

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

**Environmental Assessment
DOI-BLM-WY-R010-2010-0011-EA**

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**Lease Parcel Review
August 2010**

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Affected Resources EA Checklist

Bureau of Land Management, Worland Field Office
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Determination	Resource	Rationale for Determination
PI	Air Quality	No affects associated with leasing. Minimal affects possible under expected actual development. Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS (Table 16 pg 154) And in the Washakie RMP/FEIS (DEIS pg 110 and Appendix J pg 198). New information about current air quality in the Bighorn Basin is available.
NP	Areas of Critical Environmental Concern	
NP	BLM Natural Areas	
NI	Cultural Resources	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 154; ROD Appendix 3) And in the Washakie RMP/FEIS (DEIS Appendix J pg 205)
PI	Greenhouse Gas Emissions	No direct greenhouse gas emissions associated with leasing. Minimal emissions possible under expected actual development. New information on greenhouse gas emissions available.
NP	Environmental Justice	
NP	Farmlands (Prime or Unique)	
NI	Fish and Wildlife Excluding Federally Listed Species	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 161-163; ROD Appendix 3) And in the Washakie RMP/FEIS (DEIS 115, Appendix J pg 208)
NP	Floodplains	
NP	Fuels/Fire Management	
NI	Geology/Mineral Resources/Energy Production	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 161-163; ROD Appendix 3) And in the Washakie RMP/FEIS (DEIS pg 110 Appendix J pg 198)
NI	Hydrologic Conditions	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 168) And in the Washakie RMP/FEIS (DEIS pg 112; Appendix J pg 201)
NI	Invasive Species/Noxious Weeds	The Worland Field Office, operates under INPS protocols as set forth in the following documents: Vegetation Treatment on BLM Lands in the Seventeen Western States FEIS and ROD (2007); Management Plan for Invasive Weeds in the Bighorn Basin of Wyoming (WY-010-EA4-34), Executive Order 13112-1999 provides guidance to federal agencies involving INPS; Cooperative agreements with weed and pest control districts: KA051028 (Big Horn County), KAA051027 (Washakie County), AA051026 (Park County) and KAA051029 (Hot Springs County).
NI	Lands/Access	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 158, 162-163) And in the Washakie RMP/FEIS (DEIS pg 118)
NI	Livestock Grazing	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels(Table 16 pg 168) And in the Washakie RMP/FEIS (DEIS pg 112; Appendix J pg 201)
NI	Migratory Birds	The act of the proposed action (leasing) would have no affect on this resource. Site specific NEPA for proposed surface disturbing activities would further analyze affects and mitigation applied in compliance with the Migratory Bird Species-Interim Management Guidance Policy (included within Instruction Memorandum No. 2008-050)

NI	Native American Religious Concerns	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16 pg 154; ROD Appendix 3); And in the Washakie RMP/FEIS (DEIS Appendix J pg 205)
NI	Paleontology	The act of the proposed action (leasing) would have no affect on this resource. Impacts from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS (Table 16pg 154); And in Washakie RMP/FEIS (DEIS pg94)
NP	Rangeland Health Standards	
NI	Recreation	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16 pg 154; ROD Appendix 3) And in the Washakie RMP/FEIS (DEIS Appendix J pg 205)
NI	Socio-Economics	Affects from oil and gas activities was analyzed in the Grass Creek RMP/FEIS (Table 5-19pg 279) And in Washakie RMP/FEIS (DEIS pg 118)
NI	Soils	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16; ROD Appendix 3) And in Washakie RMP/FEIS (DEIS Appendix J pg 198)
NP	Threatened, Endangered or Candidate Plant Species	
PI	Threatened, Endangered or Candidate Animal Species	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS and in Washakie RMP/FEIS. New information and policy changes are discussed further in the EA.
NP	Wastes (hazardous or solid)	
NI	Water Resources/Quality (drinking/surface/ground)	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16; ROD Appendix 3); And in Washakie RMP/FEIS (DEIS Appendix J pg 198)
NP	Wetlands/Riparian Zones	
NP	Wild and Scenic Rivers	
NP	Wilderness/WSA	
NP	Woodland/Forestry	
NI	Vegetation Excluding Federally Listed Species	Affects from surface disturbing activities was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16; ROD Appendix 3) And in Washakie RMP/FEIS (DEIS 113); In addition, based on site specific NEPA WY Reclamation Policy would be implemented if development were initiated.
NI	Visual Resources	Affects from development was analyzed in the Grass Creek RMP/FEIS with appropriate mitigation measures attached to lease parcels (Table 16; ROD Appendix 3) And in Washakie RMP/FEIS (DEIS 204); In addition the VRM BMPs would be implemented based on a site specific NEPA if development were initiated.
NP	Wild Horses and Burros	
PI	Areas with Wilderness Characteristics	Lands containing wilderness characteristics were analyzed, and the results contained in Appendix D.

DETERMINATION –

NP – not present in the area impacted by the proposed or alternative actions

NI – present, but adequately analyzed in RMP/FEIS for leasing actions

PI – present, not analyzed in RMP/FEIS or new information requires further analysis in the EA

**BUREAU OF LAND MANAGEMENT
WORLAND FIELD OFFICE
ENVIRONMENTAL ASSESSMENT FOR
AUGUST 2010 LEASE SALE REVIEW
DOI-BLM-WY-R010-2010-0011-EA**

1.0 INTRODUCTION

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920, as amended [30 U.S.C. 181 *et seq.*] and the Federal Land Policy and Management Act of 1976, to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

As required by 43 CFR 3120.1-2, the BLM Wyoming State Office conducts a quarterly competitive lease sale to sell available oil and gas lease parcels. A Notice of Competitive Lease Sale, which lists lease parcels to be offered at the auction, is published by the BLM State Office at least 45 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Surface management of non-BLM administered land overlaying federal minerals is determined by BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the BLM State Office sends a draft parcel list to each field office where the parcels are located. Field Office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing; if appropriate stipulations have been included; if new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted, and if there are special resource conditions of which potential bidders should be made aware. Each Field Office confirms this review by preparing a Documentation of NEPA Adequacy (DNA) which supports BLM's decision that there have been no changed circumstances warranting further NEPA analysis. Once the draft parcel review and DNA is completed and returned to the State Office, a list of available lease parcels and stipulations is made available to the public through a Notice of Competitive Lease Sale (NCLS).

On rare occasions, additional information obtained after the publication of the NCLS, may result in withdrawal of certain parcels prior to the day of the lease sale.

The following Environmental Assessment (EA) documents the Worland Field Office review of the 3 parcels that were nominated. All parcels addressed in this EA are under the administration of the Worland Field Office. It serves to verify conformance with the approved land use plan, addresses new information, and provides the rationale for issuing parcels to be sold during the aforementioned lease sale.

1.1 Purpose and Need

The purpose of this document is to analyze the impacts of issuing leases for parcels to be sold at the August 2010 competitive oil and gas lease sale to allow private individuals or companies to explore for and develop oil and gas resources on public lands. BLM has prepared this EA to analyze whether it remains appropriate to issue leases for these nominated parcels.

The sale and issuance of oil and gas leases is needed to meet the growing energy needs of the United States public. Wyoming is a major source of natural gas for heating and electrical energy production in the lower 48 states, especially for markets in the Eastern United States. Continued sale and issuance of lease parcels is necessary to maintain options for production as oil and gas companies seek new areas for production or attempt to develop previously inaccessible or uneconomical reserves.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Washakie Resource Management Plan and Final Environmental Impact Statement (1988), and the Grass Creek Resource Management Plan and Final Environmental Impact Statement. The Final Resource Management Plans were approved by a Record of Decision (ROD) signed September 1988 and September 1998, respectively.

According to the Grass Creek RMP ROD, “the entire planning area (about 1,171,000 acres of BLM-administered mineral estate) is open to oil and gas leasing consideration. About 20,200 acres of BLM-administered mineral estate are open to leasing consideration with a “no surface occupancy” stipulation (See Glossary and Map 6). These lands identified for “no surface occupancy” are identical to the lands where BLM would pursue mineral withdrawals from operation of the 1872 Mining Law.) The rest of the planning area is subject to standard lease terms and conditions, and seasonal or other requirements. (See Appendix 3)”

According to the Washakie RMP ROD, approximately 11, 200 acres are closed to leasing in the Spanish Point Karst ACEC, 86,100 acres may be leased with “no surface occupancy” restrictions to protect important wildlife habitat, and cultural and recreation sites; approximately 985,600 acres are open to leasing with seasonal restriction to protect important wildlife habitat and 520,000 acres are available for leasing with other standard surface protection restrictions.

Both RMPs described specific stipulations that would be attached to new leases offered in certain areas.

1.3 Leasing:

Analysis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, USC 4321 *et seq.*) was conducted by Field Office resource specialists who relied on personal knowledge of the areas involved and/or reviewed existing databases and file information to determine if appropriate stipulations had been attached to specific parcels prior to being made available for lease.

It is unknown when, where or if future well sites or roads might be proposed. Detailed site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

Issuance of leases would not be in conflict with any local, county, or state plans.

1.4 Federal, State or Local Permits, Licenses or Other Consultation Requirements

Purchasers of oil and gas leases are required to obey all applicable federal, state, and local laws and regulations including obtaining all necessary permits required should lease development occur.

