impaired Waters." This list can be found in Appendix A of Montana's 2012 Water Quality Integrated Report. The list includes all waters for which there are known impairments. A copy of Appendix A can be downloaded from the following website: http://cwaic.mt.gov/wq_reps.aspx?yr=2012qryId=100667.	See Chapter 3, Water Resources, Water Quality section and the Water Appendix, Impaired Waterbodies in the Planning Area section for changes in the text.
DR-MTDK-MC-13-0190-1	The "2007 Montana Nonpoint Source Management Plan" is obsolete. It was replaced by the "2012 Montana Nonpoint Source Management Plan". The 2012 plan is available for download at the following DEQ website: http://deq.mt.gov/wqinfo/nonpoint/NonpointSourceProgram.mcpx.	See Chapter 3, Water Resources, Water Quality section for updated text.
DR-MTDK-MC-13-0190-2	The "Draft Redwater River Nutrient and Salinity TMDLs and Framework Water Quality Improvement Plan (2010)" has been finalized. The final document is titled "Redwater River Nutrient and Salinity TMDLs and Framework Water Quality Improvement Plan". It is available for download at the following DEQ website: http://www.deq.mt.gov/wqinfo/TMDL/finalReports.mcpx.	See Chapter 3, Water Resources, Water Quality section for updated text.
DR-MTDK-MC-13-0102-16	Update the reference on pg. 3-42 to the Northern Cheyenne Tribe's water quality standards, which were approved by the EPA on March 21,2013, with no action taken on the electrical conductivity (EC) and sodium absorption ratio (SAR) criteria. The approved standards apply to all Reservation surface waters. BLM can also direct the reader to the following link for more information from the Northern Cheyenne website: http://www.cheyennenation.comlwater.html.	See Chapter 3, Water Resources, Water Quality section. The text of the analysis has been changed.
DR-MTDK-MC-13-0190-3	DEQ's 2010 Water Quality Integrated Report (303(d)/305(b)) is now obsolete. It has been replaced by the 2012 Water Quality Integrated Report. A copy of the 2012 report can be downloaded from the following website: http://cwaic.mt.gov/wq_reps.aspx?yr=2012qryId=100667.	See Chapter 3, Water Resources, Water Quality section; and the Water Appendix, Tables 2 and 3 and the Impaired Waterbodies in the Planning Area section for modifications made to include data from the 2012 Water Quality Integrated Report.
DR-MTDK-MC-13-0102-15	Reference Montana's 2012 Clean Water Act(CWA) Section 303(d) Impaired Waters List, as approved by the EPA, and discuss water quality trends observed between 2010 and 2012 to more fully describe current conditions in, and downstream of, the planning area. If MDEQ has not assessed the water quality in all waterbodies within the planning area, then list such waterbodies and indicate that the water quality condition has not yet been assessed by MDEQ.	See Chapter 3, Water Resources, Water Quality section; the Impaired Waterbodies in the Planning Area section in the Water Appendix, and Impaired Streams and Rivers, Reservoirs and Lakes tables in the Water Appendix. They have been modified to include data from the 2012 Water Quality Integrated Report. Information for waterbodies not listed as impaired in the Water Appendix of the PRMP/FEIS may be accessed via Montana DEQ's Clean Water Act Information Center at: http://cwaic.mt.gov.
DR-MTDK-	Water Appendix, pg. WAT-6, Table 2. The information in this table comes from the 2010 Montana List of Impaired Waters. The 2012 List is the most	See Chapter 3, Water Resources, Water Quality section; the Impaired Waterbodies in the Planning Area section in the Water

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MC-13-0190-12	current.	Appendix, and Tables 2 and 3 in the Water Appendix. They have been modified to include data from the 2012 Water Quality Integrated Report.
DR-MTDK-MC-13-0117-33	Though the Draft RMP states, "BLM resources management would impact local economy's dependence on the livestock industry, oil and gas exploration and production, coal mining, and recreation activities" the Draft RMP does not provide any further analysis of the economic impacts.	See Chapter 4 for analyses from BLM's proposed actions.
DR-MTDK-MC-13-0136-7	Include a detailed socioeconomic analysis of the impacts related to locatable minerals.	See Chapter 4 for analyses from BLM's proposed actions. ***Mineral Development:*** Leasing and development of federal minerals would continue under all alternatives. Continued mineral development within the MCFO includes crude oil, natural gas, coal, and bentonite. The amount of bentonite mined on federal lands is a function of market demand, more so than a function of amount of land available to mine. Over the next 20 years, market demand for bentonite is anticipated to remain relatively constant. Nominal increases in market demand for bentonite are anticipated to result in static production with annual production on BLM-administered lands within the MCFO ranging between 300,000 to 350,000 tons per year under all alternatives. Bentonite is a locatable mineral and the federal government collects $2.8 million from bentonite mining activities within the MCFO.
DR-MTDK-MC-13-0053-1	1. Prairie County was not responsible for the Miles City District Draft RMP being at least 2 years behind schedule according to our MOU for Cooperative Agency. 2. The BLM has no legal responsibility to meet a court-ordered deadline that was directed to the U. S. Fish and Wildlife Service. 3. The BLM's directive does not come from USFWS, but rather FLPMA. 4. USFWS has the responsibility to implement the ESA and not the BLM. 5. The Miles City District Planning Team did not do or address the regulations that are part of your "Desktop Guide to Cooperative Agency Relations". Satisfaction of the regulations is a requirement of NEPA. 43 CFR 1610.3-2. and 40 CFR 1502.16 (CEQ)[The environmental consequences section of the EIS] shall include discussions of ... (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. 40 CFR 1506.2 (CEQ)(d). To better integrate environmental impact statements into state and local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan or	See Chapter 4 for the anticipated impacts from BLM's proposed actions. See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.

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	laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency's would reconcile its proposed action with the plan or law.	
DR-MTDK-MC-13-0085-3	40 CFR 1502.16 (CEQ) . [The environmental consequences section of the EIS] shall include discussions of.. c) Possible conflicts between the proposed action and the objectives of Federal, Regional, State and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.	See Chapter 4 for the anticipated impacts from BLM's proposed actions. See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0149-1	43 CFR 1610.3-2 (BLM) Consistency requirements (a) Guidance and resource management plans and amendments ... shall be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other Federal agencies, State and local governments, and Indian tribes, so long as the guidance and resource management plans are also consistent with the purposes, policies, and programs of Federal laws and regulations applicable to public lands. 40 CFR 1502.16 (CEQ) [The environmental consequences section of the EIS] shall include discussions of... (c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned. 40 CFR 1506.2 (CEQ) (d) To better integrate environmental impact statements into state and local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan or laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency's would reconcile its proposed action with the plan or law.	See Chapter 4 for the anticipated impacts from BLM's proposed actions. See Chapter 5 Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0193-3	40 CFR 1502.16 (CEQ)[The environmental consequences section of the EIS] shall include discussions of...(c) Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.	See Chapter 4 for the anticipated impacts from BLM's proposed actions. See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0130-8	The BLM does no analysis of the projected methane emissions from coal mining, stating that Methane emissions from proposed new or expanded coal mines would be estimated as part of project-level planning, and emission reduction measures would be considered. BLM needs to account for methane emissions of the potential coal mines in the resource planning area and revise the RMP.	See Chapter 4, Air Resources and Climate, alternative-specific emission inventories sections for methane emissions included. Also, detailed emission inventories are included within the Air Resources and Climate Appendix, Air Resource Technical Support Document.
DR-MTDK-	Even if science cannot isolate each additional gas well contribution to overall emissions, this does not obviate BLM's responsibility to consider oil and gas	See Chapter 4, Air Resources and Climate, alternative-specific sections, where aggregate GHG emissions for each alternative

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MC-13-0089-10	development in the MCFO from the cumulative impacts of the oil and gas sector.	are provided. Detailed emission inventories are provided in the *Air Resource Technical Support Document*.
DR-MTDK-MC-13-0089-16	BLM does not provide any consideration of the relationship between GHG emissions and the RMP decision made, and fails to address or identify any alternatives or mitigation of GHG emissions from oil and gas development in the Miles City RMP.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document for GHG emission inventories. GHG BMPs are provided in the Mitigation Measures and Conservation Actions Appendix. Note, the USEPA and MDEQ require emission controls that reduce GHG emissions, as described in the Chapter 3, "Air Resources and Climate," "Climate Change," "National Actions to Reduce GHGs" section and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2.
DR-MTDK-MC-13-0089-19	The methane emission estimates are important given the noted importance of near term action to ameliorate climate change - near term action that scientists say should focus, inter alia, on preventing the emission of short-lived but potent GHGs like methane while, at the same time, stemming the ongoing increase in the concentration of carbon dioxide. These uncertainties necessitate analysis in the Miles City RMP.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document for GHG emission inventories. GHG BMPs are provided in the Mitigation Measures and Conservation Actions Appendix. Note, the USEPA and MDEQ require emission controls that reduce GHG emissions, as described in the Chapter 3, "Air Resources and Climate," "Climate Change," "National Actions to Reduce GHGs" section and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2.
DR-MTDK-MC-13-0089-20	BLM has an opportunity to improve our knowledge base regarding GHG emissions from oil and gas production. Take the requisite hard look NEPA analysis before selling and executing oil and gas leases.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document for GHG emission inventories. GHG BMPs are provided in the Mitigation Measures and Conservation Actions Appendix. Note, the USEPA and MDEQ require emission controls that reduce GHG emissions, as described in the Chapter 3, "Air Resources and Climate," "Climate Change," "National Actions to Reduce GHGs" section and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2. Also, the requisite level of information necessary

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		to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decisions. As the PRMP/FEIS analyzes land use planning-level decisions, which by their nature are broad in scope, the requisite level of data and information is more generalized in order to apply a wide-ranging landscape perspective. Although the BLM realizes that more data and more site-specific data could always be gathered, the baseline data used in the EIS provides the necessary basis to make informed land use plan-level decisions.
DR-MTDK-MC-13-0089-25	Emissions from oil and gas development are not limited only to combustion, rather they occur throughout the chain of production - with some of the greatest emissions occurring at the point of extraction. These impacts are a consequence of various stages of oil and gas development from the drilling and fracking of oil and gas wells, to air quality impacts and the release of hazardous emissions. The MCFO has failed to sufficiently address and analyze these impacts.	See Chapter 4, Air Resources and Climate, alternative-specific sections. Emissions from non-combustion sources are included in the emission inventories provided for each Alternative. Detailed emission inventories are provided in the *Air Resource Technical Support Document*. Air resource impacts associated with these emissions are explained in Chapter 4, Air Resources and Climate.
DR-MTDK-MC-13-0089-37	In addition to the cumulative effects of conventional air pollution, energy development in the region is causing significant GHG pollution in the form of methane emissions. BLM must consider the cumulative impacts of oil and gas and coal development in the area.	See Chapter 4, Air Resources and Climate, alternative-specific sections. Methane emissions for each alternative are provided. Detailed emission inventories are provided in the Air Resources and Climate Appendix, Air Resource Technical Support Document.
DR-MTDK-MC-13-0098-8	The Draft RMP states that the oil and gas emission inventories were generally based on emission standards required by DEQ and EPA. The Daft RMP identifies new Federal regulations and states that the oil and gas emission inventories will be updated in the Proposed RMP to address these regulatory changes. However it is not clear if BLM considered DEQ's reasonable precautions or emission control requirements in the inventory development.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document. Emission inventories have been updated to reflect additional MDEQ regulations.
DR-MTDK-MC-13-0121-10	The MCFO should take into account the reduction in emissions associated with the New Source Performance Standards (NSPS) 1 and the National Emission Standards for Hazardous Air Pollutants (NESHAP) 1 also known as Maximum Achievable Control Technology (MAST) standards.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document. Emission inventories have been updated to reflect recent EPA and additional MDEQ regulations.
DR-MTDK-MC-13-0121-7	The GHG emissions predicted by BLM are higher than actual because federally approved regulations that were already designed to reduce GHGs were not taken into account.	See Chapter 4, Air Resources and Climate, alternative-specific sections and the Air Resources and Climate Appendix, Air Resource Technical Support Document. Emission inventories have been updated to reflect recent EPA regulations that will reduce GHG emissions.

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DR-MTDK-MC-13-0121-14	Pg. 4-14. The Draft RMP discusses the fact that AQRV analysis will be fully conducted using the CALPUFF and PGM modeling results. There is would be no opportunity afforded the public to comment on this analysis.	See Chapter 4, Air Resources and Climate, AQRV Impacts section and in the Air Resource Technical Support Document for the CALPUFF modeling methodology and results. PGM methodologies and results are provided to the public via the MCFO website.
DR-MTDK-MC-13-0167-3	In the discussion of all the Chapter 4 alternatives, it states that future PGM modeling will be used. The statements should reference both limited AQRV analysis that will occur now and the PGM modeling analysis that will occur in the future to evaluate potential air impacts.	See Chapter 4, Air Resources and Climate, AQRV Impacts section. Results of the limited visibility analysis performed after completion of the Draft RMP/EIS are provided.
DR-MTDK-MC-13-0089-36	In addition to the cumulative land disturbance from energy development in the region, BLM has failed to consider the cumulative impacts of air pollution caused by this development.	See Chapter 4, Air Resources and Climate, Cumulative Impacts section; and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 5.1. Cumulative air pollution impacts are addressed qualitatively based on available data.
DR-MTDK-MC-13-0089-5	By dismissing the additional contributions of air pollutants as negligible or a small contribution to a percentage of the NAAQS, the MCFO also fails to consider the cumulative impacts of air pollution caused by the oil and gas development. Include operations at the Colstrip coal-fired power plant, which uses coal from the Rosebud Mine. Colstrip causes significant air pollution, including emissions of sulfur dioxide (SO2).	See Chapter 4, Air Resources and Climate, Cumulative section for discussion of air quality and AQRV cumulative impact analysis; as well as the discussion of future cumulative modeling in the *Air Resources and Climate Appendix*, "Air Resource Management Plan," "Future Modeling" section.
DR-MTDK-MC-13-0089-3	The MCFO's preferred alternative calls for oil and gas activity that would add to regional emissions, with emission increases up to at least 47 percent. Draft EIS at pg. 4-7 - 4-8. Although the MCFO has modeled some of the air quality impacts, it dismissed many of the admitted increases as negligible because they will not exceed NAAQS. Draft EIS at pg. 4-13 - 4-14. This analysis does not consider, as the MCFO notes, more localized impacts that may be much greater, or more constant. The impacts of these shorter term and more localized impacts should not be discounted.	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section and the Air Resources and Climate Appendix, *Air Resource Technical Support Document*. Localized air quality impacts were predicted via AERMOD modeling, which assessed local impacts of oil and gas drilling, completion, construction, and production activities.
DR-MTDK-MC-13-0097-21	The BLM's appropriate role in addressing air quality in land use plans is to "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans." 43 U.S.C. § 1712(c)(8). The proposed air quality mitigation requirements do not simply "provide for compliance" with applicable MDEQ air emission regulation. Instead, they supersede and displace the state regulatory authority. For example, proposed mitigation includes requirements to implement particular control technologies, utilize particular types of fuel, and use only certain types of engine technology. See pg. ARMP-16 through	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section for an explanation of Tier 2 versus Tier 4 modeled impacts. Also see Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.3.

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	ARMP-19.	
DR-MTDK-MC-13-0102-1	BLM conducted near-field modeling to disclose potential impacts to the National Ambient Air Quality Standards (NAAQS) in the MCFO planning area. However, it appears that the 3-hr SO2 NAAQS analysis was omitted from the near-field modeling runs for the Draft RMP although it was included in the modeling protocol agreed to through the AQTW.	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section where modeling results for the 3-hr SO2 standard are included.
DR-MTDK-MC-13-0108-21	With respect to the BLM's proposal to require Tier 4 engines on diesel-powered drill rigs, id. at pg. 4-7: Whether such extraordinary emission controls on equipment are necessary to protect air quality should be based upon model-predicted impacts as they compare to applicable EPA-established air quality standards and prevention of significant deterioration increments; BLM should not presume that such controls are necessary before their actual need is demonstrated. Additionally, in Montana, the Montana DEQ is charged with the monitoring and protection of air quality, including on federal surface, under the authority of its EPA-approved Clean Air Act program.	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section for an explanation of Tier 2 versus Tier 4 modeled impacts. Also, see the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management for Oil and Gas Resources, section 1.5.3.
DR-MTDK-MC-13-0121-13	The State already successfully manages an EPA approved air quality program; and, it has been demonstrated the oil and gas activities with the planning area will not result in diminished air quality. Consequently, the requirement to implement Tier 4 engines is unnecessary, exceeds BLM's statutory authority and must, therefore, be eliminated.	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section for an explanation of Tier 2 versus Tier 4 modeled impacts. See Chapter 2, Comparison of Alternatives Table 2-5, Air Resources and Climate, Alternatives A – E for proposed management of Tier 4 engines. Also see the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management for Oil and Gas Resources, section 1.5.3.
DR-MTDK-MC-13-0121-8	The numbers documented in the Draft RMP show exceedances of PSD increments. The analysis is not appropriate for evaluating air quality impacts and must be removed from the document. It is the responsibility of MDEQ to implement the PSD permitting program for major sources.	See Chapter 4, Air Resources and Climate, Near-field Criteria Air Pollutant Concentrations from Oil and Gas Activities section. The PSD increment analysis is not a regulatory analysis and is presented only to provide context.
DR-MTDK-MC-13-0089-54	The MLP process provides another mechanism for the MCFO to address air quality impacts, including greenhouse gas pollution, from oil and gas operations. MCFO should consider, in an MLP, the impacts to air quality from oil and gas development in the area, areas where development should be limited or prohibited, and stipulations to reduce or capture emissions where development is allowed.	See Chapter 4, Air Resources and Climate. Climate change impacts and near-field/far-field air resource impacts are addressed throughout the planning area. See Chapter 2, Minerals section. The MLP is no longer recommended under the PRMP/FEIS.
DR-MTDK-MC-13-0167-2	VISCREEN is addressed in the Appendix, but is not described in Chapter 4. The "Far-field AQRV Impacts" section should be renamed to "AQRV Impacts" and should include the commitment to perform near-field analysis.	See Chapter 4, Air Resources and Climate. This section has been revised to modify the heading and include a summary of VISCREEN results.

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DR-MTDK-MC-13-0142-13	There is little explanation of what constitutes the specific type of projects being disclosed. For example, does the term "pipeline" refer to only gathering lines in an oil and gas field? What does the "ROW" category include? Does the term "Major Pipeline" refer only to interstate pipelines? Does Table 4-1 limit the number of acres and projects listed for the life of the RMP?	See Chapter 4, Analytical Assumptions section for revisions. Also, see Table 1 in the Disturbance Appendix for more information.
DR-MTDK-MC-13-0142-14	Will Table 4-1 impose a limit on the amount of surface disturbance for the various categories of activities?	See Chapter 4, Analytical Assumptions section. Assumptions are made only for the purpose of analysis and do not represent potential RMP decisions.
DR-MTDK-MC-13-0130-13	The Draft RMP mentions cumulative impacts of those pertaining to the Nelson Creek Project (near Circle, Montana, in McCone County), a 500-megawatt, lignite burning, coal-fired power plant that is completely defunct and has been moved to North Dakota, yet there is not one mention of the second largest coal fired power plant in the Nation, the Colstrip Power Plant, a 2700 megawatt plant, more than 5 times the size of the proposed Nelson Creek project.	See Chapter 4, Analytical Assumptions, Type of Impacts, Cumulative Impacts section for revisions. The Nelson Creek Project has been removed from the list. The power plant in Colstrip is considered in the effects to air. See the Air Resources and Climate Appendix.
DR-MTDK-MC-13-0108-15	In Chapter 4 of the Draft RMP/EIS, the discussion of the various RMP alternative impacts on coal resources is very difficult to follow because different information is disclosed for each alternative. The RMP should be revised so that a true comparison of impacts can be made.	See Chapter 4, Coal section for revisions.
DR-MTDK-MC-13-0176-5	Address the cumulative effects of the Tongue RR, oil drilling, CBM and coal mining, increased development associated with increasing human population.	See Chapter 4, Cumulative Impacts sections for cumulative effects assessed.
DR-MTDK-MC-13-0089-34	NEPA requires BLM MCFO to look at the cumulative impacts of the Proposed Action. See 40 C.F.R. § 1508.25. Failure to include cumulative impacts of all the mineral development authorized by the Miles City RMP segments the process of coal, oil and gas development into many mini-NEPAs. This practice, in turn, has the effect of hiding the fact that the cumulative impacts of all the segments are significant.	See Chapter 4, Environmental Consequences. Cumulative effects to resources from mineral development are found at the end of each of the Resource topics.
DR-MTDK-MC-13-0090-31	Sage Grouse populations have flourished because of the benefit of agriculture to their habitat. These improvements include grains and seeds from agriculture production, water facilities and haystacks for feeding and cover. All these benefits must be recognized and the Sage Grouse strategy must include a cost benefit analysis of the restrictions or potential removal of agriculture on the landscape.	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for effects to Greater Sage-grouse habitat, including the cumulative effects.
DR-MTDK-MC-13-	Pg. 4-135 -"In some areas, such as the Cedar Creek Anticline, decreased male sage-grouse lek attendance has exceeded 80 percent, which is largely attributed to oil and gas development." What is the citation for this information?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for modifications.

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0104-24		
DR-MTDK-MC-13-0104-28	Pg. 4-165. If it is assumed that male lek attendance is an index of population status, then the logic would be that a small lek would equate to a small population and a large lek would equate to a large population, as a direct proportion. If this is not the case what is the relationship between numbers of males on a lek and population status? Why would large leks be a better indicator of population status than small leks?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section. Large leks (more than 25 males) are needed to keep Greater Sage-grouse on the landscape (see Taylor et al. 2010) and, continue to be the best indicator of population status.
DR-MTDK-MC-13-0104-32	On pgs. 4-136, 4-140, 4-146, 4-154, 4-161, in the Environmental Consequences, Fish and Wildlife, Terrestrial section, there is a sentence included under each alternative which says "The oil and gas RFD for this RMP predicts development of 278 CBNG wells, which would disturb an estimated 134 acres." Given the different restrictions on leasing acreage, NSO stipulations, and CSU stipulations, there is no way the same number of wells could be drilled under each alternative.	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for modifications to the impact analyses.
DR-MTDK-MC-13-0121-23	Oil and gas well pad densities are cited in Chapters 3 and 4 as having an effect on sage-grouse and sage-grouse habitat. What are the well-pad densities assumed for the alternatives?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section and the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenario for Resource Management Plan Alternatives section for revisions to the RFD and impact analyses.
DR-MTDK-MC-13-0121-34	While grazing has the potential to affect sage-grouse habitat, the Draft RMP fails to describe how sage grouse habitat and displacement of sage-grouse have been affected by grazing practices in the MCFO planning area. What studies have been done to distinguish between impacts to sage-grouse and habitat from grazing as compared to energy development? What is the range condition of sage-grouse habitats within the MCFO planning area?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species, Alternative E for potential effects to Greater Sage-grouse habitat from livestock grazing. Studies considered are found in Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species - Avian; Greater Sage-grouse section. See Chapter 3, Livestock Grazing, Rangeland Health section for rangeland condition summaries and descriptions. Range conditions (including Greater Sage-grouse habitat) across 98% of the Miles City Field Office currently meet all five Rangeland Health Standards.
DR-MTDK-MC-13-0121-47	Page 4-135 " Male lek attendance would be expected to be reduced when subjected to the current standard noise limitation of 50 decibels at the lek site. What is the source of this information?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for modifications.
DR-MTDK-MC-13-0121-53	Page 4-165. If it is assumed that male lek attendance is an index of population status, then the logic would be that a small lek would equate to a small population and a large lek would equate to a large population, as a direct proportion. If this is not the case, what is the relationship between numbers of males on a lek and population status? Why would large leks be a better	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section. Large leks (more than 25 males) are needed to keep Greater Sage-grouse on the landscape (see Taylor et al. 2010) and, continue to be the best indicator of population status.

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	indicator of population status than small leks?	
DR-MTDK-MC-13-0121-54	On what is the conjecture based that 8 or more well pads per section and some undefined level of additional development would result in the complete loss of sage-grouse?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section and the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section for revisions to the RFD and impact analyses.
DR-MTDK-MC-13-0142-23	Page 4-165. If it is assumed that male lek attendance is an index of population status, then the logic would be that a small lek would equate to a small population and a large lek would equate to a large population, as a direct proportion. If this is not implied in the above statement on pg. 4-165, what is the relationship between numbers of males on a lek and population status?	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section. Large leks (more than 25 males) are needed to keep Greater Sage-grouse on the landscape (see Taylor et al. 2010) and, continue to be the best indicator of population status.
DR-MTDK-MC-13-0196-6	It is also unclear how the totals for sage-grouse priority habitat areas and general habitat areas under Alternative E in Table 2-1 equate to the totals in Table 4-88 (pg. 4-273) and Table 4-90 (4-274) (e.g., 830,000 surface acres priority habitat, 1,600,000 surface acres general habitat).	See Chapter 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section for revisions.
DR-MTDK-MC-13-0169-17	The drastic and alarming decline in the natural habitat and numbers of greater sage-grouse (along with other game species such as pronghorn, sharp-tailed grouse, mule deer and non-game species like plover, Sprague's pipit, badger, jack rabbit, prairie dogs, and ferrets), in particular, requires special attention. BLM must take a hard look at how the proposed action directly (and, as discussed below, indirectly and cumulatively) impacts these important natural resources. Oil and gas development and ever increasing motorized access and use of public lands has resulted in the overall loss and degradation that is putting sage grouse and other species in peril. The impacts, therefore, must be carefully analyzed by BLM.	See Chapter 4, Fish, Aquatic, and Wildlife Habitat, Including Special Status Species section for effects from BLM's proposed actions on wildlife habitat. The requisite level of information necessary to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decisions. As the PRMP/FEIS analyzes land use planning-level decisions, which by their nature are broad in scope, the requisite level of data and information is more generalized in order to apply a wide-ranging landscape perspective. Although the BLM realizes that more data and more site-specific data could always be gathered, the baseline data used in the PRMP/FEIS provides the necessary basis to make informed land use plan-level decisions.
DR-MTDK-MC-13-0105-11	The Keystone XL pipeline should be discussed.	See Chapter 4, Lands and Realty, Assumptions and Methodology for all Alternatives section. The Keystone Pipeline is accounted for in Chapter 4 assumptions as one of the major pipelines assumed in the short term.
DR-MTDK-MC-13-0169-23	First, BLM never analyzes the direct, indirect, and cumulative impacts of this approach on the various resources in the analysis area, including but not limited to lands with wilderness characteristics, ACECs, WSAs, native wildlife (including but not limited to, big game habitat and sage grouse habitat), soils, cultural and historic properties, water resources. Important security areas for big game species, for instance, will continue to be carved up under BLM's	See Chapter 4, Lands with Wilderness Characteristics section for anticipated effects from BLM's proposed actions. Travel Management Planning, which includes road and trail numbers, inventory and analysis, will be conducted during implementation planning. Following completion of the RMP, a

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	hands off approach. Second, no effort is made to inventory, document, and map the existing • system of routes in the analysis area. As such, it is impossible for BLM to analyze the impacts of such routes (and for the public to comment on the impacts of such routes) in the absence of an comprehensive inventory documenting and mapping all existing routes in the analysis area. And, the baseline condition will continue to change and get worse before a future travel plan is adopted. Third, as per Tri-State, no new user-created routes were to be created in the analysis area motorized use was to be restricted to existing routes that existed in 2003 (when the ROD was signed), subject to a few exceptions. BLM, however, has taken no steps to document the existing system of routes that existed in 2003. Nor is BLM attempting to do so now. What is preventing members of the public from creating new existing routes in the analysis area prior to adoption of the RMP and any future travel plan? And, how will BLM even know such routes are new given that lack of a comprehensive inventory? Indeed, in the Draft RMP/EIS, BLM concedes that the number of existing routes may change prior to completing a travel plan for the region. This is a violation of NEPA, Tri-State, E.O. 11644, and 43 C.F.R.§ 8342. Fourth, the draft RMP does authorize OHV use areas, including SRMAs as open to motorized vehicle use. But there is no evidence in the Draft RMP/EIS that BLM considered and applied the minimization criteria (outlined above) when making this decision. This is a violation of E.O. 11644 and BLM's implementing regulations. Fifth, BLM should designate a system of routes (roads and trail) and not leave it up to whatever may be perceived as an existing route. As mentioned above, these routes should be depicted on a map and undergo a NEPA and minimization criteria analysis. BLM should also determine where lands fall on the Recreational Opportunities Spectrum (ROS). Managing an area as semi-primitive or even semi-primitive motorized, might help when lay the ground work for future travel planning. Finally, BLM should not postpone completing a travel plan for the analysis area. In fact, BLM should have included travel planning for the entire analysis area in the Draft RMP/EIS because, in effect, it is designating a system of routes open to motorized use (just without any details about what the system is or end date). In the absence of any travel planning, the BLM should, at a minimum, limit motorize travel to designated routes in areas where a wilderness inventory has been conducted. Through the 2011 wilderness	transportation plan will be developed with the public that establishes a comprehensive designated route system for all areas where the RMP Record of Decision has determined OHV use is limited to designated routes.

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	inventory process, BLM has already identified existing routes and no new vehicle routes should be created before the travel planning process begins, which probably will not be completed for many years.	
DR-MTDK-MC-13-0146-13	Pg. 2-75, Action 7. Communities lost 2000 AUMs from Alternative A to Alternative E. These losses should be more completely explained.	See Chapter 4, Livestock Grazing section for a description of effects from decreased AUMs.
	The BLM has underestimated values used for number of wells, pace of development and surface disturbance per well based on what we have observed in the development of similar energy developments throughout the region and in the Bakken development in western ND/eastern MT.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section. The 2008 and 2013 USGS resource estimates have been taken into consideration in the assumptions and RFD.
DR-MTDK-MC-13-0097-10	Draft RMP at pg. 2-81 - include the following as a new "Management Action" for Oil, Gas, and Geothermal in the Proposed RMP: Existing oil and gas or other mineral rights will be honored.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for revisions. Also, see several sections in the front of Chapter 2, for example, under the directions "How To Read Table 2-5" for discussion on valid existing rights.
DR-MTDK-MC-13-0097-12	The Draft EIS fails to adequately identify the effect of proposed management prescriptions upon oil, gas, and EOR operations on existing leases. The EIS should discuss the impact of proposed management direction on development of those existing leases for each resource discussed in Chapter 4 of the EIS (air, soil, water, vegetation etc.)	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for revisions.
DR-MTDK-MC-13-0097-31	The BLM's authority to regulate, condition, or limit surface disturbing activities on existing leases is limited. A federal oil and gas lease is a real property right. See, e.g., Winkler v. Andrus, 614 F.2d 707, 712 (loth Cir. 1980); Union Oil Co. v. Morton, 512 F.2d 743, 747 (9th Cir. 1975). A company has a legal right to occupy the surface to explore for, produce, and develop its leases. Pennaco Energy v. U.S. Department of the Interior, 377 F.3d 1147, 1160 (loth Cir. 2004); 43 C.F.R. § 3101.1-2. Where land is leased without a No Surface Occupancy Stipulation, the Department cannot deny the permit to drill; it can only impose 'reasonable' conditions .... " Sierra Club v. Peterson, 717 F.2d 1409, 1411 (D.C. Cir. 1983). Examples of "reasonable" conditions the BLM may impose include those that "do not: require relocation of proposed operations by more than 200 meters; require that operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year." 43 C.F.R. § 3101.1-2.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for revisions.

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DR-MTDK-MC-13-0097-4	The Draft RMP states that "Upon plan approval (ROD), valid existing rights would not be changed by the decisions in this document until a permit or lease expired; following this, the area would be subject to the decisions reached in this document." Draft EIS at pg. 2-12. This statement is confusing and inaccurate because development on existing leases, like all future activities, will be "subject to" the decisions reached in the RMP. See 43 U.S.C. § 1732(a); see also 43 C.F.R. §1610.5-3(a) ("All future resource management authorizations and actions ... and subsequent more detailed or specific planning, shall conform to the approved plan.")	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, and several sections in the front of Chapter 2, for example, under the directions "How To Read Table 2-5" for discussion on valid existing rights.
DR-MTDK-MC-13-0097-8	Draft RMP at pg. 4-263: delete the sentence stating "Post lease actions or authorizations (e.g. APDs or road or pipeline ROWs) would potentially be encumbered by timing and CSU stipulations for oil, gas, and geothermal leasing and development on a case-by-case basis and as required through project-specific NEPA analysis or other environmental review."	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section discussing BLM's authority on post-lease actions/authorizations.
DR-MTDK-MC-13-0104-3	Chapter 4, pg. 263, states that between 867- 1432 wells could be drilled on BLM minerals under Alternative A; while, on pg. 275 under the Cumulative Effects discussion it is indicated that between 796 and 1,762 wells could be drilled on BLM minerals. The discussion of Alternative E (Preferred), however, states on pg. 4-273 that between 4,262 and 6,972 wells could be drilled on all ownership, which considerably exceeds the Reasonable Foreseeable Development (RFD). The same figures are used under the Cumulative Effects section. Another example of these inconsistencies is the number of acres available for leasing. Under the preferred alternative, 1.2 million acres would allow No Surface Occupancy (NSO) restrictions, but then in the RFD section it says 1.5 million acres will be NSO.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section for revisions.
DR-MTDK-MC-13-0121-2	It is projected that nearly 6 million barrels of oil (approximately 1.4 million barrels of BLM minerals) and nearly 6 trillion cubic feet of natural gas (approximately 1.3 trillion cubic feet of BLM minerals) could be produced. We question whether these figures have been updated to comport with recently revised resource estimates issued by the US Geological Survey.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section. The 2008 and 2013 USGS resource estimates have been taken into consideration in the assumptions and Reasonable Foreseeable Development Scenario of the MCFO RMP.
DR-MTDK-MC-13-0121-4	BLM does not have the authority to impose new stipulations on leases after they have been issued. Nor does BLM have authority to impose mitigation measures, such as Conditions of Approval (COA), that exceed the terms and conditions of previously issued leases.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for revisions.
DR-MTDK-	Are all proposed surface management restrictions applied equally regardless of whether the BLM Administered Lands in question are Surface or Federal	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid

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MC-13-0121-58	Mineral Estate and/or Oil and Gas Lease?	Minerals, Operating Standards and Approval Procedures section. Proposed leasing actions found in the RMP, upon approval, will apply to private surface overlying federal oil and gas mineral acres (split-estate lands) in accordance with federal laws and regulations.
DR-MTDK-MC-13-0162-8	BLM has underestimated values used for number or wells, pace of development and surface disturbance per well based on what we have observed in the development of similar energy developments throughout the region and in the Bakken development in western North Dakota/eastern MT.	See Chapter 4, Minerals, Oil and Gas, Assumptions and Methodology section and the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section. The 2008 and 2013 USGS resource estimates have been taken into consideration in the Fluid Minerals Chapter 4 Assumptions and Methodology and Reasonable Foreseeable Development Scenario of the MCFO RMP.
DR-MTDK-MC-13-0117-34	The BLM has not considered how its transportation plan will negatively impact hunting.	See Chapter 4, Recreation, Cumulative Impacts section for effects to hunting from BLM's proposed actions. Following completion of the RMP, a transportation plan will be developed with public input that establishes a comprehensive designated route system for all areas where the RMP Record of Decision has determined OHV use is limited to existing roads and trails.
DR-MTDK-MC-13-0176-3	Cumulative Impacts pg. 4-317. The sixth paragraph is an inaccurate statement " ... FWP leases rights for hunting access ... " FWP doesn't lease rights but enters into a contractual agreement to allow public hunting access.	See Chapter 4, Recreation, for corrected text.
DR-MTDK-MC-13-0089-33	Authorizing 5.4 million acres in the Miles City RMP to oil and gas development and its ensuing infrastructure - which includes the construction of well pads, evaporation ponds, roads, power lines, and pipelines - clearly will represent a dramatic and community altering change to the physical environment. The impacts that this development will have on the traditional rural, ranching communities must be sufficiently identified in the RMP.	See Chapter 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0090-16	On pg. 4-403, under Environmental Justice, the Draft RMP makes the following statement: "No alternative considered would result in any identifiable disproportionate impacts specific to any minority or low-income population or community." The Draft RMP on pg. 4-402 states: .... very small towns highly dependent upon agriculture .... " It is clear you acknowledge there are small towns dependent on agriculture of which are of low income and struggle to survive but you discount their importance and state there would be no impact to these low income families and communities. Please take a hard look at these two statements in the Draft RMP and consider the fact that you are imposing	See Chapter 4, Social and Economic section for revisions. The requisite level of information necessary to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decisions. As the PRMP/FEIS analyzes land use planning-level decisions, which by their nature are broad in scope, the requisite level of data and information is more generalized in order to apply a wide-ranging landscape perspective. Although the BLM realizes that more data and more site-specific data could always be gathered, the baseline data

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	environmental injustice to these very small communities.	used in the PRMP/FEIS provides the necessary basis to make informed land use plan-level decisions.
DR-MTDK-MC-13-0090-17	The Implan system uses data and information from major urban areas and no information from small communities are gathered or included. Clearly the statement in the Draft RMP that "very small towns dependent on agriculture" shows your agency acknowledges the negative impact your decision will have on their communities but through the Implan system this information and fact is lost. Take a hard look at these two statements and do further analysis on the impacts your decision will have as this directly relates to the environmental justice of the decision.	See Chapter 4, Social and Economic section for revisions. The requisite level of information necessary to make a reasoned choice among the alternatives in an EIS is based on the scope and nature of the proposed decisions. As the PRMP/FEIS analyzes land use planning-level decisions, which by their nature are broad in scope, the requisite level of data and information is more generalized in order to apply a wide-ranging landscape perspective. Although the BLM realizes that more data and more site-specific data could always be gathered, the baseline data used in the PRMP/FEIS provides the necessary basis to make informed land use plan-level decisions.
DR-MTDK-MC-13-0090-3	The Draft RMP reports the following statement on pg. 4-398. "No alternative would affect the major social trends or social organizations in the local communities of the planning area". How are you able to make this statement when the majority of local citizens commenting on this plan have explained the large negative impact of closing large areas of BLM managed land to recreation, agriculture and resource development?	See Chapter 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0108-13	In Economics, the Draft RMP states Federal coal production would remain near current levels to support continued operation of the four existing mines in the planning area. The annual amount of federal coal produced (25,288,000 short tons per year) and the royalties from this production ($41,504,000) would remain the same under all the alternatives. Id. at 4-406. Because additional federal coal development in excess of current levels is likely, especially given the findings of the Powder River Basin Report, the analysis of economic and other impacts should acknowledge the likelihood of increased production royalties.	See Chapter 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0117-4	The relevant information or impacts that the BLM failed to consider include but are not limited to: the historical and current information detailing the cultural heritage of ranching in the impacted area; the impacts of layers and layers of regulation (Wild and Scenic River designation, Wilderness Study Area designation, the neighboring CM Russell Wildlife Refuge designation, and so on) that already exist and which all negatively affect the historic, cultural, economic, and social environment attached to the area. The Draft RMP limits all pipelines, phone lines, cell towers, electrical lines, and the like; but, there is no analysis of these limitations and their impact on local communities and economies. Furthermore, this exclusion forces all such linear	See Chapter 4, Social and Economic section for revisions.