Worland Field Office wildlife biologist reviewed each parcel prior to them being offered for sale. They determined that leasing of all parcels would be in compliance with threatened and endangered species management guidelines as there are no documented T&E species, or their habitats, located within the parcels. No further consultation with the U.S. Fish and Wildlife Service is required at this stage.

2.0 PROPOSED ACTIONS AND ALTERNATIVES

A total of three lease parcels were nominated for the August 2010 sale. This section describes the alternatives considered for analysis.

2.1 Alternative A No Action:

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

Under the No Action alternative, the BLM would not issue any of the leases that have been nominated. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, and state leases.

It is not expected that demand for energy oil and gas will go down, and a decision to not issue these leases would not prevent future leasing in these areas consistent with land use planning decisions, and subject to appropriate stipulations, identified in the Resource Management Plan. Therefore, it is anticipated that these parcels may be nominated and leased at a future date. While future leases may contain more restrictive lease terms, it is reasonable to consider that a substantial portion of the development possible under current planning decisions will be possible under future leases.

2.2 Alternative B Full Lease Issuance:

Under Alternative B, all three nominated parcels, approximately 1800 acres, would be issued with the stipulations recommended at the time of nomination as detailed in Appendix A.

2.3 Alternative C Proposed Action:

Alternative C analyzes the nominated lease parcels to determine if the State Director should issue the leases as modified in light of new resource information. This would include issuing parcel #90 as nominated containing approximately 240 acres of federal minerals administered by the Worland Field Office; and modifying the nomination boundary for parcel #85 containing approximately 880 acres, and thereby deferring approximately 320 acres. Standard terms and conditions as well as special stipulations would apply. Lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) were added to each parcel as identified by the Worland Field Office to address site specific concerns or new information not identified in the land use planning process.

Additionally, there would be a recommendation to the State Director to defer the issuance of parcel #91 containing approximately 360 acres.

All parcels for Alternative C, as modified, are listed in Appendix B with the parcel number, acreage, lease number, location and stipulations.

Once sold, the lease purchaser has the right to use so much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (Title 43 Code of Federal Registration 3101.1-4).

Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; ownership of the minerals leased revert back to the federal government and may be leased again.

Before a lease owner or operator conducts any surface disturbing activities on the lease, BLM must first approve and Application for Permit to Drill (APD) and a surface use plan specified in Title 43 Code of Federal Registration 3162.

Surface use restrictions, including timing limitation stipulations (TLS), NSO stipulations, and controlled surface use (CSU) stipulations, as well as unavailable for leasing designations, cannot be retroactively applied to valid, existing oil and gas leases or to valid, existing use authorizations (e.g., Application for Permit to Drill [APD]). Post-lease actions/authorizations (e.g., APDs, road/pipeline ROWs), however, could be encumbered by TLS and CSU restrictions on a case-by-case basis, as required through project-specific NEPA analysis or other environmental review.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on relevant major resources and issues. Certain critical environmental components require analysis under BLM policy. Only those aspects of the affected environment that are potentially impacted are described in detail.

The proposed lease parcels are located in Big Horn, and Washakie Counties, Wyoming. This environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Washakie Resource Management Plan, September 1988 and the Grass Creek Resource Management Plan September 1998.

In addition to the air quality information in the RMPs cited above, new information about GHGs and their effects on national and global climate conditions has emerged since the RMPs were prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), water vapor; and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes.

This EA incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate.

3.1 Air Resources

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

Air Quality

The U.S. Environmental Protection Agency (EPA) established air quality standards (NAAQS) for criteria pollutants. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). Air pollutant concentrations greater than the NAAQS represent a risk to human health.

EPA has delegated regulation of air quality to the State of Wyoming and is administered by the Wyoming Department of Environmental Quality. Wyoming Ambient Air Quality Standards (WAAQS) and NAAQS identify maximum limits for concentrations of criteria air pollutants at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health that, by law, require public safeguards be

implemented. State standards must be at least as protective of human health as federal standards, and may be more restrictive than federal standards, as allowed by the Clean Air Act.

The counties that lie within the jurisdictional boundaries of the Worland Field Office are classified as in attainment of all state and national ambient air quality standards as defined in the Clean Air Act of 1977, as amended. Modeling conducted to date by the WYDEQ does not indicate that air quality is likely to exceed any limits specified by the Clean Air Act in the near future.

Although various state and federal agencies monitor air pollutant concentrations, visibility, and atmospheric deposition throughout Wyoming, at present there are only two air quality monitors near the Worland Field Office boundaries; found in Park County. Table 3.1 lists the available air quality monitoring sites in the Bighorn Basin and relevant sites nearby. The Wyoming Department of Environmental Quality (DEQ) operates a PM10 monitor as part of the State and Local Monitoring Site (SLAMS) network in Cody, Wyoming (Park County). Additional SLAMS and Special Purpose Monitoring (SPM) sites operate in nearby counties. Nearby monitoring sites include several IMPROVE monitors and BLM administered sites that are part of the Wyoming Air Resource Monitoring System (WARMS). Atmospheric deposition (wet) measurements of ammonium, sulfate, and various metals are taken at the Sinks Canyon, South Pass and Yellowstone Park sites, which the BLM operates as part of the National Acid Deposition Program (NADP).

Table 3.1 Available Air Quality Monitoring Sites

County	Site Name	Type of Monitor	Parameter	Operating Schedule	Location	
					Longitude	Latitude
Park	Cody	SLAMS	PM ₁₀	1/6	-109.073	44.532
	North Absaroka (managed by USFS)	IMPROVE	PM _{2.5} , NO ₃ , Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3	-109.382	44.745
Fremont	Lander	SLAMS	PM _{2.5}	1/3	-108.733	42.833
Campbell	Thunder Basin	SPM	Ozone, Nitrogen Oxides & Met	Hourly	-105.300	44.672
	Thunder Basin	IMPROVE	PM _{2.5} , NO ₃ , Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3	-105.287	44.663
Johnson	Buffalo	WARMS	PM _{2.5} , NO ₃ , Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3 (PM _{2.5}) & 1/7 (others)	-106.019	44.144
	Cloud Peak	IMPROVE	PM _{2.5} , NO ₃ , Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3	-106.956	44.333
Sheridan	Sheridan - Highland Park	SLAMS	PM ₁₀ & PM _{2.5}	1/3 (PM ₁₀); 1/3 & 1/6 (PM _{2.5})	-107.000	44.806
	Sheridan - Police Station	SLAMS	PM ₁₀ & PM _{2.5}	1/1 (PM ₁₀) & 1/3 & 1/6 (PM _{2.5})	-107.000	44.833
	Sheridan (managed by BLM)	WARMS	PM _{2.5} , NO ₃ , Ammonium, Nitric Acid, Sulfate & Sulfur Dioxide	1/3 (PM _{2.5}) & 1/7 (others)	-106.847	44.933

Source: REF 6151; REF 6150; REF 6152; REF 6153; REF 6154; REF 6149

BLM Bureau of Land Management

IMPROVE Interagency Monitoring of Protected Visual Environments

NO₃ Nitrate

PM Particulate Matter

SLAMS State and Local Monitoring Site

SPM Special Purpose Monitoring

USFS United States Forest Service

WARMS Wyoming Air Resource Monitoring System

With only two air quality monitors in the Bighorn Basin (Cody/PM10 and North Absaroka/IMPROVE), it is difficult to accurately assess existing air quality conditions throughout the area. However, as noted above, air quality, visibility, and atmospheric deposition are monitored throughout Wyoming, including adjacent planning areas. Therefore, the BLM assessed recent air quality conditions in the Bighorn Basin by examining data collected at the two monitors in the area, supplemented by various monitors in neighboring planning areas, as summarized in Table 3.2. The examination of these data indicates that the current air quality for criteria pollutants in the Resource area is considered good overall. Based on measurements in the area, visibility in the Resource area is considered excellent.

Table 3.2 Summary of Air Quality in the Big Horn Basin

Pollutant	Averaging Time	NAAQS			WAAQS			Representative Concentrations		
		(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)
Carbon Monoxide	1 hour ¹	35	35000	40,000	35	35000	40,000	1.7	1730	1,979
	8 hour ¹	9	9000	10,000	9	9000	10,000	0.8	814	931
Nitrogen Dioxide	Annual ² (Arithmetic Mean)	0.053	53	100	0.053	53	100	0.002	2	3.4
Ozone	8 hour ³	0.075	75	147	0.075	75	147	0.078	78	153
PM ₁₀	24 hour ⁴	N/A	N/A	150	N/A	N/A	150	N/A	N/A	91
PM _{2.5}	24 hour ⁵	N/A	N/A	35	N/A	N/A	65	N/A	N/A	11.7
	Annual ⁶	N/A	N/A	15	N/A	N/A	15	N/A	N/A	7.6
Sulfur Dioxide	24 hour ⁷	0.140	140	365	0.099	99	260	0.001	0.57	1.48
	Annual ⁷ (Arithmetic Mean)	0.031	31	80	0.023	23	60	0.0003	0.25	0.66

¹Not to be exceeded more than once per year. Data collected at Yellowstone National Park during 2005.

²Thunder Basin data, 2008.