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	projects on to private land without an adequate cumulative impacts analysis.	
DR-MTDK-MC-13-0117-6	The Draft RMP does not provide any sort of comparison of the economic costs among the alternatives with regard to the impacts on grazing. The economic analysis shows economic impacts from natural gas exploration and development. However, the BLM still has not provided any analysis quantifying the potential impacts to ranching.	See Chapter 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0166-3	How are you addressing erionite and the potential human health risks that may be associated with exposure. Erionite is present in Carter County, Montana on both BLM as well as National Forest System lands.	See Chapter 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0090-4	The Draft RMP refers to a study done by Rasker, Alexander, Van den Noort, and Carter 2004 which attempts to display the benefits and need for open space. The study is not definitive and was done in response to increased subdivision activity in high density areas of western Montana. Your Draft RMP makes this statement: "However, they may be concerned that some development would be pushed onto private land in areas which resource protections would be less stringent". Please provide a reference for the quotation.	See Chapter 4, Social and Economic, Economics section for revisions.
	A full economic analysis should be conducted and the economic impacts ($) by Alternative should be clearly outlined.	See Chapter 4, Social and Economic, Economics section, Alternatives A through E, for impacts assessed from BLM's proposed management actions in Chapter 2.
DR-MTDK-MC-13-0158-4	Evaluate and disclose the potential economic benefits of employing the Carter MLP.	See Chapter 4, Social and Economic, Economics section, for economic effects from BLM's proposed actions.
DR-MTDK-MC-13-0158-5	The BLM should develop and include in the Proposed RMP a discussion of the potential economic benefits of designating the Carter MLP.	See Chapter 4, Social and Economic, Economics section, for economic effects from BLM's proposed actions. Also, see Chapter 2, Minerals, Oil & Gas, Proposed Carter MLP section for revisions in the alternatives.
DR-MTDK-MC-13-0090-7	The recreation analysis is lacking in accuracy as the spending of users is not accurate. On pg. 4-409 of the Draft RMP it states that "for every 1000 visitor days, there would be a corresponding change of .15 jobs and 3,804 in labor income." Further statements include impact from non local-overnight and local overnight jobs and income. We know by the visitor use survey conducted by the Forest Service that spending per visitor user day is much higher than the $3.80 value included in your Draft RMP and the overnight value of $14.06 you used. The numbers used by the Forest Service are more than $100 per local visitor day and $300 per non-local visitor day. These numbers were from	See Chapter 4, Social and Economic, Economics section, for updated recreation visitor expenditure profiles.

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	several years ago when fuel prices were less than a third of what they are today. Adjusted for inflation the cost per user day has risen substantially. I request you take a hard look at your user day expenditures included in your Draft RMP and adjust them to better reflect the true economic impact of recreation in your Draft RMP and present a true reflection of recreational spending to the public.	
DR-MTDK-MC-13-0161-3	Your EIS does not even touch on the possible negative economic consequences that future BLM management will be responsible for under this alternative.	See Chapter 4, Social and Economic, Economics section, which describes changes in employment, income, in various private sectors and changes to social conditions.
DR-MTDK-MC-13-0094-4	There are 4 economic multipliers in a local economy: They are: (1) Output, (2) Employment, (3) Income and (4) Value Added. Have you done any economic analysis on how each of the multipliers is affected?	See Chapter 4, Social and Economic, Economics section. Multipliers are used to assess employment and income effects on the local economy. A description of these multipliers has been added , along with detail on the impact area and modeling tool used to generate these multipliers.
DR-MTDK-MC-13-0103-4	You have not address the commutative and County economic impact this plan will have to the people of Montana. You have not addressed impacts to schools, gas stations, hotels and eating, sporting good and equipment like ATVS and SUVs, housing market, the growth in the area, and tax revenues that would be losses that would have been generated from the proposed changes.	See Chapter 4, Social and Economic, Economics section. Multipliers are used to assess employment and income effects on the local economy. A description of these multipliers has been added, along with detail on the impact area and modeling tool used to generate these multipliers.
DR-MTDK-MC-13-0192-1	The BLM contemplates removing 2000 AUMs from areas within the RMP. The document hardly addresses the impact to these ranchers and the local economy.	See Chapter 4, Social and Economic, Economics section. The analysis of grazing related economic effects has been updated on the importance of public land grazing. Also, see changes to livestock grazing alternatives in Chapter 2.
DR-MTDK-MC-13-0192-2	The document mentions that service industries are the number one economic driver in the area. What it fails to address is that the majority of those industries rely on the agricultural industry to stay in business.	See Chapter 4, Social and Economic, Economics section. The analysis of grazing related economic effects has been updated on the importance of public land grazing.
DR-MTDK-MC-13-0030-4	Chapter 4, Table 4-141, pg. 4-407, 1 head month (cattle and horses) = .78 AUMs is in conflict with the definition of an AUM everywhere else in the Resource Management Plan.	See Chapter 4, Social and Economic, Economics, Cumulative Impacts section. The conflict has been removed.
DR-MTDK-MC-13-0089-26	As BLM proceeds with the Miles City RMP and evaluates public land management throughout the MCFO, including the possibility of opening federal lands to oil and gas development and hydraulic fracturing, it must consider the human health impacts associated with these extractive practices.	See Chapter 4, Social and Economic, Social Conditions section for a discussion on effects anticipated from BLM's proposed actions.
DR-MTDK-MC-13-	Erodible soils represent a significant source of pollutants in the planning area. For this reason, we recommend the Proposed RMP include a map depicting areas of steep slopes and fragile or erodible soils and proximity to surface	See Chapter 4, Soils section for the impacts from surface-disturbing activities on soils. A map is not included due to the small size of individual areas not being discernable at the scale

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0102-17	waters. Depending on a host of variables including soil characteristics, industrial operations and topography, associated runoff could introduce sediments as well as salts, selenium, heavy metals and other pollutants into surface waters. To fully disclose and, if necessary, mitigate the potential impacts of soil disturbance, we recommend that the Proposed RMP include an estimate of erosion rates, by alternative, in areas where fragile or erodible soils are present.	of the planning area. Erosion rates are not provided as they are site-specific; they vary by location.
DR-MTDK-MC-13-0135-5	"Concentrated use for big game retrieval" seems to be a contradiction of terms since one time retrieval would not equate to "concentrated use."	See Chapter 4, Soils section. Often, when one set of vehicle tracks are created, subsequent use occurs, resulting in compaction and erosion.
DR-MTDK-MC-13-0131-2	We have excess silt coming down on the hay fields from open OHV use.	See Chapter 4, Soils section. OHV use could result in an increase in siltation. Also, as described in Chapter 2, certain OHV areas previously designated “open” would no longer be “open” under the PRMP/FEIS.
DR-MTDK-MC-13-0176-4	Consider the cumulative effects of the Tongue River Railroad on recreational access to public lands.	See Chapter 4, Types of Impacts, Cumulative Impacts section for actions considered in cumulative effects assessed.
DR-MTDK-MC-13-0126-10	Chapter 4, pg. 92, Cumulative Impacts: this section talks about soils, not vegetation, but it is under the vegetation section.	See Chapter 4, Vegetation section for edits to address vegetation.
DR-MTDK-MC-13-0126-16	Chapter 4, pg. 106, There is no evidence that harvesting cottonwoods would "maintain or improve the integrity and functionality of riparian and wetland areas by maintaining cottonwood health." Cottonwoods establish on bare, mineral soil created by flooding. Harvesting has no effect on this process. Harvesting cottonwood would simply reduce the number of trees present, thereby reducing wildlife habitat and perhaps allowing tamarisk and Russian olive to invade.	See Chapter 4, Vegetation section, Alternative E for text changes.
DR-MTDK-MC-13-0126-9	Chapter 4, pg. 86, Assumptions and Methodology. Many people in BLM are working to increase the amount of sagebrush on public lands to protect sage grouse, but this section states that sagebrush will not be restored but rather will be treated with herbicide. This needs further clarification.	See Chapter 4, Vegetation, Assumptions and Methodology section for text changes. The example creating the confusion in Chapter 4 has been removed.
DR-MTDK-MC-13-0089-59	New research shows that chemically concentrated fracking fluids can migrate into groundwater aquifers within a matter of years. A second round of testing in the Pavillion, Wyoming area was recently performed by the U.S. Geological Survey, which supported EPA’s preliminary findings that hydraulic fracturing	See Chapter 4, Water Resources for text changes describing impacts from hydraulic fracturing. Also, see changes to Chapter 3, Fluid Minerals section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures,

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	resulted in groundwater contamination.	Completion Operations section.
DR-MTDK-MC-13-0089-60	The New York Times recently uncovered a 1987 U.S. Environmental Protection Agency (EPA) report to Congress which found, among other things, that fracking can cause groundwater contamination, and cites as an example a case where hydraulic fracturing fluids contaminated a water well in West Virginia. The EPA report was further summarized and reviewed in an Environmental Working Group report.	See Chapter 4, Water Resources for text changes describing impacts from hydraulic fracturing. Also, see changes to Chapter 3, Fluid Minerals section and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures, Completion Operations section.
DR-MTDK-MC-13-0134-3	The filter socks that have been straining frack water have been exceeding federal radioactivity limits. This is an entirely new threat to our water system and, since the Montana Bakken stems from the same formation, it is a likely threat in Montana as well as North Dakota. The RMP must take these new developments into consideration. One resource could be the draft EPA Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources. This study is scheduled to be completed in 2014 and should be addressed in the RMP.	See Chapter 4, Water Resources for text changes describing impacts from hydraulic fracturing. Also, See Chapter 3, Minerals, Leasable Minerals, Oil and Gas; and the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures, Completion Operations section for modifications. Draft documents are considered in planning but their draft decisions are not incorporated as they are subject to change.
DR-MTDK-MC-13-0146-9	Pg. 4-81, Paragraph 6 begins with Livestock grazing on 16 million acres. Where did the 16 million acres come from? I thought the BLM had between 2.7 million to 3.6 million acres.	See Chapter 4, Water Resources, Alternative E for text changes.
DR-MTDK-MC-13-0135-6	There is no evidence or information to demonstrate that the relatively slight, ephemeral compaction of soil from one time motorized big game retrieval (MBGR) reduces water quality or accelerates erosion. It is difficult to imagine that a onetime crossing of a drainage by an OHV has ever resulted in reduced water quality.	See Chapter 4, Water Resources, Alternatives C and D for text changes. See also, Chapter 4, Soils section. Often, when one set of vehicle tracks are created, subsequent use occurs, resulting in compaction and erosion.
DR-MTDK-MC-13-0089-28	BLM must address the direct, indirect, and cumulative impacts to groundwater, 40 C.F.R. § 1508.25(c), giving particular scrutiny to the potential for contamination of groundwater supplies.	See Chapter 4, Water Resources, for the direct, indirect, and cumulative impacts to groundwater from various actions.
DR-MTDK-MC-13-0089-32	BLM must closely assess the direct, indirect, and cumulative impacts of lease development on water supplies. 40 C.F.R. § 1508.7, 1508.8. This analysis must consider the potential sources of water in the MCFO that would be used for oil and gas development, and the impacts of these water withdrawals on water availability for drinking, agriculture, and wildlife. The analysis must further address the impacts to water quantity at different annual, seasonal, monthly, and daily time scales because the impacts of such water withdrawals could be more acute during times, months, and seasons of scarcity.	See Chapter 4, Water Resources, Impacts Common to all Alternatives; and Chapter 4, Fish, Aquatics and Wildlife Habitat, Impacts Common to all Alternatives sections for text changes. Sufficient data do not exist to quantify the impacts of water withdrawals to water quantity at annual, seasonal, monthly, and daily time scales.
DR-MTDK-	The Proposed RMP should analyze the following: estimated water demand for the anticipated oil and gas development in the planning area; possible sources	See Chapter 4, Water Resources, Impacts Common to all Alternatives; Riparian and Wetland Areas, Impacts Common to

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MC-13-0102-33	of this water; and potential impacts of the water withdrawals (e.g., drawdown of aquifer water levels, reductions instream flow and associated water quality, and impacts on aquatic life, wetlands, and other aquatic resources).	all Alternatives; and Fish, Aquatic and Wildlife Habitat, Including Special Status Species, Aquatic, Impacts Common to all Alternatives sections for text changes. Sufficient data do not exist to quantify estimated water demand.
DR-MTDK-MC-13-0104-31	On pg. 4-55, the document reads "Left untreated, produced water discharge and infiltration or leaking produced water disposal pits would be likely to reach stream channels via subsurface flow, which would decrease water quality." Pg. 4-56 reads "Produced water spilled or treated in infiltration, unlined, or leaking evaporations impoundments (water disposal pits) would impact shallow groundwater aquifers and contain the potential to reach and contaminate surface water through groundwater interface." A Montana Pollution Discharge Elimination System (MPDES) permit is required in order to discharge to surface water in Montana. All discharged water must comply with the limits set by DEQ to determine water degradation will not occur.	See Chapter 4, Water Resources, Impacts Common to all Alternatives section for text changes.
DR-MTDK-MC-13-0108-22	While the analysis and identified mitigation measures may be appropriate for some types of oil and gas exploratory and/or production drilling, they are not appropriate in the context of coal exploratory drilling. The RMP should explicitly note that, for shallow exploration, air drilling is often used, and drill cuttings are not contained in pits. This reduces the need for construction of drill pads, thus reducing surface disturbance. For deeper exploration holes, reserve pits generally contain bentonite-based muds; the reserve pit is backfilled and reclaimed at the end of the drilling.	See Chapter 4, Water Resources, Impacts Common to all Alternatives section for the impacts from coal exploration activities to water resources. For situations where coal exploration activities use reserve pits to contain cuttings and drilling fluids, the impacts would be a combination of those discussed for surface-disturbing activities "including...mineral and energy exploration" and those discussed for the use of reserve pits. For situations where reserve pits are not used, the impacts would be limited to those discussed for surface-disturbing activities. The impact analysis in Chapter 4, Water Resources, Impacts Common to all Alternatives, states that the use of pitless or closed-loop technology would potentially conserve water and reduce surface disturbance. It is implied that this may not be true in every case. The use of pitless or closed-loop technology would be prescribed on a case-by-case basis as identified in the NEPA process.
DR-MTDK-MC-13-0121-15	The evidence in Wyoming conflicts with the statement that 1) Infiltration from water disposal pits would be likely to reach stream channels and 2) would impact shallow groundwater. Between August 2004 and December 2009, approximately 2,013 impoundments with nearly 2,300 associated monitoring wells or borings were evaluated for potential groundwater impacts. Of these, only 273 impoundments required permits and monitoring. In 2010, 170 of these wells were studied in three hydrologic settings, 72% exhibited stabled groundwater chemistry (no change), 12% show TDS and sulfate concentrations	See Chapter 4, Water Resources, Impacts Common to all Alternatives section for text changes.

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	on an upward trend, 6% have flushed (increase with a decrease back to normal over time), and 6% exhibit an improvement in water quality. (Steinhorst 2010).	
DR-MTDK-MC-13-0142-15	Pg. 4-62. Referring to the paragraph that starts "Although all methods would cause surface disturbance, the magnitude and duration of the impacts of surface-disturbing activities..." The conclusions of this paragraph describe a "worst case" situation not necessarily applicable to stream channel crossing or activity within wetlands. It is recommended that a reference to the Army Corps of Engineers (ACE) regulatory program under Section of 404 of the Clean Water Act be referenced and a proper perspective of these impacts be provided in the Proposed RMP which are reduced under these regulatory programs. Additionally, this section fails to acknowledge the benefits and increased frequency of using horizontal drilling technologies to bore under wetlands and/or other water bodies that may be encountered during a pipeline project.	See Chapter 4, Water Resources, Impacts Common to all Alternatives for text changes and the potential impacts from horizontal directional drilling.
DR-MTDK-MC-13-0146-32	Whenever BLM monitoring identifies that livestock grazing is not meeting Rangeland Health Standards and Guidelines or that riparian ecosystems are rated nonfunctioning or functioning at risk, BLM makes changes to the grazing management to rectify the problem. Therefore, livestock grazing managed by BLM CANNOT "alter the watershed hydrology by lowering the water table; compacting soils; decreasing low flows and infiltration rates; and increasing overland flow, volume of peak flows, and floodwater velocity".	See Chapter 4, Water Resources, Impacts Common to all Alternatives section for text changes.
DR-MTDK-MC-13-0126-8	Chapter 4, pg. 50, Management common to all alternatives, There is no mention of stock ponds. How would the construction of new stock ponds affect the downstream environment? How would the decommissioning of stock ponds affect the downstream environment?	See Chapter 4, Water Resources. The impacts from surface water impoundments are discussed under the Impacts Common to all Alternatives section.
DR-MTDK-MC-13-0076-2	Two recent studies have used radio-telemetry to assess impacts of energy infrastructure on sage-grouse. LeBeau (2012) investigated the impacts of wind facilities and an associated transmission line in Wyoming, and Nonne et al. (2013) released a final report of a 10-year study of a transmission line in Nevada. The Nonne study is currently the only long-term study conducted that specifically evaluates potential impacts of a power line on sage-grouse. The LeBeau study indicated that habitat quality is a significant influencer of sage-grouse occupancy, regardless of the presence of a transmission line. BLM needs to consider these studies, which use current telemetry techniques and specifically investigate sage-grouse responses to power lines, when addressing power lines in its RMP updates.	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Impacts Common to all Alternatives section for additional discussion.
DR-MTDK-MC-13-	The cumulative effects of land management within the MCFO planning area on sage grouse over Management Zone 1 area are not addressed under Cumulative Impacts.	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Cumulative Impacts sections for modifications. See Cumulative Impact Assessment: Miles City,

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0104-27		for Cumulative Impacts Analysis based on WAFWA Management Zone 1.
DR-MTDK-MC-13-0121-29	Page 3-74. Sage-grouse populations decline by 2 percent annually (Connelly, Knick, Schroeder, Stiver, WAFWA 2004). • Does this statement refer to populations throughout the range of the sage-grouse? Several statements in the Draft RMP and in reference literature appear to contradict that information. For instance, in the paragraph on pg. 3-74, in reference to Montana specifically, the text indicates: The total number of males in these trend areas peaked in 2006 with 988 males. The number of males counted on trend areas declined from 2007 to 2009 but increased in 2010. The overall trend for sage-grouse in trend areas is stable (Beyer et al 2010). • In addition, the following statement (attributed to Beyer et al [2010]) on pg. 4-162 also appears to conflict with the above information: Sage-grouse lek counts are used to monitor sage-grouse populations and trends and ideally are counted multiple times over the course of the breeding season. However, a lack of data outside of the PRB area of Montana and insufficient population data throughout the planning area has resulted in a lack of information about specific population trends. The Montana Sage Grouse Work Group (2005) also states, "Recent genetic analysis (Oyler-McCanceet al 2001) indicates that Montana sage-grouse are representative of a single population with good genetic diversity broad-scale assessment."	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Alternative E for modifications. Also, the "2 percent annually" is a range-wide percentage; the Montana count references are on trend leks within Region 7 which is within the planning area.
DR-MTDK-MC-13-0121-45	Page 4-135 “ In some areas, such as the Cedar Creek Anticline, decreased male lek attendance has exceeded 80 percent, which is largely attributed to oil and gas development. What is the source for this information?	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Alternative A. The sentence has been deleted.
DR-MTDK-MC-13-0126-11	Chapter 4, pg. 108, Cumulative impacts It should be mentioned that these crested wheatgrass fields are often near-monocultures that provide poor wildlife habitat.	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Cumulative Impacts sections for effects to Fish and Wildlife habitat from BLM’s proposed actions.
DR-MTDK-MC-13-0142-22	Pgs. 4-163 to 167 - Cumulative Impact. The cumulative impact section summarizes the past effects of various land uses and other factors that have affected wildlife, including sage-grouse. This discussion appears to repeat much of the discussion in Chapter 3. Addressing predicted impacts to sage-grouse, relies heavily on research conducted in Management Zone 1. However, the cumulative effects of land management within the MCFO planning area on sage-grouse over this broader Management Zone 1 area are not addressed under Cumulative Impacts. At a minimum, the MCFO Draft RMP should address the potential cumulative effects of the proposed planning activities in the MCFO	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Cumulative Impacts sections for revisions. See Cumulative Impact Assessment: Miles City, for Cumulative Impacts Analysis based on WAFWA Management Zone 1.

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	planning area as they relate to the HiLine and Billings Pompey's Pillar planning areas.	
DR-MTDK-MC-13-0142-8	Page 3-74. Sage-grouse populations decline by 2 percent annually (Connelly, Knick, Schroeder, Stiver, WAFWA 2004)." Does this statement refer to populations throughout the range of the sage-grouse or just within the MCFO? Several statements in the Draft RMP and in reference literature appear to contradict information presented above. For instance, in the paragraph on pg. 3-74, in reference to Montana specifically, the text indicates: "The total number of males in these trend areas peaked in 2006 with 988 males. The number of males counted on trend areas declined from 2007 to 2009 but increased in 2010. The overall trend for sage-grouse in trend areas is stable (Beyer et al 2010)." In addition, the following statement (attributed to Beyer et al [2010]) on pg. 4-162 also appears to conflict with the above information: "Sage-grouse lek counts are used to monitor sage-grouse populations and trends and ideally are counted multiple times over the course of the breeding season. However, a lack of data outside of the PRB area of Montana and insufficient population data throughout the planning area has resulted in a lack of information about specific population trends." The Montana Sage Grouse Work Group (2005) also states, "Recent genetic analysis (Oyler-McCance et al 2001) indicates that Montana sage-grouse are representative of a single population with good genetic diversity (broad-scale assessment)." Given the potential inconsistencies of the above statements, it is important to accurately depict the trend in population within the MCFO. Once this is accomplished, sources of the information should be clearly provided.	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Alternative E for modifications. Also, the "2 percent annually" is a range-wide percentage; the Montana count references are on trend leks within MFWP Region 7 which is within the planning area.
DR-MTDK-MC-13-0190-9	In your Chapter 4 discussion of piping plover and interior least tern habitat, you make the following statement: "Piping plovers and interior least terns are limited to the saline wetlands in northeastern Montana and graveled islands associated with the Yellowstone and Missouri rivers. The greatest impacts to both species are fluctuating water levels and recreational use of the graveled islands, occurrences over which the BLM has essentially no management control. As a result, they are minimally affected by BLM-authorized activities." The assertion that BLM has "essentially no management control" over fluctuating water levels within the MCFO RMP planning area is false. Numerous BLM-authorized activities have a profound effect on water level fluctuation.	See Chapter 4; Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Cumulative Impacts sections for text changes.
DR-MTDK-MC-13-	According to NEPA and FLPMA, you were required to coordinate and cooperate with local governments that may be affected by your RMP. You were also required to coordinate and cooperate with all incorporated towns and	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. During plan initiation, all of the counties in the planning area

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0013-1	counties that may be affected by your RMP. There are over 200 recognized local governments not including cities, towns, and counties. I strongly suspect that you did not contact or make effort to coordinate and cooperate.	were invited to become Cooperating Agencies and help BLM prepare the Draft RMP/EIS.
DR-MTDK-MC-13-0016-1	NEPA requires cooperation and coordination with local land use and growth policies of recognized local governments (Counties, cities, towns, grazing districts, fire districts, school districts, weed districts, hospital districts, road districts, state governments, tribes, other federal agencies. It means any entity that has ability to collect tax dollars and spend them). NEPA requires efforts to make federal plans consistent with local plans so long as federal law allows and, if not able to, are required to publish reasons for failure in the Environmental Consequences of the Environmental Impact Statement. NEPA requires BLM to preserve history and heritage of use if at all possible. NEPA requires BLM to do analysis of the economic impacts of their proposed plan with all affected constituents and public entities; and when federal law allows, design plans are not to be negative to local economies.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans were considered in the preparation of the RMP.
DR-MTDK-MC-13-0022-1	There is nothing in Environmental Consequences addressing possible conflicts with local purposes, policies, approved plans, and programs. Where an inconsistency exists, the statement should describe the extent to which the agency's would reconcile its proposed action with the plan or law.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0070-2	The legislature passed and the governor signed H B 169. This will become Law on October 1, 2013. H B 169 codifies in state law, Title 76, the use of a Growth Policy as the legal document a local county may use to coordinate with federal agencies on land planning action that affect their county. HB 169 makes the Growth Policy the legal document the county can use to coordinate. The BLM should contact all counties affected by these 3 RMPs and ask if they wish to coordinate.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0085-2	Satisfaction of the following regulations is a requirement of NEPA. 43 CFR 1610.3-2 (BLM) Consistency requirements a) Guidance and resource management plans and amendments shall be consistent with officially approved or adopted resource related plans and policies and programs contained therein, of other Federal agencies, State and local governments and Indian tribes, so long as the guidance and resource management plans are also consistent with the purposes, policies and programs of Federal laws and regulations applicable to public lands.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0085-4	40 CFR 1506.2 (CEQ) (d). To better integrate environmental impact statements into state and local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan or laws (whether or not federally sanctioned). Where an inconsistency exists, the	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.

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	statement should describe the extent to which the agency would reconcile its proposed action with the plan or law.	
DR-MTDK-MC-13-0117-20	The BLM Failed to Comply With Intergovernmental Cooperation Act. The Intergovernmental Cooperation Act ("ICA"), 31 U.S.C. § 6501-6506, and companion Executive Order 12372, require all federal agencies to consider local viewpoints during the planning stages of any federal project. 31 U.S.C. § 6506(c). The obligation of the BLM to consider local government concerns is a legally enforceable right. City of Waltham v. United States Postal Serv,_, 11 F.3d 235, 245 (1st Cir. 1993). Injunctive relief is available in those cases where the federal agencies have failed to comply with the ICA. City of Rochester v. United States Postal Serv., 541 F.2d 967, 976 (2nd Cir. 1976). The consideration of local government plans and policies must occur on the record. Federal agencies have an affirmative duty to develop a list of factors which support or explain an agency's decision to act in disharmony with local land use plans. Village of Palatine v. United States Postal Serv., 742 F. Supp. 1377, 1397 (N.D. Ill. 1990).	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. All counties in the Planning Area were invited to become Cooperating Agencies and help BLM prepare the Draft RMP/EIS.
DR-MTDK-MC-13-0122-2	Land management documents like this must be consistent with local government resource plans. If they are inconsistent, the Draft RMP must disclose and discuss any inconsistencies with local plans and laws, and discuss how these inconsistencies will be reconciled. The Draft RMP must evaluate the environmental consequences resulting from its conflict with local resource plans. And perhaps most importantly for this document, the Draft RMP must evaluate and discuss the economic impact of its proposed action, and the impact of its inconsistency with local government resource plans.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0122-3	In this regard, numerous local governments have expressed to me that the Draft RMP/EIS did not evaluate their resource plans, did not evaluate inconsistencies with such plans, and did not adequately analyze the economic impacts of its restrictions compared to local government resource plans. These same concerned local government leaders also feel they were surprised by many of the provisions contained within the Draft RMP/EIS, which were contrary to what they had reviewed in their role as cooperating local government and agency representatives. I urge you to ensure BLM officials fully utilize the cooperating agency process in good faith, with full disclosure, and with respect to the role these local citizen representatives have under federal and state law.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0177-1	The BLM had a duty to provide adequate public notice and the opportunity for local governments and citizens to participate in the process. 42 U.S.C.A. § 4321, et seq; 43 U.S.C.A. Â§ 1712 (c)(9) & (f).	See Chapter 1 for Introduction and discussion of planning process. See Chapter 5, Consultation and Coordination for discussion of public involvement opportunities. See also Chapter 5, Consistency section for inconsistencies identified

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		between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0177-10	The BLM had a duty to carefully consider the economic impacts of the Draft RMPs in the local areas impacted by the plans. Laub v. United States Dept of Interior, 342 F.3d 1080, 1087 (9th Cir. 2003). The BLM failed to comply with its legal duty, by eliminating local government review of the drafts and consistency review with local plans and failing to provide local government with adequate time to do so.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. See Chapter 4, Social and Economic, Economics section, for economic effects anticipated from BLM's proposed actions. During plan initiation, all of the counties in the planning area were invited to become Cooperating Agencies and help BLM prepare the Draft RMP/EIS.
DR-MTDK-MC-13-0177-11	Pursuant to the Intergovernmental Cooperation Act ("ICA") and an Executive Order, the BLM had a duty to fully consider on the record the local government/cooperating agencies' plans and policies. 31 U.S.C.A. §§ 6501-6506; Executive Order 12373. The BLM failed to comply with its legal duty.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0177-13	The BLM had a duty to coordinate with local governments. 16 U.S.C.A. § 3451 et seq. The BLM failed to comply with its legal duty.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans and county input were considered in the preparation of the RMP. At the onset of the RMP planning process the BLM invited entities of federal, tribal, state and county governments to collaborate with the BLM on the development of the Draft RMP/EIS by becoming cooperating agencies. The cooperating agencies provided input in the development of the Draft RMP/EIS.
DR-MTDK-MC-13-0177-2	The BLM had a duty to make the Draft RMP/EISs consistent with the local government approved resource-related plans. 40 C.F.R. Â§ 1610.3-2. The BLM failed to comply with its duty by not obtaining local plans or providing adequate opportunity for local government review of and comparison with the Draft RMP/EISs.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans were considered in the preparation of the RMP.
DR-MTDK-MC-13-0177-3	The BLM had a duty to include in the Draft RMPs written discussions of any inconsistencies with and possible conflicts between the proposed action and regional, State, and local land use plans. 40 C.F.R. § 1502.16.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans were considered in the preparation of the RMP.
DR-MTDK-MC-13-0177-5	The BLM had a duty to identify in writing any inconsistency of the Draft RMPs with any approved state or local plan or laws. 40 C.F.R. § 1506.2. The BLM failed to comply with its legal duty and did not propose or discuss possible amendments to or actions to mitigate or eliminate these inconsistencies.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans were considered in the preparation of the RMP.
DR-MTDK-MC-13-	The BLM had a duty to use the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise. 40 C.F.R. § 1501.6.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans. Available County Growth plans and county input were

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0177-6		considered in the preparation of the RMP.
DR-MTDK-MC-13-0188-2	There is nothing in this RMP to indicate that there was a Consistency Review done, comparing this RMP to any land plans or growth policies that are in place and pertinent to Valley County, City of Glasgow, Town of Opheim, Town of Nashua, Town of Fort Peck, or any of the Town Sites located in Valley County. This would, and should be, a basic priority to any RMP that has such far reaching consequences.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0193-4	40 CFR 1506.2 (CEQ)(d). To better integrate environmental impact statements into state and local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan or laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency's would reconcile its proposed action with the plan or law.	See Chapter 5, Consistency section for inconsistencies identified between the PRMP/FEIS and available county growth plans.
DR-MTDK-MC-13-0052-1	As a cooperating local government unit (MOU dated 2-22-2011) and a close associate of the over 50 local government units and their citizen members impacted by the Miles City RMP, it is our conclusion, and the conclusion of the other local government units we have spoken with, that the comment period for the Draft RMP-EIS is not adequate at this time to provide an opportunity for local government units and the persons affected by the RMP to complete a thorough and meaningful review of the Draft document and its impacts.	See Chapter 5, Public Comment Period on the Draft RMP/EIS. The public comment period on the Draft RMP/EIS was open for 90 days.
DR-MTDK-MC-13-0044-2	Lastly, it is our understanding that the BLM must comply with NEPA and FLPMA in this planning process. We are not sure that the short time frame to comment; during the busiest work season of the year, on documents that many negatively impacted people did not receive, even complies with the legal requirements of NEPA and FLPMA. Furthermore, it is our understanding that the BLM is holding open-house meetings instead of receiving formal comments on the Draft RMP/EIS. Again, we question whether this format and process complies with NEPA and FLPMA.	See Chapter 5, Public Comment Period on the Draft RMP/EIS. In compliance with NEPA, the BLM Miles City Field Office held Open House meetings to answer questions about the Draft RMP/EIS. The public comment period on the Draft RMP/EIS was open for 90 days. Members of the public could participate in either, or both, according to their preferences.
DR-MTDK-MC-13-0057-2	Lastly, it is our understanding that the BLM must comply with NEPA and FLPMA in this planning process. We are not sure that the short-timeframe to comment, during the busiest work season of the year, on documents that many negatively impacted people did not receive, even complies with the legal requirements of NEPA and FLPMA. Furthermore, it is our understanding that the BLM is holding open house meetings instead of receiving formal comments on the Draft RMP/EIS. Again, we question whether this format and process complies with NEPA and FLPMA.	See Chapter 5, Public Comment Period on the Draft RMP/EIS. In compliance with NEPA, the BLM Miles City Field Office held Open House meetings to answer questions about the Draft RMP/EIS. The public comment period on the Draft RMP/EIS was open for 90 days. Members of the public could participate in either, or both, according to their preferences.
DR-MTDK-	Lastly, it is our understanding that the BLM must comply with NEPA and FLPMA in this planning process. We are not-sure that the short-time frame to	See Chapter 5, Public Comment Period on the Draft RMP/EIS. In compliance with NEPA, the BLM Miles City Field Office

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MC-13-0063-2	comment on such an extensive document is appropriate. Furthermore, it is our understanding that the BLM is holding open house meetings instead of receiving formal comments on the Draft RMP/EIS. We question whether this format and process complies with NEPA and FLPMA.	held Open House meetings to answer questions about the Draft RMP/EIS. The public comment period on the Draft RMP/EIS was open for 90 days. Members of the public could participate in either, or both, according to their preferences.
DR-MTDK-MC-13-0117-2	Examples of the BLM's failure to analyze the direct and indirect historic, cultural, economic, and social effects: The BLM plans on cutting 100,000 acres and 2000 AUMs from livestock grazing use. However, there is inadequate or no review, analysis, or research on how this drastic cut in livestock grazing will impact the cultural, economic and social effects. Further, this area has been used for livestock grazing for more than 120 years, which would mean that the cut in livestock grazing would also have a negative effect on the historic use of the area. at 2-204-205.	See Chapters 2 and 4, Livestock Grazing section, for changes to the Proposed Alternative (E).
DR-MTDK-MC-13-0146-17	This paragraph states that livestock operators who had their permits cancelled would have to fence their allotments off from their private land with no help from the BLM. Does this mean fences have no effect on wildlife movements or mortality which was previously mentioned in the document?	See Chapters 2 and 4, Livestock Grazing sections, for text changes.
DR-MTDK-MC-13-0121-48	The Draft RMP does not present information to document whether noise levels are natural or generated by human activities. Indisputably, wind has a substantial effect on noise levels. Do natural factors such as wind increase median noise levels to 50 to 60 dBA at leks and if so, do natural factors such as wind noise reduce lek attendance? Clarification of these points has implications for monitoring leks to estimate population trends.	See Chapters 3 and 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species. These sections have been revised and include 2012 research and references to noise levels and effects.
DR-MTDK-MC-13-0142-19	Pg. 3-81 states, It should be noted that median noise levels for rural areas would range from 20 to 40 dBA in the morning and evening and from 50 to 60 dBA in the afternoon (when wind speeds would typically be the greatest) (Mariah Assoc. 2005). However, the Draft RMP does not present information to document under what conditions these samples were taken or whether they were instantaneous readings or measured over a weighted time frame such as 5, 10 or 15 minutes. Wind does indeed have a substantial effect on noise levels. Assuming this to be true, do natural factors such as wind noise reduce lek attendance? If it does, this could impact conclusions regarding population trends. It would seem more important to assess different sound frequencies to such as the dB(A) which approximates human response or the dB(C) which would assess lower frequencies to understand any correlation to sage-grouse.	See Chapters 3 and 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species. These sections have been revised and include 2012 research and references to noise levels and effects.
DR-MTDK-MC-13-0142-30	Pg. BMP-44. The statement is made "Limit noise to less than 10 decibels above ambient measures (20 to 24 dBA) at sunrise at the perimeter of a lek during active lek season". This requirement is completely inconsistent with the previous background of 39 dBA background plus the 10 decibel threshold.	See Chapters 3 and 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species. These sections have been revised and include 2012 research and references to noise levels and effects.