³To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 75 ppb. Measured fourth highest concentration for 2008 for the Thunder Basin site.

⁴Not to be exceeded more than once per year on average over 3 years. Maximum 24-hour average for 2008 at Cody SLAMS site.

⁵To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor in an area must not exceed 35 $\mu\text{g}/\text{m}^3$. Maximum 24-hour average for 2006 for the North Absaroka IMPROVE site.

⁶To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu\text{g}/\text{m}^3$. Annual average for 2008 for the Lander SLAMS site (waiting for new data from North Absaroka).

⁷Maximum 24-hour and annual averages for 2008 for the Sheridan WARMS site.

N/A Not Applicable

NAAQS National Ambient Air Quality Standards

WARMS Wyoming Air Resource Monitoring System

PM_{2.5} particulate matter less than 2.5 microns in diameter

WAAQS Wyoming Ambient Air Quality Standards

PM₁₀ particulate matter less than 10 microns in diameter

$\mu\text{g}/\text{m}^3$ micrograms per cubic meter

ppm parts per million

ppb parts per billion

Climate

The climate in the Resource Area is designated as a combination of Intermountain Semi-desert and Southern Rocky Mountain Steppe. The Bighorn Basin is bounded on the northeast by the Pryor Mountains, on the east by the Big Horn Mountains, on the south by Owl Creek and Bridger and Washakie Ranges, on the west by the Absaroka Mountains, and open to the north into Montana. Summers are generally hot and short, and winters long and cold. Precipitation is generally low, though greater at higher elevations, and is generally evenly distributed across the year, with the exception of the drier summer months. Wind speeds are variable and generally strong. Table 3.3 lists temperature, precipitation, and

wind speed data for the Resource Area. This information is derived from daily ambient measurements for 1971 through 2000. The summer period covers June, July, and August; the winter period covers December, January, and February.

Climate change refers to any significant change in measures of climate (e.g., temperature or precipitation) lasting for an extended period of time (decades or longer). Climate change may result from natural processes, such as changes in the sun's intensity; natural processes within the climate system (such as changes in ocean circulation); human activities that change the atmosphere's composition (such as burning fossil fuels) and the land surface (such as urbanization) (IPCC 2007).

Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The primary greenhouse gases that enter the atmosphere as a result of anthropogenic activities include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These synthetic gases are powerful GHGs that are emitted from a variety of industrial processes.

Ongoing scientific research has identified the potential impacts of anthropogenic greenhouse gas (GHG) emissions and changes in biological sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused CO₂e concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years. In contrast, black carbon is a relatively short-lived pollutant, as it remains in the atmosphere for only about a week. It is estimated that black carbon is the second greatest contributor to global warming behind CO₂ (Ramanathan and Carmichael, 2008).

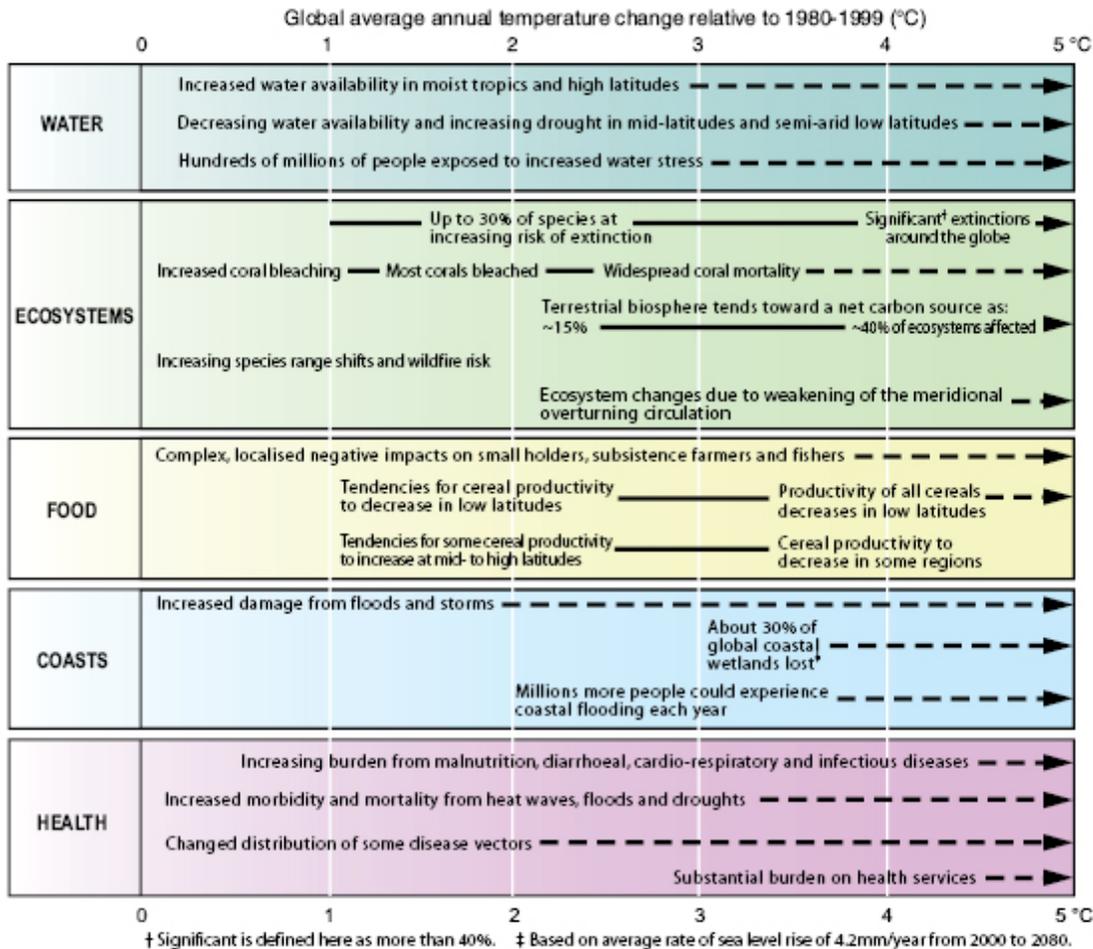
Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1° F since 1900, with nearly a 1.8°F increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

Table 3.3 Climate data for Worland

Climate Component	Worland, WY
Mean maximum summer temperatures (June, July, August)(degrees Fahrenheit)	81.3; 89.8, 88.6
Mean minimum winter temperatures (December, January, February)(degrees Fahrenheit)	6.0; 2.4; 9.9
Mean annual temperature)(degrees Fahrenheit)	44.9
Mean annual precipitation (inches)	8.03
Mean annual snowfall (inches)	16.0
Mean annual wind speed (miles per hour)	5.6
Prevailing wind direction	Northerly/southerly

Based on research compiled for the International Panel on Climate Change Fourth Assessment Report, 2007, potential effects of climate change on resources in the affected environment are likely to be varied. Figure 3.1, taken from the Fourth Assessment Report indicates varying responses of the natural world to increasing temperatures as a result of increasing global temperatures.

Figure 3.1: Examples of impacts associated with global average temperature change (Impacts will vary by extent of adaptation, rate of temperature change and socio-economic pathway)



Within North America, the report specifically forecasts that: Warming in western mountains is projected to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources; in the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5 to 20%, but with important variability among regions; major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources; cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts and coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution. Specific modeling and/or assessments of the potential effects for the Worland Field Office and for the State of WY currently do not exist.

Some activities within the Resource area generate greenhouse gas (GHG) emissions. Oil and gas development activities can generate carbon dioxide (CO₂) and NH₄. CO₂ emissions result from the use of combustion engines, while methane can be released during processing. Wildland fires also are a source of CO₂ and other GHG emissions, while livestock grazing is a source of methane. Other activities in the Resource Area with the potential to contribute to climate change include soil erosion from disturbed areas and fugitive dust from roads, which have the potential to darken snow-covered surfaces and cause faster

snow melt. A description of the potential greenhouse gas emissions associated with the proposed leasing activities is included in Section 4.

Visibility

There are several National Parks, National Forests, recreation areas, and wilderness areas in or adjacent to the Big Horn Basin. Table 3.4 lists areas designated as Class I or Class II airsheds. National Parks, Monuments and some state designated Wilderness Areas are designated as Class I. The Clean Air Act “declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas . . . from manmade air pollution.” 42 U.S.C. § 7491(a)(1).25. Under the BLM Manual Section 8560.36, BLM lands, including wilderness areas not designated as Class I, are managed as Class II, which provides that moderate deterioration of air quality associated with industrial and population growth may occur.

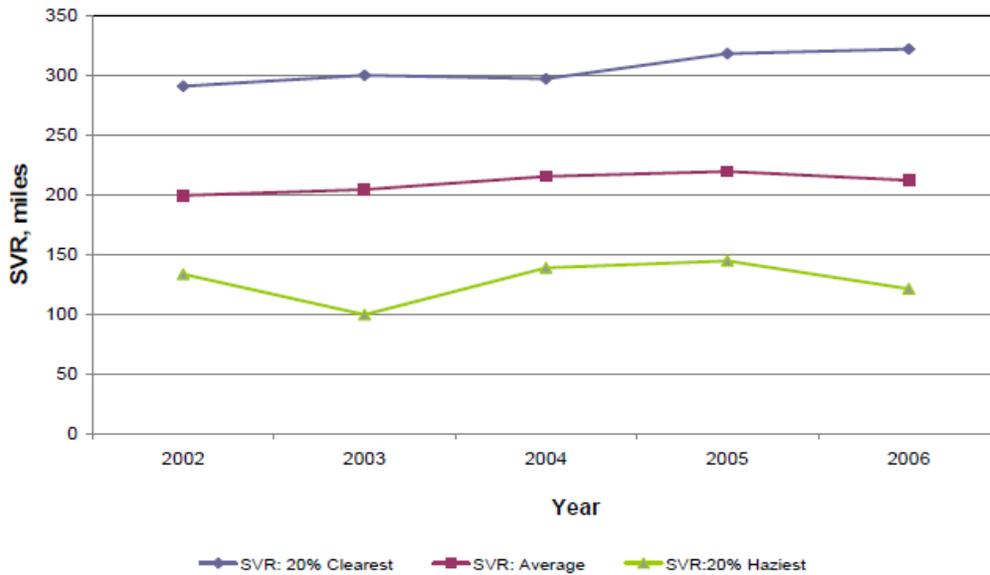
Table 3.4 Class I or Class II areas

Area Type	Area Name	Closest Distance to the Big Horn Basin (miles)	Direction from the Big Horn Basin	Clean Air Act Status of the Area
National Park	Wind Cave National Park	200	East	Class I
	Yellowstone National Park	Adjacent	West	Class I
Recreation Area	Bighorn Canyon National Recreation Area	In		Class II
Wilderness Area	Cloud Peak Wilderness Area	In		Class II
	North Absaroka Wilderness Area	In		Class I
	Washakie Wilderness Area	In		Class I
	Fitzpatrick Wilderness Area	30	Southwest	Class I
	Popo Agie Wilderness Area	50	South	Class II
	Bridger Wilderness Area	35	Southwest	Class I
	Teton Wilderness Area	Adjacent	Southeast	Class II
National Forest	Bighorn National Forest	In		Class II
	Thunder Basin National Grassland	75	East	Class II

Estimates of visibility in the Big Horn Basin are primarily derived from air quality and meteorological measurements taken at the North Absaroka IMPROVE site. To supplement these measurements, the BLM used recent data collected at the nearby Cloud Peak IMPROVE monitor to assess regional visibility conditions.

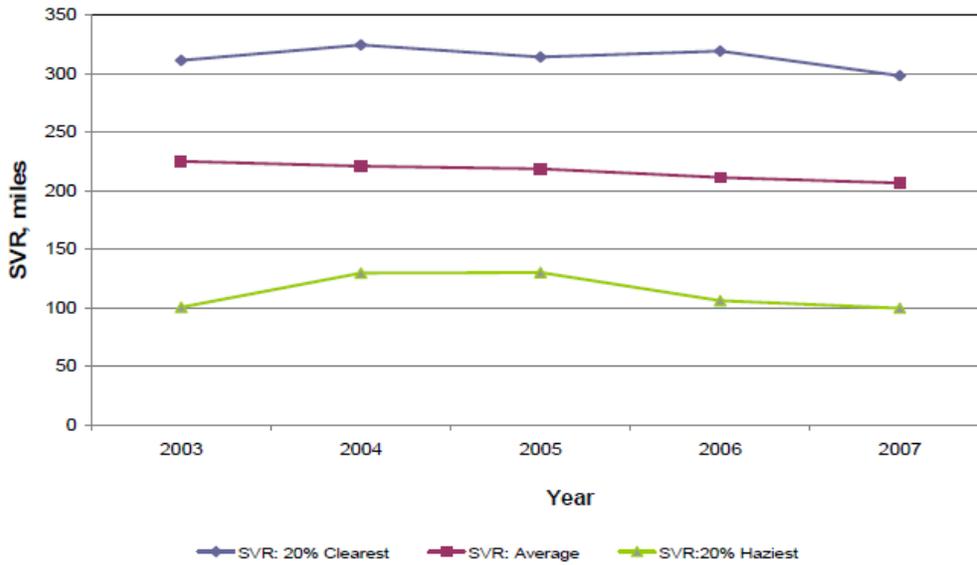
Figure 3.2 shows visibility estimates for the North Absaroka site for 2002 through 2006. The data indicate excellent visibility conditions, with no real trends in this limited period. Figure 3.3 shows visibility data for the Cloud Peak IMPROVE site for 2003 through 2007. The data for the Cloud Peak site are consistent with the North Absaroka site, reflecting excellent visibility conditions.

Figure 3.2 Annual Visibility (SVR) for the North Absaroka IMPROVE site



Source: REF 6152
 IMPROVE Interagency Monitoring of Protected Visual Environments
 SVR standard visual range

Figure 3.3 Annual Visibility (SVR) for the Cloud Peak IMPROVE site



Source: REF 6152
IMPROVE Interagency Monitoring of Protected Visual Environments
SVR standard visual range

3.2 Wildlife--Special Status Species

Section 7 of the ESA requires that BLM land managers ensure that any action authorized, funded, or carried out by the BLM is not likely to jeopardize the continued existence of any threatened or endangered species and that it avoids any appreciable reduction in the likelihood of recovery of affected species. Consultation is required on any action proposed by the BLM or another federal agency that affects a listed species or that jeopardizes or modifies critical habitat.

The BLM's Special Status Species Policy outlined in BLM Manual 6840 is to conserve listed species and the ecosystems on which they depend and to ensure that actions authorized or carried out by BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any of these species. The BLM's policy is intended to ensure the survival of those plants that are rare or uncommon, either because they are restricted to specific uncommon habitat or because they may be in jeopardy due to human or other actions.

By BLM policy, species proposed for federal listing are to be managed with the same level of protection provided for threatened and endangered species. The policy for federal candidate species and BLM sensitive species is to ensure that no action that requires federal approval should contribute to the need to list a species as threatened or endangered.

Other management direction is based on RMP management objectives, activity level plans, and other aquatic habitat and fisheries management direction, including 50 CFR 17, the Land Use Planning Handbook, Appendix C, Part E, Fish and Wildlife.

The current RMPs have evaluated the need to protect habitat necessary for the success of species identified through these regulations and policies. New information regarding the status of the Greater Sage-grouse has elevated its status from a BLM sensitive species to a federal candidate species. Policy was issued by the Wyoming BLM in December, 2009 under Information Memoranda 2010-012 and 2010-013; additional policy was issued by the Washington Office BLM under Information Memoranda 2010-071.

The greater sage-grouse is a candidate species for listing under provisions of the ESA as determined by the USFWS and documented in a March 5, 2010 Federal Register notice declaring that listing of the Greater Sage Grouse was warranted but precluded. Greater sage-grouse are distributed in sagebrush habitat throughout the Bighorn Basin, where habitat fragmentation and degradation has not reduced habitat to unsuitable. Greater sage-grouse leks are generally at mid elevations within sagebrush habitat. Nesting and brood-rearing habitat is sometimes associated with the lek and sometimes found at a distance from the lek in sagebrush habitat. These remaining suitable sagebrush habitat areas could be productive for greater sage-grouse; however, fragmentation and degradation might limit the distribution and abundance of greater sage-grouse. The WGFD has identified core areas, which represent these relatively productive areas, and has suggested special management for these areas.

There are many sources of habitat fragmentation, all of which may affect the greater sage-grouse. Industrial development, livestock and wildlife grazing, mining, gravel pit operations, oil and gas activity, land exchanges and disposal, vegetation manipulation, fuel reduction projects and other activities may cause an artificial component to a natural habitat condition. Structures such as powerlines and towers and industrial disruptive activities may cause avoidance and abandonment of habitat. Livestock grazing, fuels treatments, and weed spread infestations are factors which may cause habitat degradation depending upon severity, intensity, and design. West Nile virus, which recently has had lethal effects on greater sage-grouse in parts of Wyoming, could become an important factor in greater sage-grouse survival. There has been little research to document the presence of the virus and its effect on greater sage-grouse in the Bighorn Basin.

Greater sage-grouse have been declining across the west, which has prompted several petitions to list them as threatened under the ESA, including a recent petition that led to the March 5, 2010 finding by the USFWS of warranted for listing but precluded. Population levels throughout the Resource area declined during the mid 1990s. Since 2004, the levels have maintained or slightly increased. It is thought this resurgence was a result of well-timed precipitation events. These precipitation events promoted forage growth, which aided the survival of young. Population growth has varied throughout the Resource area based on specific local conditions, with some areas showing little change; other areas have had a recent increase in lek count numbers. With recent improvement in spring and summer conditions in many parts of the Bighorn Basin, there are some greater sage-grouse leks that have become active again after many years of non-use. Winter conditions generally are not a limiting factor in the Bighorn Basin because snow depths are not as severe as in other parts of Wyoming.

3.3 Lands with Wilderness Characteristics

As part of the current planning effort, the Worland Field Office performed an inventory of lands in the Resource area in 2009 to determine if any BLM-administered lands had wilderness characteristics. Wilderness characteristics are resource values that include naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation. Areas evaluated for wilderness characteristics generally occur in undeveloped locations of sufficient size (approximately 5,000 acres) to be practical to manage for these characteristics. Smaller areas are considered if they are contiguous with designated Wilderness or WSAs, or in rare circumstances, are of a manageable size in accordance with FLPMA.