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	There is no peer reviewed data that supports a background noise limitation at dawn for a 20-24 background level. BLM needs to remove this item from the Proposed EIS/RMP and replace it with the 39 dBA which is currently in use when assessing noise considerations in sage grouse habitat. This requirement could constrain a multitude of mechanical activities essential to maintaining facilities and equipment.	
DR-MTDK-MC-13-0191-1	The discussion of Greater Sage-grouse does not include any mention of the COT Report, nor the specific localized and widespread threats and Priority Areas for Conservation (PACs) discussed therein that apply specifically to the two Greater Sage-grouse populations in the MCFO planning area (Yellowstone Watershed and Powder River Basin).	See Chapters 3 and 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species, Greater Sage-grouse sections for revisions. The COT Report threats and effects analysis from the proposed actions are included.
DR-MTDK-MC-13-0191-3	The Chapter 4 effects analysis for Greater Sage-grouse does not include clear metrics/effects indicators for each action; a consistently applied analysis framework across alternatives on which to base effects comparisons; a consistent effects determination (adverse, beneficial, neutral, etc.) for each alternative action; nor supporting rationale for each effect determination. For these reasons, we found it was not possible to clearly ascertain, understand, and evaluate the effects, both adverse and beneficial, to Greater Sage-grouse associated with the various alternative actions.	See Chapters 3 and 4, Fish, Aquatic and Wildlife Habitat, Including Special Status Species, Greater Sage-grouse sections for revisions. The COT Report threats and effects analysis from the proposed actions are included.
DR-MTDK-MC-13-0117-17	The agency has failed to adequately outline the quantitative and qualitative economic impacts on the private sector. Similarly, the economic analysis is completely void of any quantitative or qualitative costs and benefits to the State and local governments from imposition of the Draft RMP. The economic analysis section does note that the costs of managing the area may change under the RMP; however, there is no assessment of any impact to State or local governments.	See Chapters 3 and 4, Social and Economic section for revisions.
DR-MTDK-MC-13-0117-18	The UMRA requires that the agency estimate the future costs of complying with a federal mandate, as well as any disproportionate budgetary effects upon State or local governments or particular segments of the private sector. U.S.C. § 1532(a)(3). Nowhere in the Draft RMP does the BLM provide such an estimate. Furthermore, the BLM failed to provide an analysis of the budgetary impact to local communities from having to provide increased emergency services on the Draft RMP lands.	See Chapters 3 and 4, Social and Economic section for the description of social, economic and environmental justice conditions and trends.
DR-MTDK-MC-13-0121-40	What percentage of the MCFO planning area is within 6.9 kilometers of urban development and other infrastructure (e.g., highways, wind farms, communication towers) and how do these values affect management direction?	See Map 14. The Land Pattern Adjustment and Access Map shows major roads and county seats. See Chapter 4, Social and Economic, Social Conditions section for effects to urban areas from BLM's proposed actions.
DR-	To what extent is Montana Fish, Wildlife and Parks included in decisions	See the "Dear Reader" letter. Montana Fish, Wildlife and Parks

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MTDK-MC-13-0171-7	regarding fish and wildlife as they relate to the Public Trust?	is a Cooperating Agency in the preparation of the RMP, along with several counties, conservation districts, tribes, and state and federal agencies. In order to help prepare the Draft RMP/EIS, Cooperating Agencies were provided preliminary versions of the Draft RMP/EIS for their review, including Montana Fish, Wildlife and Parks. All of the proposed decisions in the RMP are BLM's. In general, however, the BLM manages habitat on public lands rather than the fish and wildlife themselves.
DR-MTDK-MC-13-0169-12	No map depicting the WSAs in the analysis area is provided. Nor is there a map showing the proposed action in relation to the WSAs. The Draft RMP references map 88 but that is incorrect a map depicting renewable energy potential, not WSAs. Volume IV of the Draft RMP (maps) references map 89 as a map of special designation areas (which would presumable include WSAs) but no map 89 exists.	See the "Special Designation Areas" Map displaying WSAs, Map 39.
DR-MTDK-MC-13-0089-12	Even though climate change emissions from the Alternatives may look minor when viewed in isolation, when considered cumulatively with all of the other methane emissions from BLM managed land they become significant and cannot be ignored.	See the Air Resource Technical Support Document available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html. The BLM accounts for GHG emissions by including them in the emission inventories. GHG emission reductions are accomplished via USEPA and MDEQ regulations, as well as BLM best management practices. See the Mitigation Measures and Conservation Actions Appendix.
DR-MTDK-MC-13-0102-11	Pg. 16 - include the discussion of emissions associated with "production" sources, e.g., oil wells, gas wells, and CBNG wells, from the September 21, 2012 final near-field modeling protocol, pg. 8 - p. 17. Figure 1 illustrates the well pad and receptor layout for PM10 and PM2.5 modeling. Was this same receptor layout used for the other criteria pollutants? Pg. 22 - Predicted criteria air pollutant concentrations were compared to the NAAQS, MAAQS, and Prevention of Significant Deterioration (PSD) increments. The annual comparisons for the NAAQS and MAAQS need to be discussed in this paragraph.	See the Air Resource Technical Support Document available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html. Section 2.2 provides a description of production sources. A clarification stating that well pad and receptor layouts for other (non-PM) modeled pollutants were similar for other pollutants was added in Section 3.3. Annual comparisons to the NAAQS and MAAQS were provided in Table 18 for those pollutants with annual averaging times.
DR-MTDK-MC-13-0146-18	Table 4-8 and 4-9. The estimated emissions from wildfires should definitely be included as it absolutely dwarfs all the other emissions combined. The effects of forced build up in fuel loads is going to wind up in some huge fires with monstrous emissions. The wildfire emissions, at least from previous years, should be averaged and used to project future emissions.	See the Air Resource Technical Support Document available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html. Wildfire emissions for each alternative are provided. Footnotes to emission tables in Chapter 4, "Air Resources and Climate," Alternative-specific sections have been modified to explain that

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		wildfire emission estimates are included in the Air Resource Technical Support Document.
DR-MTDK-MC-13-0102-10	It is important that the emissions controls and mitigation measures used to develop the emissions inventory be included as required mitigation measures for activities under the RMP. The alternative specific emissions inventory includes an 84% control efficiency of gravel or scoria surfacing for calculating dust emissions. The ARTSD, pg. 6, identifies assumptions used in this emissions inventory, including a 50% fugitive dust control efficiency but no mention of this 84% control with gravel or scoria. If 84% surfacing control was used in the near-field modeling, then we recommend that this control efficiency be added to the identified assumptions on pg. 6 of the AR TSD and that gravel/scoria surfacing be added to the initial mitigation list of the ARMP, Section 6.1.	See the Air Resource Technical Support Document, Appendix F, available online on the BLM MCFO RMP webpage: http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp.html. Near-field modeling was based on an emission inventory that assumed 50 percent fugitive dust control during construction.
DR-MTDK-MC-13-0089-44	BLM has noted many methane pollution mitigation measures in its Climate Change Supplementary Information Report. The report also addresses key mitigation technologies for oil production and Coal Bed Methane.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2 and Chapter 3, Air Resources and Climate, National Action to Reduce GHGs. A combination of current MDEQ and USEPA regulations require many GHG emission controls. For several of the emission sources mentioned, GHG emissions reported under the USEPA GHG Mandatory Reporting Rule constituted less than 1% of CO_2e emissions from oil and gas activity in the region. The BLM encourages use of GHG-reducing BMPs provided in the Mitigation Measures and Conservation Actions Appendix. Also, methane reinjection does not avoid combustion emissions because power, typically provided by onsite engines combusting fossil fuel, is needed to reinject methane under pressure.
DR-MTDK-MC-13-0089-46	Best available methane emissions reduction technology would include at least the following, which are technically proven, commercially available and in most cases profitable: Green or reduced-emissions completions; Liquids unloading; Improved maintenance for compressors, dry seals; Pneumatic devices; TEG dehydrator emission controls; Desiccant dehydrators; Vapor recovery units; Pipelines; and Leak Monitoring and Repair.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2 and Chapter 3, "Air Resources and Climate," "National Action to Reduce GHGs." A combination of current MDEQ and USEPA regulations require many GHG emission controls. For several of the emission sources mentioned, GHG emissions reported under the USEPA GHG Mandatory Reporting Rule constituted less than 1% of CO_2e emissions from oil and gas activity in the region. The BLM encourages use of GHG-reducing BMPs provided in the Mitigation Measures and Conservation Actions

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		Appendix.
DR-MTDK-MC-13-0097-23	In establishing enhanced mitigation requirements, the BLM states that "preference will be given to mitigation measures that the MDEQ intends to impose as new regulations or air quality permitting provisions." Pg. ARMP-18. But giving only "preference" to MDEQ-developed regulation is insufficient because it leaves open the possibility that BLM may replace MDEQ's careful balancing of environmental, economic, and technical benefits with BLM's own.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.3. BLM land management actions do not replace or affect MDEQ regulations.
DR-MTDK-MC-13-0098-1	BLM has mischaracterized Montana's air quality program by only referencing the regulation of large stationary sources and not recognizing the full extent of Montana's Air Monitoring, Analysis, and Planning Program or Air Quality Permitting, Compliance and Registration Program.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5. An additional description of the MDEQ air quality program and associated regulations has been added.
DR-MTDK-MC-13-0098-10	BLM should consider establishing spatial limitations when requiring enhanced mitigation measures. It would be inappropriate to mandate mitigation measures for an entire planning area that are not consistent with the CAA.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, Monitoring-Based Mitigation section for language limiting the geographic scope of mitigation measures.
DR-MTDK-MC-13-0098-12	Prior to completion of the photochemical grid modeling (PGM), BLM would review NAAQS exceedances and determine if enhanced mitigation is warranted. BLM has proposed to monitor EPA's Air Quality System (AQS) database to determine if monitoring data is showing an exceedance. It is not clear what criteria BLM will use to determine if an exceedance has occurred. BLM should include an explanation of how an exceedance will be determined in the RMP. Additionally, once data is posted to the AQS, even though available for review, the data may not be certified for several months. It would be inappropriate to compare uncertified data to the NAAQS.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, Monitoring-Based Mitigation section for language requesting concurrence from the MDEQ and USEPA on any potential exceedances.
DR-MTDK-MC-13-0098-13	Following completion of the PGM, BLM has proposed to calculate site specific design values for each pollutant monitored at a federal reference monitor within the planning area. If a BLM calculated design value is greater than 85% of the NAAQS, enhanced mitigation measures would be evaluated and selected by the BLM, in cooperation with DEQ, etc., when appropriate. It is unclear what criteria BLM will use to determine when it is appropriate or not appropriate to consult with DEQ. Additionally, establishing a threshold of 85% of the NAAQS does not appear to have any legal basis within the CAA. It is unclear under what authority BLM plans to implement mitigation measures based on this proposed threshold.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, Monitoring-Based Mitigation section for revised language indicating the MDEQ would always be consulted when identifying mitigation measures. The CAA does not include an 85 percent threshold; however, the BLM's mandate is to protect air resources. The BLM will begin reviewing oil and gas emission impacts when ambient monitoring indicates that air pollutant concentrations are approaching the NAAQS. This process should allow enough time to consult with MDEQ and formulate actions, if needed, in order to prevent NAAQS violations.

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DR-MTDK-MC-13-0098-3	The Bureau of Land Management (BLM) seems to disregard most of Montana's air quality program with reference only to DEQ regulating large stationary sources, which is not an accurate representation of DEQ's air quality programs.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5 for an additional description of the MDEQ air quality program and associated regulations.
DR-MTDK-MC-13-0102-3	The Air Resources Technical Support Document (ARTSD), pg. 6, states that Tier 4 emission standards were assumed in the Draft RMP near-field modeling analysis in order to demonstrate compliance with the 1-hr NO2 NAAQS. We note that the ARMP, Section 6.1, initial mitigation requirement for diesel drill rig engines >200 hp to meet Tier 4 emission standards for non-road diesel engines indicates that "oil and gas operators may use drill rig engines that exceed Tier 4 emission standards if modeling demonstrates compliance with the NAAQS and protection of AQRVs." We assume that this caveat means that additional near-field modeling will be required at the project-level if higher-emitting engines will be used.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 6.1 for discussion. Text has been modified to state that modeling or monitoring may be used to demonstrate compliance if non-Tier 4 engines are used. Demonstrations may be made at the project level or at a programmatic level.
DR-MTDK-MC-13-0102-6	Section 1.5 of the ARMP includes a detailed discussion of requirements for oil and gas activities that were developed through the 2008 Montana Statewide Oil & Gas EIS (Statewide), some of which are being integrated into the MCFO ARMP. We note that two of the Statewide requirements that are not "carried forward" into this ARMP are requirements to (1) maximize the number of wells connected to each compressor and (2) utilize natural gas fired or electrical compressors or generators. We recommend that BLM provide its rationale for discontinuing these emission-reducing requirements. In addition, given that the Draft RMP and Monitoring Appendix note that coal bed natural gas activities in the Decker area will continue to be managed under the Statewide EIS, it is somewhat difficult to follow which Statewide and/or MCFO requirements apply where. It would be helpful to provide a table in the ARMP to clarify if/when/where each Statewide and/or MCFO requirement applies upon completion of the ROD.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.6. Rationale has been added.
DR-MTDK-MC-13-0102-7	ARMP pg. 14-15: We understand that BLM intends to run the PGM to cover the full 20 year planning cycle of the RMP rather than performing an initial PGM run followed by periodic reassessments as described in Section 5.1.2 on p. ARMP-14. We recommend revising the text to clarify this point. In addition, we recommend revising Table ARMP-4 to include time in the schedule for the AQTW to review results from emissions modeling.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 5.1.2 and Table pg. ARMP-4 for discussion.
DR-MTDK-MC-13-	ARMP Section 6.2.3 indicates that following PGM completion, BLM would calculate design values for each pollutant monitored at a federal reference monitor within the planning area. We recommend revising this language to	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 6.2.3 for revised

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0102-8	include federal equivalent method monitors since the PM10 monitors at Birney, Broadus and Sidney are federal equivalent method monitors (not federal reference method monitors).	language.
DR-MTDK-MC-13-0102-9	ARMP Section 6.2.4 does not include a timeline for implementation of enhanced mitigation after the PGM is completed. We recommend a 1-year timeline for implementation of measures after selection of enhanced mitigation, similar to the timeline provided for implementation of enhanced mitigation measures prior to PGM completion (see Section 6.2.2: "Selected mitigation measures would be implemented within 1 year after the BLM decision to apply additional mitigation").	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 6.3.2 for discussion.
DR-MTDK-MC-13-0104-5	We object to BLM's attempt to exceed both federal and state regulations by requiring compliance with a New Source Performance Standard (NSPS).	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.3 for a description of BLM authority to manage air resources.
DR-MTDK-MC-13-0121-11	The PM10 monitors are not appropriately placed to measure PM10 as defined by MDEQ. The document even quotes MDEQ as stating that the Birney and Broadus sites PM10 monitoring values are not indicative or representative of general PM10 concentrations in the desired monitored area (pg. 10-ARMP). Therefore, these monitors would not provide a reliable measure of PM10, and, therefore, must not be used to implement mitigation measures associated with PM10. As shown in Table 3-2, pg. 3-13 of the Draft RMP there is already a significant amount of air quality monitoring that is ongoing for not only a variety of pollutants, but also wet deposition and visibility monitoring in this Montana planning area. Because the Clean Air Act has already established extensive actions based on actual monitoring data, BLM should only use approved design values prior to implementing mitigation measures on sources in the planning area.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources.
DR-MTDK-MC-13-0121-6	The Draft RMP fails to acknowledge the EPA's approved air quality registration program for the oil and gas industry in which sources are required to control emissions and the State conducts compliance investigations to ensure that the requirements are met.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.3.
DR-MTDK-MC-13-0133-1	4 of the 5 Alternatives include a proposal whereby the BLM would be establishing a separate air quality program from the State of Montana to regulate air quality impacts. In some cases, the requirements for mitigation go beyond what is currently required under the Clean Air Act.	See the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, sections 1.5.2 and 1.5.3 for an explanation on the interaction between the oil and gas registration program and BLM air resource management authority.
DR-	AQRV impacts are not assessed as a function of "new" versus "existing" air	See the Air Resources and Climate Appendix, Miles City Field

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MTDK-MC-13-0167-4	quality emission levels. Although referenced as a subjective analysis, FLAG guidance does not support such a determination.	Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 5.1 for discussion. Cumulative impacts including new and existing emissions will be modeled using photochemical grid modeling to assess air quality and AQRV impacts.
DR-MTDK-MC-13-0104-16	Many different peer-reviewed studies show varying impacts on sage-grouse from oil and gas operations. Why has BLM not included information from these studies in the document? Are the impacts recorded for the (past) intense developments in Wyoming assumed to be typical of what would occur in the MCFO planning area with future oil and gas development?	See the Bibliography for references considered in preparation of the RMP. Assumptions for the analysis are found in Chapter 4. Impacts from Wyoming development were considered, but not automatically assumed to be the same.
DR-MTDK-MC-13-0169-22	First, not enough information is provided in the Draft RMP to properly assess NHPA compliance. For example, BLM states that it has inventoried the analysis area for cultural and historic properties but it appears from the Draft RMP that only a Class I literature review has occurred to date for the draft RMP. Second, the proposed action (or at least certain aspects of it) qualify as an undertaking triggering the need “now “to undertake a reasonable and good faith effort to identify cultural and historic properties. For example, the proposed action includes designating specific areas, including SRMAs, for OHV use. This is clearly an undertaking that will result in increased surface disturbance.	See the Bibliography reference Aaberg 2006. A Class I literature review has been conducted covering the entire planning area . Aaberg’s study reviewed all the previously conducted Class II and Class III on-the-ground inventories conducted within the planning area and all the cultural and paleontological sites recorded, as of 2006. Also, see Chapter 2; Comparison of Alternatives Table 2-5; Special Recreation Management Areas (SRMAs), Extensive Recreation Management Areas (ERMAs) and Public Lands not Designated section for changes to the Proposed Alternative (E). No new SRMAs are being proposed in Alternative E that are open for OHV use. The existing open OHV use areas have undergone cultural Class III inventories. Note, the existing open OHV areas are no longer recommended open in the PRMP/FEIS.
DR-MTDK-MC-13-0150-3	The Miles City Draft RMP references the 2006 guidance provide by the Avian Power Line Interaction Committee. Draft RMP at pg. 2-29. Please note that a newer APLIC guideline manual was released in 2012 and should be referenced.	See the Bibliography reference Avian Power Line Interaction Committee (APLIC) 2012. The reference has been added.
DR-MTDK-MC-13-0121-12	The Draft RMP lists a number of initial air mitigations that will require implementation measures upon signature of the ROD. Several of the measures deal with fugitive dust control. While fugitive dust should be controlled, meeting State requirements (Administrative Rule of Montana 17.8.308) clearly satisfies BLM’s objectives.	See the Bibliography reference Bureau of Land Management and the United States Forest Service 2007b; the BLM "Gold Book" where gravel, scoria, and other dust abatement measures are included in the BMPs.
DR-MTDK-MC-13-0190-7	Information in Chapter 2, Livestock Grazing, Action 9 suggests that there are 190,000 acres (nearly 300 square miles) of BLM grazing allotments in the MCFO RMP planning area that are failing to meet rangeland health standards as a result of poor grazing practices.	See the Bibliography reference for BLM Washington Office Instruction Memorandum 2014 - 124 (BLM 2012g). When a portion of an allotment is not meeting standards, all of the acreage within the allotment is counted as not meeting standards due to the scale assessed.

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DR-MTDK-MC-13-0142-17	Pg. 4-135 - contains the statement "The efficacy of BLM NSO stipulations for leasing and development within 0.25 miles of a lek would result in an estimated lek persistence (the ability of leks to remain on the landscape) of approximately 5 percent, while lek persistence in areas without oil and gas development would be expected to average 85 percent." Source references/citations are needed for this statement.	See the Bibliography reference Knick, S.T. 2011 for timeframes and specifics on lek persistence. See Chapter 4 for revisions of the analyses.
DR-MTDK-MC-13-0121-38	Pg. 3-80 " Nearly 16 percent of Sage-Grouse Management Zone 1 is within 3 kilometers of oil and gas wells, a distance in which ecological impacts are likely to occur (Knick et al 2011). Much of the current oil and gas development is occurring on private lands, with little or no mitigation efforts, which elevates the ecological and conservation importance of sage-grouse habitat on public lands. Please provide the source of information (citation) which states that current oil and gas development is occurring on private land with little or no mitigation efforts.	See the Bibliography reference Knick, S.T. 2011. Also, see Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial); Special Status Species - Avian; Greater Sage-grouse section for revisions.
DR-MTDK-MC-13-0121-50	Pg. 4-162 " Because it would take 4 or more years from initiation of disturbance to noticeable population responses, impacts may not be known at or prior to the project initiation stage. This statement is not supported by a citation. Why would it take 4 or more years to detect population effects?	See the Bibliography reference Knick, S.T. 2011. The time lag effect has been observed and documented in the Pinedale Anticline (Wyoming) and the Powder River Basin (Montana).
DR-MTDK-MC-13-0142-20	Page 4-162 - "Because it would take 4 or more years from initiation of disturbance to noticeable population responses, impacts may not be known at or prior to the project initiation stage." COMMENT: This statement is not supported by all the monitoring that already occurs. Annual monitoring would detect any changes and allow trending analysis to occur over time. It should also be noted that besides surface disturbance, other factors need to be considered such as predation and weather affects (especially drought). The reference to 4 years implies an impact threshold that seems to be lacking science based information and should be removed from the FEIS.	See the Bibliography reference Knick, S.T. 2011. The time lag effect has been observed and documented in the Pinedale Anticline (Wyoming) and the Powder River Basin (Montana).
DR-MTDK-MC-13-0142-18	Pg. 4-135 - "Male lek attendance would be expected to be reduced when subjected to the current standard noise limitation of 50 decibels at the lek site." What is the source (citation) of this information?	See the Bibliography reference Patricelli, G.L. 2010 for more information. See Chapter 4 for revisions of the analyses.
DR-MTDK-MC-13-0104-26	Pg. 4-135- "Male lek attendance would be expected to be reduced when subjected to the current standard noise limitation of 50 decibels at the lek site." Citations are needed for this information.	See the Bibliography reference Patricelli, G.L. 2010. See Chapter 4 for revisions of the analyses.
DR-MTDK-MC-13-	Pg. 4-130 " Sage-grouse Management. BLM needs to clearly explain assumptions made in this section concerning sage-grouse management. According to the Draft RMP, there is an assumption that male sage-grouse lek	See the Bibliography reference Reese and Bowyer 2007 for more information. Although Greater Sage-grouse population numbers can be difficult to estimate, counting males on leks provides

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0121-42	attendance is a reliable index of population numbers and trends. Ramey et al (2011) indicate that the reduction in male lek counts has been assumed to equate to populations; however, this hypothesis has not been tested with probability based population counts. Does MCFO assume that male attendance on leks is in direct proportion to population size? If so, what is the scientific justification for this assumption? If not, what is the statistical relationship between male lek attendance and population size, and why?	insight to population trends.
DR-MTDK-MC-13-0121-30	Pg. 3-74 " In portions of Sage-Grouse Management Zone 1, sage-grouse populations have declined through wholesale loss of habitat and through impacts of disturbance and direct mortality to birds on the remaining habitat. What is BLM's source (citation) for this information and please clarify which portions of Sage-Grouse Management Zone 1 and/or which parts of the MCFO planning area to which this statement applies?	See the Bibliography reference Samson et al. 2004 for more information. Numerous sources of direct and indirect mortality are addressed. The planning area is entirely within Management Zone 1. Knick, S.T. 2011 is the reference.
DR-MTDK-MC-13-0142-9	Pg. 3-74 - "In portions of Sage-Grouse Management Zone 1, sage-grouse populations have declined through wholesale loss of habitat and through impacts of disturbance and direct mortality to birds on the remaining habitat." What is BLM's source of this information and please clarify which portions of Sage-Grouse Management Zone 1 and/or which parts of the MCFO planning area to which this statement applies?	See the Bibliography reference Samson et al. 2004 for more information. Numerous sources of direct and indirect mortality are addressed. The planning area is entirely within Management Zone 1. Knick, S.T. 2011 is the reference.
DR-MTDK-MC-13-0121-41	Pg. 3-82 " The greater sage-grouse range in Sage-Grouse Management Zone 1 is very similar to overall portions of the range in which sage-grouse have been extirpated already (i.e., areas with high human footprints), mostly because of the abundance of and distribution of sagebrush occurring in Sage-Grouse Management Zone 1 (Wisdom, Meinke, Knick, and Schroeder 2011), which suggests sage-grouse in Sage-Grouse Management Zone 1 are more vulnerable to declines than those in other portions of sage-grouse range." If Sage-Grouse Management Zone 1 is very similar to overall portions of the range in which sage-grouse have been extirpated, mostly because of the abundance and distribution of sagebrush, please explain why the seven sage-grouse management zones were delineated based on floristic provinces.	See the Bibliography reference Stiver et al. (2006, pg. 1-11) for more information on the zones.
DR-MTDK-MC-13-0121-17	Without a clear explanation for the seven year active (lek) definition, this restriction is unreasonable and arbitrary.	See the Bibliography reference United States Fish and Wildlife Service, 2002d. The 7-year period is a known preferred prey species fluctuation from population high to lows and provides protection for unoccupied raptor nests.
DR-MTDK-MC-13-0142-4	What is the scientific justification for a nest considered to be "active" if it has been used in the past seven years?	See the Bibliography reference United States Fish and Wildlife Service, 2002d. The 7-year period is a known preferred prey species fluctuation from population high to lows and provides protection for unoccupied raptor nests.

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DR-MTDK-MC-13-0108-4	A recent USGS report on Coal Geology, Resources, and Reserves in the Montana Powder River Basin supports the need to update the coal development information in the Draft RMP. That report, released in February 2013, acknowledges that [r]esources once considered to be subeconomic, may be elevated to the status of reserves with continued favorable sales prices as well as productivity and technological advances in mining. Therefore, reserve studies should be considered a cyclic process and models should be adjusted periodically using the most recent data and reassessed using the most current recovery technology and economics. See Haacke, Scott, Osmonson, Luppens et al., Assessment of Coal Geology, Resources, and Reserves in the Montana Powder River Basin at 31-32, Open File Report 2012-2013, USGS (hereinafter USGS Report), available at http://pubs.usgs.gov/of/2012/1113/OF12-1113.pdf.	See the Bibliography reference United States Geological Survey 2013. The USGS report has been considered and is now incorporated as a reference.
DR-MTDK-MC-13-0108-2	The Draft RMP should be revised to identify additional coal areas of interest to address (1) improved conventional mining methods and new mining techniques and technologies that have been developed and/or refined since the 1985 and 1996 RMPs (e.g., underground coal gasification, microbial conversion, more efficient conventional mining methods, and other coal-conversion technologies), (2) demonstrated interest in coal exploration and development in the past two decades, and (3) documentation of updated geologic resources prepared by the U.S. Geologic Survey (USGS) and others. BLM should provide for additional development of coal reserves on BLM-administered surface land and mineral estates within the planning period of this RMP, consistent with current energy and mineral development policies.	See the Bibliography reference USGS 2013. The cited USGS report has been incorporated as a reference in the PRMP/FEIS. The USGS coal estimate report was conducted as a requirement of the Energy Policy Act and is not a substitute for the coal screens required by 43 CFR 3420.1-4.
DR-MTDK-MC-13-0108-7	The USGS Report identifies substantially more available coal resources "more than 162 billion short tons" in the Montana Powder River Basin, with approximately 35 billion short tons identified as recoverable. USGS Report at 31. The Draft RMP/EIS' statement that approximately 1.2 billion tons are considered recoverable refers only to reserves at producing mines and is not representative of the coal development potential within the resource management area. The coal development potential area shown on Map 76 should be expanded to include the recoverable coal resources identified by the USGS.	See the Bibliography reference USGS 2013. The cited USGS report is incorporated as a reference in the PRMP/FEIS. The USGS coal estimate report was conducted as a requirement of the Energy Policy Act and is not a substitute for the coal screens required by 43 CFR 3420.1-4.
DR-MTDK-MC-13-0121-36	Taylor et al (2007) analyzed six oil and gas development areas in Wyoming with various degrees and ages of activity to determine sage-grouse population trends relative to intensity and timing of oil and gas development. Scientists studying sage-grouse clearly have varying interpretations concerning effects of oil and gas development on population trends. Has BLM considered results of studies conducted by Ramey et al (2011) and Taylor et al (2007) in addressing	See the Bibliography, Ramey reference. The Taylor reference is unpublished.

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	the effects of oil and gas development on sage-grouse and sage-grouse habitat?	
DR-MTDK-MC-13-0104-25	Pg. 4-135 -"The efficacy of BLM NSO stipulations for leasing and development within 0.25 miles of a lek would result in an estimated lek persistence (the ability of leks to remain on the landscape) of approximately 5 percent, while lek persistence in areas without oil and gas development would be expected to average 85 percent. " References and citations must be provided.	See the Bibliography, reference Walker et al. 2007 for more information.
DR-MTDK-MC-13-0104-18	Pg. 3-80 - "Nearly 16 percent of Sage-Grouse Management Zone 1 is within 3 kilometers of oil and gas wells, a distance in which ecological impacts are likely to occur (Knick et al 2011). Much of the current oil and gas development is occurring on private lands, with little or no mitigation efforts, which elevates the ecological and conservation importance of sage-grouse habitat on public lands. " Please provide the source of information stating much of the current development is on private lands.	See the Bibliography. Knick et al 2011 is the reference.
DR-MTDK-MC-13-0104-13	Pg. 3-74- "In portions of Sage-Grouse Management Zone 1, sage-grouse populations have declined through wholesale loss of habitat and through impacts of disturbance and direct mortality to birds on the remaining habitat." What is the source of this information and which parts of Zone 1 and/or the MCFO planning area does this statement apply to?	See the Bibliography. Samson et al. 2004 is the reference.
DR-MTDK-MC-13-0094-2	Publish in your RMP the right of protest and appeal to the Interior Board of Land Appeals, and how.	See the Dear Reader letter at the front of the document for instructions on protesting or appealing the proposed decisions in the PRMP/FEIS.
DR-MTDK-MC-13-0121-44	How will the WMPP stipulations, including provisions for monitoring and adaptive management discussed therein, be carried forward with respect to implementation of the RMP?	See the Fish, Aquatic and Wildlife Habitat, Including Special Status Species Appendix. The WMPP has been removed. For mitigation and monitoring recommendations, see Greater Sage-Grouse (GRSG) Required Design Features Appendix; the Greater Sage-Grouse (GRSG) Monitoring Framework Appendix, the Mitigation Measures and Conservation Actions Appendix and the Monitoring Appendix.
DR-MTDK-MC-13-0162-3	The Wildlife Monitoring Protection Plan: the process for annual reports and meetings needs to include specific dates at the time of the ROD not an uncertain date to be developed later. The adaptive management process described for use does not conform to the DOI Manual on Adaptive Management. Thresholds and other commitments are vague and need specifics (e.g., 10% decline in population) Protocols for some monitoring are not likely to be effective (e.g., 5-year interval for lek searches, 1x visits/season for lek activity determination) and need to be based on recommendations for all sources, including the NTT Team recommendations and newly available	See the Fish, Aquatic and Wildlife Habitat, Including Special Status Species Appendix, Wildlife, for updates. The Wildlife Monitoring and Protection Plan has been removed.

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	scientific publications and guidance, not just the BLM MT sage grouse working group. Some of the dates for seasonal restrictions need to be consistent with latest recommendation from recent WAFWA recommendations or reasons given as to the divergence.	
DR-MTDK-MC-13-0190-10	The use of the term "permanent water" is confusing. It suggests that in order to have a riparian area you must also have a perennial stream.	See the Glossary definition for "Riparian Area". The definition has been modified.
DR-MTDK-MC-13-0098-5	The Draft RMP contains numerous terms with unique legal and technical meaning and implications under the CAA. In many cases, the draft RMP terminology is not clearly defined and may have different meanings than established by the CAA (i.e. “adverse impacts, increment analysis, air quality related values, design value, etc.)	See the Glossary for definitions of air resource terms, including exceedance, exceptional event, design value, prevention of significant deterioration increment and increment analysis, potential to emit, and air quality related value.
DR-MTDK-MC-13-0191-18	Several proposed actions in Table 2-1 are conditioned such that they would not impact the "functionality" of Greater Sage-grouse habitat, or would be allowed if they "improved or maintained" Greater Sage-grouse habitat. However, no definitions, criteria/standards, or assessment methodologies are provided for these terms. We recommend that such definitions, criteria/standards, and proposed assessment methodologies be provided	See the Glossary for definitions, such as “Functional habitat”.
DR-MTDK-MC-13-0190-6	For Water, Action 7, under Alternative E, please define the term "floodplain." Is it the 25-yr, 100-yr, 500-yr?	See the Glossary for definitions.
DR-MTDK-MC-13-0142-26	BLM has failed in the Draft RMP to differentiate between what constitutes a BMP, Mitigation Guidelines, and even what constitutes a regulatory requirement.	See the Glossary for definitions. Also, see the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0151-1	Chapter 2, pg.s 43 & 44, Actions 6 & 7 state that surface disturbing activities are to be avoided within 2 miles of leks and it also states low voltage power lines would need to be buried. How can we bury the power lines without disturbing the surface?	See the Glossary for the definition of “avoidance areas”. Avoid does not equate to not allowed or allowed in every instance. Also, see also Chapter 2, Greater Sage-Grouse (GRSG) Habitat Management section and its subsections for revisions.
DR-MTDK-MC-13-0133-4	The Draft RMP indicates, that proposed ROW must be "compatible with the purpose for which the area was designated" and "not otherwise feasible on lands outside the avoidance area.” However, these statements do not specify any standards by which such determinations will be made.	See the Glossary. The definition for "Avoidance Areas" has been reworded to provide a better explanation.

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DR-MTDK-MC-13-0097-26	The standard for evaluating proposals to develop in avoidance areas should be revised. The standard given in the glossary is that such proposals must be: (1) "compatible with the purpose for which the area was designated"; and (2) "not otherwise feasible on lands outside the avoidance area." Draft RMP pg. GLO-3.	See the Glossary. The definition for "Avoidance Areas" has been reworded to provide a better explanation.
DR-MTDK-MC-13-0076-9	Perch discouragers were originally designed to reduce raptor electrocutions by moving birds from an unsafe (electrocution risk) perching location to a safer alternative, either on the same structure or a nearby structure on the same line. Recent data has documented poor effectiveness in perch discouragers and greater effectiveness of covers for preventing electrocutions (see Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 [APLIC 2006], pgs. 17-18).	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs. Note, the operator must comply with the most recent APLIC guidelines which include the use of covers.
DR-MTDK-MC-13-0092-1	It is unclear what BMPs BLM would apply within the planning area and whether they would be applied consistently.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0092-2	Some of the BMPs are incomplete. For example, neither the Montana or NTT BMPs for grazing management prescribe a minimum grass height in sage-grouse nesting and brood-rearing habitat, which the Draft RMP identified as important for predator avoidance (pg. 4-160).	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs. Also, see Chapter 2, Greater Sage-Grouse (GRSG) Habitat Management section and its subsections for addition text.
DR-MTDK-MC-13-0104-21	Pg. BMP-43 -"Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season." There is no information regarding exactly what constitutes a noise shield or at what distance from the lek it would be required. Further, there are many engineering issues that may prevent installation.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-	The BMPs should be modified to make it clear that the actions are required for oil and gas drilling operations only.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation

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MC-13-0108-20		Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs. Note, BMPs apply to the entire RMP, not just the oil and gas sections.
DR-MTDK-MC-13-0133-5	While we understand the need to co-locate facilities, reasons other than erosion may make this infeasible. For example, different operators on adjoining leases may be unable to co-locate facilities due to different safety and operating practices. Therefore, we recommend that the following phrase be added to this statement, "to the extent technically and economically feasible."	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0142-28	Pg. BMP-3 (l): the subsections states "Interim and final reclamation would begin within 25 days of the disturbance. Interim reclamation would be completed to within a few feet of facilities." It is inappropriate to require any reclamation activities to begin within 25 days of disturbance. While pipeline reclamation is typically conducted in conjunction after a line is installed, it could be difficult to meet even for linear projects if certain circumstance occurred. Language should be inserted that follows existing guidance for right of ways regarding reclamation timing.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions and explanation. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0142-29	It is virtually impossible to remove all oil from a pipeline prior to Hydrotesting. Therefore a better description of the pre-cleaning methodology should be included in the BMP.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions and explanation. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0191-11	There are no West Nile virus measures in the Fish and Wildlife Appendix, as stated.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix for discussion.
DR-MTDK-MC-13-0196-1	It is unclear what BMPs BLM would apply within the planning area and whether they would be applied consistently.	See the Greater Sage-Grouse (GRSG) Required Design Features Appendix and the Mitigation Measures and Conservation Actions Appendix for revisions and explanation. The BMP Appendix is now the Greater Sage-Grouse (GRSG) Required Design Features Appendix, where all Greater Sage-grouse mitigation is found; and the Mitigation Measures and

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		Conservation Actions Appendix, for all remaining BMPs.
DR-MTDK-MC-13-0166-2	At pg. LAN-8, it is noted that the lands of the Custer National Forest are withdrawn but the acres are not known. The Custer National Forest lands addressed in the Draft RMP consist of the Ashland District and the Montana portion of the Sioux Ranger District. We are not aware of locatable mineral resources on these lands.	See the Lands and Realty - Renewable Energy Appendix. The reference to these types of Forest Service withdrawals has been removed from the document.
DR-MTDK-MC-13-0190-16	Livestock Grazing Appendix, pg. LVG-2, Figure 1. Please describe the process/criteria for determining whether or not resource management opportunities are "limited."	See the Livestock Grazing Appendix. The Authorized Officer makes the determination if opportunities are limited, based on the factors listed on the Flowchart page.
DR-MTDK-MC-13-0108-19	In the past, some BLM offices have interpreted oil and gas NSO and CSU stipulations as applicable to all mineral development. Because the stipulations are specific to oil and gas leasing, the RMP should expressly confirm that they are not applicable to coal leasing and development, which is subject to its own coal screening process.	See the Minerals Appendix, Fluid Minerals, Lease Stipulations section for revisions. Oil and gas stipulations only apply to oil and gas lease operations.
DR-MTDK-MC-13-0121-24	Under Alternative E, a CSU stipulation would be included for oil and gas leases in the Sage-Grouse Restoration Area. How would these stipulations be developed and what factors would be evaluated in determining the stipulations?	See the Minerals Appendix, Fluid Minerals, Lease Stipulations section for a list of all stipulations, including CSU.
DR-MTDK-MC-13-0121-61	Two of the three Draft RMPs reviewed indicate that CSU stipulations will be developed for activities in various sage-grouse habitats; however, BLM fails to specify in the MCFO Draft RMP how CSU such stipulations will be formulated.	See the Minerals Appendix, Fluid Minerals, Lease Stipulations section for a list of all stipulations, including CSU.
DR-MTDK-MC-13-0123-1	No Surface Occupancy (NSO) does not seem to mean (as would be expected) no occupation of the land surface. There are too many exceptions offered and no public process spelled out that will allow the public to comment anytime exceptions are made. This needs to be corrected. If exceptions are made to NSO, the BLM needs to notify interested parties and allow for public comment, including an analysis under the National Environmental Policy Act.	See the Minerals Appendix, Fluid Minerals, Lease Stipulations; Implementation of Waivers, Exceptions or Modifications section for the process of using WEMs.
	Pg. 3-164, at the bottom of the page states "The MCFO has responded to a number of vehicular accidents that involved the accidental release of hazardous materials or petroleum products from transport vehicles. The hazardous materials management program may become involved with a particular response action or cleanup when the release affects BLM-administered lands." This is the only mention of this "hazardous materials management program" and there is no explanation of their involvement in these cleanups or when their involvement is necessary.	See the Minerals Appendix, Fluid Minerals, Oil and Gas. An undesirable events section was added under the Fluid Minerals Operations and Procedures section.
	The 2010 Energy Lease Reforms should be fully implemented; it is hard to tell	See the Minerals Appendix, Fluid Minerals, Operating Standards

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	if this RMP does that. The MCFO has an opportunity to expand MLP efforts in more than one area covered by the RMP, as the majority of the BLM lands are unleased as of 2011 (4.8 Million Acres or 76.5%).	and Approval Procedures section. Operations and procedures have been revised to show the Leasing Reform fully implemented in accordance with WO IM No. 2010-117. Also, an area must meet certain criteria to be considered an MLP. The entire planning area was evaluated per the MLP criteria. See Chapter 2, Minerals, Oil & Gas, Proposed Carter MLP Area section. Note, although the Carter MLP area is considered for MLP treatment in Alternative C, no areas are recommended for an MLP in the Proposed Plan/Alternative (E).
DR-MTDK-MC-13-0097-18	Pg. MIN-55 states: "As part of approval, an EA is completed for each APD." This statement is incorrect. As a matter of law, an APD approval may be subject to a categorical exclusion from NEPA analysis. The Energy Policy Act of 2005 provides five statutory categorical exclusions from NEPA review that may be used to authorize oil and gas development on federal oil and gas leases. 42 V.S.C. § 15942(b). The RMP and EIS should recognize that these categorical exclusions may exempt future oil and gas development from additional NEPA analysis, and that not all APDs will require preparation of an EA.	See the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for revisions.
DR-MTDK-MC-13-0171-10	Each of the new high tech oil/gas wells (Hydraulically Fractured or Fracked) will utilize 2-3 million gallons of water during fracking and most of this total comes back out with the oil and gas. How will these impacts to the land and aquifer be managed?	See the Minerals Appendix, Fluid Minerals, Operating Standards and Approval Procedures section for detail on the disposal of produced water and the safeguards used to protect groundwater quality during drilling operations.
DR-MTDK-MC-13-0171-11	How will management look in the event of a large water event and pits overflowing onto the landscape and quite possibly local water sources?	See the Minerals Appendix, Fluid Minerals, Production and Development, Water Production section specifying produced water disposal would follow the requirements of Onshore Oil and Gas Order No. 7, Disposal of Produced Water (BLM 1993).
DR-MTDK-MC-13-0134-6	It is not clear in the RMP why parts of the Bakken were not considered for Master Leasing Plans and if Master Development Plans were also a possibility. This needs to be considered.	See the Minerals Appendix, Fluid Minerals, Proposed Carter Master Leasing Plan Area, Background section. An area must meet certain criteria to be considered an MLP. The entire planning area was evaluated per the MLP criteria. Master Development Plans are more often developed after a lease or leases are issued, such as when a full-field development plan is considered for approval and implementation.
DR-MTDK-MC-13-0104-29	Pg. 4-175- "Areas of development in which 8 or more well pads per section were allowed, in combination with the existing and proposed development occurring across the Montana border in Wyoming, would potentially result in the complete loss of sage-grouse in these areas. • Pg. 4-165 "Areas of development in which 8 or more wells pads per section were allowed, in	See the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section for the anticipated projections of future drilling activity which provides estimates of new wells per township.

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	combination with existing and proposed development occurring across the Montana border in Wyoming, would potentially result in the complete loss of sage-grouse in these areas." Under the preferred alternative E, how is the issue of well-pad density addressed? What are the projected well-pad densities in the various categories of sage-grouse habitat? On what is the conjecture based that 8 or more well pads per section and some undefined level of additional development would result in the complete loss of sage-grouse?	
DR-MTDK-MC-13-0121-52	Under Alternative E, what are the projected well-pad densities in the various categories of sage-grouse habitat? Moreover, what scientific citation has BLM relied upon to make the assumption?	See the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section for the anticipated projections of future drilling activity which provides estimates of new wells per township.
DR-MTDK-MC-13-0162-2	In the Reasonably Foreseeable Development scenario (used by BLM to estimate energy development potential) over 3,300 wells are projected in moderate/low potential in the next 20 years, which seems to be contrary to the reason BLM gave for not analyzing the TRCP Sportsmen Area alternative (i.e., low potential).	See the Minerals Appendix, Fluid Minerals, Reasonably Foreseeable Development Scenarios for Resource Management Plan Alternatives section for changes to the oil and gas RFD.
DR-MTDK-MC-13-0121-59	Is it assumed that if a particular Surface acreage is under BLM Management then the mineral estate within that same acreage is also under BLM Administered Federal Mineral Estate and/or Oil and Gas Lease as well?	See the Minerals Appendix, Fluid Minerals, Split Estate section. BLM administered surface does not always overlie BLM administered minerals.
DR-MTDK-MC-13-0108-11	The Draft RMP should, at a minimum, continue to assume that a mine and end-use facility, similar to generic mine and facility described in Minerals Appendix, will be developed in the Big Dry RMP area during the life of the plan. It should also analyze the impacts of such a mine and end-use facility.	See the Minerals Appendix, Solid Minerals RFD, Coal section. BLM has updated the RFDs for the planning area based on the updated coal forecast by U.S. Energy Information Administration (EIA)'s Annual Energy Outlook 2013.
DR-MTDK-MC-13-0105-7	On pg. MIN-137 there is discussion about Surface Owner Consent. The RMP states that this RMP did not attempt to obtain information regarding Surface Owner Consent.	See the Minerals Appendix, Solid Minerals RFD, Coal section. Consultation with qualified surface owners is required (43 CFR 3420.1-4(4)(i)) as part of the coal leasing process either while preparing a comprehensive land use plan or land use analysis. . During implementation, all coal screens will be applied, as appropriate, during environmental analysis conducted in response to site-specific lease applications. The RFD for the coal mines has been updated.
DR-MTDK-MC-13-0067-2	Under the coal section of the minerals appendix (MIN-157) that there was a statement on Decker Coal as follows: It is not anticipated that the operators of this mine will need to lease additional federal coal reserves; subsequently, an RFD is not necessary. On April 12th, 2013 Decker entered into a Memorandum of Understanding with the Department of the Interior, Bureau of Land	See the Minerals Appendix, Solid Minerals RFD, Coal section. The RFD for the Decker Mine has been updated.

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	Management for the purpose of preparing an environmental assessment for the Decker Coal Lease Modification at the West Decker Mine.	
DR-MTDK-MC-13-0108-10	This limited RFD scenario for coal is directly contradicted by BLM's own December 2011 report prepared as part of the Powder River Basin Coal Review. That report concludes that, by 2030, three additional coal mines will likely be developed in the Ashland/Colstrip region (the proposed Many Stars and Otter Creek mines and a new mine that has yet to be proposed), and two new mines will be developed in the Sheridan/Decker region (the proposed Youngs Creek mine and one that has not yet been proposed). See PRB Report at 3-2 to 3-8. These new developments are in addition to the currently operating coal mines, which the report anticipates will continue through 2030. Id. at 3-7. The PRB Report specifically acknowledges that [f]uture coal mining in the Montana PRB study area is considered highly likely based on the anticipated production rates in relation to the available economic reserves. Id. (3) The report is available at http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs.html.	See the Minerals Appendix, Solid Minerals RFD, Coal section. The RFD has been re-evaluated using updated production and coal forecast data. The cited potential mines are either speculative at this time (Many Stars), do not contain federal coal (Otter Creek, Many Stars), or are outside of the planning area (Many Stars, Youngs Creek).
DR-MTDK-MC-13-0108-3	As noted above, the information relevant to coal development potential contained in those previous RMPs is out of date and does not take into account (1) additional exploration information gathered in the intervening years, (2) changes or additions in extractive technology, including underground coal gasification and microbial coal conversion, (3) operating and mining efficiency improvements in existing conventional mining techniques directly affecting the surface mining stripping ratio economic cut-off, and (4) current coal market pricing in determining the economic recoverability of coal. Since those previous RMPs were prepared, significant coal exploration has been conducted by the private sector under the authorization of State of Montana prospecting permits and the federal coal exploration license program. From these efforts, a substantial amount of public information is available, which BLM should use to update its evaluation of coal resources in the planning area.	See the Minerals Appendix, Solid Minerals RFD, Coal section. The RFD has been re-evaluated using updated production and coal forecast data.
DR-MTDK-MC-13-0134-14	While coal leasing decisions are pulled forward from the Big Dry and Powder River RMPs (1996 and 1985), the Reasonable Foreseeable Development scenarios need to be updated as well. The most obvious example of this can be found on pg. 157 of the Minerals Appendix, where it is stated that it is not anticipated that the operators of this mine [Decker] will need to lease additional federal coal, and that subsequently, an RFD is not necessary.	See the Minerals Appendix, Solid Minerals RFD, Coal section. The coal RFD has been updated.
DR-MTDK-	BLM's assumption on marketability of coal from the region is out of date. The RMP relies on a 2009 DOE-EIA Annual Energy Outlook for its assumptions as	See the Minerals Appendix, Solid Minerals RFD, Coal section. The coal production forecast has been updated using the US

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MC-13-0134-22	noted in the Minerals Appendix, pg. 157. Since that overly optimistic outlook for coal markets, U.S. domestic coal markets have undergone a stunning decline. By mid-2012, coal had fallen from almost 50% of electric power generation in 2005 to 36%. A burgeoning natural gas sector with low prices has undercut coal's competitiveness. Also, more than 100 aging coal plants are being retired, many of them being replaced by natural gas, wind, and investments in energy efficiency. The EIA released a report on May 30, 2013, on sales of fossil fuels from federal lands, finding a 1% decline in coal sales.	Energy Information Administration (EIA) Annual Energy Outlook 2013 report.
DR-MTDK-MC-13-0172-1	The Agency states, It is assumed that the Decker Mine will produce at or below the 2008 production levels for the long term. It is not anticipated that the operators of this mine will need to lease additional federal coal reserves; subsequently, an RFD [reasonably foreseeable development] is not necessary. With the new push to ramp up production and increase exports, the BLM's assumptions now appear completely misplaced.	See the Minerals Appendix, Solid Minerals RFD, Coal section. The coal RFD has been updated.
DR-MTDK-MC-13-0191-6	The Western Association of Fish and Wildlife Agencies (WAFWA)Sage-Grouse Guidelines are included in the Fish and Wildlife Appendix starting on pg. FWI -1 .However, it is unclear as to how and under what circumstances these would be applied to proposed actions under any of the alternatives. Also, it is unclear from the Greater Sage-grouse Monitoring section starting on pg. FWI-9 as to when implementation and effectiveness monitoring would be conducted, and what methodology would be employed.	See the Mitigation Measures and Conservation Actions Appendix and GRSG Monitoring Framework appendices for updates.
DR-MTDK-MC-13-0089-58	Considering alternatives to prevent or abate GHG emissions, in particular through enforceable stipulations required in the RMP to attach to subsequent oil and gas leases, is reasonable and prudent.	See the Mitigation Measures and Conservation Actions Appendix for a summary of BMPs that apply across all alternatives to decrease GHG emissions.
DR-MTDK-MC-13-0104-6	BLM has failed to acknowledge that in accordance with valid existing lease rights, many of the identified measures in the BMP Appendix would abrogate such rights.	See the Mitigation Measures and Conservation Actions Appendix, Introduction, explaining application of BMPs.
DR-MTDK-MC-13-0121-21	Please define the term nest dragged. •	See the Mitigation Measures and Conservation Actions Appendix, Introduction, for revisions. The terminology is no longer used.
DR-MTDK-MC-13-0142-27	In addition to the fact that not all of the BMP measures would be achievable or even appropriate mitigation in all cases, BLM has failed to acknowledge that in accordance with valid existing rights, many of the identified measures in the Appendix would abrogate such rights.	See the Mitigation Measures and Conservation Actions Appendix, Introduction, explaining application of BMPs and operating procedures.
DR-	The Greater Sage-grouse BMPs starting on pg. BMP-18 contain many	See the Mitigation Measures and Conservation Actions

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MTDK-MC-13-0191-4	measures of potential conservation benefit to Greater Sage-grouse. However, we found the organization and intended applicability of these measures to be extremely unclear and confusing.	Appendix, Introduction, for revisions.
DR-MTDK-MC-13-0191-5	We recommend the BMP Appendix be reorganized, consolidated, and edited to provide clarity as to which measures would apply to which actions under which circumstances and alternatives. We also recommend that, where possible, measures be edited to provide clear consistency with conservation measures and options included in the COT Report.	See the Mitigation Measures and Conservation Actions Appendix, Introduction, for revisions.
DR-MTDK-MC-13-0171-8	Are there any studies or are studies planned regarding activities within the RMP on wildlife and effects of activities on the land?	See the Monitoring Appendix for planned monitoring activities. Also, studies (i.e. research) are referenced in the document and will continue to be utilized for future management activities.
DR-MTDK-MC-13-0151-3	According to research listed in a document entitled "Consequences of Treating Wyoming's Big Sagebrush to Enhance Wildlife Habitats" published in Rangeland Ecology and Management, 6(5}: 440- 455, 2012 it is stated that very hot wildfires actually kill sagebrush. When the undergrowth is not regulated and becomes a mat of dry tinder to feed the fire that can kill sagebrush for 25 to 100 years. Chapter 2, pg. 50, Action 24 states if monitoring data demonstrates livestock use is adversely affecting, sage-grouse or their habitat, change in active use could be considered. Who monitors these?	See the Monitoring Appendix. BLM conducts monitoring throughout the planning area.
DR-MTDK-MC-13-0150-14	There are two maps titled Oil and Gas Leasing Restrictions in Alternative B.	See the Oil and Gas Leasing Restrictions maps for corrections.
DR-MTDK-MC-13-0130-10	The public does not know which rivers were evaluated for wild and scenic river designation and which were deemed ineligible due to not being free-flowing and/or failing to possess outstanding remarkable values. Nor does the public know how those terms (free-flowing and outstandingly remarkable) were defined by BLM. Particular attention should be placed on rivers that have both ecological, fish and wildlife, and historic/cultural values, including the Tongue River. Moreover, BLM's statement that certain river segments that were along the route used by the Corps of Discovery is not an outstandingly remarkable value in the absence of some physical feature • related to the event is misplaced and inconsistent with the WSRA's eligibility criteria and the Agency's own guidance (1982 Interagency Guidelines). The same is true with respect to the pallid sturgeon population. The presence of the endangered species alone, should suffice for an outstandingly remarkable value (spawning habitat is not necessary). Also missing from the Draft RMP is BLM's	See the Special Designation Areas Appendix, Wild and Scenic Rivers section.

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	obligation to consider and analyze how the proposed action may affect potential wild and scenic rivers in the analysis area.	
DR-MTDK-MC-13-0169-25	In order to submit meaningful public comment on the Draft RMP, the BLM must provide the inventory of eligible rivers and explain its methodology for identifying eligible rivers. For example, BLM suggests in the appendix to the Draft RMP (pg. SPE-22) that to be deemed an outstandingly remarkable value it must be exemplary, significant, or be nationally or regionally important. BLM cites no authority to support such a high standard and we are not aware of any in the Wild and Scenic Rivers Act (WSRA) or the 1982 Interagency Guidelines.	See the Special Designation Areas Appendix, Wild and Scenic Rivers section.
DR-MTDK-MC-13-0092-12	From the contents of the MCFO Draft RMP, it is difficult to determine whether prairie dogs currently inhabit the Black-footed Ferret ACEC at all.	See the Special Designations Appendix. The area is no longer recommended for ACEC designation. See Chapter 2, Comparison of Alternatives Table 2-5, Fish, Aquatic and Wildlife Habitat, Including Special Status Species section, Management Common to all Alternatives, for reference to the Black-footed Ferret Working Group. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species, Terrestrial section for discussion on black-footed ferret habitat; approximately 455 acres of BLM-administered lands are occupied by active prairie dog towns within the ACEC.
DR-MTDK-MC-13-0108-23	BLM should reconsider maintaining the ACEC designation for the Black-Footed Ferret Reintroduction area.	See the Special Designations Appendix. The area is no longer recommended for ACEC designation.
DR-MTDK-MC-13-0174-3	BLM needs to address the potential impacts of climate change on the spread of invasive plants, particularly cheatgrass (Bromus tectorum), which may highly alter the quality of habitat by outcompeting native grasses and forbs and causing increased frequency and severity of wildfires, which are detrimental to fire-intolerant sagebrush species. Recent modeling studies have shown the possible expansion of cheatgrass in the Eastern Region of sage-grouse under various climate-change scenarios (Bradley 2009).	See the Vegetation Appendix discussion on research illustrating cheatgrass is not a threat in the northern great plains.
DR-MTDK-MC-13-0190-11	The second part of the statement, regarding waterbodies not be in expected to meet water quality standards after implementation of BMPs for nonpoint sources, is false. In most cases, where nonpoint source pollution is the main cause of impairment, the application of BMPs is expected to lead to achievement of water quality standards	See the Water Appendix, Impaired Waterbodies in the Planning Area, the 303(d) List section for text changes.
DR-	Water Appendix, pg. WAT-26, under heading "Water Quality Categories" You	See the Water Appendix, Impaired Waterbodies in the Planning

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MTDK-MC-13-0190-13	state: "The MDEQ places each waterbody in the Montana's Water Quality Integrated Report (305(b)) in one unique assessment category". However, in Table 2 of the Water Appendix, you cite numerous examples of where DEQ has placed a single waterbody into two categories (e.g. "5, 2B"). You identify Subcategory 4B, a category that Montana for which Montana has no current listings, but you fail to identify subcategories 2A and 2B, for which Montana has multiple current listings.	Area, Water Quality Categories section. The text of the analysis has been changed to include Water Quality Categories 2A and 2B.
DR-MTDK-MC-13-0190-14	Consider replacing the water quality category definitions with the following: 2012 303D/305B Water Quality Categories ID Description 1 - All uses assessed and fully supported. 2A - Available data and/or information indicate that some, but not all of the beneficial uses are supported. 2B - Available data and/or information indicate that a water quality standard is exceeded due to an apparent natural source in the absence of any identified anthropogenic sources. 3 - Insufficient data to assess any use. 4A - All TMDLs needed have been completed. 4C - TMDLs are not required; no pollutant-related use impairment identified. 5 - One or more uses are impaired and a TMDL is required.	See the Water Appendix, Impaired Waterbodies in the Planning Area, Water Quality Categories section for text changes.
DR-MTDK-MC-13-0190-15	Water Appendix, pg. WAT-26. You have used the term "source" where you should have used the term "cause," and vice/versa. The term "possible cause" should be changed to "probable cause"	See the Water Appendix, Impaired Waterbodies in the Planning Area, Impairment Causes; and Possible Sources of Impairment sections for text changes.
DR-MTDK-MC-13-0105-5	What is the impaired status of Otter Creek? Also, the Tongue River is above the salinity standards set by the numeric water quality standards.	See the Water Appendix. Otter Creek and the Tongue River are listed in the table showing impaired waterbodies.
DR-MTDK-MC-13-0089-30	At the Rosebud Mine, coal mining is causing significant degradation of water quality, and is contributing to water quality violations of already impaired streams.	See the Water Appendix. The Rosebud Mine is a probable source of impairment to East Fork Armells Creek. The MDEQ includes coal mining as a probable source of impairment to East Fork Armells Creek for the section reaching from Colstrip to the mouth and surface mining for the section reaching from the headwaters to Colstrip. These impaired reaches are listed in the Water Appendix; see the table showing the list of impaired streams and rivers in the planning area. Also, see Chapter 4, Water Resources, Impacts Common to all Alternatives section and alternatives A through E for the potential impacts from oil, gas, and coal development on water resources.
DR-MTDK-MC-13-	Explain how (using what sources) and when Greater Sage-grouse habitat and management objectives would be developed for Category M and C livestock grazing allotments.	Site specific objectives will be developed when a site-specific action is proposed.

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0191-13		
DR-MTDK-MC-13-0169-13	In the Draft RMP, BLM references a 2006 study but fails to include it in the RMP.	The 2006 study referenced in the RMP is available on-line at_ http://www.blm.gov/mt/st/en/fo/miles_city_field_office/rmp/docs.html.
DR-MTDK-MC-13-0191-16	Table 2-1, Greater Sage-grouse RA Action 4, Alternative D. We are unsure what is meant by "Surface disturbing activities (including ROWs) would be allowed subject to timing and distance (60 days/200 meters). "	The 60 days means proposed surface disturbing activities will not take place during a 60-day period identified by BLM (timing). The 200 meters means a proposed project could be moved from the proposed location up to 200 meters (distance). Per 43 Code of Federal Regulations (CFR) 3101.1-2 (pertaining to fluid minerals), conditions of approval are deemed consistent with lease rights provided they do not require relocation of proposed operations by more than 200 meters, mandate that operations be sited off the leasehold (i.e. no surface occupancy), or prohibit new surface-disturbing activities for a period of more than 60 days in a lease year.
DR-MTDK-MC-13-0196-5	It is unclear whether the 792,000 acres of protection priority habitat areas for sage-grouse are included in the 1,403,000 oil and gas acres under Alternative E (pg. 2-41 - 2-42, Table 2-1).	The acreages are included as part of the oil and gas acres.
DR-MTDK-MC-13-0121-1	BLM has failed to explain its rationale for selecting the Preferred Alternative.	See Chapter 2, Alternatives Considered in Detail section. The Draft RMP/EIS did not "select" a preferred alternative, rather, it identified a preferred alternative based on CEQ regulations. The alternative which contains the most desired combination of potential planning decisions, and meets the multiple use and sustained yield mandates of Section 103(c) of FLPMA (43 U.S.C. 1702(c)), is identified as the preferred alternative.
DR-MTDK-MC-13-0146-11	Who is responsible for invasive species in the exclosures full of invasive noxious weeds? If Leafy Spurge or Canada Thistle is sprayed and the trees die, is the Weed Board responsible?	The BLM is responsible and prioritizes treatment areas by those areas of public access, riparian areas, emergency stabilization and rehab areas and special status species habitat.
DR-MTDK-MC-13-0146-19	Pg. 2-90 and 2-91 Who fences out livestock? Who maintains these fenced exclosures? Who takes care of noxious weeds within these exclosures?	The BLM prioritizes treatment areas by those areas of public access, riparian areas, emergency stabilization and rehabilitation areas, and special status species habitat. Resource objectives determine when exclosures are treated.
DR-MTDK-MC-13-	BLM's claims assume that restrictions on leases would preclude or limit future development, reduce lease values, and/or drive drilling activity to non-federal lands. See id. This view is flawed in several respects. First, restrictions on	The BLM recognizes that cost-effective methane reductions depend on well-specific characteristics. Oil and gas operators are aware of these characteristics and can best identify when

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0089-14	leases requiring reductions in methane emissions could actually lead to higher profits and valuations for operators on BLM lands, since many commercially available technologies to capture methane have been shown to have rapid paybacks and yield substantial profits thereafter. Further, restrictions on leases that require methane emissions reductions could plausibly spur state oil and gas commissions and state land offices to follow BLM's lead to reduce methane waste, increase royalty payments and take action on climate change by adopting comparable lease restrictions to minimize methane emissions.	methane emission reductions would increase profitability and valuations. State oil and gas commissions and state land offices are also well-prepared to identify methods to reduce methane waste and increase royalty payments.
DR-MTDK-MC-13-0171-1	Have there been any soils baseline studies throughout the RMP areas in regarding the different soil composition and communities and how will surface disturbances be managed?	The BLM uses soils information provided by the USDS-NCRS. They provide information, e.g. erodibility, on the different soil associations. For management of Soils, see Chapter 2, Comparison of Alternatives Table 2-5, Soils section.
DR-MTDK-MC-13-0146-34	The citation for Mosley et al. is incorrect. Mosley is misspelled and the publication date is 1997 not 1999.	The citation and spelling are correct. The December 1999 date refers to the internet edition publication date.
DR-MTDK-MC-13-0051-1	The Lewis and Clark Trail. The no action alternative lists trail acres as 16,350 and the action alternatives (other than Alternative D) list 14,499 acres. Please demonstrate in the Proposed EIS the location of the 1851 acres of trail that will no longer be designated as SRMA and the rationale for this proposed reduction.	The difference in acreage numbers is due to the technology available today (GIS) that BLM was lacking when the original acres were visually estimated.
DR-MTDK-MC-13-0051-3	Chapter 2 Alternatives pg. 2-93 Action 6: Please clarify where and why the Lewis and Clark Trail SRMA boundary is proposed to be changed, resulting in a reduction from current SRMA acres of 16,350 to 14,499 acres.	The difference in acreage numbers is due to the technology available today (GIS) that BLM was lacking when the original acres were visually estimated.
DR-MTDK-MC-13-0080-1	Map 41 Land Pattern Adjust and Access. We do not agree to this designation for part of our ranch in the Medium priority area for access. Why is it your goal to acquire public land access to our ranch?	The map is a generalized graphic display of access goals to provide public access to larger tracts of BLM administered land. Any actual access acquisition proposal would be pursued on a case-by-case basis, and include an environmental analysis, with public notification and comment. Also, see the Land Pattern Adjustment and Access Map (14) for changes.
DR-MTDK-MC-13-0166-1	On Map 41, the Land Pattern Adjustment and Access map, a portion of the Ashland Ranger District near the southeast corner is shown as a medium consideration for access. Please clarify the rationale for identifying and including National Forest System lands.	The map is a generalized graphic display of access goals to provide public access to larger tracts of BLM administered land. Any actual access acquisition proposal would be pursued on a case-by-case basis, and include an environmental analysis, with public notification and comment. Also, see the Land Pattern Adjustment and Access Map (14) for changes.
DR-MTDK-	Maps 61-67, one of which shows continuous blocks of BLM lands, were missing from the Draft RMP.	The maps referenced are available electronically on the RMP CD and the RMP webpage.

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MC-13-0176-1		
DR-MTDK-MC-13-0105-3	The BLM should look at the Otter Creek development as well as the Tongue River Railroad in the RMP.	The proposed Otter Creek Mine is in the early stages of seeking State and Federal mine permits. BLM considers the proposed Otter Creek Mine to be speculative at this time. Also, there is no federal coal included in the proposed Otter Creek Mine. All future coal applications, including for Otter Creek, would be considered on a case-by-case basis. NEPA review would be conducted at that time. See Chapter 4, Lands and Realty, Assumptions and Methodology section. The Tongue River Railroad is analyzed in the RMP via the assumption for a railroad.
DR-MTDK-MC-13-0130-12	The BLM does mention that the agency will consider the cumulative impacts of those pertaining to the Tongue River Railroad project. Yet that one sentence is the only time in the entire document that the Tongue River Railroad is referred to. The proposed Otter Creek coal mine, whose owners are seeking a permit, is not mentioned once in the document. BLM owns surface in the Otter Creek coal tracts. Impacts from this development on cultural and historic resources, vegetation, wildlife and water need to be examined.	The proposed Otter Creek Mine is in the early stages of seeking State and Federal mine permits. BLM considers the proposed Otter Creek Mine to be speculative at this time. Also, there is no Federal coal in the proposed Otter Creek Mine.
DR-MTDK-MC-13-0130-17	Studies show that discharges of ground water high in sodium bicarbonate from coal bed methane wells, the same water that would be discharged from the Otter Creek coal mine, are likely to adversely impact aquatic life, including young fish. Impacts on fisheries and aquatic life must be fully analyzed in the draft EIS.	The proposed Otter Creek Mine is in the early stages of seeking State and Federal mine permits. BLM considers the proposed Otter Creek Mine to be speculative at this time. Also, there is no Federal coal in the proposed Otter Creek Mine.
DR-MTDK-MC-13-0089-43	MCFO should consider adoption of a performance standard-based approach which would establish maximum leak and vent rates for oil and gas activity.	The USEPA and MDEQ require emission controls that reduce GHG emissions, as described in Chapter 3, Air Resources and Climate, Climate Change, National Action to Reduce GHGs section and the Air Resources and Climate Appendix, Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources, section 1.5.2.
DR-MTDK-MC-13-0159-1	Map 17 – Closed to Grazing – Calypso SRMA. Will the fence be woven wire to make it sheep tight?	This is an existing fence. No new fence would be constructed.
DR-MTDK-MC-13-0126-13	Chapter 1, pg. 5, Issue 2. Three of the sensitive plant species in the MCFO are considered globally secure so they are under no "risk of future federal listing under the ESA."	Though globally stable, the BLM manages species if rare in Montana, for species diversity for the state.

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
DR-MTDK-MC-13-0090-6	The Draft RMP is not sufficient in conveying to the public a clear picture of what roads and trails are proposed to be closed or remain open. The maps associated with the Draft RMP do not indicate road and trail numbers which are necessary for the public to provide substantive comments on specific roads and trails.	Travel Management Planning, which includes road and trail numbers, will be conducted during implementation planning. Following completion of the RMP, a transportation plan will be developed with the public that establishes a comprehensive designated route system for all areas where the RMP Record of Decision has determined OHV use is limited to existing roads and trails.
DR-MTDK-MC-13-0164-1	Travel management. Upon inspection of the maps the BLM provided of the areas impacted by the plan we found that the majority of the roads and areas indicated on the map lack specific locations or, in some cases, anything that made them even remotely distinguishable from one another.	Travel Management Planning, which includes road and trail numbers, will be conducted during implementation planning. Following completion of the RMP, a transportation plan will be developed with the public that establishes a comprehensive designated route system for all areas where the RMP Record of Decision has determined OHV use is limited to existing roads and trails.
DR-MTDK-MC-13-0125-7	We request an assessment of each and all motorized routes in the RMP, and their cumulative effect on wildlife displacement, noxious weed spread, and other resource damage.	Travel Management Planning, which includes site-specific roads and trails, will be conducted during implementation planning. Following completion of the RMP, a transportation plan will be developed with the public that establishes a comprehensive designated route system for all areas where the RMP Record of Decision has determined OHV use is limited to existing roads and trails.
DR-MTDK-MC-13-0134-20	Climate change is also a concern that the BLM needs to take a hard look at. According to the Billings Gazette, carbon dioxide emissions rose by more than 11 percent in Montana last decade as the state continued to have one of the highest per capita greenhouse gas emission rates in the country. This is extremely significant since the carbon dioxide levels in the atmosphere recently surpassed 400 parts per million. The impacts from oil and gas development alone will accelerate climate change, as will the cumulative impacts from the other proposed developments in the area such as coal mining, a tar sands pipeline, and a coal-hauling railroad. The BLM is required to study and address the impacts of climate change. A simple solution would be putting some of the BLM minerals off-limits to leasing. The preferred alternative does not do this.	When compared to the No-Action Alternative (A), the PRMP/FEIS Proposed Alternative (E) would restrict oil and gas mineral estate available for leasing and thereby decrease GHG emissions.
DR-MTDK-MC-13-0135-2	We recommend that the BLM identify areas that may be particularly suitable for the development of a new shooting range, or areas that could accommodate more shooters even though they may be more informal settings.	With the exception that the "discharge or use of firearm, other weapons, or fireworks" is prohibited on developed recreation sites and areas, unless otherwise authorized, 43 CFR 8365.2-5 (a), shooting and possession and use of firearms are allowed on public lands managed by the BLM. The BLM's policy prohibits the agency from directly operating shooting *ranges*, or from

Comment Number	Comment Text from Draft RMP/EIS	Response to Comment from PRMP/FEIS
		issuing new leases of public lands for shooting ranges. New shooting ranges cannot be authorized by any type of lease or other land use authorization that does not transfer title to the applicant.
DR-MTDK-MC-13-0121-32	Pg. 3-76 "Throughout Sage-Grouse Management Zone 1, land ownership is predominantly private (70 percent). Ownership on the remaining range of the greater sage-grouse in Sage-Grouse Management Zone 1 is 68 percent private and 13 percent state or other federal ownership (not including the Fort Peck and Fort Belknap Indian Reservations), with 83 percent of the federal lands in the range of the greater sage-grouse in Management Zone 1 managed by the BLM. COMMENT: This statement is unclear. Does this mean that 83 percent of the 13 percent of federal ownership in Management Zone 1 is within the remaining range of the greater sage-grouse?	Yes, that is correct. See Chapter 3, Fish, Aquatic and Wildlife Habitat, Including Special Status Species; Special Status Species (Aquatics, Avian and Terrestrial) section for revisions.
DR-MTDK-MC-13-0171-2	Have there been any baseline studies in any areas of the RMP of the vegetative community? BLM needs to either start managing all of the ACECs that have been designated, or get rid of them.	Yes. Rangeland Vegetation monitoring studies have been established across the MCFO since the 1960s. See the Special Designation Areas Appendix. The Black-footed Ferret, Plover and Yonkee areas are no longer recommended for ACEC designation.

RECLAMATION APPENDIX

INTRODUCTION

This appendix gives guidance for appropriate reclamation planning prior to authorization and following surface disturbance. Prior to a surface-disturbing activity taking place, sites would be evaluated on a case-by-case basis and mitigation measures would be prescribed where appropriate. Reclamation planning would be site-specific, project-specific, and incorporate the project's complexity, environmental concerns, post-disturbance land use, and reclamation potential.

As such, the level of detail and complexity required of reclamation planning would be dependent on the nature of the resource being impacted and the extent and complexity of the surface-disturbing activity. Some activities may require a highly detailed Reclamation Plan to ensure that reclamation goals and objectives are achieved, while others may have reclamation measures integrated into the engineering design, permit application, or other comparable project documentation.

In cases where a Reclamation Plan is required, the Bureau of Land Management (BLM) would work with the project proponent or proponents to prepare the Plan. Plans would incorporate program or regulation specific requirements. The Reclamation Plan would be considered complete when the applicable requirements described below have been addressed, the techniques to meet the requirements are described in detail, and the BLM approves the Reclamation Plan. Reclamation Plans would be periodically reviewed (including monitoring and reporting) and modified as needed. Reclamation is considered successful when all applicable requirements described in the approval document for the proposed activity have been addressed onsite and the BLM approves the reclamation.

RECLAMATION GOALS

The goals for reclamation activities would be consistent with the impacted resources' goals and objectives within this Resource Management Plan (RMP). The short-term goal of reclamation activities includes immediate stabilization of the disturbed area and the creation of conditions needed to meet long-term goals. The long-term goal of reclamation activities is concurrent eventual ecosystem restoration through natural processes, a safe and stable landscape, and achievement of desired conditions described in the RMP.

RECLAMATION OBJECTIVES

These reclamation objectives would be selected and applied on a site-specific, project-specific basis. Not all reclamation objectives would be appropriate for all surface-disturbing activities, and the project proponents should carefully select reclamation measures based on the characteristics of the site, and surface-disturbing activity. In addition, these objectives are not all inclusive, as specialized experience, evolving technology, and future research may provide additional methodology or refinement of the listed objectives. Where these reclamation guidelines differ from stricter applicable laws, rules, and regulations, those standards replace this policy.

Most landscapes can be reclaimed using established conventional reclamation methods. However, some areas have unique characteristics that make achieving all the reclamation requirements unrealistic (e.g., sensitive soils, sensitive vegetation types, soils with severe physical or chemical limitations, steep slopes). These limited reclamation potential areas may require site-specific measures not addressed in this appendix. For these areas, each project would develop a unique set of requirements for reclamation success.

The reclamation objectives are:

1. **Ensure subsurface integrity and eliminate sources of ground and surface water contamination.**

    a. Maintain all erosion or sediment control devices until vegetation is reestablished, site is stabilized, or the devices are no longer needed.
    b. Fertilizer and soil additives would not be applied where they could adversely impact water quality.
    c. Water bars are required on 25 percent slopes or greater and will be used as necessary on gentler slopes.
        1. Suggested spacing between water bars would follow the guidelines below:
            a. for slopes less than 10 percent, the spacing would be at least every 100 to 400 feet,
            b. for slopes 10 to 19 percent, the spacing would be at least every 75 to 200 feet,
            c. for slopes 20 to 39 percent, the spacing would be at least every 50 feet,
            d. for slopes greater than 39 percent, the spacing would be at least every 25 feet, and
            e. *The Gold Book* (BLM and USFS 2007b) has further guidance and cross-sectional diagrams for water dips that are drivable.
        2. Vary water bar spacing to:
            a. fit site conditions,
            b. promptly intercept surface water before the volume of water and velocity increase enough to generate erosion, and
            c. facilitate drainage toward natural dips, rocky ground, or vegetation to intercept sediment.
        3. Design water bars to:
            a. be 4 to 6 inches high, but could be deeper depending on site conditions,
            b. be at a 20 degree angle to the slope and channel water to the downhill side, and
            c. avoid directing sediment into drainages.

2. **Reestablish slope and surface stability and desired topographic diversity.**

    a. Reconstruct the landscape to blend with adjacent contours and to maintain the approximate original contour. However, if the site has stabilized and recontouring would cause additional disturbance, this step may be waived by the authorized officer.
    b. Maximize geomorphic stability and topographic diversity of the reclaimed topography.
    c. Disturbed areas would be recontoured to provide proper drainage.
    d. Eliminate highwalls, cut slopes, or topographic depressions, unless otherwise directed.
    e. Backfill to prevent surface subsidence. No downward movement of surface material would be evident, and the site would be maintained to correct settling within 1 year of reclamation. See the *Monitoring Appendix* for specific guidelines on subsidence assessment.
    f. There would be no evidence of slope instability on or adjacent to the site, other than minimal sheet, rill, or wind scour erosion within 1 year of reclamation. Minimize accelerated erosion and sedimentation on or adjacent to the reclaimed area with appropriate erosion and sedimentation control measures immediately following disturbance. See the *Monitoring Appendix* for specific guidelines on erosion assessment.
    g. Erosion control matting would be unrolled from the bottom toward the top of the slope, placed along the direction of water-flow and loosely over soils with extreme surface roughness, and in compliance with the manufacturer's instructions (Wright 2000).
    h. Reclaim all roads and trails unless they meet public demand.

i. The Burned Area Emergency Stabilization and Rehabilitation BLM Handbook H-1742-1 contains further guidance on erosion and sedimentation control Best Management Practices (BMPs).

3. Reconstruct and stabilize watercourses and drainage features.

a. Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in the site's naturally functioning basin or, if appropriate, nearby and similar reference basins.
b. Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in the site's naturally functioning system or, if appropriate, nearby and similar reference systems. There would be minimal evidence of streambank erosion and no evidence of active headcutting and channelization (beyond that which already exists) within 1 year of the disturbance.
c. Upland erosion would be controlled effectively and sediment would not be transported to stream systems.

4. Maintain the biological, chemical, and physical integrity of the soil resource.

a. Identify, delineate, and salvage all topsoil and subsoil based on a site-specific and project-specific soil evaluation. Subsoil or overburden may be used as suitable growth medium if topsoil is not suitable.
b. When possible, soil would be direct-hauled to similar ecological sites during the reclamation process. If this were not possible, topsoil would be stockpiled separately from subsoil. All stockpiles would be appropriately identified and remain undisturbed until reclamation.
c. Protect all stored soil material from erosion, degradation, and contamination. Stockpiles would be of a stable configuration. Stockpiles would be located above the high water mark and away from riparian areas, floodplains, wetlands, and other sensitive areas. If stored for more than 30 days, erosion control (e.g., water or tackifier) would be applied immediately. If stored during the growing season, native seed would be applied within 30 days of storage. Stockpiles would be stored near the disturbance. Applied water would not degrade soil quality.
d. Displaced farmland, whether in production or not, would be reclaimed to original productivity.