The BLM Land Use Planning Handbook (H-1601-1) states that the BLM must consider the management of lands with wilderness characteristics during the land use planning process. The criteria used to identify these lands are essentially the same criteria used for determining wilderness characteristics for WSAs. However, the authority set forth in Section 603(a) of FLPMA to complete the three-part wilderness review process (inventory, study, and report to Congress) expired on October 21, 1993; therefore, FLPMA does not apply to new WSA proposals and consideration of new WSA proposals on BLM-administered public lands is no longer valid. The BLM is still required to inventory lands to determine whether they possess wilderness characteristics.

As the basis for the 2009 inventory, the BLM reviewed comments made during public scoping for the Bighorn Basin RMP revision, and recommendations developed during an internal review of multiple-use lands in the Resource area. In addition, the lands considered included areas recommended as part of the “Wilderness at Risk: Citizens’ Wilderness Proposal for Wyoming BLM-administered Lands” submitted to the BLM by the Wyoming Wilderness Association in February 2004. The Citizens’ Wilderness Proposal promoted the designation of approximately 1.1 million acres of BLM-administered lands for wilderness statewide, of which approximately 283,709 acres are in the Resource area. In addition to the Citizens’ Wilderness Proposal, the BLM considered a Biodiversity Conservation Alliance proposal for a formal wilderness inventory of lands in the McCullough Peaks area.

The BLM analyzed the areas with potential for wilderness characteristics to determine which, if any, lands met the definition. As part of the analysis, the BLM evaluated whether the areas were of a sufficient size, were in a natural condition, possessed outstanding opportunities for solitude, and presented opportunities for primitive and unconfined recreation. The inventory identified 52 areas in the Resource area. The final evaluation forms are available for public review at the WFO.

At present, no specific management has been developed for these areas.

4.0 ENVIRONMENTAL EFFECTS

4.1 Air Resources

Alternative A: No Action

Under the no action alternative no development would occur. Due to demand for oil and gas, it is expected that these parcels may be re-nominated in the future; consistent with appropriate land use planning decisions, and would be offered for sale with additional stipulations. There is no way to accurately predict what level of restrictions future leasing may require, but it can be assumed that a substantial portion of the development that would have been authorized under the leases currently sold would still be permitted under future leases. Nominations of parcels for lease under future land use plans and decisions would be screened for consistency with the land use plan in effect at the time, and the appropriate environmental analysis would be conducted to determine associated air quality impacts. Impacts to air quality from leases issued from any future sales would be analyzed in the appropriate environmental documents for those sales. Analysis of air quality impacts is also required at the time an application for a permit to drill is submitted.

A decision to not issue leases for any of the parcels would support continued current uses of these parcels. These uses are primarily associated with grazing, with some dispersed recreation such as hunting and hiking. These uses typically entail vehicle travel for access, and would be expected to continue at current rates.

Alternative B: Full Lease Issuance

Under this alternative, leases would be issued with the stipulations attached at the time of nomination. However, due to the larger acreage under this Alternative potentially subject to surface disturbing activities, drilling and production, the potential for impacts are similar to, but have a higher probability of occurring in larger amounts, as under Alternative C.

Alternative C: Proposed Action

Issuing leases for the subject tracts would have no direct impacts to air quality. Any potential effects to air quality would occur if and when the leases were developed. Over the last 10 years, the leasing of Federal oil and gas mineral estate in the Worland Field Office has resulted in an average total of 30 wells drilled on federal leases annually. These wells would contribute a small percentage of the total emissions (including GHG's) from oil and gas activities in Wyoming.

Potential impacts of development could include increased air borne soil particles associated with the construction of new well pads, pipelines, or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g. compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

In May 2009, the BLM Wyoming State Office Reservoir Management Group produced a draft Reasonably Foreseeable Development Scenario (RFD) document for the Bighorn Basin RMP revision. This document demonstrates that approximately 60 wells would be drilled annually for Federal minerals. (The petroleum resources specific to these leases in the Proposed Action are not known whether they are gas or oil or a combination thereof). The absolute density of drilling depends upon the technology available (vertical, directional, or horizontal) and the geology of the hydrocarbon-bearing zone. As a result, it is unknown the specific numbers of wells that could potentially be drilled under a full field development scenario as a result of issuing the leases. However, the RFD takes these assumptions into account, and on a Field Office wide basis, is still valid. Current APD permitting trends within the field office confirm that these assumptions are still accurate as from October 1999 through September 30, 2009 the Worland Field Office has approved 312 APDs, or an average of 31 APDs per year.

Subsequent development of any leases issued, would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs. When compared to total national or global emissions, the amount released as a result of potential production from the proposed lease tracts would not have a measurable effect.

Coalbed methane development does not currently exist within the field office and, therefore, there are no expected emissions from this source due to the lack of interest by Worland Operators. The RFD does assume that over the next twenty years, up to 150 coalbed methane wells could be drilled.

Mitigation

None

4.2 Greenhouse Gas Emissions

Alternative A: No Action

A decision to not issue the leases would preclude oil and gas development that could contribute greenhouse gas emissions from these leases. However, as discussed previously under the no action alternative, this would not preclude future nomination, leasing, and development consistent with land use planning decisions at that time. Based on demand for oil and gas, it is expected that these parcels would be nominated in the future; consistent with appropriate land use planning decisions, and would be offered for sale with appropriate stipulations. There is no way to accurately predict what level of restrictions future leasing may require, but it can be assumed that a substantial portion of the development that would have been authorized under the leases currently sold would still be permitted under future leases. This would result in a postponement of development, and the possibility of the development occurring with increased restriction on greenhouse gas emissions. The levels and types of restrictions would be determined at the time of lease, and submittal of development activities for approval, but are expected to allow for at least moderate development of areas open to leasing. Therefore, the no-action alternative would likely delay, and not prevent, greenhouse gas emissions. The no-action alternative may also result in reduced levels of emissions associated with future expanded restrictions.

See Section 4.5 for a discussion of the impacts of these potential greenhouse gas emissions on global climate change.

Alternative B: Full Lease Issuance

Under this alternative, leases would be issued with the appropriate stipulations as listed in Appendix A. However, due to the larger acreage under this Alternative potentially subject to surface disturbing activities, drilling and production, the potential for greenhouse gas emissions are similar to, but have a higher probability of occurring in larger amounts, as under Alternative C.

See Section 4.5 for a discussion of the impacts of these potential greenhouse gas emissions on global climate change.

Alternative C: Proposed Action

The issuance of leases in itself would not result in any direct greenhouse gas emissions. However, in regard to future development, the assessment of GHG emissions and climate change is in its formative phase. While it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of making the proposed tracts available for leasing, some general assumptions however can be made: issuing the proposed tracts may contribute to drilling new wells.

The Center for Climate Strategies (CCS) prepared the Wyoming Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) for the Wyoming Department of Environmental Quality (WYDEQ) through an effort of the Western Regional Air Partnership (WRAP). This inventory report presents a preliminary draft greenhouse gas (GHG) emissions inventory and forecast from 1990 to 2020 for Wyoming. This report provides an initial comprehensive understanding of Wyoming's current and possible future GHG emissions. The information presented provides the State with a starting point for revising the initial estimates as improvements to data sources and assumptions are identified.

The inventory report discloses that activities in Wyoming accounted for approximately 56 million metric tons (MMt) of *gross* carbon dioxide equivalent (CO₂e) emissions in 2005, an amount equal to 0.8% of total US gross GHG emissions. These emission estimates focus on activities in Wyoming and are *consumption-based*; they exclude emissions associated with electricity that is exported from the State. Wyoming's gross GHG emissions increased 25% from 1990 to 2005, while national emissions rose by only 16% from 1990 to 2004. Annual sequestration (removal) of GHG emissions due to forestry and other land-uses in Wyoming are estimated at 36 MMtCO₂e in 2005. Wyoming's per capita emission rate is more than four times greater than the national average of 25 MtCO₂e/yr. This large difference between national and State per capita emissions occurs in most of the sectors – Wyoming's emission per capita significantly exceed national emissions per capita for the following sectors: electricity, industrial, fossil fuel production, transportation, industrial process and agriculture. The reasons for the higher per capita intensity in Wyoming are varied but include the State's strong fossil fuel production industry and other industries with high fossil fuel consumption intensity, large agriculture industry, large distances, and low population base. Between 1990 and 2005, per capita emissions in Wyoming have increased, mostly due to increased activity in the fossil fuel industry, while national per capita emissions have changed relatively little.

Wyoming's gross GHG emissions are expected to continue to grow to 69 MMtCO₂e by 2020, 56% above 1990 levels. As shown in Figure ES-3, demand for electricity is projected to be the largest contributor to future emissions growth, followed by emissions associated with transportation. Although GHG emissions from fossil fuel production had the greatest increase by sector in the period 1990 to 2005, the growth from this sector is projected to decline due to assumption of decreased carbon dioxide emissions from venting at processing plants.