5. Prepare site for revegetation.

a. Provide suitable surface and subsurface physical, chemical, and biological properties to support the long-term establishment and viability of the desired plant community as soon as possible following disturbance.
b. Redistribute soil resources along contours and in a manner similar to the original vertical profile. Incorporate soil material so that it blends in with the adjacent landscape, corresponding to adjacent surface roughness (macro- and microtopography). Avoid scalping more than 1 inch of undisturbed soils when redistributing spoils and salvage piles.
c. Reduce subsoil compaction to a minimum of 18 inches deep, except in bedrock, prior to redistribution of topsoil. Cross-rip along contours with two passes perpendicular to each other.
d. Prepare a proper seedbed when environmental conditions are appropriate (Strom et al. 2010):

    1. Replace topsoil unevenly back over subsoil in order to create microsites.
    2. Seed when a weak ball can be formed from soil 2 to 3 inches below the surface.
    3. Clods would be less than 2 inches in diameter.

4. A 170-pound person would leave footprints no deeper than half an inch.

6. Establish a desired, self-perpetuating, native plant community.

a. Establish species composition, richness, structure, and total ground cover appropriate for the desired plant community as soon as possible following disturbance. The site would be compared to a reference site or a National Resources Conservation Services (NRCS) Ecological Site Description (http://www.mt.nrcs.usda.gov/technical/ecs/range/ecolsites/), whichever is appropriate. Multiple treatments may be required before success is achieved. See the *Monitoring Appendix* for specific guidelines on vegetation assessments. Vegetation objectives include:

    1. Within 2 years of reclamation, the site would contain 50 percent of the reference area's vegetative basal cover.
    2. Within 5 years of reclamation, the site would contain 80 percent of the reference area's vegetative basal and canopy cover.
    3. Within 2 years of reclamation, 50 percent of the vegetative cover would consist of desirable species.
    4. Within 5 years of the reclamation, 90 percent of the vegetative cover would consist of desirable species.
    5. Composition would meet reference site conditions within 5 years of the reclamation. For example, structure would be made up of 70 to 75 percent grasses and grass-like species, 5 to 10 percent forbs, and 5 to 10 percent shrubs. A minimum of 25 percent of the shrub component would be the reference site's dominant species.
    6. Monocultures would not be allowed beyond 2 years of reclamation.
    7. The site would not have state- or county-listed noxious weeds within 5 years of reclamation.

b. Using NRCS ecological sites and soil surveys, select genetically appropriate and locally adapted native plant materials based on the site characteristics and ecological setting whenever possible. Streambanks would be replanted with riparian vegetation following current ecological restoration practices.
c. Native species are preferred; select nonnative plants only as an approved short-term, non-persistent, alternative to native plant materials (BLM Handbook 1740-2 and Executive Order 13112 of February 3, 1999). Ensure the nonnative species are designed to aid in the reestablishment of native plant communities and will not hybridize, displace, or offer long-term competition to the endemic plants.
d. Seed sites when environmental conditions are appropriate and as soon as possible following re-contouring and seedbed preparation. Dormant fall seeding is recommended, typically after October 1st, when soil temperatures are less than 40 degrees Fahrenheit (F) at a 2-inch depth (for 10 days or more) and before the ground freezes (Holzworth and Wiesner 2007). Warm season species are more successful when seeded in the spring when soil temperatures are a minimum of 55 degrees F (2007). Spring seeding should take place as early as possible, prior to May 15, on thawed, friable surface soil (2007). If seeding after May 15, complete seeding prior to August 15, and when soil is moist down to 2 feet deep (2007).
e. Approved seed rates would be specified in pounds of pure live seed (PLS) per acre and be designed to adequately cover the soil upon germination. Seed would be tested to ensure viability and purity (germination or tetrazolium chloride tested by a registered seed analyst within 1 year of receipt). Seed would be certified weed free (BLM 2006a, 2007c, and BLM Manual H-1740-2). Seed would have easily accessible documentation (not seed bag tags), including sources.
f. Drill or broadcast seed along contours. Broadcast seeding followed by packing with a roller or drag (e.g., chain, harrow) with two passes perpendicular to each other is the preferred method of seeding. Drill seed with a 6-inch row spacing. Bury seed at depths

2.5 to 3 times the diameter of the seed; for small seeds use length rather than diameter (Monsen et al. 2004). Hydroseeding is not recommended, but if approved, the seed should be spread in an initial pass and then covered by a mulch mixture (if needed) in a second pass; the mulch and seed should never be combined in a single pass.

g. The recommended drill seeding rate for large-seeded species is 20 pure live seed per square foot (or PLS/ft^2), and the recommended drill seeding rate for small-seeded species (most seed mixes) is 30 to 40 PLS/ft^2. Double the drill-seeding rate for broadcast or aerial seeding to a maximum of 80 PLS/ft^2.
h. Seed additives are allowed (e.g., rhizobium, mycorrhizae, fungicide, pilling).
i. If the site does not meet desired roughness following seeding and packing, the site would be scarified or imprinted (e.g., rip, roll, imprint, harrow). Scarify and imprint no greater than several inches deep, along contours (Steinfeld et al. 2007). However, this step in the process would be followed only if necessary, because running equipment over the site would further pulverize and compact the soil.
j. Rock and woody debris would be replaced along contours and equivalent to pre-disturbance conditions and positioned to blend with adjacent areas. Felled trees would be low-stumped (uphill side no greater than 6-inches above the ground) and removed from drainages. Any excess woody debris would be removed or burned in upland areas.
k. Protect seed and seedling establishment with appropriate measures. Erosion-control matting and mulch would be biodegradable and certified weed and insect free. Matting would contain holes greater than 2 inches in diameter and a 2-year photodegradation life. Tackifier would be biodegradable. Straw or native hay mulch would be mold- and fungi-free and would be crimped in vertically at a rate of 1 to 2 tons per acre, so that 80 to 90 percent of the ground is covered (Wright 2000). Wood mulch is not recommended. All twine associated with straw or hay mulch would be biodegradable, but if it is not, then it would be collected and properly disposed.
l. The Burned Area Emergency Stabilization and Rehabilitation Handbook, the Integrated Vegetation Management Handbook, and the Native Seed Network website (http://www.nativeseednetwork.org/) contain further guidance on revegetation BMPs.

7. Reestablish complementary visual composition.

a. Ensure the reclaimed landscape features blend into the adjacent area and conform to RMP decisions (BLM Manual H-8431).
b. Ensure the reclaimed landscape does not result in long-term changes to the scenic quality of the area or change the scenic quality rating (BLM Manual H-8410).

8. Manage invasive species (the same as appears in the *Best Management Practices Appendix*).

a. The project area would be inventoried for invasive species on and adjacent to the site before initial activities.
b. An invasive species management plan would be developed if appropriate.
c. Invasive species would be controlled using an integrated pest management approach.

9. Develop and implement a project-appropriate reclamation monitoring and reporting strategy.

a. Contain a compliance and effectiveness monitoring protocol in accordance with BLM-approved monitoring methods. Observations would include accelerated erosion and sedimentation, subsidence, revegetation, and invasive species. Observations would be preferably taken in the spring, before livestock are turned onto the reclaimed sites. Subsequent annual inspections would occur at the same vegetative phenological stage as the first inspection.
b. Evaluate monitoring data for compliance with the reclamation plan.

c. Document and report monitoring data detailing vegetation reestablishment, utilization, and site stability to the BLM within 2 months of the on-site inspection. Include in the document:

    1. digital tabulated data and photographs,
    2. shapefiles of global positioning system locations that include all associated data,
    3. a discussion of the existing environment as compared to the objectives,
    4. vegetation data summarized by morphological group (e.g., grass, grass-like, forb, shrub, or tree),
    5. livestock utilization over the past year including species, timing, and duration, and
    6 if any of the objectives have not been met, include in the report an explanation for failing to meet the objective and recommendations for remedial measures where appropriate.

d. The BLM would evaluate the report and reply back to within 2 months of receiving the report. Site-specific evaluations may be recommended following BLM evaluation of data. The BLM may suggest remedial measures, alter proposed remedial measures, or alter the method or interval for monitoring and reporting.
e. Implement revised reclamation strategies where appropriate.
f. Continue the process of monitoring, evaluating, documenting, reporting, and implementing until reclamation goals and objectives are achieved.
g. In locations where the reclamation goals and objectives have been achieved, and with the written concurrence of the BLM, the monitoring requirement would be removed, and no additional monitoring or reporting would be required.

RECREATION APPENDIX

INTRODUCTION

This appendix contains in-depth information for recreation resources and management in the planning area. Information includes guidance used for recreation management in the planning area.

RECREATION SETTING CHARACTERISTICS – EXPERIENCE AND BENEFITS CHECKLIST

The websites below were used to determine the Recreation Setting Characteristics Matrix and the Experience and Benefit Checklist for the designated Special Recreation Management Areas (SRMAs) of the Miles City Field Office.

- A Unified Strategy to Implement "BLM Priorities for Recreation and Visitor Services" Workplan: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images/national_recreation/planning.Par.76166.File.dat/im2007-043_a1.pdf and

- IM 2011-004, Transmittal of Revised Recreation and Visitor Services Land Use Planning Guidance: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-004.html.

EXISTING SRMAs

CALYPSO SRMA

Management Goals

- Ensure the continued availability of a variety of outdoor recreational opportunities and visitor experiences.
- Manage to emphasize interpretive and educational opportunities.

Management Objectives

- Identify experiences available and differences of the great diversity of topographic, geologic, vegetation, and scenic phenomenon in proximity to the Calypso Trail and Terry Badlands (in relationship to the Calypso SRMA due to the close proximity of the two).
- Provide users with opportunities to view, experience, and appreciate examples of cultural and historic use of nearby Calypso Trail, and examples of the ways the resources on public lands are being managed in harmony with the environment, as an asset to the existing scenic character of the Terry Badlands.
- Ensure the SRMA will have a minimum adverse effect on adjacent natural scenic, historical and cultural environments and harmonize with the management objectives of land and resource uses which are now or may be occurring on the lands.
- Maintain and enhance recreation opportunities for residents and visitors to the area to accommodate camping, sightseeing, wildlife viewing, hunting, picnicking, hiking, Yellowstone River access and other compatible uses in prescribed settings so visitors are able to realize experiences and benefits.
- Pursue opportunities for partnerships.
- Pursue future opportunities for recreation development as demand arises.

Experiences

- Experiences that visitors enjoy include: enjoying the artistic expression of nature, solitude, family recreation, fishing, scenery, escaping everyday responsibilities for a while, exploring, togetherness, learning outdoor skills, enjoying teaching others about the outdoors, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, a restored mind from unwanted stress, and a greater sense of overall wellness, improved outdoor recreation skills, greater respect for cultural heritage, greater environmental sensitivity, and improved outdoor knowledge.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, greater family bonding, and an enhanced lifestyle.
- Economic and environmental benefits include positive contributions to local-regional economic stability, increased desirability as a place to live or retire, enhanced ability for visitors to find areas providing wanted recreation experiences and benefits, increased local tax revenue from visitors, greater retention of distinctive natural landscape features, and an increased stewardship and protection by users.

LEWIS AND CLARK TRAIL SRMA

Management Goals

- Continue to manage the Lewis and Clark Trail in accordance with the act that established the trail in 1978.
- Manage to ensure the continued availability of a variety of outdoor recreational opportunities and visitor experiences associated with the Lewis and Clark Trail.

Management Objectives

- Update and comply with the Lewis and Clark Trail Plan as well as Manual 6280, Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation.
- Inventory and monitor National Trail resources, qualities, values, and associated settings and the primary use or uses of the trail as well as stewardship responsibilities.
- Manage for public use and enjoyment, while preserving the historic and cultural resources related to the events that occurred during the Lewis and Clark Expedition.
- Provide adjacent communities with convenient opportunities to exercise and improve their physical fitness at the multiple-use recreational Lewis and Clark National Historic Trail.
- Maintain and enhance recreation opportunities for residents and visitors along the trail to accommodate camping, scenery and wildlife viewing, hunting, picnicking, boating, fishing, hiking, and other compatible and dispersed recreational uses in prescribed settings so visitors are able to realize experiences and benefits.
- Pursue opportunities for partnership and cooperative management with adjacent property owners and other interested parties.
- Pursue access opportunities such as land exchanges and easement acquisitions to improve public access along the Lewis and Clark Trail where opportunity arise.
- Acquire lands or interests in lands from willing sellers, as appropriate and consistent with policy direction, to further purposes for which the trail was designated, consistent with other BLM resource programs.
- Complete, sign and maintain the BLM-managed portions of the Lewis and Clark Trail to allow the public to enjoy the trail while maintaining the surrounding natural beauty of the corridor and the opportunity for a relatively primitive recreation opportunity.
- Manage the portions of the Lewis and Clark Trail, including the National Trail Management Corridor, crossing lands administered by the MCFO to protect and enhance their respective historic values. Consider interpretive opportunities on a case-by-case basis.
- Manage MCFO portions of the Lewis and Clark National Historic Trail under the VRM Class II.
- Conduct periodic monitoring of activities along those segments of the Lewis and Clark National Historic Trail and Corridor managed by the MCFO to ensure that management actions are not adversely impacting the historical values for which the trails were designated.
- Maintain and enhance local social and economic values.
- Pursue future opportunities for recreation development as demand arises.

Experiences

- Experiences that visitors enjoy include: developing their own skills and abilities, testing their endurance, gaining self-confidence, enjoying going exploring on their own, enjoying risk taking adventures, enjoying nature, savoring the total sensory-sigh, sound and smell-experience of a natural landscape, nostalgia, feeling good about solitude and being isolated.

Benefits

- Personal benefits include greater self-reliance, improved skills for outdoor enjoyment, greater respect for my cultural heritage, closer relationship with the outdoor world, enhanced sense of personal freedom, greater sense of adventure, and increased appreciation of area's cultural history.
- Household and community benefits include increased compassion for others and increased community involvement reducing erosion of our community's small-town, rural character.
- Economic and environmental benefits include increased desirability as a place to live or retire, maintenance of community's distinctive recreation-tourism market niche or character, and conservation of entire sustainable ecosystems.

PROPOSED SRMAs (Alternative E)

SHORT PINE OFF-HIGHWAY VEHICLE (OHV) RECREATION AREA

Management Goals

- Provide a variety of opportunities for a safe OHV riding experience and OHV use education for local/regional residents and visitors to the area.

Management Objectives

- Update the Short Pine OHV Recreation Area site Recreation Area Management Plan (RAMP).
- Communicate riding ethics and regulations, promoting designated areas for OHV practice and skill development.
- Maintain, restore, and enhance areas within the OHV SRMA to manage the area for a front and middle country setting.
- Maintain or enhance a diversity of recreational and OHV experiences and benefits.
- Provide OHV trail riding opportunities for all levels of experience in a safe manner that co-exists with other resource uses as well as other dispersed recreational activities.

Experiences

- Experiences that visitors enjoy include: developing skills and abilities, testing endurance, enjoying risk-taking adventure, enjoying the closeness of friends and family, escaping everyday responsibilities for a while, and reducing some built up mental tensions.

Benefits

- Personal benefits include improved physical fitness, restored mind from unwanted stress, improved outdoor knowledge, skills and self-confidence, diminished mental anxiety and improved mental well-being.
- Household and community benefits include involvement in recreation and other land use decisions and more informed citizenry about where to go for different kinds of recreation experiences and benefits, greater family bonding.
- Economic and environmental benefits include positive contributions to local-regional economic stability, increased desirability as a place to live or retire, enhanced ability for visitors to find areas providing wanted recreation experiences and benefits, and maintenance of a distinctive recreation setting character.

HOWREY ISLAND

Management Goals

- Ensure the continued availability of a variety of outdoor recreation opportunities and experiences and benefits to local/regional residents and visitors to the Howrey Island Recreation Area.

Management Objectives

- Update the Howrey Island Recreation Site RAMP.
- Maintain, restore or enhance the area for river-related recreation activities, fisheries, wildlife viewing, hiking, camping, hunting and existing dispersed recreational activities for local residents and visitors to the area.
- Manage conflicts with other resource values and uses in coordination and cooperation with affected interests.
- Maintain, restore and enhance the Americans with Disabilities Act accessible trail and other amenities.
- Pursue future opportunities for recreation development as demand arises.

Experiences

- Experiences that visitors enjoy include: solitude, family recreation, fishing, exercise, scenery, escaping everyday responsibilities for a while, exploring, togetherness, participating in group events, learning outdoor skills, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, a restored mind from unwanted stress, a greater sense of overall wellness, and improved outdoor knowledge.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation, community involvement and an enhanced lifestyle.
- Economic and environmental benefits include increased work productivity; decreased job turnover; greater community ownership and stewardship of park, recreation, and natural resources; reduced wildlife harassment by recreation users; reduced spread of invasive species such as plants, insects, and aquatics organisms, and increased awareness and protection of natural landscapes.

MATTHEWS RECREATION AREA

Management Goals

- Ensure the continued availability of outdoor recreation opportunities and benefits to local residents and visitors to the Matthews Recreation Area.

Management Objectives

- Update the Matthews Recreation Site RAMP.
- Maintain, restore or enhance the area for water-related recreation activities, fisheries, scenery and wildlife viewing, hiking, camping, hunting, running, bird watching, picnicking, exercising pets, Yellowstone River access, and existing dispersed recreational activities for local residents and visitors to the area.
- Manage conflicts with other resource values and uses in coordination and cooperation with affected interests without risking health and safety.
- Pursue future opportunities for recreation development as demand arises.

Experiences

- Experiences that visitors enjoy include: solitude, family recreation, fishing, exercise, scenery, escaping everyday responsibilities for a while, having access to close-to-home outdoor amenities, exploring, togetherness, participating in group events, learning outdoor skills, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, a restored mind from unwanted stress, a greater sense of overall wellness, and improved outdoor knowledge.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation, community involvement and increased community involvement reducing erosion.
- Economic and environmental benefits include increased work productivity; decreased job turnover; greater community ownership and stewardship of park, recreation, and natural resources; reduced wildlife harassment by recreation users; improved respect for privately-owned lands and increased awareness and protection of natural landscapes.

DEAN S. RESERVOIR

Management Goals

- Manage to ensure the continued availability of a variety of outdoor recreation opportunities and visitor experiences associated with Dean S. Reservoir recreation site for residents of the local area.

Management Objectives

- Maintain, restore or enhance the area for recreational activities that include fishing, wildlife viewing, camping, hiking, hunting, camping, sledding, running, exercising pets,, picnicking and other dispersed uses.
- Manage conflicts with other resource values and uses in coordination and cooperation with affected interests while in a healthy and safe manner.
- Improve accessibility and aesthetics and improve soil/shore stability.
- Dredge and deepen the reservoir basin as opportunities arise to maintain the fishery.
- Reclaim unnecessary or undesirable vehicle routes.
- Pursue future opportunities for recreation development as demand arises.

Experiences

- Experiences that visitors enjoy include: frequent exercise, enjoying easy access to diverse recreation, solitude, family recreation, fishing, exercise, scenery, escaping everyday responsibilities for a while, having access to close-to-home outdoor amenities, exploring, togetherness, learning outdoor skills, achievement, escaping pressures, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, better health maintenance, a restored mind from unwanted stress, a greater sense of overall wellness, family togetherness, and improved outdoor knowledge.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation, community involvement and increased community involvement reducing erosion.
- Economic and environmental benefits include increased work productivity; decreased job turnover; greater community ownership and stewardship of park, recreation, and natural resources; reduced wildlife harassment by recreation users; improved respect for privately-owned lands and increased awareness and protection of natural landscapes.

MOORHEAD CAMPGROUND

Management Goals

- Ensure the continued availability and diversity of a variety of outdoor recreational opportunities and visitor experiences.

Management Objectives

- Update the Moorhead Campground Site RAMP.
- Maintain or enhance the current campground and facilities as needed or demand arises and funding allows.
- Pursue future opportunities for recreation development as demand arises.
- Mitigate conflict with other resource values and uses as appropriate, in coordination and cooperation with affected interests in a healthy and safe manner.

Experiences

- Experiences that visitors enjoy include: family togetherness, enjoying the closeness of friends and family, meeting new people with similar interests, enjoying nature, nostalgia, enjoying an escape from crowds of people, and enjoying teaching others about the outdoors.

Benefits

- Personal benefits include stronger ties with family and friends, a more outdoor-oriented lifestyle, greater freedom from urban living, and better mental health.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation and greater family bonding.
- Economic and environmental benefits include increased work productivity; more positive contributions to local-regional economy; greater protection of area historic structures and archeological sites, and reduced negative human impacts such as litter, vegetative trampling, and unplanned trails.

STRAWBERRY HILL RECREATION AREA

Management Goals

- Ensure the continued availability of a variety of outdoor recreation opportunities and experiences and benefits.

Management Objectives

- Using an interdisciplinary team prepare a Strawberry Hill RAMP.
- Maintain, restore, or enhance recreation opportunities to accommodate existing and future uses, including hiking, mountain biking, running, geo-caching, equestrian use, hunting, camping, wildlife viewing, OHV use on existing roads and trails, cross-country skiing, snowmobiling, sledding, and other dispersed use at a primitive site.
- Maintain or enhance a diversity of recreational opportunities and benefits.
- Manage conflicts with other resource values and uses in coordination and cooperation with affected interests in a healthy and safe manner.
- Reclaim unnecessary or undesirable vehicle/OHV routes.
- Pursue future opportunities for recreation development as demand arises.
- Plan, construct and maintain non-motorized recreational trails as funding and staffing allow.

Experiences

- Experiences that visitors enjoy include: developing skills and abilities, solitude, family recreation, exercise, scenery, escaping everyday responsibilities for a while, having access to close-to-home outdoor amenities, exploring, togetherness, learning outdoor skills, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, a restored mind from unwanted stress, a greater sense of overall wellness, and improved outdoor knowledge.
- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation, community involvement and increased community involvement reducing erosion.
- Economic and environmental benefits include increased work productivity; decreased job turnover; greater community ownership and stewardship of park, recreation, and natural resources; reduced wildlife harassment by recreation users; and increased awareness and protection of natural landscapes.

PROPOSED ERMAs (Alternative E)

PUMPKIN CREEK

Management Goals

- Ensure management of these lands for a variety of sustainable visitor experiences concurrent with other cultural and natural resources and resource uses by various publics and agencies.

Management Objectives

- Using an interdisciplinary team prepare a Pumpkin Creek Management Plan that emphasizes a multiple use approach in management and adaptability.
- Maintain or enhance a diversity of recreational opportunities, experiences, and benefits.
- Manage conflicts with other resource values and uses in coordination and cooperation with affected interests in a healthy and safe manner.
- Reclaim unnecessary or undesirable vehicle routes.
- Conduct transportation planning to address all resource use aspects, including but not limited to: recreational, access concerns, agriculture, commercial, traditional, wildlife and casual use.
- Maintain, restore, and enhance areas within the Pumpkin Creek Area to meet Standards and Guidelines for Rangeland Health.
- Provide compliance with the Montana/Dakota's Recreation Strategy.
- Maintain recreation setting characteristics.
- Maintain, restore, and enhance fish and wildlife habitat including BLM Special Status species. Pro-active habitat restoration projects will take place as time and funding allow that will also enhance recreational pursuits and experiences.

Experiences

- Experiences that visitors enjoy include: developing skills and abilities, solitude, family recreation, exercise, scenery, escaping everyday responsibilities for a while, having access to close-to-home outdoor amenities, exploring, togetherness, learning outdoor skills, and enjoying nature.

Benefits

- Personal benefits include improved physical fitness, a restored mind from unwanted stress, a greater sense of overall wellness, and improved outdoor knowledge.

- Household and community benefits include an improved quality of life, a greater appreciation for the area and outdoor-oriented lifestyle, involvement in recreation, community involvement and increased community involvement reducing erosion.
- Economic and environmental benefits include increased work productivity; decreased job turnover; greater community ownership and stewardship of park, recreation, and natural resources.

TRAVEL MANAGEMENT PLANNING

TABLE 1.
TRAVEL PLANNING INFORMATION

TPA	TPA NAME	TPA Acres	BLM-administered Acres	Estimated Miles BLM
1	MCFO Master Lease Plan (MLP) Area (located within the Greater Sage Grouse – North Carter PA/South Carter RA)	392,666	138,754	461
2	Greater Sage Grouse – North Carter PA	684,529	248,019	696
3	Greater Sage Grouse – South Carter RA	213,395	57,783	187
4	Greater Sage Grouse – GH in Carter, Powder River and Custer counties	4,541,195	554,419	1,692
5	Greater Sage Grouse – Cedar Creek RA	190,485	37,250	173
6	Greater Sage Grouse – GH in Fallon, Wibaux, Dawson and Prairie counties	2,403,012	574,079	2,605
7	Greater Sage Grouse – North Garfield PA	549,289	170,864	759
8	Greater Sage Grouse – GH in Garfield and McCone counties	3,453,300	490,673	1,753
9	Greater Sage Grouse – North Rosebud PA	1,829,088	172,976	370
10	Greater Sage Grouse – West Decker RA/GH in Big Horn County	681,967	72,558	186
11	Greater Sage Grouse – GH in Rosebud and Treasure counties	1,477,496	46,712	147
12	Glendive Short Pine OHV TMA	3,091	3,091	Unknown
13	Remaining BLM-administered lands in Custer, Carter, Prairie, Powder River, Rosebud and Treasure counties	1,041,964	13,963	49
14	Remaining BLM-administered lands in Garfield, McCone, Wibaux, Dawson, Richland, Roosevelt, Sheridan, and Daniels counties	7,094,146	107,370	424
	Total	**24,555,623**	**2,688,511**	**9,502**

SPECIAL DESIGNATION AREAS APPENDIX

INTRODUCTION

This appendix contains in-depth information for special designation areas and designation processes in the planning area. Information includes detailed information about existing and nominated areas of critical environmental concern (ACECs) and the process used when considering rivers for designation as wild and scenic rivers.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

INTRODUCTION

The ACEC designation is an administrative designation used by the Bureau of Land Management (BLM) through the land use planning process. ACEC designation is authorized under Sec. 102(a)(11) of the Federal Land Policy and Management Act (FLPMA).

BLM regulations (43 Code of Federal Regulations [CFR] part 1610.0-5(a)) define an ACEC as:

> "within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards."

Because ACEC designations can only be made on BLM-administered surface estate, private lands and lands administered by other agencies cannot be designated ACECs. In order to be designated, special management beyond standard provisions established by the plan must be required to protect the relevant and important values.

EVALUATION PROCESS

In order to be designated an ACEC, the nominated area must meet both the relevance and importance criteria as defined in 43 CFR 1610.7-2 and BLM Manual 1613. If the relevance and importance criteria are met, an area must be identified as a potential ACEC and considered for designation and management in the resource planning process.

To contain "relevance" an area must meet one or more of the following criteria by containing:

1. significant historic, cultural, or scenic values, including rare or sensitive archeological resources and religious or cultural resources important to American Indians;
2. fish and wildlife resources, including habitat for endangered, sensitive, or threatened species or habitat essential for maintaining diversity of species;
3. natural process or systems including endangered, sensitive, or threatened, plant species; rare geologic features; or rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or
4. natural hazards including avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs.

To contain "importance" the value, resource, system, process, or hazard described above must have substantial significance and values characterized by one or more of the following:

1. more than locally significant qualities;

2. qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, unique, endangered, threatened, or vulnerable to adverse change;
3. recognition as warranting protection to satisfy national priority concerns or carry out the mandates of FLPMA;
4. qualities that warrant recognition to satisfy public or management concerns about safety and public welfare; or
5. posing a significant threat to human life or safety or property.

An interdisciplinary team evaluates each area to determine if it meets both the relevance and importance criteria. Evidence of relevance and importance may be gathered from BLM or other sources. If an area does not meet the criteria for ACEC designation, or special management attention is not prescribed, analysis supporting the conclusion is incorporated into this resource management plan (RMP).

The relevance and importance evaluations for each nominated and existing ACEC are described below.

NOMINATED ACECS

The areas described below have been nominated for consideration for ACEC designation.

CUSTER CREEK AND BIG DRY ARM

Nominated for black-tailed prairie dog habitat for reintroduction of the black-footed ferret. This nomination contains lands within the Black-Footed Ferret Reintroduction ACEC (see *Existing ACECs* below). Therefore, the evaluation below is for lands lying outside the existing ACEC (Custer Creek) and a new proposal for lands along the Missouri River Breaks (Big Dry Arm).

Relevance Criteria: The nominated areas do not meet the relevance criteria because the areas are not suitable habitat for black-tailed prairie dogs. Furthermore, the subject lands nominated for ACEC designation are within a checkerboard-land ownership pattern, which would complicate a potential reintroduction of black-footed ferrets on private lands (where poisoning of prairie dogs or other habitat manipulation projects could occur on these lands).

Importance Criteria: The nominated areas do not meet the importance criteria because the lands do not have more than a local significance; are not fragile or irreplaceable, endangered or threatened; and have not been recognized as warranted to receive protection to satisfy national priorities.

Summary: The lands evaluated do not meet the relevance or importance criteria. These lands are not recommended for ACEC designation. The BLM continues to work with the Montana Black-footed Ferret Working Group on developing black-footed ferret reintroduction sites where potential habitat exists within the planning area, with the goal of creating at least one viable reintroduction site within the planning area that meets the minimum criteria for successful reestablishment of black-footed ferrets.

IMPORTANT BIRD AREAS

Nominated as the Tongue River, Musselshell, and Powder/Carter County (sage-grouse) important bird areas. See the end of this section for evaluation of sage-grouse habitat.

CEDAR CREEK BATTLEFIELD

Nominated for important cultural values (1,022 BLM-administered acres; Map 39).

Relevance: The Cedar Creek Battlefield meets relevance criterion 1 for containing significant historic and cultural values. The battlefield is one of the major battlefields of the great Sioux War. This war and associated sites are of major interest to both national historians and history enthusiasts, as well as the American Indian cultures of the Sioux, Crow, and Cheyenne Tribes.

Importance: The Cedar Creek Battlefield site meets the importance criteria 1, 2, and 3. The site possesses more than locally significant qualities; values that are fragile, sensitive, rare, irreplaceable, exemplary, unique, or threatened; the site is vulnerable to adverse change; and the site possesses values that warrant protection as mandated by FLPMA. The site is part of a nationally significant cultural war and represents one of the significant battles of the Sioux War.

Summary: The Cedar Creek Battlefield is approximately 1,021 public surface and mineral acres in size and located about 20 miles northwest of Terry, Montana, in Prairie County.

This area is a good example of a battlefield from the great Sioux War of 1876 to 1877, which was America's most prolonged and costly Indian war. The eighth of only twelve Sioux War battlefields, it remains interesting and one of the most enigmatic battlefields in American history more than 100 years later. The war was initially waged over the rights to gold in the Black Hills of South Dakota although the rights and privileges granted to the Sioux in the Fort Laramie Treaty of 1868 were also in dispute. The result transformed the entire northern plains from Indian and buffalo country into an open area for western settlement, which was dominated by miners, cattlemen, and homesteaders. This conflict produced a military-cultural epic with few comparisons in United States history.

While the eastern United States contains many numerous Revolutionary and Civil War battlefields, the great Sioux War of 1876 was probably the next largest war (based on geographic area) fought on American soil, spanning five states. This was the only war fought in the west. Public interest in this war is increasing, as evidenced by the numbers of visitors to the Little Bighorn Battlefield each year (and other developed sites). However, other major sites from the war lack the focused attention given to the Battle of the Little Bighorn.

The BLM is fortunate to have the unique opportunity to administer public lands containing six of the twelve major battle sites, five of which are within the Miles City Field Office (MCFO) planning area. The actual battlefield site area encompasses about 3,780 acres (all ownerships), with approximately 940 BLM-administered acres constituting the heart of the battlefield.

The Cedar Creek Battle was fought on October 21, 1876, the eighth of twelve major engagements of the Sioux War fought in a little over a year’s time. When a supply train did not arrive as scheduled at the Tongue River Cantonment, General Nelson A. Miles led the entire 5th Infantry out in relief. Miles met the wagon train on October 18, and the wagons were able to reach the cantonment on October 20. Miles did not return to his Tongue River post but pursued the wagon train attackers into the highlands north of the Yellowstone River between what is now Miles City and Glendive, Montana. On October 20, Miles spotted a large group of Sioux. Two Indians came forward under a white flag of truce announcing that Sitting Bull wished to confer with Miles about surrendering his people. The meeting, the first between a government agent and a leader of the non-agency Sioux, was ultimately fruitless. Sitting Bull declared his desire to remain in buffalo country and his insistence that the troops must leave. Miles broke off the meeting, and Sitting Bull and his followers returned to their camp some 5 miles away.

On the morning of October 21, Miles advanced against Sitting Bull’s village in the bottom of Cedar Creek. At mid-morning, the two agreed to talk again, but they could not reach mutually agreeable terms. The meeting broke up at noon, and Miles deployed for an attack. At first, the confrontation resembled a giant chess game, with each side trying to seize minor tactical advantages but neither side wishing to fire the first shot. However, when the Sioux were seen igniting the grass, Miles’ scouts fired, and an afternoon-long battle ensued. The Sioux were quickly outmaneuvered and overwhelmed, and they abandoned their village, fleeing northeast. Casualties from the Cedar Creek engagement included two soldiers wounded and five American Indians killed.

The Cedar Creek Battlefield meets both relevance and importance criteria and is recommended for ACEC designation.

FLAT CREEK

Nominated for important paleontological values (547 BLM-administered acres; Map 39).

Relevance: This microfossil site meets relevance criterion 3 for a “natural process or system.” The Hell Creek geologic formation and the associated fossils preserve a high-quality record of the end of the dinosaur age at the close of the Cretaceous Period., which is relatively rare worldwide. The area has produced fossils for display and research, and field studies of depositional patterns and earth history have taken place within the area. The necessary combination of bedrock exposure of the proper age and quality preservation of fossils provides research and collecting opportunities that are rare for this geologic period.

Importance: The Flat Creek area meets importance criteria 1 and 2. The area has produced fossils and provided research data that has proven to be significant to the national and global scientific communities. Comparison of fossils and other data collected in this area has provided scientists with insight about the end of the dinosaur age, such as the types of animals and plants present, the environment in which they lived, and the cause of the mass extinction at the close of the Cretaceous Period. The fossil material and information is fragile and needs to be researched in place. In addition, the resource is best served by public ownership of the land, which ensures access by the scientific community.

Summary: The Flat Creek paleontological area is approximately 547 public surface and mineral acres located in Garfield County. The area meets both relevance and importance criteria and is recommended for ACEC designation.

LONG MEDICINE WHEEL

Nominated for important cultural resource values (179 BLM-administered acres; Map 39).

Relevance: The Long Medicine Wheel area meets relevance criterion 1 for containing significant historic and cultural values. The cultural manifestations displayed at the Long Medicine Wheel site are rare.

Importance: The Long Medicine Wheel archeological site meets importance criterion 1 for possessing more than locally significant qualities. This site is regionally renowned, rare, and a sensitive site type of interest and concern to American Indians. The site possesses significant qualities that make it important and of interest to the region's archeological community. The site is considered eligible for nomination to the National Register of Historic Places (NRHP) and eligible for consideration as a traditional cultural property (TCP).

The Long Medicine Wheel site also meets importance criterion 2 for possessing values that are fragile, sensitive, fairly rare, irreplaceable, exemplary, unique, endangered, threatened, and vulnerable to adverse change. Although the site is not “one of a kind,” all medicine wheel type sites are considered rare and each has its own unique properties. The site and the information it contains are unique and irreplaceable. The fact that this site is a ceremonial site type makes it of particular interest to American Indians and eligible for designation as a traditional cultural property. The site is also threatened, endangered, and vulnerable to both erosion and the loss of the site's valuable information to artifact collectors.

Summary: The Long Medicine Wheel area is approximately 179 acres of BLM-administered surface located in northeastern Montana in north-central McCone County, about 6 miles south of the Missouri River and 12 miles southwest of Wolf Point, Montana.

The Long Medicine Wheel (Site 24MC148) is a large stone circle of over 25 meters in diameter with a central small stone cairn or rock pile. This site functioned as a prehistoric American Indian ceremonial circle and is located on top of a high prominent butte in northern McCone County. This site is significant because it is one of only five medicine wheels recorded in the Northern Plains, and it is the only one known sit to be recorded on BLM-administered lands within the MCFO planning area.

Ethnographic overview studies completed for the MCFO have identified this site type to be of interest and concern to American Indians. This historic property is also protected under the National Historic Preservation Act of 1966, American Indian Religious Freedom Act (42 U.S.C. 1996), Native American Graves Protection and Repatriation Act, Executive Order 13007 (May 24, 1996), and other statutes and executive orders. The Long Medicine Wheel site meets the relevance and importance criteria and is recommended for ACEC designation.

WALSTEIN

Nominated for important cultural and paleontological values (2,054 BLM-administered acres; Map 39).

Relevance: This area meets relevance criterion 1 as part of "a natural process or system," having produced a number of significant paleontological and cultural properties, including the Mill Iron Site. Fossils in this area preserve a high-quality record of the end of the dinosaur age at the close of the Cretaceous Period, which is relatively rare worldwide. The area has produced fossils for display and research, and field studies of depositional patterns and earth history have taken place within the area. The necessary combination of bedrock exposure of the proper age and quality preservation of fossils provides research and collecting opportunities that are rare for this geologic time period.

The area has a number of cultural sites that are considered significant and eligible for nomination to the NRHP. In addition, the area is eligible for allocation to conservation use through the development of a cultural resource management plan (CRMP). This significance is derived from the number of Paleo-Indian age sites and these site's unique properties and potential to contribute to important scientific information regarding cultural traditions from the Paleo-Indian period.

*Importance***:** The area meets importance criteria 1, 2, and 3. It possesses information that is regionally significant, fragile, sensitive, irreplaceable, unique, and vulnerable to vandalism and adverse change. Natural or human-caused changes could result in the loss of significant scientific data. In addition, the area warrants allocation to conservation use, carrying out the mandates of cultural resource protection within FLPMA and the cultural resource management planning system. It is important that buried deposits be preserved to be of maximum value to the scientific community.

The Walstein area has produced fossils and provided research data that has proven to be significant to the national and global scientific communities. Comparison of fossils and other data collected in this area has provided scientists with insight about the end of the dinosaur age, such as the types of animals and plants present, the environment in which they lived, and the cause of the mass extinction at the close of the Cretaceous Period. The fossil material and information is fragile and needs to be researched in place. In addition, the resource is best served by public ownership of the land, which ensures access by the scientific community.

Summary: The Walstein area is 2,053 BLM-administered acres located in Carter County. The Hell Creek formation is significant for paleontological resources spanning the end of the Cretaceous Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record just before the mass extinction of dinosaurs and other life forms). As a result of the quality bedrock exposure and the preservation of the fossils in this area, the Walstein area provides an example of this fossil record. A number of scientific papers have been written based on research done in this area, and several major finds have also been recovered from the area. Most notably, this area has produced new dinosaur fossil localities, such as a new Tyrannosaurus Rex for the Los Angeles County Museum. This area containing exposures of the Hell Creek and Fort Union formations have also produced other dinosaur vertebrate fossils as well as other vertebrate fossils, including turtle and crocodile remains. The area continues to provide information as new material weathers out of the rock.

The Walstein area also qualifies as an ACEC under both the relevance and importance criteria for the cultural values the area contains. The area contains the Mill Iron site (24CT30-Mill Iron site), which is a Goshen period Paleo-Indian site dating between the Folsom and Clovis periods, the oldest known, well-documented aged human occupations in the Americas. The Mill Iron site and others are determined eligible or are considered eligible for nomination to the NRHP. The area is significant for its prehistoric Paleo-Indian period sites. These sites represent the oldest known occupations in the western hemisphere and contain important information on early prehistory of American Indians in the plains environment. The Walstein area meets both relevance and importance criteria. It is recommended for ACEC designation.

POWDERVILLE

Nominated for unique paleontological values (Alternative A: 29,571 acres; Alternatives B, C, and D: 27,151 acres; and Alternative E: 9,518 acres).

Relevance: This area meets relevance criteria 1, for “a natural process or system.” The Hell Creek Geologic formation and the associated fossils preserve a unique record of the end of the dinosaur age at the close of the Cretaceous Period, which is relatively rare worldwide. The area has produced fossils for display and research, and field studies of depositional patterns and earth history have occurred within the area. The necessary combination of bedrock exposure of the proper age and quality preservation of fossils provides research and collecting opportunities rare for this geological time period.

Importance: The Powderville area has produced fossils and provided research data that has proven to be significant to the national and global scientific communities. Comparison of fossils and other data collected here has provided scientists with insight about the end of the dinosaur age, such as the types of animals and plants present, the environment in which they lived, and the cause of the mass extinction at the close of the Cretaceous Period. This fossil material and information is fragile and needs to be researched in place. In addition, the resource is best served by public ownership of the land, thereby assuring access by the scientific community.

Summary: The Powderville area is located in Powder River and Carter counties. The Hell Creek formation is significant for paleontological resources spanning the end of the Cretaceous Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record just before the mass extinction of dinosaurs and other life forms. As a result of the quality bedrock exposure and the preservation of the fossils in this area, the Powderville area provides an example of this fossil record. A number of scientific papers have been written based on research done in this area and several major finds have been recovered from this area. Most notably, this area has recently produced new dinosaur fossil localities, including the Jane site, a rare juvenile *Tyrannosaurus Rex*, also known as *Nanotyranus*, which was excavated by the Burpee Museum of Rockford, Illinois. The area has also produced many other numerous dinosaur vertebrate fossils, including *Tyrannosaurus rex*, hadrosaur, *Triceratops*, and other vertebrate fossils that include fish, turtle, crocodile, champsosaur and mammal remains. The area continues to provide new and exciting information as new material weathers out of the exposed rock formations.

YONKEE

Nominated for unique cultural resource values (40 BLM-administered acres; Map 39).

Relevance: The Yonkee area meets the relevance criterion for having significant historic and cultural values. The cultural phase displayed at the Powers-Yonkee site is rare and is the "type" site for the Yonkee cultural phase, making it of interest to the region's archeological community.

Importance: The Powers-Yonkee Site, a bison kill site, is significant because it is among one of the first reported bison kill sites in the Northwestern Plains. It is also the “type” site for the Yonkee projectile point style and cultural phase, making it an excellent example of Late Plains Archaic sites. The Powers-Yonkee site, also known by its Smithsonian trinomial number 24PR5, was originally believed to be a Late Middle Prehistoric period site dating to about 2,500 years before the Common Era. As this site was the first of its cultural phase to be described, it became the "type" site for this phase. This arroyo trap bison kill contained skeletal remains of bison intermediate between *Bison bison* and *Bison antiquus*.

Archeological excavations were originally conducted in 1961, defining the Yonkee cultural phase. During the past decade, archeologists began to question seriously certain interpretations initiated in the original Powers-Yonkee report. In 1986, at the instigation of Jerry Clark, then BLM's Miles City District archeologist, the BLM entered into a cooperative agreement with Montana State University to perform additional assessments of the Powers-Yonkee site, which was conducted by Dr. Tom Roll of Montana State University. The assessment determined that most of the remaining deposits are located on BLM-administered lands and substantial portions of the site remain. Subsequent radiocarbon dates now suggest the site dates to about 1,000 years before the Common Era.

The site has contributed valuable information to the scientific community and has added significantly to the further understanding of the prehistory of the Northwestern Plains. The site also qualifies for inclusion on the NRHP. To date, only a portion of the site has been excavated, and substantial deposits remain available for future study. These studies may help resolve the many unanswered questions concerning the prehistory of the Northwestern Plains.

Summary: Although the Yonkee area meets the relevance and importance criteria, it does not require special management attention to protect and prevent irreparable damage to important cultural resources. The Cultural Resources management actions within this RMP require all significant cultural resources be protected with an oil and gas leasing No Surface Occupancy stipulation and all surface-disturbing activities allowed only as long as the activities would not have an adverse effect to the resource.

EVALUATION OF RELEVANCE AND IMPORTANCE CRITERIA FOR PROPOSED GREATER SAGE-GROUSE AREA OF CRITICAL ENVIRONMENTAL CONCERN

In response to the *Notice of Intent to Prepare Environmental Impact Statements To Incorporate Greater Sage-grouse Conservation Measures Into Land Use Plans and Land Management Plans* (BLM 2011e), the BLM received an ACEC nomination for greater sage-grouse from WildEarth Guardians that will be considered in this planning process.

This report presents the completed evaluation form for the nominated ACEC in the planning area (Table 1). An ACEC that meets both relevance and importance criteria is included in Alternative B and analyzed in this RMP. Map 4 identifies the location of the nominated ACEC.

Area Considered and General Location: Portions of Garfield, McCone, Custer, Carter, Powder River, Big Horn, Rosebud, and Treasure counties (Map 4).

General Description: Priority habitat areas for greater sage-grouse.

Acreage: 1,067,000 BLM-administered surface acres.

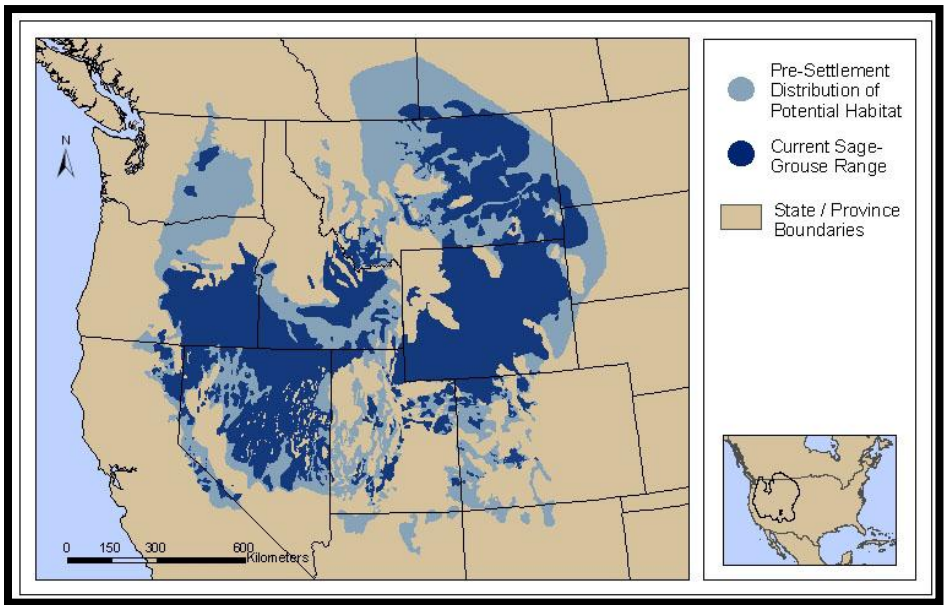
Values Considered: Greater sage-grouse habitat.

TABLE 1.
GREATER SAGE-GROUSE RELEVANCE AND IMPORTANCE EVALUATION

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value	No	No significant historic or cultural values are known. Scenic values are moderate, but are similar to those of many other areas in the planning area.
A fish and wildlife resource	Yes	The nomination meets the relevance criterion for wildlife resources. The nominated area provides habitat for greater sage-grouse (1,067,000 BLM-administered surface acres), a BLM sensitive species, and the area has also been identified as a core area by Montana Fish, Wildlife, and Parks (MFWP).
A natural process or system	Yes	The nomination also meets the criterion for a natural system or process because of the condition of the sagebrush habitat in the nomination area.
Natural hazards	No	No natural hazards are known.
Importance Value	Yes/No	Rationale for Determination
More than locally significant qualities	No	Although the area contains habitat for greater sage-grouse conservation as noted in the nomination material, the area is not

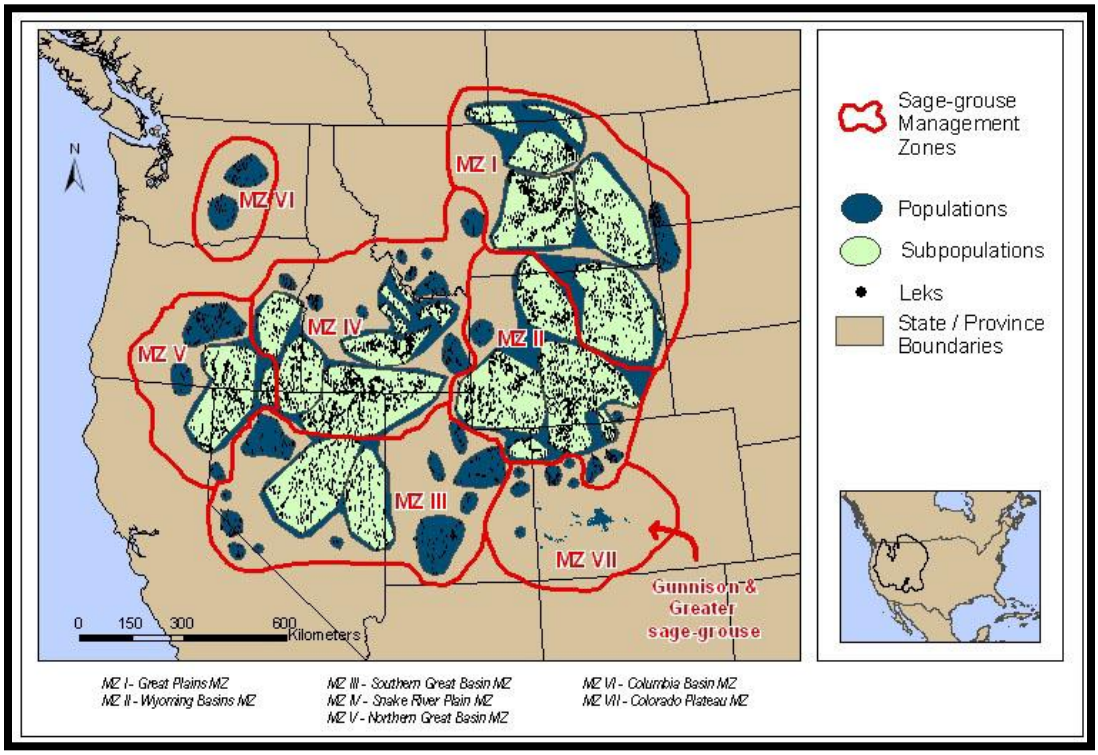
Relevance Value	Yes/No	Rationale for Determination
		significantly unique or more important than other habitat areas in this region. Greater sage-grouse are distributed throughout the western United States (Figure 1). The portion of the distribution in Montana, Wyoming, North Dakota, South Dakota, Alberta, and Saskatchewan are designated as Management Zone I (Stiver et al. 2006) (Figure 2). Management zones are delineations of greater sage-grouse populations and subpopulations within floristic zones with similar management issues. Within Management Zone I in Montana, MFWP designated core areas (MFWP 2012) and Wyoming Game and Fish designated core areas in Wyoming (WDFG 2010b) (Figures 3 and 4). In addition, Montana Audubon has also designated five important bird areas for sage-steppe associated birds, including greater sage-grouse, in Montana, most of which are contained within the MFWP core areas (Figure 5). While all of these areas are considered important to greater sage-grouse conservation, the areas are dispersed throughout the region and are not significantly unique to a specific region or planning unit. In addition, greater sage-grouse habitat in these core areas is owned by a number of different entities and habitat on BLM-administered lands is not distinct from habitat managed by other ownerships.
Special qualities	No	The area is not particularly fragile or sensitive to change as compared to other sites in Montana.
Warrants national priority or FLPMA protection	Yes	Satisfies national priority concerns.
Safety or public welfare concerns	No	No safety or public welfare concerns are known.
Poses a significant threat	No	No significant threats.

FIGURE 1.
GREATER SAGE-GROUSE DISTRIBUTION



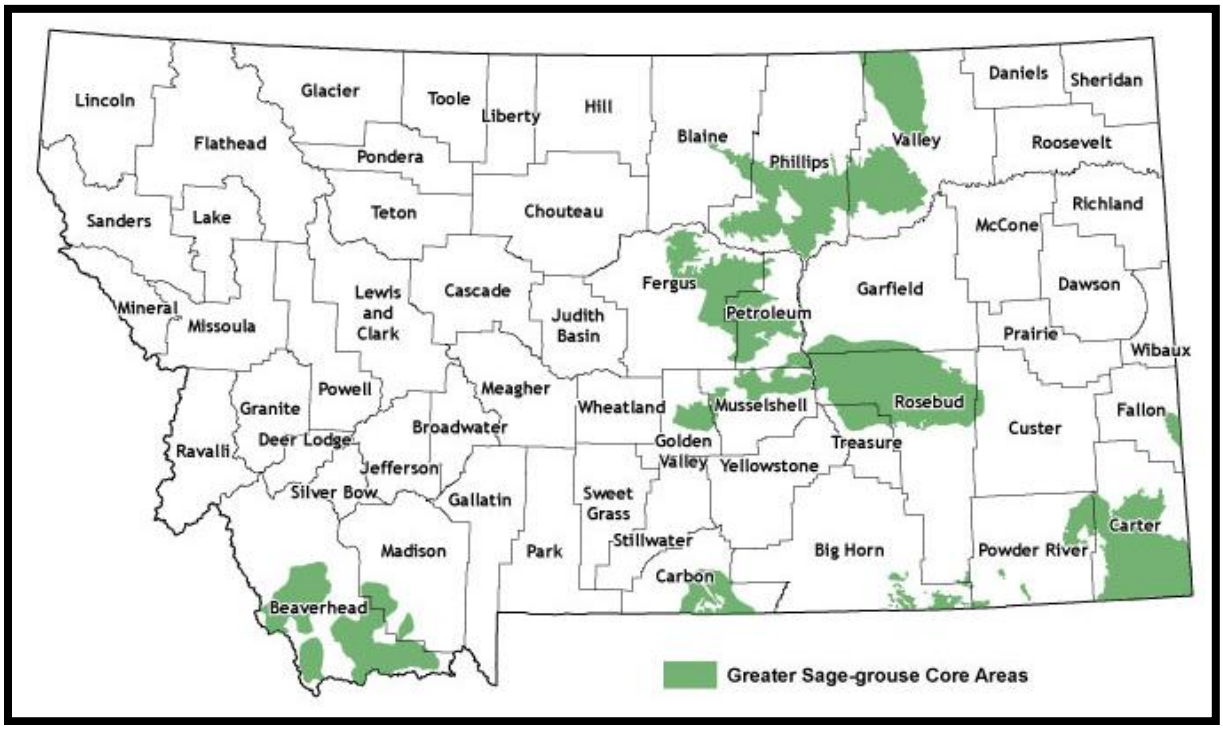
Source: Stiver et al. 2006

FIGURE 2.
GREATER SAGE-GROUSE MANAGEMENT ZONES



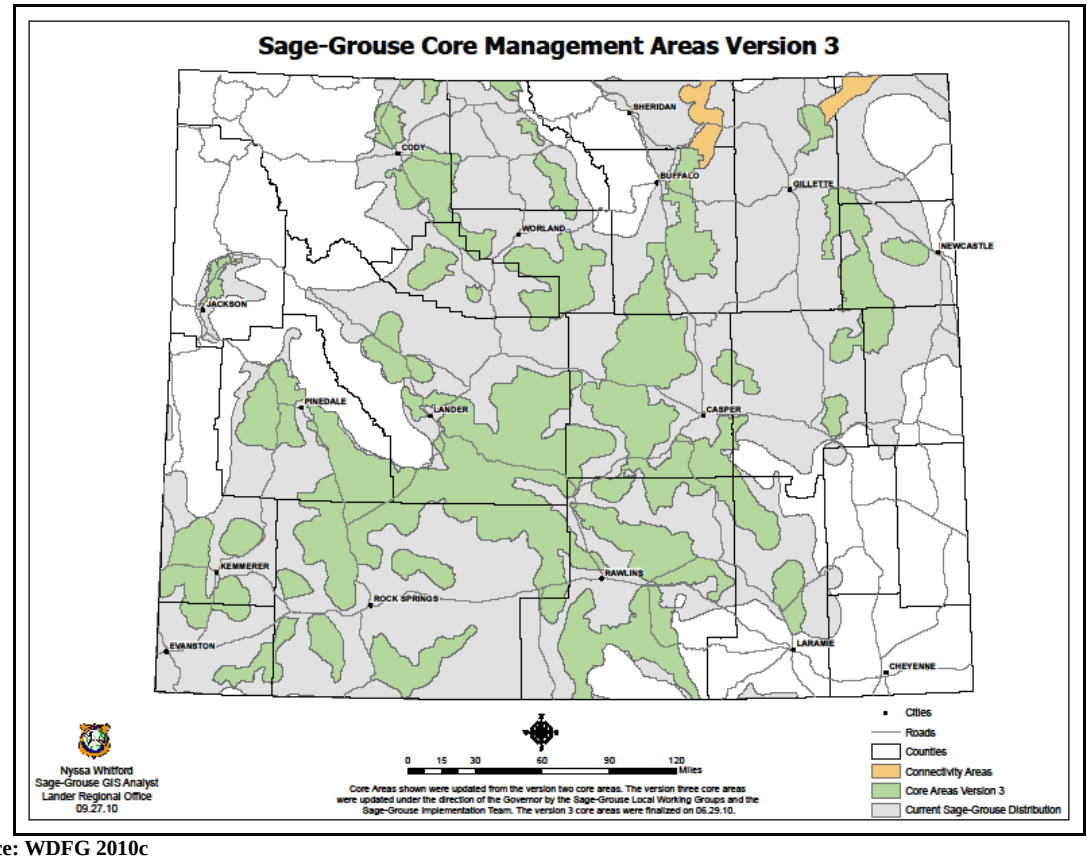
Source: Stiver et al. 2006

FIGURE 3.
GREATER SAGE-GROUSE CORE AREAS IN MONTANA



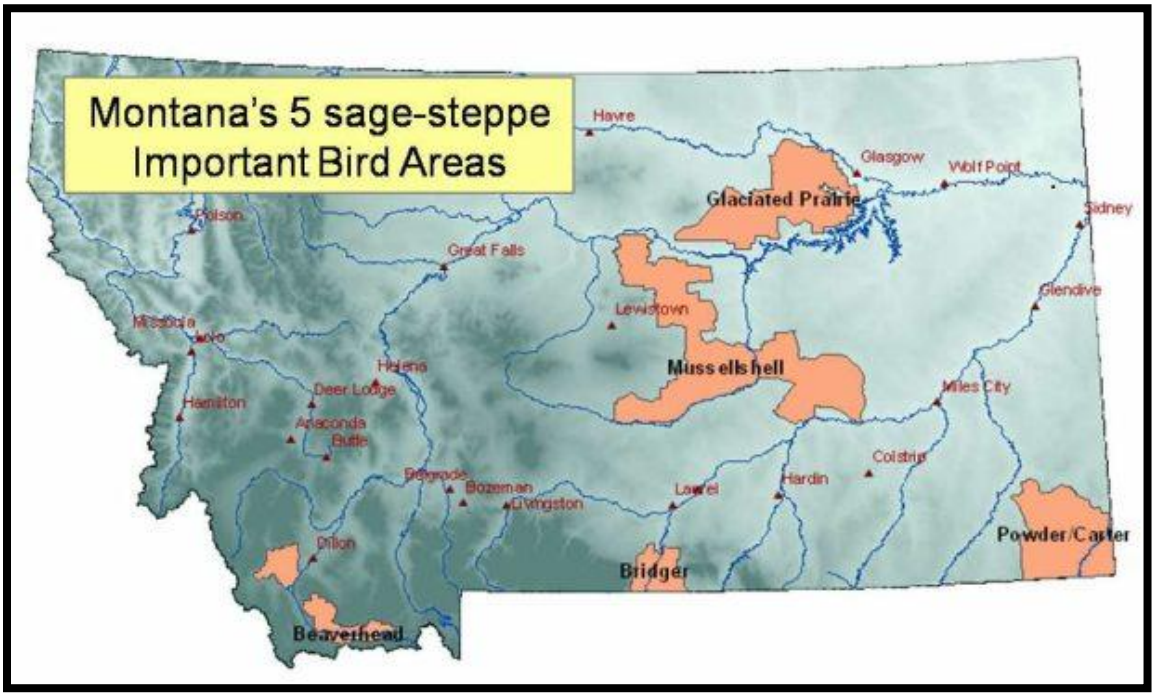
Source: MFWP 2012
Sage-grouse core areas are habitats associated with Montana's highest densities of sage-grouse (25 percent quartile), based on male counts, or sage-grouse lek complexes and associated habitat important to sage-grouse distribution (MFWP 2012).

FIGURE 4.
GREATER SAGE-GROUSE CORE AREAS IN WYOMING



Source: WDFG 2010c

FIGURE 5.
IMPORTANT BIRD AREAS IN MONTANA



Source: Montana Audubon 2012

EXISTING ACECs

There are 16 ACECs already designated within the planning area (BLM 1994b and 1999a). The existing ACECs were reevaluated to determine if they still meet the criteria to be ACECs. Two of the 16 ACECs (Howrey Island and Black-Footed Ferret Reintroduction) no longer have the values that made them relevant and one of the 16 does not require special management (Piping Plover), so these three are recommended for non-designation in this RMP. The values that make the remaining 13 areas ACECs have not changed, and they are carried forward as ACECs in the RMP (see Chapter 2, *Special Designation Areas*.)

HOWREY ISLAND

Originally designated for special wildlife values.

Relevance: Howrey Island does not meet any of the relevance criteria. When originally designated, the area met criterion 2 for providing habitat for a threatened species, the bald eagle. The bald eagle has been delisted and is no longer a threatened species.

Importance: Howrey Island meets importance criterion 2. The island has qualities and values that make it fragile, sensitive, and unique.

Summary: Howrey Island is approximately 592 public surface acres located in Treasure County. Because this area meets the importance criteria but not the relevance criteria, Howrey Island is not recommended for continued ACEC designation. (Note: this area is considered for special recreation management area designation in the RMP; Map 15).

BATTLE BUTTE BATTLEFIELD ACEC

Designated for unique historic values (Alternative A, 121 acres; Alternatives B through D, 237 acres; and Alternative E, 320 acres; Map 39).

Relevance: Battle Butte Battlefield meets relevance criterion 1. This significant site is 1 of 12 battlefields of the Sioux War. This site is of major interest to both national historians and history enthusiasts as well as the American Indian cultures of the Sioux, Crow, and Cheyenne Tribes.

Importance: Battle Butte Battlefield meets relevance criteria 1, 2, and 3. The site is part of a battle directly associated with Crazy Horse, one of the Sioux's main leaders. Battle Butte Battlefield contains irreplaceable information and is vulnerable to adverse change. The site is an exemplary example of Sioux War battle sites and possesses values that warrant protection as mandated by FLPMA.

Summary: The Battle Butte Battlefield is located in Rosebud County. It meets both the relevance and importance criteria and is recommended for continued ACEC designation. Battle Butte, or the Wolf Mountains Battle, was fought in January 8, 1877, in a blinding blizzard. Led by army scout Yellowstone Kelly, Colonel Nelson Miles commanded a force of 436 men composing seven companies of the 5th and 22nd infantries. They marched from the Tongue River Cantonment south along the Tongue River in search of American Indian winter villages. After 10 days march up the river, Miles' command encountered warriors from Crazy Horse's winter camp, which consisted of 1,200 inhabitants located south of Birney, Montana. The Sioux attacked west of the Tongue River and then occupied the high ground, firing down into the U.S. soldiers' positions. Miles ordered his men to attack uphill to take command of the high ground. Once Miles' men were able to hold the high ground, the Sioux's advantage was lost. Low on ammunition, the Sioux retreated upstream. In the ensuing blizzard, the Sioux were able to escape up the Tongue River. Both sides suffered casualties.

REYNOLDS BATTLEFIELD ACEC

Designated for significant historic values (Alternative A: 324 acres and Alternatives B through E: 922 acres; Map 39).

Relevance: Reynolds Battlefield meets relevance criterion 1. This significant site from the Sioux War and associated sites are of major interest to both national historians and history buffs as well as the American Indian cultures of the Sioux, Crow, and Cheyenne.

Importance: Reynolds Battlefield meets importance criteria 1, 2, and 3. The area is an exemplary example of Sioux War battle sites. The battlefield is rare, 1 of only 12, with this the first of the major battles. The Reynolds Battlefield possesses values that warrant protection as mandated by the FLPMA.

Summary: The Reynolds Battlefield is located in Custer County. It is the first engagement of 12 major battles of the Sioux War of 1876 to 1877. The Big Horn Expedition left Fort Fetterman, Wyoming, in mid-February and endured almost continual harsh winter weather with sub-zero temperatures. Marching north up the Powder River drainage, they crossed into Montana near Decker and proceeded down the Tongue River to Hanging Woman Creek. There, Crook ordered Colonel Joseph J. Reynolds, 3rd Cavalry, with six companies of the 2nd and 3rd Cavalry to attack the only village they had found thus far, a village to the east on the Powder River. Reynolds attacked the village at dawn on March 17, 1876. In the early morning battle, the troops captured the village, burning all of the camp tepees. Most of the camp inhabitants were able to escape. Some 800 ponies were also captured. The village retaliated by firing down into the army positions from a high bluff to the west. The troops withdrew under heavy fire. Their hasty withdrawal, ordered by Reynolds, resulted in four army dead left in the field. Later that night, the village recaptured their horse herd. Crook was enraged by these events and ordered Reynolds court-martialed. One damaging aspect of this battle was the fact that the village was not Sitting Bull's Sioux camp, as originally thought, but a Cheyenne camp on their way back to the reservation. This unprovoked attack on a peaceable village turned the Cheyenne against the United States government. The Cheyenne sided with the Sioux and participated in most of the subsequent phases of the war.

Reynolds Battlefield meets the relevance and importance criteria and is recommended for continued ACEC designation.

BIG SHEEP MOUNTAIN ACEC

Designated for unique cultural values (363 BLM-administered acres; Map 39).

Relevance: The site meets relevance criterion 1 as a significant cultural resource property. The significance is derived from the site’s unique properties and potential to contribute important scientific information on nearly the full range of cultural traditions from the Paleo-Indian period to the Late Plains Archaic period.

Importance: The site meets importance criteria 1, 2, and 3. It possesses information that is regionally significant, fragile, sensitive, irreplaceable, unique, and vulnerable to vandalism and adverse change. Natural or human-caused changes could result in the loss of significant scientific data. In addition, the site warrants allocation to conservation use, carrying out the mandates of cultural resource protection within FLPMA and the cultural resource management planning system. Special management attention is needed to preserve the buried deposits for maximum value to the scientific community.

Summary: The site (24PE210) meets both the relevance and importance criteria and is recommended for continued ACEC designation. The site is located in Prairie County and measures 360 acres in size. It is considered eligible for nomination to the NRHP. The site is considered significant for its span of cultural periods over some 10,000 years. The site contains important information on prehistory and history of the American Indian in the plains environment. A CRMP proposed for the site will take the place of an ACEC activity plan. The CRMP will allocate the site to conservation use. BLM management objectives should involve the long-term conservation of this site for future generations to study and enjoy. Specific research questions could be formulated in order to study artifacts and records from the site, which could be used to demonstrate a number of prehistoric activities that were present or conducted at the site.

HOE ACEC

Designated for unique cultural values (147 BLM-administered acres; Map 39).

Relevance: The site meets relevance criterion 1 as a significant cultural resource property. The significance is derived from the site's unique properties and its potential to contribute important scientific information regarding possible agricultural traditions from the Late Prehistoric period that relate to the Middle Missouri tradition.

Importance: The site meets importance criteria 1, 2, and 3. It possesses information that is regionally significant, fragile, sensitive, irreplaceable, unique, and vulnerable to vandalism and adverse change. Natural or human-caused changes could result in the loss of significant scientific data. In addition, the site warrants allocation to conservation use, carrying out the mandates of cultural resource protection within FLPMA and the cultural resource management planning system. It is important that buried deposits be preserved to be of maximum value to the scientific community. The need for preservation necessitates special management attention.

Summary: The site (24PE263) meets both the relevance and importance criteria and is recommended for continued ACEC designation. Located in Prairie County, the site measures 144 acres in size and has been determined eligible for nomination to the NRHP. It is significant for late prehistoric agricultural subsistence strategies and an associated habitation site. The site represents the westernmost findings of possible agricultural practices of the middle Missouri tradition. It contains important information on prehistory of the American Indian in the plains environment. A cultural resource plan will be developed and take the place of an ACEC activity plan and allocate the site to conservation use. BLM management objectives should involve the long-term conservation of the site for future generations to study and enjoy. Specific research questions could be formulated in order to study artifacts and records from the site, which could be used to demonstrate a number of prehistoric activities that were present or conducted at the site.

JORDAN BISON KILL ACEC

Designated for unique cultural values (160 BLM-administered acres; Map 39).

Relevance: The site meets relevance criterion 1 as a significant cultural resource property. The significance is derived from the site's unique properties and potential to contribute important scientific information on bison procurement and subsistence strategies from the Late Prehistoric period.

Importance: The site meets importance criteria 1, 2, and 3. The site possesses information that is regionally significant, fragile, sensitive, irreplaceable, unique, and vulnerable to vandalism and adverse change. Natural or human-caused changes could result in the loss of the site's significant scientific data. In addition, the site warrants allocation to conservation use, carrying out the mandates of cultural resource protection within FLPMA and the cultural resource management planning system. Special management attention is needed to preserve the site's buried deposits, for maximum value to the scientific community.

Summary: The site (24GF271) meets both the relevance and importance criteria and is recommended for continued ACEC designation. Located in Garfield County, the 160-acre site is considered eligible for nomination to the NRHP. It is significant for Late Prehistoric period bison kill procurement and subsistence strategies and associated habitation and processing site. The site contains important information on prehistory of the American Indian in the plains environment. The site has a CRMP that will be updated and take the place of an ACEC activity plan. The site is allocated to scientific use but will be reallocated to conservation use. BLM management objectives should involve the long-term conservation of the site for future generations to study and enjoy. Specific research questions could be formulated in order to study artifacts and records from the site, which could be used to demonstrate a number of prehistoric activities that were present or conducted at the site.

POWDER RIVER DEPOT ACEC

Designated for unique cultural values (1,401 BLM-administered acres; Map 39).
Relevance: The site meets relevance criterion 1 as a significant cultural resource property. The site has important scientific information on the historic use of the area by the late 19th century military. The archeological findings can be compared with written records.

Importance: The site meets importance criteria 1, 2, and 3. The site possesses information that is both regionally and nationally significant. The site is fragile, sensitive, irreplaceable, unique, and vulnerable to adverse change, vandalism, and unauthorized metal-detector use. Natural or human-caused changes could result in the loss of the significant scientific data. In addition, the site warrants allocation to conservation use, which would carry out the mandates of cultural resource protection within FLPMA and the cultural resource management planning system. Special management attention is needed to study the historic information at the site, which necessitates preservation of buried deposits for maximum benefits to the scientific community.

Summary: The site meets both the relevance and importance criteria and is recommended for continued ACEC designation. The site (24PE231) is 1,386 acres in size and has been determined eligible for nomination to the NRHP. The area includes Sheridan Butte located along the Yellowstone River, where historic graffiti dating to the Indian War period is on the butte's rock outcrops. The Powder River Depot was the location of General Terry's supply depot that supplied General Custer's troops before they headed to the Little Big Horn River. It was the main supply depot for the armies that pursued the fleeing Sioux and Cheyenne Tribes throughout the summer of 1876. The site contains a wealth of archeological information on the encampment and the everyday life of the soldiers of that period. The numerous buried metallic artifacts are subject to looting and vandalism through unauthorized use of metal detectors. A CRMP will take the place of an ACEC activity plan. The CRMP will allocate the site to conservation use. BLM management objectives should involve the long-term conservation of this site for future generations to study and enjoy. Specific research questions could be formulated in order to study artifacts and records from the site, which could be used to demonstrate a number of prehistoric activities that were present or conducted at the site.

SELINE ACEC

Designated for unique cultural values (80 BLM-administered acres; Map 39).

Relevance: The site meets relevance criterion 1 because it is a significant cultural resource property. The significance is derived from the site's unique properties and information potential that can contribute important scientific information on cultural traditions from the middle prehistoric period.

Importance: The site meets importance criteria 1, 2, and 3. It possesses information that is regionally significant, fragile, sensitive, irreplaceable, unique, and vulnerable to vandalism and adverse change. Natural or human-caused changes could result in the loss of significant scientific data. In addition, the site warrants allocation to conservation use, carrying out the mandates of cultural resource protection within FLPMA, and the cultural resource management planning system. Special management attention is needed to preserve the site's buried deposits to provide information to the scientific community.

Summary: The site (24DW250) meets both the relevance and importance criteria and is recommended for continued ACEC designation. Located in Dawson County, the site measures some 80 acres in size and is considered eligible for nomination to the NRHP. The site possesses important information on prehistory of the American Indian in the plains environment. The CRMP for the area, when updated, will take the place of an ACEC activity plan. The plan will allocate the site to conservation use. BLM management objectives should involve the long-term conservation of this site for future generations to study and enjoy. Specific research questions could be formulated in order to study artifacts and records from the site, which could be used to demonstrate a number of prehistoric activities that were present or conducted at the site.

SMOKY BUTTE ACEC

Designated for unique geological values (80 BLM-administered acres; Map 39).

Relevance: Smoky Butte is a 250-foot high prominence located about eight miles west of Jordan in Garfield County. The Smoky Butte area meets relevance criteria 1 and 3. The area has regionally significant scenic values. It is a landmark feature that can be seen for miles; a striking contrast to the surrounding rolling plains. It was used by early day travelers as a guide when traveling through the area. Pioneers traveling the "Green Trail" west to Lewistown, Montana, could see Smoky Butte for a considerable distance (BLM 1995). It is considered

to possess significant local and regional scenic and historic values. The rocks that are present at Smoky Butte consist of a rare mineral assemblage.

The area is an excellent example of the geologic process of igneous intrusion. Smoky Butte is located in the middle of a 2-mile long line of narrow igneous intrusive dikes and plug-like features. These igneous intrusives form a narrow, linear group of low buttes and knobs, oriented northeast to southwest, that rise out of the otherwise rolling prairie. The igneous rocks were intruded into the flat-lying sedimentary rocks of the Paleocene Fort Union formation and Late Cretaceous Hell Creek sandstones and were emplaced along the axis (obliquely) of the Blood Creek Syncline (Mitchell, Platt, and Downey 1987). The intrusive igneous rocks at Smoky Butte are hard and resist erosion, as do the adjacent sedimentary rocks, which were slightly baked and hardened by the hot igneous intrusive. This hardness "holds up" the buttes by providing more resistance to erosion than the surrounding sedimentary rocks. Although Smoky Butte is an interesting example of igneous intrusion and many geologic features associated with such an event are present there, the primary importance of the butte lies in the unique mineral assemblage of the igneous rocks.

The igneous rocks at Smoky Butte have been categorized as a lamproite, which is a type of volcanic or hypabyssal igneous rock. Matson (1960) noted that one of the most striking features of the intrusive rock complex was rocks that were high in potassium and titanium and similar to rocks found at West Kimberly, Australia, and the Leucite Hills of Wyoming. Matson (1960) and Velde (1975) observed that the igneous rock is a mixture of minerals. Velde (1975) further classified it as an armalcolite-ti-phlogopite-iopside-analcite-bearing lamproite. Velde's analysis revealed that the Smoky Butte lamproite contains a rare mineral called armalcolite, a mineral found in samples of rock from the moon (1975). Velde (1975) reported that the armalcolite at Smoky Butte has the closest composition to the lunar armalcolite of any known terrestrial rocks. In addition, Wagner and Velde (1986) discovered that the mineral davanite, an alkali titanosilicate mineral found in Siberia, is also present in the Smoky Butte lamproite. Smoky Butte contains a rare mineralogic assemblage and is an excellent example of the geologic process of igneous intrusion.

Importance: Smoky Butte meets importance criteria 1 and 2. Smoky Butte has more than locally significant qualities that give it special worth, consequence, and meaning. Scientists from the United States, Canada, and France have studied the special geologic features present in this area. The Smoky Butte area has been the subject of an M.S. thesis study, and a study published by the USGS. It has been reported in scientific trade journals, such as American Mineralogist, Journal of Petrology, and Earth and Planetary Science Letters. Smoky Butte is discussed in Mitchell and Bergman's *Petrology of Lamproites* (1991), published by Plenum Press, and Alt and Hyndmans' *Roadside Geology of Montana* (1986), published by Mountain Press Publishing Company. The area was also the subject of a special July 1989 field trip of the 28th International Geological Congress, which was studying the Montana High Potassium Igneous Province.

Information gleaned from these rocks has been used to draw conclusions and advance theories about the origin of the rocks and the composition and geotectonics of the mantle of the earth. Scientists believe that the source material for the lamproite at Smoky Butte is derived from the earth's mantle; because the crust has been estimated to be about 45 kilometers thick in this area (Velde 1975), this conclusion would mean the material originated deep in the earth's crust.