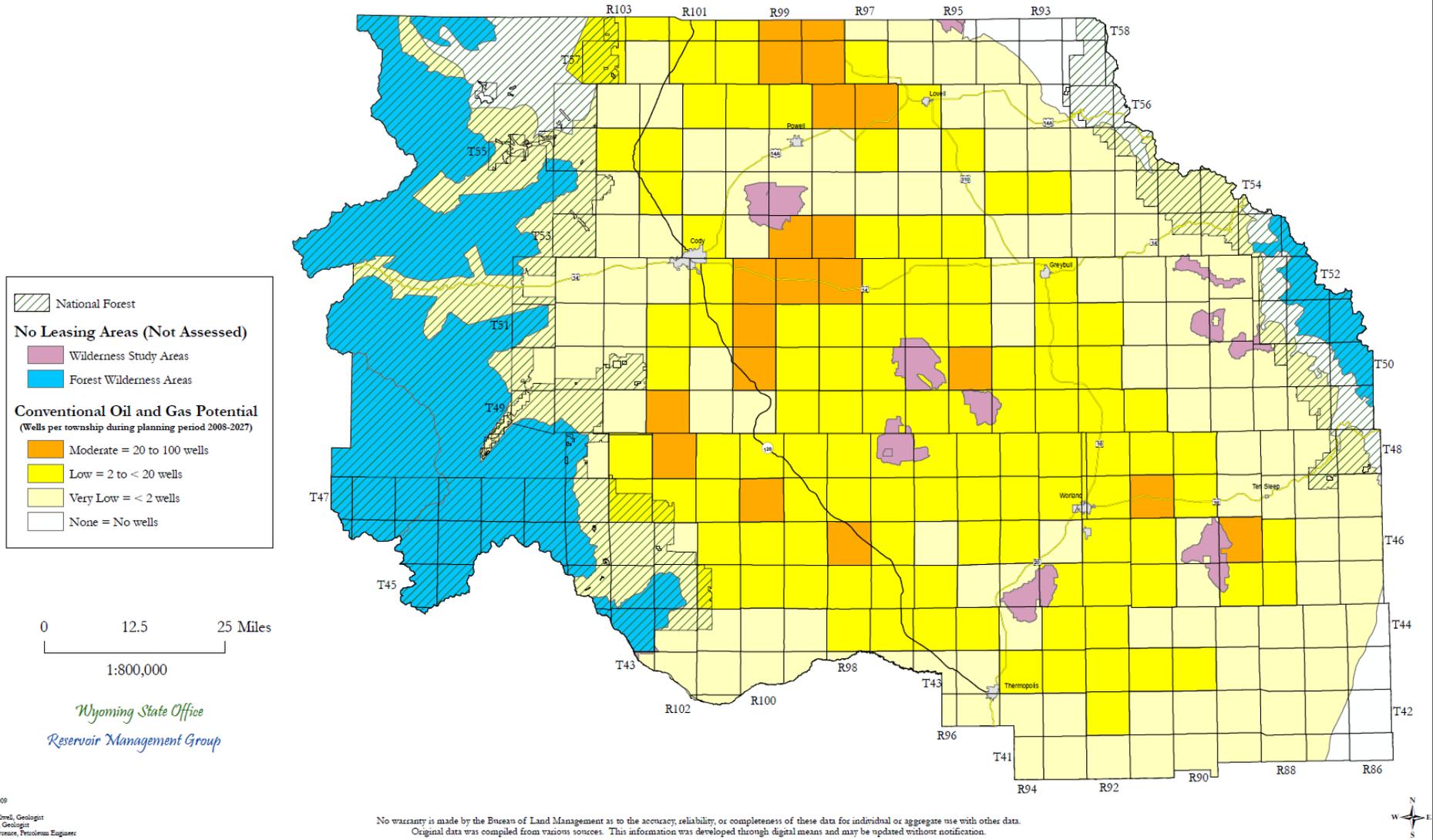
As of 2008, the Inventory indicates that there over 33,000 oil and gas wells in the State.

There are approximately 2688 existing Federal oil and gas wells in the Worland Field Office, which account for approximately 7.6 percent of the total Federal wells in Wyoming. Therefore, GHG emissions from all wells within the field office amount to approximately 1.4896 metric tons annually (mt) (19.6 mt X 0.076 = 1.4896 mt).

Of the leases that have been sold, 14 parcels are located within an area defined as having Moderate Potential for Oil and Gas development in the 2009 Draft Reasonably Foreseeable Development (RFD) Scenario Document produced by the WY State Office Reservoir management Group for the Bighorn Basin RMP revision process. Additionally, 107 parcels are located in the Low Potential area and 21 parcels are located within the Very Low Potential area. The potential number of wells to be drilled per township in these areas is shown below in Figure 3 taken from the 2009 draft RFD Scenario document.

See Section 4.5 for a discussion of the impacts of these potential greenhouse gas emissions on global climate change.

Figure 45.
Oil and gas (excluding coalbed natural gas) development potential and projected drilling densities within the Bighorn Basin Planning Area for 2008 through 2027.



Mitigation

The BLM holds regulatory jurisdiction over portions of natural gas and petroleum systems, identified in the EPA Inventory of US Greenhouse Gas Emissions and Sinks document. Exercise of this regulatory jurisdiction has led to development of “Best Management Practices (BMPs)” designed to reduce emissions from field production and operations. Analysis and approval of future development on the lease parcels would include applicable BMPs as conditions of approval (COAs) in order to reduce or mitigate GHG emissions. Additional measures developed at the project development stage would be incorporated as COAs in the approved APD or with a programmatic EIS, which are binding on the operator.

Such mitigation measures may include, but are not limited to:

- Flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion through the use of multi-chamber combustors;
- “Green” (flareless) completions,
- Water dirt roads during periods of high use in order to reduce fugitive dust emissions;
- Require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored;
- Installation of liquids gathering facilities or central production facilities to reduce the total number of sources and minimize truck traffic,
- Use of natural gas fired or electric drill rig engines,
- The use of selective catalytic reducers on diesel-fired drilling engines; and,
- Re-vegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads.

The EPA Inventory data show that adoption by industry of the Best Management Practices proposed by the EPA's Natural Gas Energy Star program has reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). The Worland Field Office will work with industry to facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.3 Wildlife Special Status Species

Alternative A: No Action

Under the No-Action alternative, oil and gas development of the three parcels would not occur. Therefore, no impacts would result from BLM actions. Additionally, activities in Sage Grouse Key Areas would be limited to those associated with current land uses, primarily recreation and agriculture. Sage Grouse Key Areas are the core areas identified by the state of Wyoming, adjusted to include additional habitat identified in consultation with the local WY Game and Fish office, and consistent with the WY Governor’s strategy to conserve the species in support of the USFWS finding of Warranted but Precluded. As discussed previously, many of these parcels may be eligible for nomination, lease, and development in the future, and could be leased subject to appropriate levels of restriction identified in the RMP at the time.

Alternative B: Full Issuance

Under this alternative, all leases would be issued with the stipulations as detailed in Appendix A. However, due to the larger acreage under this Alternative potentially subject to surface disturbing activities, the potential for impacts are similar to, but have a higher probability of occurring and at a greater intensity, as under Alternative C. Without conformance with the WY Sage Grouse Core Area Conservation Strategy, it is likely that the Sage Grouse would be listed as a T&E species; such a listing would violate the BLM Sensitive Species policy as authorized under BLM Manual 6840.

Alternative C: Proposed Action

Under this alternative, leases for one parcel (#85) would be issued with stipulations in accordance with the Sage Grouse Core strategy. All other impacts are the same as those described in the Draft Grass Creek and Washakie RMP's as they relate to Sage Grouse.

Mitigation

Modification of the stipulations for this parcel is recommended to ensure continued population and habitat objectives for the Greater Sage Grouse. Additional mitigation and/or Conditions of Approval could be identified at the development stage to further minimize impacts associated with oil and gas development.

4.4 Multiple Use Lands with Wilderness Characteristics

Alternative A: No Action

In the No-Action Alternative, these leases would not be issued. Management of these areas with wilderness characteristics would be preserved for analysis and decision in an appropriate planning document. Future leasing decisions would be consistent with that document.

Alternative B: Full Issuance

Under this alternative, all three leases would be issued with the stipulations as detailed in Appendix A. However, due to the larger acreage under this Alternative potentially subject to surface disturbing activities, the potential for impacts are similar to, but have a higher probability of occurring, as under Alternative B. Regardless, issuance of all leases, including those potentially containing wilderness characteristics could cause adverse environmental impacts and preclude alternative formulation under the Bighorn Basin RMP revision which could potentially violate NEPA policy.

Alternative C: Proposed Action

An inventory of areas identified as containing wilderness characteristics was performed in the Worland Field Office in 2009. As a result, all three parcels were screened for wilderness characteristics. Of those, approximately 680 acres within two parcels out of the three parcels offered for lease contain areas that have been identified as containing wilderness characteristics

Under this alternative, one lease would be issued as nominated, and a deferral of issuance of two lease parcels, containing approximately 680 acres of lands potentially containing wilderness characteristics, would be deferred until management direction could be instituted in the RMP Record of Decision. If the

decision was made not to issue the leases, those parcels would not be subject to development but could potentially be made available at another time.

Mitigation

None

4.5 Cumulative Impacts

There are approximately 2,688 Federal producing wells in the Worland Field Office; there are no producing coalbed methane production wells.