The Smoky Butte lamproite is also unique because it is the easternmost known intrusive feature in Montana. The nearest intrusive rocks to Smoky Butte occur 55 to 60 miles to the southwest, on Porcupine Dome and near Ingomar Dome (Matson 1960). Smoky Butte is also the youngest, dated at 27 million years (Oligocene), and taken together with the Missouri Breaks diatremes, may represent the last phases of igneous activity in the north-central Montana alkalic province (Marvin, Hearn, Mehnert, Naeser, Zartman, and Lindsey 1980). Smoky Butte would be vulnerable to damage from exploration and mining activities carried out under a locatable mineral entry (mining claim). Smoky Butte was quarried many years ago for riprap to face a nearby dam. The present quarry site is small and actually provides an excellent exposure of the rocks that compose Smoky Butte. However, further mining activity would not improve viewing or enhance research and would only serve to destroy the surface exposure of this rare geologic feature.
Summary: Smoky Butte is 80 acres in size and is located in Garfield County. It meets both the relevance and importance criteria and is recommended for continued ACEC designation. Smoky Butte contains public land with a variety of unique values and needs protection and special management attention.

FINGER BUTTES ACEC

Designated for scenery (1,520 BLM-administered acres; Map 39).

Relevance: Finger Buttes meets relevance criteria 1 and 2. The area represents more than badlands topography, a rather typical topographic type for southeastern Montana. Finger Buttes has scenic qualities of color, line, and form consisting of bare sandstone pinnacle topography that is outlined on the horizon, creating an interesting view. These scenic values are unique and do not exist elsewhere in the local or regional area.

Importance: Finger Buttes meets importance criteria 1 and 2. The area consists of a series of pipestem and tower sandstone outcrops not found elsewhere in the area. The Finger Buttes area is fragile, irreplaceable, and vulnerable to adverse change.

Summary: Finger Buttes meets both relevance and importance criteria and is recommended for continued ACEC designation. It is approximately 1,520 public surface acres located in Carter County. There is no legal access into the area, which consists of tall, slim, smokestack-like tan and gray sandstone monuments, towers, and prominences. These buttes are formed in the Arikaree formation, a formation that appears in southeastern Montana. The area possesses outstanding scenery.

ASH CREEK DIVIDE ACEC

Designated for paleontological values (7,921 BLM-administered acres; Map 39).

Relevance: The area meets relevance criterion 3, "a natural process or system." The Hell Creek geologic formation and associated fossils preserve a record of the end of the dinosaur age at the close of the Cretaceous Period. The area preserves a high-quality record of this period, which is relatively rare worldwide. The area has produced fossils for display and research, and field studies of depositional patterns and earth history have occurred within the area. The necessary combination of bedrock exposure of the proper age and quality preservation of fossils provides research and collecting opportunities rare for this geological time period.

Importance: The Ash Creek Divide area meets importance criteria 1 and 2. It has produced fossils and provided research data that has proven to be significant to the scientific community within the United States as well as worldwide. Comparison of fossils and other data collected here has provided scientists with insight about the end of the dinosaur age, such as the types of animals and plants present, the environment in which they lived, and the cause of the mass extinction at the close of the Cretaceous Period. The fossil material and information is fragile and needs to be researched in place. In addition, the resource is best served by public ownership of the land, which would ensure access for the scientific community.

Summary: Ash Creek Divide meets both the relevance and importance criteria and is recommended for continued ACEC designation. The Hell Creek formation is significant for paleontological resources spanning the end of the Cretaceous Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record just before the mass extinction of the dinosaurs and other life forms. The Ash Creek Divide area is an example of this record, owing to the good exposures of the bedrock and the preservation of the fossils. As a result of the quality bedrock exposure and the preservation of the fossils in this area, the Ash Creek Divide area provides an example of this fossil record. Several scientific papers have been written based on research done in this area. The area will continue to provide information as new material weathers out of the rock.

BUG CREEK ACEC

Designated for paleontological values (3,837 BLM-administered acres; Map 39).
Relevance: The area meets relevance criterion 3, a "natural process or system." The geologic formations and the associated fossils are a rare example of a continuous record of the end of the dinosaur age (Cretaceous Period) and the beginning of the age of the mammals during the Tertiary Period. The area preserves one of the best records of this period. The area has produced fossils for display and research. Field studies of depositional patterns and earth history have taken place within the area. The necessary combination of bedrock exposures of

the proper age and quality preservation of fossils provides research and collecting opportunities rare for this geological time period.

Importance: The Bug Creek area meets importance criteria 1 and 2. It has produced fossils and provided research data that has proven to be highly significant to the national and global scientific communities. Comparison of fossils and other data collected here has given scientists insight about the end of the dinosaur age and the start of the mammal age, such as the types of animals and plants present, the environment in which they lived, and the cause and effects of the mass extinction at the close of the Cretaceous Period. The fossil material and information is fragile and needs to be researched in place. Special management attention is needed to afford proper protection. In addition, the resource is best served by public ownership of the land, thereby assuring access to the scientific community.

Summary: Bug Creek meets both the relevance and importance criteria and is recommended for continued ACEC designation. The Hell Creek formation and the overlying Tullock member of the Fort Union formation are significant for paleontological resources spanning the time from the late Cretaceous Period to the early Tertiary Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record before, during, and after the mass extinction of the dinosaurs and other life forms. As a result of the extensive exposures of the bedrock and the preservation of the fossils, the Bug Creek area is one of the best and most studied examples of this record. Many scientific papers have been written based on research from this area. The area will continue to provide information as new material weathers out of the rock. Protection of the area is important to preserve the paleontological values in this significant area.

HELL CREEK ACEC

Designated for paleontological values and the Hell Creek National Natural Landmark (19,373 BLM-administered acres; Map 39).

Relevance: The area meets relevance criterion 3, a “natural process or system.” The geologic formations and the associated fossils are a rare example of a continuous record of the end of the dinosaur age at the close of the Cretaceous Period and the subsequent beginning of the age of the mammals during the start of the Tertiary Period. The area preserves one of the best records of this period. The area has produced fossils for display and research. Field studies of depositional patterns and earth history have occurred within the area. The necessary combination of bedrock exposure of the proper age and quality preservation of fossils provides research and collecting opportunities rare for this geological time period.

Importance: The Hell Creek area meets importance criteria 1 and 2. It has produced fossils and provided research data that has proven to be highly significant to the national and global scientific communities. Comparison of fossils and other data collected here has given scientists insight about the end of the dinosaur age and the start of the mammal age, such as the types of animals and plants present, the environment in which they lived, and the cause and effects of the mass extinction at the close of the Cretaceous Period. The fossil material and information is fragile and needs to be researched in place. Special management attention is needed to afford proper protection. In addition, the resource is best served by public ownership of the land, which would ensure access for the scientific community.

Summary: Hell Creek meets both the relevance and importance criteria and is recommended for continued ACEC designation. The Hell Creek formation and the overlying Tullock member of the Fort Union formation are significant for their paleontological resources spanning the time from the late Cretaceous Period to the early Tertiary Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record before, during, and after the mass extinction of the dinosaurs and other life forms. As a result of the extensive exposures of the bedrock and the preservation of the fossils, the Hell Creek area is probably the best and most studied example of this record. The area has provided museums with displays of dinosaurs and scientific papers based on research from this area. Approximately one-half of the Hell Creek National Natural Landmark is included within the boundaries of this area. The area will continue to provide information as new material weathers out of the rock. Protection of the area is important to preserve the paleontological values in this significant area.

SAND ARROYO ACEC

Designated for paleontological values (9,052 BLM-administered acres; Map 39).

*Relevance***:** The area meets relevance criterion 3, a "natural process or system." The geologic formations and the associated fossils are a rare example of a continuous record of the end of the dinosaur age at the close of the Cretaceous Period and the subsequent beginning of the age of the mammals during the start of the Tertiary Period. The area preserves a good record of this period and is relatively rare worldwide. The area has produced fossils for display and research. Field studies of depositional patterns and earth history have occurred within the area. The necessary combination of bedrock exposure of the proper age and good preservation of fossils provides research and collecting opportunities rare for this geological period.

Importance: The Sand Arroyo area meets importance criteria 1 and 2. It has produced fossils and provided research data that has proven to be highly significant to the national and global scientific communities. Comparison of fossils and other data collected here has given scientists insight about the end of the dinosaur age and the start of the mammal age, such as the types of animals and plants present, the environment in which they lived, and the cause and effects of the mass extinction at the close of the Cretaceous Period. This fossil material and information is fragile and needs to be researched in place. Special management attention is needed to afford proper protection. In addition, the resource is best served by public ownership of the land, which would ensure access for the scientific community.

Summary: Sand Arroyo meets both the relevance and importance criteria and is recommended for continued ACEC designation. The Hell Creek formation and the overlying Tullock member of the Fort Union formation are significant for their paleontological resources spanning the late Cretaceous Period to the early Tertiary Period. The outcrops of these beds are some of the few places in the world that preserve a continuous record before, during, and after the mass extinction of the dinosaurs and other forms of life. The Sand Arroyo area is a good example of this record, owing to the extensive exposures of the bedrock and the preservation of the fossils. A number of scientific papers have been written based on research done in this area. The area will continue to provide information as new material weathers out of the rock. Protection of the area is important to preserve the significant paleontological values.

BLACK-FOOTED FERRET REINTRODUCTION ACEC

Designated for its potential as a black-footed ferret reintroduction area as well as habitat for associated wildlife species (11,221 BLM-administered acres; Map 39).

Relevance: The area no longer meets the meets relevance criteria. The BLM-administered lands do not meet the acreage requirement to be defined as potential habitat for the black-footed ferret. In order to be considered as potential habitat for the black-footed ferret reintroduction, prairie dog complexes need to be within 1.5 km of each other and comprise a total of 1,500 more acres (Biggens 1993, Biggens et al. 2006). In addition and as provided in the introduction section of this appendix, the ACEC designation can only be made on BLM-administered surface estate. The BLM-administered surface estate provides less than 100 public acres of active prairie dog complexes within the current ACEC boundary. Additionally, these complexes on BLM-administered surface estate are also located greater than 1.5 Km from each other.

Importance: The area is not significantly unique or more important than other prairie dog habitat areas in this region. While all of these areas are considered important for the consideration of black-footed ferret reintroduction, the areas are dispersed throughout the region and are not significantly unique to a specific region or planning unit. In addition, this area is owned by a number of different entities and habitat on BLM-administered lands is not distinct from habitat managed by other ownerships.

Summary: The area does not meet the relevance and importance criteria. In addition, the area does not require special management beyond standard provisions established by this RMP. This RMP provides management actions for black-footed ferret habitat and prairie dog habitat. The BLM would work with the Montana Black-footed Ferret and Prairie Dog Working Groups to identify potential black-footed ferret reintroduction sites in

the planning area thus this particular area does not require special management beyond our existing management.

PIPING PLOVER ACEC

Designated for a piping plover nesting area (15 BLM-administered acres; Map 39).

Relevance: The area is habitat for a threatened species and so meets the relevance criteria.

Importance: The area meets all of the importance criteria. Habitat for the piping plover has substantial significance and value because the area is of regional significance (due to the presence of a threatened species); saline wetlands are somewhat rare because they are fragile, sensitive, unique, and vulnerable to adverse change; and inhabitancy by a threatened species warrants protection under the ESA, as amended ,and complies with FLPMA guidelines.

Summary: The area meets both the relevance and importance criteria but the area does not require special management beyond standard provisions established by this RMP. This RMP already provides specific management actions for the protection and maintenance of piping lover habitat. In addition, due to piping plover being a threatened species, the area will receive protections which include consultation with U.S. Fish and Wildlife Service on any proposed action within the area.

WILD AND SCENIC RIVERS

The following is an evaluation of planning area river segments as they relate to eligibility, suitability, and classification criteria in the National Wild and Scenic Rivers System (NWSRS).

INTRODUCTION

Section 5(d)(1) of the Wild and Scenic Rivers Act (WSRA) of 1968, as amended (16 U.S.C. 1271 et seq.), directs federal agencies to consider potential wild and scenic rivers in their land and water planning processes*:*

“In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas…”

WHAT IS A WILD AND SCENIC RIVER?

Congress enacted the WSRA to provide a national policy for preserving and protecting selected rivers and river segments in their free-flowing condition for the benefit and enjoyment of present and future generations. The WSRA provides criteria that must be considered during the analysis. As per the WSRA, eligibility for inclusion in the NWSRS requires a river or river segment that is free flowing, within its immediate environment, and which contains one or more outstandingly remarkable values.

Free flowing is defined in Section 16(b) of the WSRA:

> "…existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the NWSRS shall not automatically bar its consideration for such inclusion…"

The term "outstandingly remarkable" is not clearly defined in the WSRA. Generally, outstandingly remarkable means something that is more than ordinary when considered within a regional (planning-area wide) context. In order for the river to be considered eligible in this study, the outstandingly remarkable value or values must occur on BLM-administered public lands within 0.25 miles of the river.

Outstandingly remarkable values consist of the elements described below.

Scenic: the landscape elements of landform, vegetation, water, color, and related factors must result in notable or exemplary visual features or attractions within the geographic region. As per the BLM Visual Resource Inventory Handbook, H-8410-1, which may be used in assessing visual quality and evaluating the extent of development upon scenic values, the rating area must be scenic quality "A". When analyzing scenic values, additional factors such as seasonal variations in vegetation, scale of cultural modifications, and length of time negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river segment length and not common to other rivers in the geographic region.

Recreational: recreational opportunities are, or have the potential to be, unusual enough to attract visitors to the geographic region. Visitors are willing to travel long distances to use the river resources for recreational purposes. Recreation-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing, hunting, and boating. Interpretive opportunities may be exceptional and attract or have the potential to attract visitors from outside the geographic area. The river may provide, or have the potential to provide, settings for national or regional commercial usage or competitive events. In addition, the river may be eligible if it is determined to provide a critically important regional recreation opportunity or be a significant component of a regional recreation opportunity spectrum setting.

Geologic: the river or the area within the river corridor contains an example or examples of a geologic feature, process, or phenomenon that is rare, unusual, or unique to the geographic region. The features may be in an unusually active stage of development, represent a textbook example, or represent a unique or rare combination of geologic features (erosional, volcanic, glacial, and other geologic structures).

Fish: fish values may be judged on the relative merits of either fish populations or habitat or a combination of these river-related conditions.

Populations: the river is nationally or regionally one of the top producers of resident, indigenous, or anadromous fish species. Of particular significance may be the presence of wild or unique stocks or populations of state, federally listed, or candidate threatened and endangered species.

Habitat: the river provides exceptionally high quality habitat for fish species indigenous to the region. Of particular significance is habitat for state, federally listed, or candidate threatened and endangered species.

Wildlife: wildlife values may be judged on the relative merits of either wildlife populations or habitat or a combination of these conditions.

Populations: the river or area within the river corridor contains nationally or regionally important populations of resident or indigenous wildlife species dependent on the river environment. Of particular significance may be species considered unique or populations of state, federally listed, or candidate threatened and endangered species.

Habitat: the river or area within the river corridor provides exceptionally high quality habitat for wildlife of national or regional significance or may provide unique habitat or a critical link in habitat conditions for state, federally listed, or candidate threatened and endangered species. Contiguous habitat conditions are such that the biological needs of the species are met.

Cultural: the river or area within the river corridor contains a site or sites where there is evidence of occupation or use by American Indians. Sites must be rare, have unusual characteristics, or exceptional human-interest values. Sites may have national or regional importance for interpreting prehistory; may be rare; may represent an area where culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes.

Historic: the river or area within the corridor contains a site or feature associated with a significant event, an important person, or a cultural activity of the past that was rare or unusual in the region. A historic site or

feature in most cases is 50 years old or older. Sites or features listed in, or eligible for inclusion in, the NRHP may be of particular significance.

Other Similar Values: while no specific evaluation guidelines have been developed for the other similar values category, additional values deemed relevant to the eligibility of the river segment should be considered in a manner consistent with the previous guidance, which would include, but would not be limited to, hydrologic, ecologic or biologic diversity, paleontologic, botanic, and scientific values.
No rivers in the planning area are currently managed under the WSRA.

EVALUATION PROCESS AND RESULTS

The wild and scenic river study process comprises two main components: the inventory phase and the study phase. The inventory phase includes identifying eligible river and stream segments, assigning tentative classification (wild, scenic, or recreational), and describing protective management for the eligible segments. The study phase includes determining the suitability of eligible segments for inclusion in the NWSRS and describing interim management measures. The inventory was conducted in 2008, during the data-gathering stage of the RMP revision, and the study phase was done during formulation of this RMP.

INVENTORY PHASE

The purpose of the inventory is to identify eligible rivers and river segments in the planning area and assign them a tentative classification. The WSRA directs agencies to consider a wide variety of internal and external sources to identify potentially eligible rivers. The goal is to avoid overlooking river segments that could be included in the NWSR. In cases where a particular river segment is predominantly nonfederal in ownership and contains interspersed BLM-administered lands, the BLM shall evaluate only the BLM-administered segments and defer to the state or private landowners' discretion regarding their determination of eligibility.

Resource specialists from the MCFO were consulted to conduct the wild and scenic rivers inventory in support of the RMP. The interdisciplinary team comprised BLM staff specialists in lands and realty; wildlife, fisheries, and riparian biology; range and riparian resources; recreation; visual resources; cultural and historical resources; minerals; and geology.

ELIGIBILITY

The BLM applies standard criteria to identified river segments to determine eligibility. There are several sources generally used to identify potentially eligible rivers, as described below.

- The Nationwide Rivers Inventory (NPS 2009) was initially completed in 1982 and is maintained and periodically updated by the National Park Service. Additions have been made following BLM and United States Forest Service inventories completed as part of each agency's land use planning processes. This inventory contains a listing of more than 3,400 free-flowing river segments in the United States believed to possess one or more outstandingly remarkable natural or cultural values judged to be of more than local or regional significance. A review of this list did not identify any rivers or river segments within the planning area.
- The Yellowstone River downstream from Forsyth to the state line with North Dakota is listed by MFWP as a blue ribbon fishery.
- MFWP's *Statewide Comprehensive Outdoor Recreation Plan 2008 to 2012* outlines Montana's 5-year plan for outdoor recreation management, conservation, and development (MFWP 2008). It provides the strategic framework for recreation facility managers to use as a guideline in planning and prioritizing resources for staff and funding and includes a timeline for implementation.
- Public scoping during the RMP revision process may identify specific river segments for consideration. No river segments in the planning area were identified using this source.

CLASSIFICATION

Once a river segment is considered eligible, it is assigned a tentative classification. Section 2(b) of the WSRA defines three classes for these rivers, as described below.

- Wild river areas are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail. These areas contain watersheds or shorelines essentially primitive and waters unpolluted and represent vestiges of primitive America. “Wild” means undeveloped; roads, dams, or diversion works are generally absent from a quarter-mile corridor on both sides of the river.
- Scenic river areas are those rivers or sections of rivers that are accessible in places via road but generally free of impoundments and containing shorelines or watersheds still largely primitive and shorelines largely undeveloped. Scenic does not necessarily mean the river corridor has to have scenery as an outstandingly remarkable value, but it does mean the river segment may contain more development (except for major dams or diversion works) than a wild segment and less development than a recreational segment. For example, roads may cross the river in places but generally do not run parallel to it. In certain cases, however, the presence of an unpaved, parallel road that is well screened from the river by vegetation could retain qualification for classification as a scenic river area.
- Recreational river areas are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Parallel roads or railroads or small dams or diversions can be allowed in this classification. A recreational river area classification does not imply that the river will be managed or prioritized for recreational use or development.

The classification assigned during the inventory phase is tentative. Final classification and designation of a river segment as part of the NWSRS are congressional legislative determinations.

STUDY PHASE

The suitability evaluation does not result in actual designation but only a suitability determination for designation. Only Congress can designate a wild and scenic river. In some instances, the Secretary of the Interior may designate a wild and scenic river when the governor of a state, under certain conditions, petitions for a river to be designated. Congress would ultimately choose the legislative language if any suitable segments are presented before them. Water-protection strategies and measures to meet the purposes of the WSRA would be the responsibility of Congress in any legislation proposed. Rivers found unsuitable would be dropped from further consideration and would be managed according to the objectives outlined in the RMP.

The preliminary suitability evaluation is completed as the RMP is prepared, and impacts that would occur from designation and non-designation of the eligible river segments would be analyzed in the EIS associated with the RMP. Public review and comment on preliminary suitability determinations included in the Draft RMP would be considered before the BLM makes final suitability determinations in the Proposed RMP/Final EIS (PRMP/FEIS).

SUITABILITY CRITERIA

The following eight factors, identified in BLM Manual Section 8351, are considered for each eligible river segment during the suitability determination:

- characteristics that do or do not make the river a worthy addition to the NWSRS;
- the status of land ownership, minerals, use in the area (including the amount of private land involved) and associated or incompatible uses;
- reasonably foreseeable potential uses of the land and related waters that would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS and values that would be foreclosed or diminished if the area were not protected as part of the NWSRS;

- federal, state, tribal, local, public, or other interests in designation or nondesignation of the river, including the extent to which the agency proposes that administration of the river, including the costs thereof, be shared by state, local, or other agencies and individuals;
- estimated cost to the United States of acquiring necessary lands, interests in lands, and administering the area should it be added to the NWSRS;
- the federal agency's ability or other mechanisms to protect and manage the identified river-related values other than designation into the NWSRS;
- historical or existing rights that could be adversely affected with designation; and other issues and concerns, if any.

INTERIM MANAGEMENT OF SUITABLE SEGMENTS

The WSRA requires that interim management measures be developed to protect the free-flowing nature, outstandingly remarkable values, and recommended classification of suitable segments until Congress acts on the designation. Identification of Eligible River Segments

To avoid overlooking potentially eligible river segments, a combination of sources was used. The primary source was the BLM's geographic information system rivers and streams layer, which is a comprehensive list of potentially free-flowing waterbodies within the planning area. The geographic information system was cross-referenced with additional sources, which include the Nationwide Rivers Inventory (NPS 2009) and the *Statewide Comprehensive Outdoor Recreation Plan 2008 to 2012* (MFWP 2008).

EVALUATION

From these sources, the BLM interdisciplinary team compiled an inventory of all rivers on BLM-administered surface lands in the planning area. The team focused on BLM-administered lands, per direction contained within BLM Manual 8351, Wild and Scenic Rivers-Policy and Program Direction for Identification, Evaluation, and Management, which states:

> "In cases where a particular river segment is predominantly non-Federal in ownership and contains interspersed BLM-administered lands, BLM shall evaluate only its segment as to eligibility and defer to the State or to the private landowners' discretion as to their determination of eligibility (p. 10)."

Initial inventory identified 144 rivers or streams for further evaluation, and 42 of these rivers or streams were determined to have 99 segments of BLM-administered land along their shorelines (Table 2). Additional evaluation was conducted to determine which of the 42 rivers or streams met the free-flowing criteria and contained any outstandingly remarkable values, as defined in the WSRA of 1968, as amended. To help with the evaluation, the designated Upper Missouri Wild and Scenic River located in Central Montana, with important fisheries, was used for comparison.

RESULTS IN THE PLANNING AREA

Free Flowing

Of the 99 segments identified in the planning area, all were determined to be free flowing along some part of their stretch.

Outstanding Remarkable Values

In order to be further evaluated for Wild and Scenic River status, the river and its adjacent land area must have one or more outstanding remarkable values. To have "outstanding remarkable values" the river-related values must be unique, rare or exemplary. Four river segments, two along the Yellowstone River and two along the Missouri River (downstream of the Fort Peck Reservoir dam), were evaluated further due to their association with the Lewis and Clark National Historic Trails and the potential for presence of pallid sturgeon habitat (an endangered species).

Lewis and Clark National Historic Trail Segments

The Missouri and Yellowstone rivers are a portion of the route travelled by the Lewis and Clark Expedition. Approximately 5.01 miles of the Yellowstone and Missouri Rivers cross through BLM ownership in the planning area. No high potential historic sites or physical remnants of the NHT have been recorded on BLM lands in these segments. While the river segments are located along the NHT, when compared to other BLM river segments, regionally, these segments do not have outstanding remarkable values associated with the Lewis and Clark Trail. In contrast, the Upper Missouri Wild and Scenic River contained numerous historic sites that have been substantiated through historical research and were specifically identified in the Comprehensive Management Plan that was developed by the trail administrator (National Park Service) Should additional inventory confirm the presence of historic sites or remains from the Corps of Discovery on BLM lands in the future, a rare value, the BLM would reevaluate such an area for Wild and Scenic River status. While the river segments were not considered eligible for wild and scenic river designation, protections are proposed for the National Historic Trails that would prevent alteration of the physical setting on BLM administered lands (and subsurface).

Fisheries

Of the four river segments with the most potential for outstanding remarkable values, two segments on the Missouri River and one segment on the Yellowstone River have the possibility of containing pallid sturgeon populations. In evaluating the Missouri and Yellowstone River segments, the team considered the presence, or lack of presence, of unique habitat or fisheries associated with the three segments that would warrant a designation of outstandingly remarkable.. None of the three segments were found to contain suitable spawning or rearing habitat (due to dams restricting spawning and larvae migrations) (AFS website 2015) or other characteristics that would help BLM maintain or increase the population. When compared to other segments of the Missouri and Yellowstone Rivers, these segments do not contain outstanding remarkable fishery values. In contrast, the Upper Missouri Wild and Scenic River identified spawning and rearing habitat for one of the six remaining paddlefish populations in the United States. The 149-mile segment also supports the blue sucker, shovel nose sturgeon, sicklefin, sturgeon chub, and the endangered pallid sturgeon. While the fishery values on the BLM administered segments in the planning area were not considered outstandingly remarkable, protections are proposed for the National Trails, riparian, wetlands and fish habitats would prevent alteration of fish habitat.

CONCLUSION

No rivers or streams were found eligible in the planning area, due to lack of outstanding remarkable values (ORVs). The four river segments that were evaluated on the Yellowstone and Missouri River were determined to lack significant historical or fishery resources on public lands/waters along the segments. Due to the absence of historical sites associated with the NHT or important habitat for the pallid sturgeon, no outstanding remarkable values were identified. Therefore,, none of the evaluated segments were found to meet the eligibility criteria of containing one or more outstandingly remarkable value.

Since none of the rivers or streams evaluated were determined to be eligible, it was not necessary to proceed with the classification or suitability determinations.

However, it should be noted that although the segments do not merit eligibility as wild and scenic rivers, the Missouri and Yellowstone river corridors have many current and proposed protections for fisheries and NHTs, in general. For example, a ½ mile No Surface Occupancy is proposed for oil and gas leasing along the Lewis and Clark Trail corridor. Proposed surface-disturbing activities in the corridors would only be allowed when the proposed activity would meet the goals and objectives for managing 100-year floodplains, National Historic Trails, riparian areas, wetlands and pallid sturgeon habitat (see Chapter 2, Table 2-5).

TABLE 2.
RIVER SEGMENTS ELIGIBLE FOR DESIGNATION AS WILD AND SCENIC RIVERS

River/Stream Name	Location County(s)	No. of BLM Segments Along River/ Stream	Total Segment Miles	Free Flowing	Values Present
Bear Creek	Powder River	1	1.68	Yes	No remarkable values.
Big Dry Creek	Garfield	1	1.97	Yes	Scenic downstream from junction with Frazier Creek. Geologic and paleontologic values along the same reach due to cutting from Fort Union to Pierre shale. Neither outstandingly remarkable.
Big Porcupine Creek	Garfield/ Rosebud	1	1.12	Yes	No remarkable values.
Buffalo Creek	Carter	3	4.21	Yes	No remarkable values.
Cabin Creek	Fallon/Prairie/Dawson	3	4.37	Yes	No remarkable values.
Calf Creek	Garfield	1	1.33	Yes	Geologic and scenic values but not outstandingly remarkable.
Cedar Creek (1)[1]	Prairie	8	11.66	Yes	Many geologic and scenic values but not outstandingly remarkable.
Cedar Creek (2)[1]	Wibaux/ Prairie/ Dawson	2	16.85	Yes	Some geologic, paleontologic, and scenic values but not outstandingly remarkable.
Cherry Creek	Prairie	8	17.88	Yes	Geologic and scenic values but not outstandingly remarkable.
Corral Creek	Carter	1	5.70	Yes	No remarkable values.
Cottonwood Creek (2)	Carter	2	4.22	Yes	No remarkable values.
Crow Creek	Carter/ Powder River	2	3.64	Yes	No remarkable values.
Custer Creek	Prairie/Custer	1	4.21	Yes	Geologic and scenic values but not outstandingly remarkable.
East Fork Cedar Creek	Prairie	1	1.36	Yes	No remarkable values.
Grimes Creek	Custer	1	1.56	Yes	No remarkable values.
Hell Creek	Garfield	1	5.00	Yes	Scenic with geologic and paleontologic values due to cutting from Fort Union to Pierre shale but not outstandingly remarkable.
Lame Jones Creek	Fallon/ Prairie/ Dawson	1	1.02	Yes	No remarkable values.
Lisk Creek	Prairie/ McCone	2	4.45	Yes	No remarkable values.
Locate Creek	Custer	2	2.87	Yes	No remarkable values.
McGinnis Creek	Garfield/ Rosebud	2	2.61	Yes	No remarkable values.
Missouri River	McCone/ Richland	2	2.96	Yes	Potential historic value due to its association with Lewis and Clark and the Corps of Discovery. It is also widely used for recreational boating and fishing. Some intact cottonwood gallery; however, it is

TABLE 2.
RIVER SEGMENTS ELIGIBLE FOR DESIGNATION AS WILD AND SCENIC RIVERS

River/Stream Name	Location County(s)	No. of BLM Segments Along River/ Stream	Total Segment Miles	Free Flowing	Values Present
					somewhat decadent with poor age class distribution due to flood control. Potential for unique fish habitat due to presence of pallid sturgeon from the Fort Peck Reservoir dam downstream to the state line with North Dakota. Values are present within BLM segments but not outstandingly remarkable.
North Cottonwood Creek	Carter	1	1.64	Yes	No remarkable values.
O'Fallon Creek	Carter/ Fallon/ Custer/ Prairie	6	8.46	Yes	No remarkable values.
Owl Creek	Carter	3	8.20	Yes	No remarkable values.
Pennel Creek	Fallon/ Custer	5	6.40	Yes	No remarkable values.
Phillips Creek	Garfield	1	1.07	Yes	No remarkable values.
Pine Creek	Fallon	3	4.98	Yes	No remarkable values.
Powder River	Powder River/Custer/ Prairie	3	5.79	Yes	Scenic along the reach within the Powder River Breaks, from the state line to Broadus but not outstandingly remarkable.
Redwater River	Prairie/ McCone/ Dawson	1	1.17	Yes	No remarkable values.
Seven Blackfoot Creek	Garfield	2	9.67	Yes	Scenic with geologic and paleontologic values due to cutting from Fort Union to Pierre shale but not outstandingly remarkable.
Sheep Creek (2)	Custer	2	3.07	Yes	No remarkable values.
South Cottonwood Creek	Carter	1	3.04	Yes	No remarkable values.
South Fork Tusler Creek	Prairie/ McCone	1	1.00	Yes	No remarkable values.
Spring Creek	Carter	1	1.58	Yes	No remarkable values.
Squaw Creek	Garfield	2	2.83	Yes	Scenic with geologic and paleontologic interest due to cutting from Fort Union to Pierre shale but not outstandingly remarkable.
Stellar Creek	Rosebud	1	2.89	Yes	No remarkable values.
Taylor Creek	Garfield	1	1.19	Yes	No remarkable values.
Timber Creek	Prairie/ McCone	2	4.50	Yes	Geologic and paleontologic values due to cutting from Fort Union to Pierre shale but not outstandingly remarkable.
West Fork Horse Creek	Rosebud	1	1.45	Yes	No remarkable values.

TABLE 2.
RIVER SEGMENTS ELIGIBLE FOR DESIGNATION AS WILD AND SCENIC RIVERS

River/Stream Name	Location County(s)	No. of BLM Segments Along River/ Stream	Total Segment Miles	Free Flowing	Values Present
Whitney Creek	Custer/ Prairie	6	8.32	Yes	No remarkable values.
Woody Creek	Garfield	1	2.17	Yes	No remarkable values.
Yellowstone River	Treasure/ Rosebud/ Custer/ Prairie/ Dawson/ Richland	2	2.05	Yes	Potential historic value due to its association with Lewis and Clark and the Corps of Discovery. It is also widely used for recreational boating and fishing. Scenic downstream of Glendive with intact cottonwood gallery. Unique fish habitat and population due to presence of pallid sturgeon from the mouth of the Tongue River downstream to the state line with North Dakota. Values present within BLM segments but not outstandingly remarkable.

[1] **Different rivers/streams that share the same name.**

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VEGETATION APPENDIX

INTRODUCTION

This appendix contains in-depth information for vegetation resources and management in the planning area. Information includes datum sources used in this plan and special status plant species in the planning area. This appendix also identifies the priority areas for invasive species management within the Miles City Field Office (MCFO).

DATUM SOURCES

For this resource management plan (RMP), geographic information system analysis of existing vegetation on lands administered by the Bureau of Land Management (BLM) was performed using an existing vegetation layer published by the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE) (USFS and USDI 2007). The remainder of this appendix describes the origins and structure of the data layer used.

LANDFIRE is a 5-year, multi-partner project developed to consistently and comprehensively describe and map vegetation, wildland fuel, and fire regimes across the United States. This project is supported by the United States Department of Agriculture Forest Service Office of Fire and Aviation Management, the United States Department of Interior Office of Wildland Fire Coordination, and The Nature Conservancy.

Data mapped by the LANDFIRE Project is produced based on peer-reviewed science from the fields of remote sensing, ecosystem simulation, vegetation and disturbance ecology, predictive landscape mapping, landscape simulation, and fire behavior and effects modeling. Data products from this project are designed to facilitate national- and regional-level strategic planning and reporting of wildland fire management activities and are created as 30-meter grid spatial resolution raster data sets.

The LANDFIRE existing vegetation layers describe the following elements of existing vegetation for each LANDFIRE mapping zone: existing vegetation type, existing vegetation canopy cover, and existing vegetation height. Vegetation is mapped using predictive landscape models based on extensive field reference data, satellite imagery, biophysical gradient layers, and classification and regression trees.

The existing vegetation layer represents the current distribution of the terrestrial ecological systems classification developed by NatureServe for the western hemisphere (Corner et al. 2003). Individual existing vegetation types are mapped in LANDFIRE using decision tree models, field reference data, LandSat imagery, digital elevation model data, and biophysical gradient data.

The existing vegetation types have been cross-walked to existing vegetation classifications. These attributes are provided to help characterize and describe the existing vegetation types on a nationwide basis in terms of these existing vegetation classifications. The division, macrogroup, and group attributes are based on the Federal Geographic Data Committee Vegetation Subcommittee's vegetation classification standard and pertain to upper physiognomic levels of the National Vegetation Classification System (NVCS) hierarchy.

Division describes the dominant life forms (tree, shrub, dwarf shrub, herbaceous, or nonvascular) within the Vegetated Division of the hierarchy. Macrogroup describes the level in the classification hierarchy defined by the relative percent canopy cover of the tree, shrub, dwarf shrub, herb, and nonvascular life form in the uppermost strata during the peak of the growing season. Group describes the predominant leaf phenology of classes defined by tree, shrub, or dwarf shrub stratum (evergreen, deciduous, mixed evergreen-deciduous), and the average vegetation height for the herbaceous stratum (tall, medium, or short).

The LANDFIRE existing vegetation data layer obtained from the project has been updated at the MCFO for some site-specific conditions. A new attribute has been created to facilitate the Woody Ravines in Eastern Montana. Areas in Garfield County have also been validated by MCFO foresters.

Table 1 lists the existing vegetation types as mapped by the LANDFIRE Project on BLM-administered lands within the planning area. These types are sorted by NVCS order, class, and subclass. NVCS order was used to map and analyze vegetation classifications for this RMP.

TABLE 1.
EXISTING NVCS VEGETATION CLASSIFICATIONS FOUND ON BLM-ADMINISTERED LANDS WITHIN THE PLANNING AREA

NVCS Division	NVCS MacroGroup	NVCS Group	Existing Vegetation Type
Great Plains Grassland and Shrubland	Great Plains Mixedgrass Prairie and Shrubland	Northern Great Plains Mixedgrass Mesic Prairie Group	*Andropogon gerardii*
			Festuca idahoensis
			Hesperostipa curtiseta
			Pascopyrum smithii – Bouteloua gracilis
			Pascopyrum smithii
			Prunus virginiana
			Pseudoroegneria spicata – Bouteloua curtipendula
			Pseudoroegneria spicata – Bouteloua gracilis
			Pseudoroegneria spicata – Pascopyrum smithii
			Schizachyrium scoparium – Bouteloua (curtipendula, gracilis)
			Schizachyrium scoparium – Carex inops ssp. Heliophila
Great Plains Grassland and Shrubland	Great Plains Mixedgrass Prairie and Shrubland	Northern Great Plains Mixedgrass Dry Prairie Group	*Hesperostipa comata – Bouteloua gracilis*
			Hesperostipa comata – Carex filifolia
			Hesperostipa comate – Carex inops ssp.
			Hesperostipa curtiseta
			Juniperus horizontalis/Carex inops ssp.
			Juniperus horizontalis/Schizachyrium scoparium
			Rhus trilobata/Carex filifolia
			Rhus trilobata. Schizachyrium scoparium
			Schizachyrium scoparium – Bouteloua curtipendula
Western North American Cool Temperate Forest	Northern Rocky Mountain Lower Montane and Foothill Forest	Northwestern Great Plains-Black Hills Ponderosa Pine Forest and Woodland Group	*Pinus ponderosa/(Andropogon gerardii, Schizachyrium scoparium)* Woodland
			Pinus ponderosa/Juniperus communis Woodland
			Pinus ponderosa/Juniperus horizontalis Woodland
			Populus tremuloides/Prunus virginiana Forest
		Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	*Pinus Ponderosa/Festuca idahoensis* Woodland
			Pinus ponderosa/Symphoricarpos albus Forest
Great Plains Cliff, Scree and Rock Vegetation	Great Plains Badlands Vegetation	Great Plains Badlands Vegetation Group	*Eriogonum pauciflorum – Gutierrezia sarothrae*
			Eroding Great Plains Badlands Sparse Vegetation
			Sarcobatus vermiculatus/Pseudoroegneria spicata Shrubland

SPECIAL STATUS SPECIES PLANTS

LAWS, REGULATIONS, AND POLICIES

Special status plant species management on BLM-administered land is authorized under and directed by the following laws, mandates, and guidance:

- Federal Land Policy and Management Act of 1976, as amended;
- Endangered Species Act of 1973, as amended;
- National Environmental Policy Act of 1969, as amended;
- Title 43, Code of Federal Regulations, Parts 24, 1610 and 4180;
- BLM Manual 6500 and 6840; and
- National and Montana BLM Policy.

BLM SENSITIVE SPECIES

The Montana Natural Heritage Program (MNHP) maintains the statewide rare plant database for the state of Montana. In 2006, the Montana Fish, Wildlife, and Parks (MFWP) and MNHP reported 3 BLM sensitive and 40 watch plant species of concern occurring in the planning area (Table 2). However, no federally listed, proposed, or candidate plants occur in the area (USFWS 2011). Detailed surveys were conducted in selected areas in Rosebud (Barton and Crispin 2003), Big Horn (Carlson and Cooper 2003), and Powder River (Heidel et al. 2002) counties, and researchers recorded no special status plant species in these areas.

Information on the three BLM sensitive species known to occur in the planning area is found below.

GEYER'S MILKVETCH

In eastern Montana, Geyer's milkvetch occurs only in the Hell Creek Recreation Area and the Charles M. Russell National Wildlife Refuge. It grows on sandy outcrops and terraces. In the Hell Creek Recreation Area, it occurs in very early, unstable successional habitat dominated by prairie sandreed (*Calamovilfa longifolia*) and Indian rice grass (*Oryzopsis hymenoides*). In the Charles M. Russell National Wildlife refuge, Geyer's milkvetch grows on outcrops of Fox Hill sandstone along the shores of Fort Peck Reservoir (MFWP and MNHP 2006). It is adapted to moderate levels of disturbance, but it may be affected by encroachment of nonnative annuals.

CRAWE'S SEDGE

Crawe's sedge has been documented from only one county in eastern Montana in Prairie County. This plant usually occurs in early successional riparian habitats that are occasionally flooded. Its response to livestock grazing or trampling is unknown. Crowe's sedge is a wetland plant and may be susceptible to hydrological changes.

BUR OAK

Bur oak is restricted in Montana to a single, but relatively large, occurrence in southern Carter County. It occurs on east-southeast trending bentonitic shale ridges and on alluvial terraces along the Thompson Creek tributary of the Little Missouri River (MFWP and MNHP 2006). Stands are generally open with native annuals and sedges or introduced grasses. Bur oak is fire resistant, and fire suppression may be reducing bur oak recruitment. Grazing of root sprouts and weeds may also reduce bur oak reproduction (MFWP and MNHP 2006).

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
Lead plant	*Amorpha canescens*	Habitats include mesic to dry black soil prairies, sand prairies, gravel prairies, and hill prairies.	Watch	Carter, Rosebud
Ovalleaf milkweed	*Asclepias ovalifolia*	Open pine woodland in seasonally moist meadow	Watch	Carter, Sheridan
Narrowleaf milkweed	*Asclepias stenophylla*	Sandy soils of prairies and open pine woodland	Watch	Carter, Rosebud
Sweetwater milkvetch	*Astragalus aretioides*	Openings of Douglas-fir, exposed ridges and slopes, and foothills and mountain zone	Watch	Big Horn
Barr's milkvetch	*Astragalus barrii*	Sparsely vegetated knobs and buttes with dry, fine-textured, often calcareous soils	Watch	Big Horn, Carter, Powder River, Rosebud
Geyer's milkvetch	*Astragalus geyeri*	Loose, sandy soils, primarily in sandy alluvial plains and terraces	Sensitive	Garfield
Roundleaf water-hyssop	*Bacopa rotundifolia*	Muddy shores of ponds and streams in the valleys and on plains	Watch	Garfield
Crawe's sedge	*Carex crawei*	Wet, gravelly, or sandy soil along streams or pond margins in valleys and mountain foothills	Sensitive	Prairie
Pregnant sedge	*Carex gravida*	Green ash ravines and wooded draws	Watch	Big Horn, Powder River, Rosebud
New jersey tea	*Ceanothus herbaceus*	Open pine forests of hills and plains	Watch	Powder River
Bittersweet	*Celastrus scandens*	Riparian woodlands and thickets on the plains	Watch	Dawson
Chaffweed	*Centunculus minimus*	Vernally wet, sparsely vegetated soil around ponds and along streams in valleys and on plains	Watch	Sheridan
Birchleaf mountain-mahogany	*Cercocarpus montanus var. glaber*	Open slopes and breaks on plains	Watch	Treasure
Smooth goosefoot	*Chenopodium subglabrum*	Early successional, sparsely vegetated habitats in sand dunes and river sandbars or sandy terraces	Watch	Carter, Powder River, Sheridan
Yellow bee plant	*Cleome lutea*	Open, often sandy soil of sagebrush steppe in valleys	Watch	Big Horn
Fendler cat's-eye	*Cryptantha fendleri*	Open areas of sand dunes in sandhill areas	Watch	Sheridan

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
Schweinitz' flatsedge	*Cyperus schweinitzii*	Sparsely vegetated sand dunes on plains	Watch	Carter, Powder River, Sheridan
Nine-anther dalea	*Dalea enneandra*	Gravelly grassland slopes on plains	Watch	Richland, Rosebud
Silky Prairie clover	*Dalea villosa*	Loose sand of sand dunes or eroded from sandstone crops	Watch	Carter, Richland, Sheridan
Scribner's panic grass	*Dichanthelium oligosanthes var. scribnerianum*	*Pinus ponderosa/Mahonia repen*s habitat at upper end of draws	Watch	Powder River
Visher's buckwheat	*Eriogonum visheri*	Barren, sedimentary rock outcrops; alluvium from those outcrops; and small exposures of soil substrates in badlands topography	Watch	Carter
Joe-pye weed	*Eupatorium maculatum*	Moist meadows, springs, margins of spring-fed streams, and swamp thickets	Watch	Big Horn
Nuttall desert-parsley	*Lomatium nuttallii*	Open, rocky, mid and lower slopes on sandstone, siltstone, or clayey shale from about 3,400- to 7,200-foot elevation	Watch	Big Horn, Rosebud
Bractless mentzelia	*Mentzelia nuda*	Sandy or gravelly soil of open hills and roadsides on plains	Watch	Dawson, Powder River, Roosevelt, Rosebud
Dwarf mentzelia	*Mentzelia pumila*	Open, usually sandy soil in desert shrubland and woodland	Watch	Big Horn
Blue toadflax	*Nuttallanthus texanus*	Open, sandy, or acid shale soils of grasslands and woodlands on the plains	Watch	Carter, Dawson
Narrowleaf penstemon	*Penstemon angustifolius*	Sandy grasslands on plains	Watch	Carter
Hot Spring phacelia	*Phacelia thermalis*	Widely varying habitats in open to partially wooded settings	Watch	Garfield
Plains phlox	*Phlox andicola*	Sandy soils in grasslands and ponderosa pine woodland	Watch	
Mealy primrose	*Primula incana*	Wet meadow habitats with relatively stable water	Watch	Sheridan

TABLE 2.
BLM SPECIAL STATUS PLANTS IN THE PLANNING AREA

Common Name	Scientific Name	Habitat Description	BLM Status	Counties of Occurrence
		tables		
Dwarf woolly-heads	*Psilocarphus brevissimus*	Drying mud of ponds and other vernally wet soil in valleys and on plains	Watch	Rosebud
Bur oak	*Quercus macrocarpa*	On bentonitic shale ridges trending WNW to ESE; also at alluvial terraces along Thompson Creek tributary of Little Missouri River	Sensitive	Carter
Persistent-sepal Yellow-cress	*Rorippa calycina*	Sparsely vegetated, moist sandy to muddy banks of streams, stock ponds, and man-made reservoirs near high water line	Watch	Big Horn, McCone, Rosebud, Treasure
Few-flowered goldenrod	*Solidago sparsiflora*	Sandy, well-drained soils of unglaciated broken and rolling plains in variety of semi-open settings	Watch	Garfield
Slender wedgegrass	*Sphenopholis intermedia*	Wet areas in valleys or foothills	Watch	Big Horn
Longleaf dropseed	*Sporobolus asper*	Open forests and grasslands on plains	Watch	Carter
Wyoming sullivantia	*Sullivantia hapemanii*	Calcareous rock walls and bounders at springs, waterfalls, and streambanks	Watch	Big Horn

INVASIVE SPECIES TREATMENT

Priority Treatment Areas for Invasive Species: Using Early Detection Rapid Response, treatment areas would be prioritized in publicly accessible areas due to higher traffic use that increase the potential spread of invasive species. Riparian areas are also an area of higher priority due to the constant seed source from the water movement. It is imperative to control invasive species in these areas to eliminate infestations from appearing further down river. Emergency stabilization and rehabilitation areas are important areas to eliminate weed infestations due to the disturbances that are created from wildland fires. These disturbances open a window of opportunity to treat infestations that were previously occurring and are now weakened from the fire activity. Another priority area is special status species habitat areas. These areas are important to maintain in order for wildlife to flourish in their natural habitat.

CHEATGRASS

Cheatgrass invasion and subsequent effects to wildfire frequency and severity and related sagebrush habitats is not considered a threat in the MCFO. Although cheatgrass occurs within the MCFO, healthy northern mixed-grass prairie plant communities have demonstrated resiliency to cheatgrass expansion. This resiliency has been illustrated by researchers at USDA's Agricultural Research Service at Fort Keogh in Miles City. Haferkamp (2001) studying annual bromes including cheatgrass in eastern Montana, anticipates no ecological shift of northern mixed-grass prairies toward annual grass dominance. Amount and abundance of annual bromes occurring on Northern Great Plains rangeland is cyclic, depending on seedbank, temperature, and amount and distribution of precipitation, (Haferkamp, 2001). He goes on to say expansion of annual bromes in mixed–grass prairie communities is buffered by two long-lived perennial grasses (western wheatgrass and blue grama), especially where grazing management maintains healthy native mixed-grass prairie vegetation. Vermeire et al. (2011) studied effects of fire on perennial and annual grasses (including cheatgrass) and found increased production of western wheatgrass and decreased annual grass production following summer fire in the northern mixed-grass prairie.

Climate change modeling by Bradley (2009) contrasts the maximum potential future cheatgrass expansion scenario with maximum potential future contraction scenario to illustrate and highlight the uncertainty in atmospheric-ocean general circulation models. Bradley's models show, depending primarily on future precipitation conditions, suitable land area for cheatgrass expansion could increase by as much as 45% or decrease by as much as 70% by 2100. The maximum area shown encompasses a large swath of Montana and approximately 50% of the MCFO, however Bradley's median precipitation change scenario (used to identify the most likely future climate change) depicts no increase in cheatgrass climatic habitat within the MCFO.

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WATER APPENDIX

INTRODUCTION

This appendix contains in-depth information for water resources and management in the planning area. Information includes groundwater wells and impaired waterbodies in the planning area.

GROUNDWATER WELLS IN THE PLANNING AREA

See Table 1 for information on common groundwater aquifers in the planning area. See Chapter 3, *Affected Environment*, for further information.

IMPAIRED WATERBODIES IN THE PLANNING AREA

The Clean Water Act requires the Montana Department of Environmental Quality (MDEQ) to report to the United States Environmental Protection Agency (USEPA) the condition and trend of waterbodies of the state. In particular, the report examines the use classification, the actual uses, and the ability of the waterbody to support that actual use. If the beneficial use is not supported or only partly supported because of water quality impairment, the sources and possible causes are listed in Montana's *Water Quality Integrated Report* (MDEQ 2012a). Impaired waterbodies have one or more impaired beneficial uses (Water Quality Categories 4A, 4B, 4C, and 5) and may or may not require a total maximum daily load (TMDL) for various reasons.

THE 303(d) LIST

Section 303(d) of the Federal Clean Water Act and Title 40, part 130 of the Code of Federal Regulations (CFR) requires that all states develop a list of waters that do not meet water quality standards. The 303(d) list is a subset (waterbodies with Water Quality Category 5) of all waterbodies listed in Montana's comprehensive *Water Quality Integrated Report*. Waterbodies on the 303(d) list have one or more impairments caused by a pollutant and require a TMDL to be completed and approved by the USEPA. See Tables 2 and 3 for information on impaired waterbodies adjacent to BLM-administered surface within the planning area.

BENEFICIAL USES

The more common uses for surface waters within the planning area include agricultural, warm-water fisheries, primary contact recreation (swimming and other activities), and aquatic life. Drinking water and cold-water fisheries are uncommon but important uses in the area. Each of these uses will have its own water quality requirements and, if water quality is impaired, that particular waterbody may not support these uses.

IMPAIRMENT CAUSES

Impairment causes can include specific inorganic and organic compounds, suspended solids, dissolved solids, pH, vegetation alteration, habitat alteration, flow alterations, and water temperature (Table 4).

PROBABLE SOURCES OF IMPAIRMENT

Many causes can have several probable sources of impairment. Assigning probable sources is tentative and depends upon the association of impairment causes and the geographical setting. The most frequent sources of impairment in the planning area are natural sources, unknown sources, and irrigated crop production (Table 5).

TABLE 1.
GROUNDWATER WELL AQUIFER USE BY COUNTY

Geologic Source	Big Horn[1]	Carter	Custer	Daniels	Dawson	Fallon	Garfield	McCone	Powder River	Prairie	Richland	Roosevelt	Rosebud	Sheridan	Treasure	Valley	Wibaux	Total
Alluvium (Holocene)	21	3	3	2	72	19			4	5	86	1	17		253	1	2	489
Alluvium (Quaternary)[2]	237	110	27	60	258	18	1	83	90	236	410	363	254	66	4	436	19	2,672
Amsden group	1				1			1				2	7		1			13
Anderson Coal of the Fort Union formation	36								1					1				38
Anderson-Dietz 1 and 2 Coals - Fort Union– formation	14													1				15
Anderson-Dietz 1 Coals Combined - Fort Union– formation	13								1									14
Bearpaw shale	17				1		3					1	7		7	6		42
Canyon Coal of the Fort Union formation	16								6				1					23
Coal Mine Spoil Banks	22												70	1				93
Dietz 1 and 2 Coals Combined - Fort Union– formation	14													1				15
Dietz 2 Coal of the Fort Union formation	18																	18
Dietz Coal of the Fort Union formation	24								1				2					27
Eagle sandstone	16					7			3	1			2					29
Fort Union formation	69	10	24	351	394	491	34	69	30	372	429	416	40	475		113	542	3,859
Fox Hills-Hell Creek Aquifer[2]	1	7	15	4	87	231	25	21	10	150	63	23	3	6	26	87	51	810
Hell Creek formation[2]	49	313	5	28	506	270	26	30	12	54	25	141	51	9		95	53	1,667
Judith River formation (of Montana group)	37		4	2	2	19	4	4	2	1		7	61	1	24	207	4	379

TABLE 1.
GROUNDWATER WELL AQUIFER USE BY COUNTY

Geologic Source	Big Horn[1]	Carter	Custer	Daniels	Dawson	Fallon	Garfield	McCone	Powder River	Prairie	Richland	Roosevelt	Rosebud	Sheridan	Treasure	Valley	Wibaux	Total
Knoblock Coal of the Fort Union formation	1								4				7					12
Kootenai formation	12																	12
Lakota sandstone (of the Inyan Kara group)	4	2	1				5					1	5	4		1		23
Lance formation	10														129			139
Lance-Hell Creek Undifferentiated[2]	4		131						272				137		83			627
Madison group or limestone	15		1	1		5		2	3		3	6	2	5		3		46
Mission Canyon Limestone (of the Madison Group)	2	1		1	3	4	1		2			4	4	2		4	1	29
Muddy Sandstone member (of the Thermopolis shale)	2	2			2	1		1	4	1				1				14
Shannon Sandstone mbr. (of Cody or Steele sh)	18		2						18				1					39
Terrace Deposits (Pleistocene)[2]	46				21					7	173	16			8		1	272
Terrace Deposits (Quaternary)[2]	223				44			1	1	11	30		20			10	2	342
Tongue River member (of the Fort Union formation.)[2]	645		164	5	930	14	3	106	1,424	316	1,251		940	5	75		227	6,105
Tullock member (of the Fort Union formation)[2]	136	1	1,104		11	1	3	34	1,078	3	27		463		148	2	1	3,012
Other formations with less than 10 wells per formation	90						1	1	7				6					105
Total	**1,813**	**449**	**1,481**	**454**	**2,332**	**1,080**	**106**	**353**	**2,973**	**1157**	**2,497**	**981**	**2,100**	**578**	**758**	**965**	**903**	**20,980**

[1]Portions of some counties may be outside of the planning area. Not all wells in a county have had the geologic source code assigned.
[2]Aquifer is identified as an Underground Source of Drinking Water (USDW) as defined by the Federal Safe Drinking Water Act. These aquifers were identified in Source Water Delineation and Assessment Reports as supplying public water systems. There is insufficient data to identify aquifers that meet other criteria for delineation as USDWs.

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
Big Dry	Big Dry Creek (MT40D001-010)	Steves Fork to mouth (Fort Peck Reservoir)	99	6.0	5	Alteration in stream-side or littoral vegetative covers, ammonia (un-ionized), nitrate, nitrogen (total), phosphorus (total)	Agriculture, municipal point source discharges	Big and Little Dry
Big Muddy	Big Muddy Creek (MT40R001_010)	North corner of Fort Peck Reservation boundary to mouth (Missouri River)	82	0.4	5	Alteration in stream-side or littoral vegetative covers, low flow alterations, nitrogen (total), phosphorus (total), sedimentation/siltation	Agriculture, grazing in riparian or shoreline zones, impacts from hydrostructure flow regulation/ modification	Lower Missouri
Charlie-Little Muddy	Charlie Creek (MT40S004_010)	East and Middle Charlie Creek to mouth (Missouri River)	33	0.7	5	Fish-passage barrier, iron, nitrogen (total), specific conductance	Crop production (cropland or dryland), highways, roads, bridges, infrastructure (new construction), natural sources	Lower Missouri
Charlie-Little Muddy	Missouri River (MT40S003_010)	Poplar River to North Dakota border	92	25.5	5	Other flow regime alterations, temperature (water)	Dam or impoundment, impacts from hydrostructure flow regulation/ modification	Lower Missouri
Fort Peck Reservoir	Nelson Creek (MT40E003-020)	Headwaters to mouth (Big Dry Creek arm of Fort Peck Reservoir)	36	0.6	5	Alteration in stream-side or littoral vegetative covers, cadmium, copper, nitrates, nitrogen (total), phosphorus (total), sulfates, total dissolved solids (TDS)	Agriculture, grazing in riparian or shoreline zones, source unknown	Redwater
Fort Peck Reservoir	Timber Creek (MT40E003_010)	Headwaters to mouth (Big Dry Creek arm of Fort Peck Reservoir)	89	6.8	4A	Nitrogen (total), Total Kjeldahl Nitrogen (TKN), phosphorus (total)	Agriculture, natural sources, source unknown	Redwater
Little Powder	Little Powder River (MT42I001_010)	The border to mouth (Powder River)	63	1.2	5	Salinity	Natural sources, source unknown	Powder
Lower Musselshell	Musselshell River (MT40C003_010)	Flatwillow Creek to Fort Peck Reservoir	76	3.7	4C	Alteration in stream-side or littoral vegetative covers, low flow alterations	Agriculture, flow alterations from water diversions, grazing in riparian or shoreline	Lower Musselshell

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
							zones, impacts from hydrostructure flow regulation/ modification, impacts from resort areas (winter and non-winter resorts), streambank modifications/ destabilization	
Lower Powder	Powder River MT42J003_011	Little Powder River to Mizpah Creek	99	4.5	5	Salinity	Natural sources, source unknown	Powder
Lower Powder	Powder River MT42J003_012	Mizpah Creek to mouth (Yellowstone River)	45	1.6	5	Salinity	Natural sources, source unknown	Powder
Lower Powder	Stump Creek MT42J004_010	Headwaters to mouth (Powder River)	30	3.6	5,2B	Salinity	Natural sources	Powder
Lower Tongue	Otter Creek (MT42C002_020)	Headwaters to mouth (Tongue River)	108	0.5	5,2B	Alteration in stream-side or littoral vegetative covers, iron, salinity, solids (suspended/bedload)	Agriculture, grazing in riparian or shoreline zones, highways, roads, bridges, infrastructure (new construction), natural sources, site clearance (land development or redevelopment)	Tongue
Lower Tongue	Pumpkin Creek (MT42C002_061)	Headwaters to Little Pumpkin Creek	88	<0.1	5	Low flow alterations, salinity, temperature (water)	Irrigated crop production, natural sources	Tongue
Lower Tongue	Pumpkin Creek (MT42C002_062)	Little Pumpkin Creek to the mouth (Tongue River)	92	8.4	5	Low flow alterations, salinity, temperature (water)	Irrigated crop production, natural sources	Tongue
Lower Tongue	Tongue River (MT42C001_011)	Twelve Mile Dam to mouth (Yellowstone River)	21	3.6	5	Cadmium, copper, iron, lead, low flow alterations, nickel, salinity, solids (suspended/bedload), sulfates, zinc	Dam construction (other than upstream flood control projects), impacts from hydrostructure flow regulation/ modification, irrigated crop production, natural	Tongue

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
							sources, streambank modifications/ destabilization	
Lower Tongue	Tongue River (MT42C001_013)	Hanging Woman Creek to Beaver Creek	75	0.5	5	Iron, low flow alterations, solids (suspended/bedload)	Impacts from hydrostructure flow regulation/ modification, natural sources, irrigated crop production, streambank modifications/ destabilization	Tongue
Lower Yellowstone	Burns Creek (MT42M002_110)	Headwaters to mouth (Yellowstone River)	54	0.2	5	Chlorophyll-a, fish-passage barrier, iron, nitrogen (total), other flow regime alterations, phosphorus (total), solids (suspended/bedload)	Crop production (crop land or dry land), hydrostructure impacts on fish passage, irrigated crop production, natural sources	Lower Yellowstone
Lower Yellowstone	Cabin Creek (MT42M002_150)	Headwaters to mouth (Yellowstone River)	103	9.7	5	Nitrogen (total), oxygen (dissolved), sedimentation/siltation	Dam or impoundment, natural sources, rangeland grazing	Lower Yellowstone
Lower Yellowstone	Cedar Creek (MT42M002_141)	26 miles upstream to mouth (Yellowstone River)	27	17.6	5	Alteration in stream-side or littoral vegetative covers, arsenic, copper, iron, lead	Grazing in riparian or shoreline zones, natural sources, spills from trucks or trains	Lower Yellowstone
Lower Yellowstone	Cedar Creek (MT42M002_142)	26 to 45 miles above the mouth	20	2.5	5,2B	Copper, iron, lead, selenium	Natural sources	Lower Yellowstone
Lower Yellowstone	Cottonwood Creek (MT42M002_100)	Headwaters to mouth (Yellowstone River)	22	1.0	5	Cadmium, fish-passage barrier, iron, physical substrate habitat alterations	Channelization, flow alterations from water diversions, hydrostructure impacts on fish passage, natural sources, source unknown	Lower Yellowstone
Lower Yellowstone	Fox Creek (MT42M002_051)	Headwaters to mouth (Yellowstone River), T22N R59E S19	50	0.8	5	Arsenic, excess algal growth, iron, lead, low flow alterations, mercury, nitrogen (total), phosphorus (total), physical	Channelization, irrigated crop production, natural sources, source	Lower Yellowstone

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
						substrate habitat alterations, solids (suspended/bedload), sulfates, TDS	unknown	
Lower Yellowstone	Glendive Creek (MT42M002_130)	Headwaters to mouth (Yellowstone River)	56	1.4	5	Alteration in stream-side or littoral vegetative covers, cadmium, chromium (total), copper, iron, lead, nickel, selenium, solids (suspended/ bedload), zinc	Grazing in riparian or shoreline zones, natural sources, source unknown	Lower Yellowstone
Lower Yellowstone	O'Brien Creek (MT42M002_060)	State line to mouth (Yellowstone River)	16	0.1	5	Excess algal growth, nitrate/nitrite (nitrite + nitrate as N), selenium	Animal feeding operations (nonpoint source), irrigated crop production	Lower Yellowstone
Lower Yellowstone	Smith Creek (MT42M002_080)	Headwaters to mouth (Yellowstone River)	45	0.9	4C	Fish-passage barrier	Low water crossing	Lower Yellowstone
Lower Yellowstone	Yellowstone River (MT42M001_011)	Lower Yellowstone Diversion Dam to North Dakota border	54	5.5	5	Alteration in stream-side or littoral vegetative covers, chromium (total), copper, fish-passage barrier, lead, nitrogen (total), pH, phosphorus (total), sedimentation/ siltation, TDS	Impacts from hydrostructure flow regulation/ modification, irrigated crop production, natural sources, source unknown, rangeland grazing, streambank modifications/ destabilization,	Yellowstone River
Lower Yellowstone	Yellowstone River (MT42M001_012)	Powder River to Lower Yellowstone Diversion Dam	77	23.9	4C	Fish-passage barrier	Dam construction (other than upstream flood control projects)	Yellowstone River
Lower Yellowstone-Sunday	Deadman Creek (MT42K002_060)	Headwaters to mouth (North Fork Sunday Creek)	17	3.5	5	Nitrogen (total), phosphorus (total)	Source unknown	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	East Fork Armells Creek (MT42K002_110)	Colstrip to mouth (Armells Creek)	32	0.6	5	Nitrate/nitrite (nitrite + nitrate as N), nitrogen (total), specific conductance, TDS	Agriculture, coal mining, transfer of water from an outside watershed	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	Harris Creek (MT42K002_020)	Headwaters to mouth (Yellowstone River)	27	6.4	5	Chlorophyll-a, other flow regime alterations, phosphorus (total), solids (suspended/ bedload)	Grazing in riparian or shoreline zones, livestock (grazing or feeding operations),	Middle Yellowstone Tributaries

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
							natural sources, transfer of water from an outside watershed	
Lower Yellowstone-Sunday	Little Porcupine Creek (MT42K002_160)	Headwaters to mouth (Yellowstone River)	119	1.1	5	Chlorophyll-a, nitrate/nitrite (nitrite + nitrate as N), nitrogen (total), phosphorus (total), TDS	Rangeland grazing, source unknown	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	Muster Creek (MT42K002_040)	Headwaters to mouth (Yellowstone River)	31	1.1	5	Chlorophyll-a, nitrate/nitrite (nitrite + nitrate as N), other flow regime alterations, phosphorus (total), solids (suspended/bedload)	Irrigated crop production, transfer of water from an outside watershed	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	North Fork Sunday Creek (MT42K002_080)	Custer/ Rosebud County border to mouth (Sunday Creek)	34	0.3	5	Sedimentation/siltation, sodium, solids (suspended/bedload), specific conductance, TDS	Channelization, crop production (cropland or dryland), natural sources	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	Stellar Creek (MT42K002_070)	Headwaters to mouth (Little Porcupine Creek)	43	5.2	5	Cadmium, chlorophyll-a, pH, phosphorus (total)	Rangeland grazing, source unknown	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	Sunday Creek (MT42K002_030)	The North and South Forks to mouth (Yellowstone River)	15	0.1	5	Chlorophyll-a, copper, iron, lead, nitrate/nitrite (nitrite + nitrate as N), nitrogen (total), phosphorus (total), physical substrate habitat alterations, TKN	Irrigated crop production, natural sources, non-irrigated crop production, rangeland grazing, source unknown	Middle Yellowstone Tributaries
Lower Yellowstone-Sunday	Yellowstone River (MT42K001_020)	The Big Horn to Cartersville Diversion Dam	59	4.7	4C	Fish-passage barrier	Dam construction (other than upstream flood control projects)	Yellowstone River
Lower Yellowstone-Sunday	Yellowstone River (MT42K001_010)	The Cartersville Diversion Dam to Powder River	89	8.6	5	Alteration in stream-side or littoral vegetative covers, copper, lead, pH, nitrate/nitrite (nitrite + nitrate as N), solids (suspended/bedload), TDS, zinc	Agriculture, irrigated crop production, municipal point source discharges, natural sources, post-development erosion and sedimentation, rangeland grazing, source unknown, streambank modifications/ destabilization	Yellowstone River
Middle Musselshell	Musselshell River (MT40C001-010)	HUC boundary near Roundup to Flatwillow	48	3.3	4C	Alteration in stream-side or littoral vegetative covers, low	Agriculture, channelization,	Upper/ Middle

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
		Creek				flow alterations, physical substrate habitat alterations	impacts from hydrostructure flow regulation/ modification, streambank modifications/ destabilization	Musselshell
Middle Powder	Powder River (MT42J001_010)	Wyoming border to Little Powder River	78	7.9	5	Salinity	Natural sources, source unknown	Powder
Mizpah	Mizpah Creek (MT42J005_011)	Headwaters to Corral Creek	132	1.7	5	Salinity	Natural sources	Powder
Mizpah	Mizpah Creek (MT42J005_012)	Corral Creek to the mouth (Powder River)	23	0.5	5	Salinity	Natural sources	Powder
O` Fallon	Pennel Creek (MT42L001_010)	Headwaters to mouth (O'Fallon Creek)	66	10.8	5	TDS	Source unknown	O` Fallon
O` Fallon	Sandstone Creek (MT42L001_020)	Headwaters to mouth (O'Fallon Creek)	73	2.5	5	Nitrate/nitrite (nitrite + nitrate as N), nitrogen (total)	Agriculture, municipal point source discharges	O` Fallon
Porcupine	Porcupine Creek (MT40O003_010)	Confluence of West and Middle Forks to mouth (Milk River)	49	0.4	5	Nitrogen (total), phosphorus (total), salinity	Non-irrigated crop production	Lower Milk
Prairie Elk-Wolf	Missouri River (MT40S001_012)	Milk River to Poplar River	82	1.8	5	Alteration in stream-side or littoral vegetative covers, other flow regime alterations, temperature (water)	Impacts from hydrostructure, flow regulation/ Modification, loss of riparian habitat	Lower Missouri
Prairie Elk-Wolf	Prairie Elk Creek (MT40S002_010)	East and Middle Forks to mouth (Missouri River)	39	0.6	4A	Alteration in stream-side or littoral vegetative covers, nitrogen (total), phosphorus (total), physical substrate habitat alterations, TKN	Agriculture, grazing in riparian or shoreline zones	Redwater
Prairie Elk-Wolf	Sand Creek (MT40S002_030)	Confluence of East and West Forks to mouth (Missouri River)	20	0.5	5	Nitrogen (total), phosphorus (total), physical substrate habitat alterations, sedimentation/ siltation, TKN	Agriculture, non-irrigated crop production, rangeland grazing	Redwater
Redwater	East Redwater Creek (MT40P002_010)	Headwaters to mouth (Redwater River)	51	0.4	5	Chlorophyll-a, nitrate/nitrite (nitrite + nitrate as N), nitrogen (total), phosphorus (total), sedimentation/siltation, specific conductance, sulfates, TDS, TKN	Agriculture, source unknown	Redwater

TABLE 2.
2012 MONTANA LIST OF IMPAIRED STREAMS AND RIVERS ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Location	Mi.	Mi. on BLM-administered land	Water Quality Cat.	Causes	Probable Sources	TMDL Area
Redwater	Redwater River (MT40P001_014)	Pasture Creek to mouth (Missouri River)	60	3.1	4C	Alteration in stream-side or littoral vegetative covers, physical substrate habitat alterations	Natural sources, rangeland grazing	Redwater
Rosebud	Rosebud Creek (MT42A001_012)	Northern Cheyenne Reservation boundary to an irrigation dam 3.8 mi above the mouth	112	<0.1	5	Other	Dam construction (other than upstream flood control projects)	Rosebud
Upper Little Missouri	Little Missouri River (MT39F001_021)	Highway 323 bridge to South Dakota border	61	0.7	5	Cadmium, copper, iron, lead, zinc	Natural sources, source unknown	Little Missouri
Upper Little Missouri	Little Missouri River (MT39F001_022)	Wyoming border to the Highway 323 bridge	45	1.0	5	Cadmium, copper, lead, nitrogen (total), phosphorus (total), zinc	Agriculture, natural sources, source unknown	Little Missouri
Upper Little Missouri	Thompson Creek (MT36F001_010)	Wyoming border to mouth (Little Missouri River)	41	0.1	5,2B	Cadmium, copper, iron, zinc	Natural Sources	Little Missouri
Upper Tongue	Hanging Woman Creek (MT42B002_032)	Wyoming border to Stroud Creek	31	0.3	5,2B	Low flow alterations, salinity	Irrigated crop production, natural sources	Tongue
Upper Tongue	Tongue River (MT42B001_020)	Tongue River Dam to Prairie Dog Creek	22	0.1	4C	Low flow alterations	Impacts from hydrostructure flow regulation/ modification, irrigated crop production, streambank modifications/ destabilization	Tongue

TABLE 3.
2012 MONTANA LIST OF IMPAIRED RESERVOIRS AND LAKES ADJACENT TO BLM-ADMINISTERED LAND

Subbasin	Name	Acres	Acres on BLM-administered land	Use Class	Water Quality Cat.	Cause	Probable Sources	TMDL Area
Upper Tongue	Tongue River Reservoir (MT42B003_010)	2,158	4.8	B-2	5	Chlorophyll-a, oxygen (dissolved), solids (suspended/bedload)	Irrigated crop production, municipal point source discharges	Tongue

TABLE 4.
CAUSES OF SURFACE WATER IMPAIRMENT IN THE PLANNING AREA

Impairment Cause	Number of Mentions on 2012 303(d) List
Nitrogen (total)	30
Phosphorus (total)	26
Alteration in stream-side or littoral vegetative covers	24
Lead	17
Low flow alterations	17
Solids (suspended/bedload)	16
Salinity	15
Copper	14
Iron	13
Nitrate/nitrite (nitrite + nitrate as N)	13
TDS	13
Chlorophyll-a	11
Other flow regime alterations	11
Physical substrate habitat alterations	11
Sedimentation/siltation	10
Cadmium	9
Fish passage barriers	9
Mercury	7
Temperature (water)	7
TKN	7
Zinc	7
Specific conductance	6
Sulfates	5
Excess algal growth	4
Arsenic	3
E. coli	3
pH	3
Selenium	2
Chromium	2
Nickel	2
Nitrate	2
Other	2
Oxygen (dissolved)	2
Sodium	2
Ammonia	1
Biological indicators	1
Cause unknown	1
High flow regime	1
Organic enrichment (sewage)	1

TABLE 5.
PROBABLE SOURCES OF IMPAIRMENT IN THE PLANNING AREA

Probable Source	Number of Mentions on 2012 303(d) List
Natural sources	34
Source unknown	31
Irrigated crop production	30
Agriculture	16
Impacts from hydrostructure flow regulation/modification	14
Rangeland grazing	14
Grazing in riparian or shoreline zones	13
Streambank modifications/ destabilization	11
Channelization	9
Non-irrigated crop production	6
Dam or impoundment	5
Municipal point source discharges	5
Transfer of water from and, outside of, the watershed	5
Crop Production (cropland or dryland)	4
Dam construction (other than upstream flood control projects)	4
Hydrostructure impacts on fish passage	4
Flow alterations from water diversions	3
Highways, roads, bridges	3
Loss of riparian habitat	3
Animal feeding operations (nonpoint source)	2
Atmospheric deposition-toxics	2
Infrastructure (new construction)	2
Coal mining	1
Habitat modification (other than hydromodification)	1
Historic bottom deposits (not sediment)	1
Impacts from abandoned mine lands (inactive)	1
Impacts from resort areas (winter and non-winter resorts)	1
Livestock (grazing or feeding operations)	1
Low water crossings	1
On-site treatment systems (Septic systems and similar decentralized systems)	1
Post-development erosion and sedimentation	1
Site clearance (land development or redevelopment)	1
Spills from trucks or trains	1
Surface mining	1

TOTAL MAXIMUM DAILY LOAD DEVELOPMENT IN THE PLANNING AREA

In compliance with the provisions of the Montana Water Quality Act adopted by MDEQ in 2000, a new methodology was employed to develop and determine the TMDL values for waterways. This methodology was developed with the assistance of the Statewide TMDL Advisory Group. It employed a weighted scoring system, based on the 13 prioritization criteria mandated by the Montana Water Quality Act, to assign a high, moderate, or low planning priority to each waterway segment. Each planning area was then scheduled for plan development. This schedule was also compiled in response to a June 2000, United States District Court order requiring USEPA and MDEQ to adopt a schedule that would ensure the development (by May 5, 2007) of all necessary TMDLs for waterways on the 1996, 303(d) list. To avoid having two separate TMDL planning schedules in effect at the same time, MDEQ adopted a single schedule, addressing waterways appearing on either the 1996 or 2000 list, and published this schedule in the 2000 Montana 303(d) list. When the 2002 303(d) list was published, an appeal of the court order was underway and, therefore, MDEQ did not attempt a full prioritization update. Only some minor rescheduling was completed, which was permissible within the time limit of the court order.

On July 25, 2003, the United States Court of Appeals for the Ninth Circuit ruled on the USEPA's appeal of the District Court order and found that the District Court had the authority to require the USEPA and MDEQ to establish and follow a schedule for developing TMDLs but did not have the discretion to refuse permit modifications on the 1996 list of impaired waters.

The court order schedule allows flexibility for the MDEQ and USEPA to respond to contingencies as long as the pace of TMDL development is maintained. The determination of TMDLs for some planning priority areas may be delayed if others are accelerated to maintain the pace. In its 2002 update list, MDEQ made several schedule modifications. Since the publication of the 2002 list, consultations between MDEQ and USEPA have identified additional rescheduling needs and allocated lead responsibility for the development of specific TMDLs to either the MDEQ or the USEPA Montana Office. These proposed schedule modifications and workload allocations were presented for consideration by the Statewide TMDL Advisory Group on September 16, 2003. The advisory group provided positive comments on these changes and encouraged MDEQ to complete the TMDLs as quickly as possible. In 2003, the Montana State Legislature extended (by an additional 5 years) the original 10-year date for completing TMDLs for waterways appearing on the 1996 list.

During the development of the 2000, 2002, and 2004 lists, MDEQ determined that several waterways in the Tongue River, Powder River, and Little Powder River basins considered impaired on the 1996 list were actually meeting water quality standards (e.g., Mizpah Creek was found to be fully supportive for nutrients, dissolved oxygen, inorganics, and suspended solids). However, it should be noted that assessments commonly indicate that flow or habitat alterations result in high levels of pollutants; therefore, some of these waterways may require additional assessment prior to developing TMDLs for the associated TMDL planning areas. It is possible that MDEQ will determine that additional waterways have attained the standards for listed pollutants. If so, completion of a TMDL will not be required, even though the waterway and the pollutants appeared on the 1996 list. Conversely, additional TMDLs may be required if the assessment demonstrates that a waterway is impaired for other pollutants not identified on the 1996 list. The Rosebud, Tongue River, and Powder River planning priority areas are undergoing pre-TMDL planning and assessment.

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