Analysis of cumulative impacts for reasonably foreseeable development (RFD) of oil and gas wells on public lands in the Worland Field Office is presented in the 1988 Draft Grass Creek and 1998 Washakie Resource Management Plans (RMP). Potential development of all available federal minerals in the field office, including those in the proposed lease parcels, was included as part of the analysis.

As described in the analysis of environmental consequences, the proposed action and/or the alternative may contribute to the effects of climate change to some extent through GHG emissions. However, it is not currently possible to associate any of these particular actions with the creation of any specific climate-related environmental effects. The lack of scientific tools designed to predict climate change at regional or local scales limits the ability to quantify potential future impacts.

The assessment of greenhouse gas (GHG) emissions and climate change is still in its formative phase; therefore, it is not yet possible to know with confidence the net impact on climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations.” As the temperatures of the land and sea change, environmental factors such as weather patterns, sea levels, precipitation rates, the timing of the seasons, desert distribution, forest cover, and ocean salinity will also change. These changes influence the world’s climate systems and will have different impacts to different areas. Some agricultural regions may become more arid while others become wetter; some mountainous areas will experience greater summer precipitation, yet experience disappearing snowpack.

The average number of oil and gas wells drilled annually in the Field Office and probable GHG emission levels, when compared to the total GHG emission estimates from the total number of Federal oil and gas wells in the State, represent an incremental contribution to the total regional and global GHG emission levels. This incremental contribution to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of these site-specific actions. As oil and gas and natural gas production technology continues to improve in the future, one assumption is that it may be feasible to further reduce GHG emissions.

Regarding the linkage between climate change related warming and associated impacts, an assessment of the IPCC states that difficulties remain in attributing observed temperature changes at smaller than

continental scales. Therefore, it is currently beyond the scope of existing science to predict climate change on regional or local scales resulting from specific sources of GHG emissions.

Significant uncertainties remain with respect to the estimates of the current level of emissions and projections of future production of fossil fuels as the oil and gas industry is difficult to forecast with the mix of drivers: economics, resource supply, demand, and regulatory procedures. The assumptions used for the projections, based on recent trends or State production trends in the near-term, and AEO2006 growth rates through 2020, do not include any significant changes in energy prices, relative to today's prices. Large price swings, resource limitations, or changes in regulations could significantly change future production and the associated GHG emissions. Other uncertainties include the volume of GHGs vented from gas processing facilities in the future, any commercial oil shale or coal-to-liquids production, and potential emissions-reducing improvements in oil and gas production, processing, and pipeline technologies.

There are currently no proposals for renewable energy projects in the Worland Field Office.

5.0 Description of Mitigating Measures and Residual Impacts

The issuance of those leases identified under the proposed action will be mitigated by attaching appropriate conditions of approval to any subsequent requests for lease development either on a case by case basis or upon receipt of a multi-well project proposal. The Worland Field Office, Surface Use and Occupancy Requirements, Conditions of Approval, and the Worland Field Office's Special Leasing Stipulations, which are in place at the Wyoming State Office, will provide adequate mitigation for issuance of all lease parcels under the Proposed Action.

Direct, indirect, cumulative and residual impacts of leasing and lease development are generally described in the Grass Creek and Washakie Approved Resource Management Plan and Record of Decisions, October 1988 and October 1998, respectively. An environmental analysis will be prepared on a case-by-case basis upon receipt of future subsequent actions.

6.0 Consultation/Coordination

Worland Field Office BLM Staff
Holly Elliott, Natural Resource Specialist

Wyoming State Office BLM Staff
Christopher Carlton, Planning and Environmental Coordinator
Merry Gamper, Physical Scientist

7.0 References

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U.S. Department of the Interior, Bureau of Land Management. 1988. Grass Creek Approved Resource Management and Plan Record of Decision. Worland, Wyoming.

U.S. Department of the Interior, Bureau of Land Management. 1998. Washakie Proposed Resource Management Plan and Final Environmental Impact Statement. Worland, Wyoming.

U.S. Department of the Interior, Bureau of Land Management. 1998. Washakie Approved Resource Management and Plan Record of Decision. Worland, Wyoming

7.1 Authorities

Code of Federal Regulations (CFR) 3100

40 CFR All Parts and Sections inclusive Protection of Environment, Revised as of July 1, 2001.

43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

APPENDIX A

Lease Parcels (As Proposed)

WY-1008-085 1200.000 Acres
T.0460N, R.0910W, 06th PM, WY
Sec. 022 NE,NESE,S2SE;
023 E2,N2NW,SEW,SW;
024 W2;

Washakie County
Worland FO
Formerly Lease No.
Stipulations:

Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3

Special Lease Stipulation

TLS (1) Feb 1 to Jul 31; (2) as mapped on the Worland Field Office GIS database; (3) protecting nesting Raptors.

WY-1008-090 240.000 Acres
T.0500N, R.0950W, 06th PM, WY
Sec. 015 E2NW,SW;

Big Horn County
Worland FO
Formerly Lease No.
Stipulations:

Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3

Special Lease Stipulation

WY-1008-091 360.000 Acres
T.0500N, R.0950W, 06th PM, WY
Sec. 022 NE,N2SE;
023 W2NW,NWSW;

Big Horn County
Worland FO
Formerly Lease No.
Stipulations:

Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3

Special Lease Stipulation

TLS (1) Nov 15 to Apr 30; (2) as mapped on the Worland Field Office GIS database; (3) protecting big game on crucial winter range.

APPENDIX B

Lease Parcels (As Modified)

WY-1008-085 880.000 Acres

T.0460N, R.0910W, 06th PM, WY

Sec. 022 NESE,S2SE;
023 S2,S2NE,SENW;
024 W2;

Washakie County

Worland FO

Formerly Lease No.

Stipulations:

Lease Notice No. 1

Lease Notice No. 2

Lease Notice No. 3

Special Lease Stipulation

TLS (1) Feb 1 to Jul 31; (2) as mapped on the Worland Field Office GIS database; (3) protecting nesting Raptors.

CSU (1) 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 critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation; (2) as mapped on the Worland Field Office GIS database; (3) protecting *Centrocercus urophasianus* (Greater sage-grouse).

WY-1008-090 240.000 Acres

T.0500N, R.0950W, 06th PM, WY

Sec. 015 E2NW,SW;

Big Horn County

Worland FO

Formerly Lease No.

Stipulations:

Lease Notice No. 1

Lease Notice No. 2

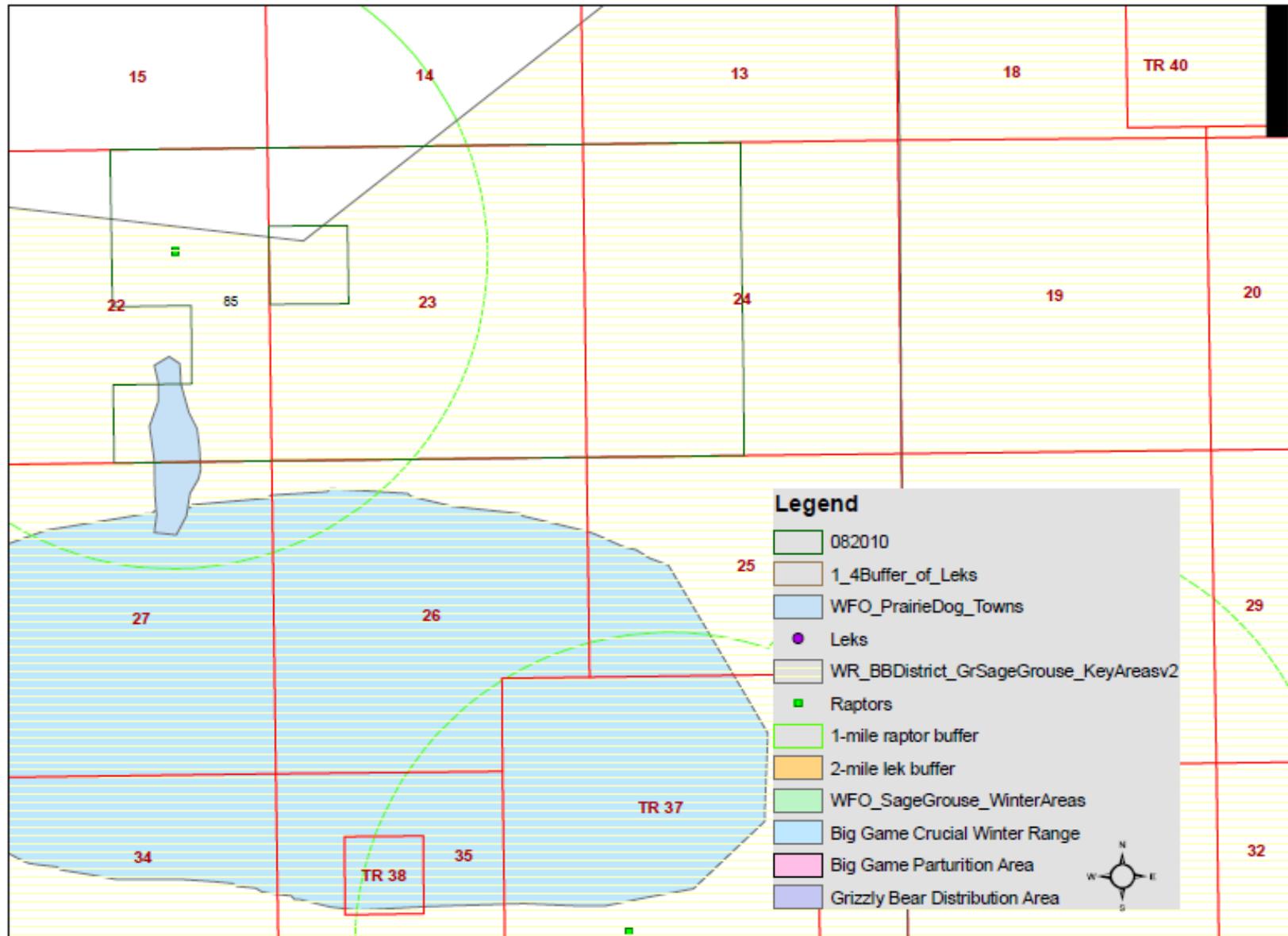
Lease Notice No. 3

Special Lease Stipulation

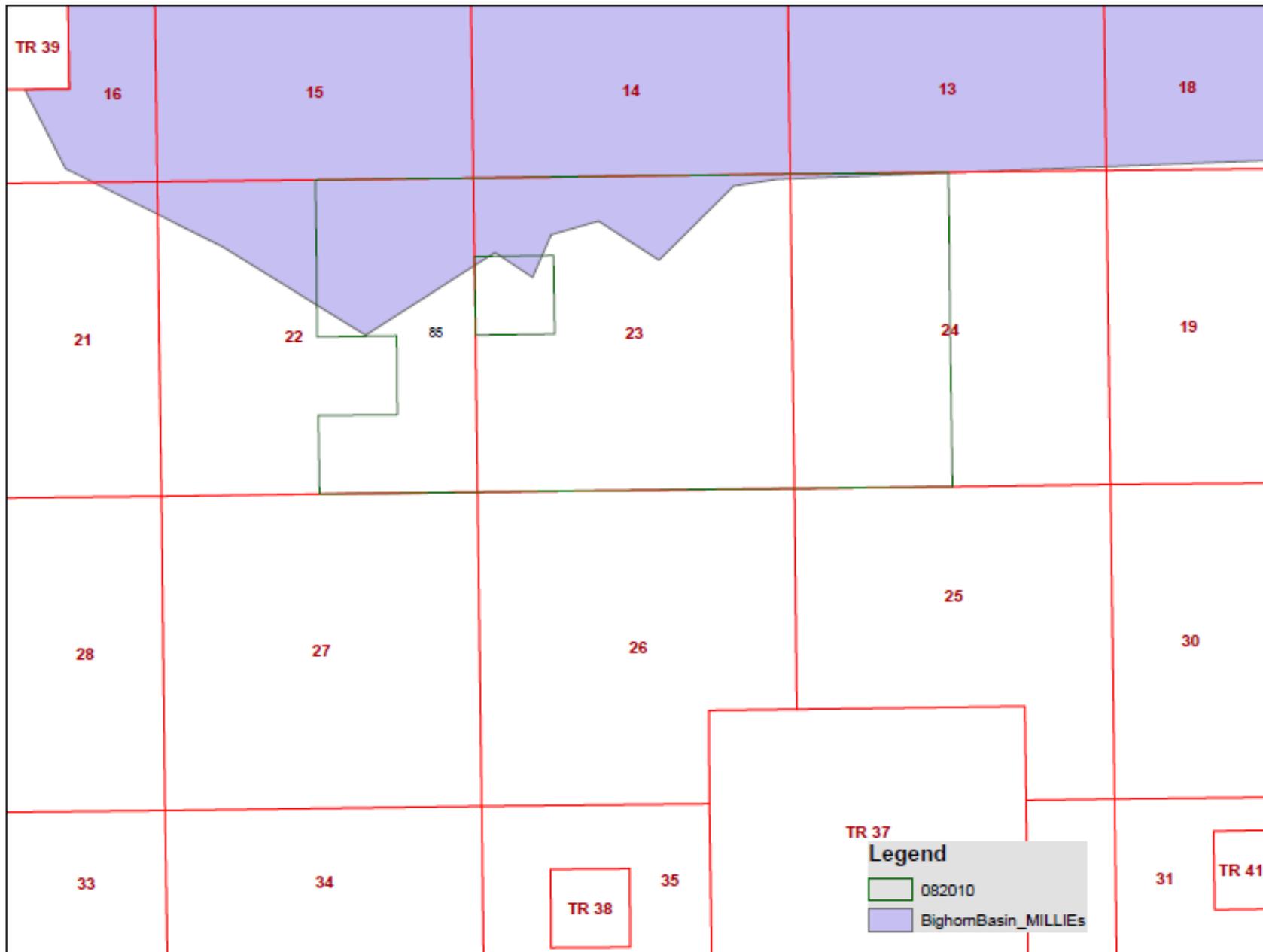
APPENDIX C

Maps of Proposed Leases

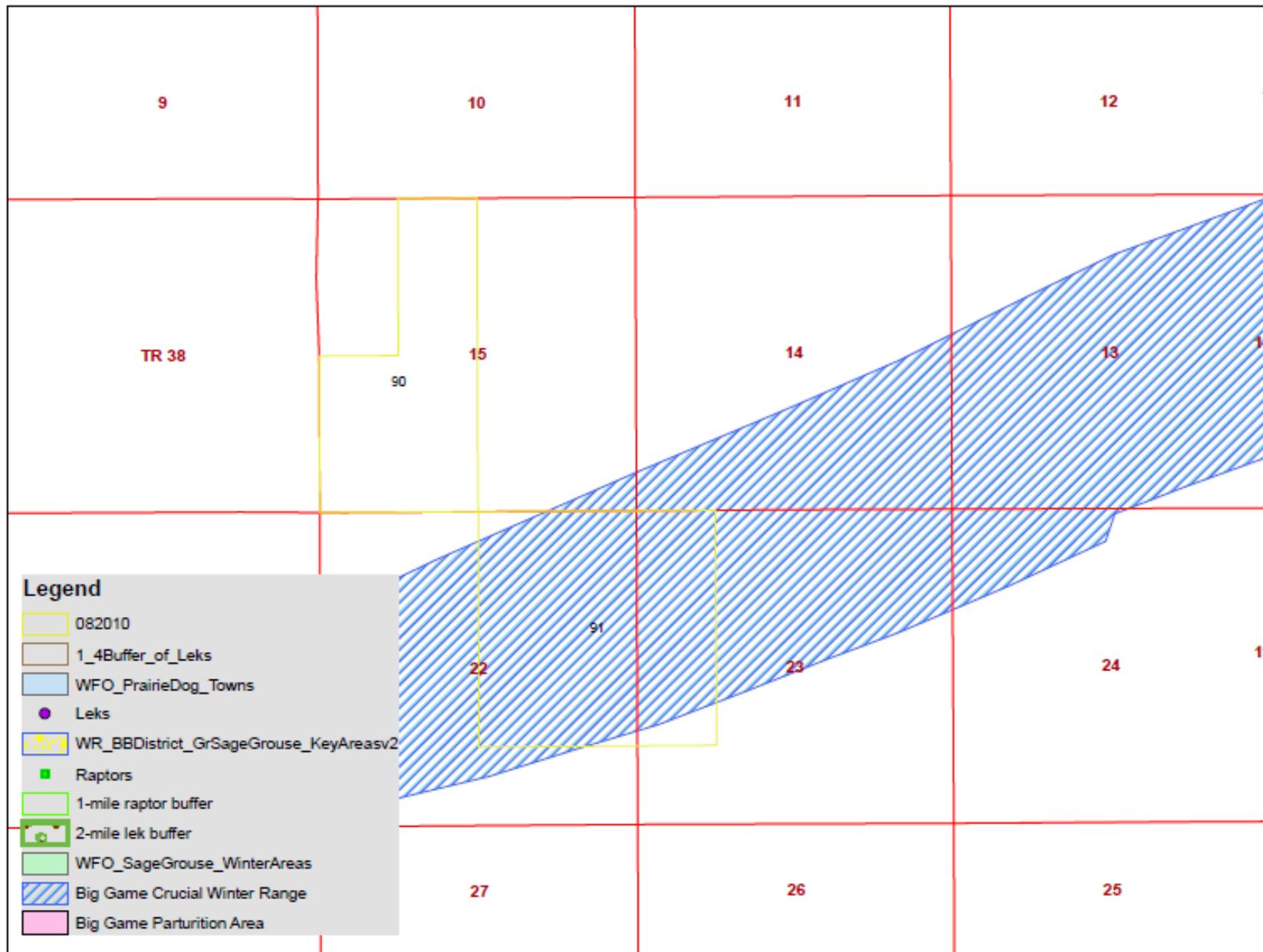
Map 1 - Parcel 85 - Wildlife



Map 2 - Parcel 85 - Multiple Use Lands with Wilderness Characteristics



Map 3 -Parcels 90 & 91 - Wildlife



Map 4 Parcels 90 & 91 – Multiple Use Lands with Wilderness Characteristics

