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

First Quarter 2019 Competitive Oil and Gas Lease Sale

BLM Wyoming

Environmental Assessment
DOI-BLM-WY-0000-2019-0001-EA

Bureau of Land Management
Wyoming State Office
5353 Yellowstone Dr.
Cheyenne, Wyoming 82009

BLM e-Planning link: https://go.usa.gov/xPpEv

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

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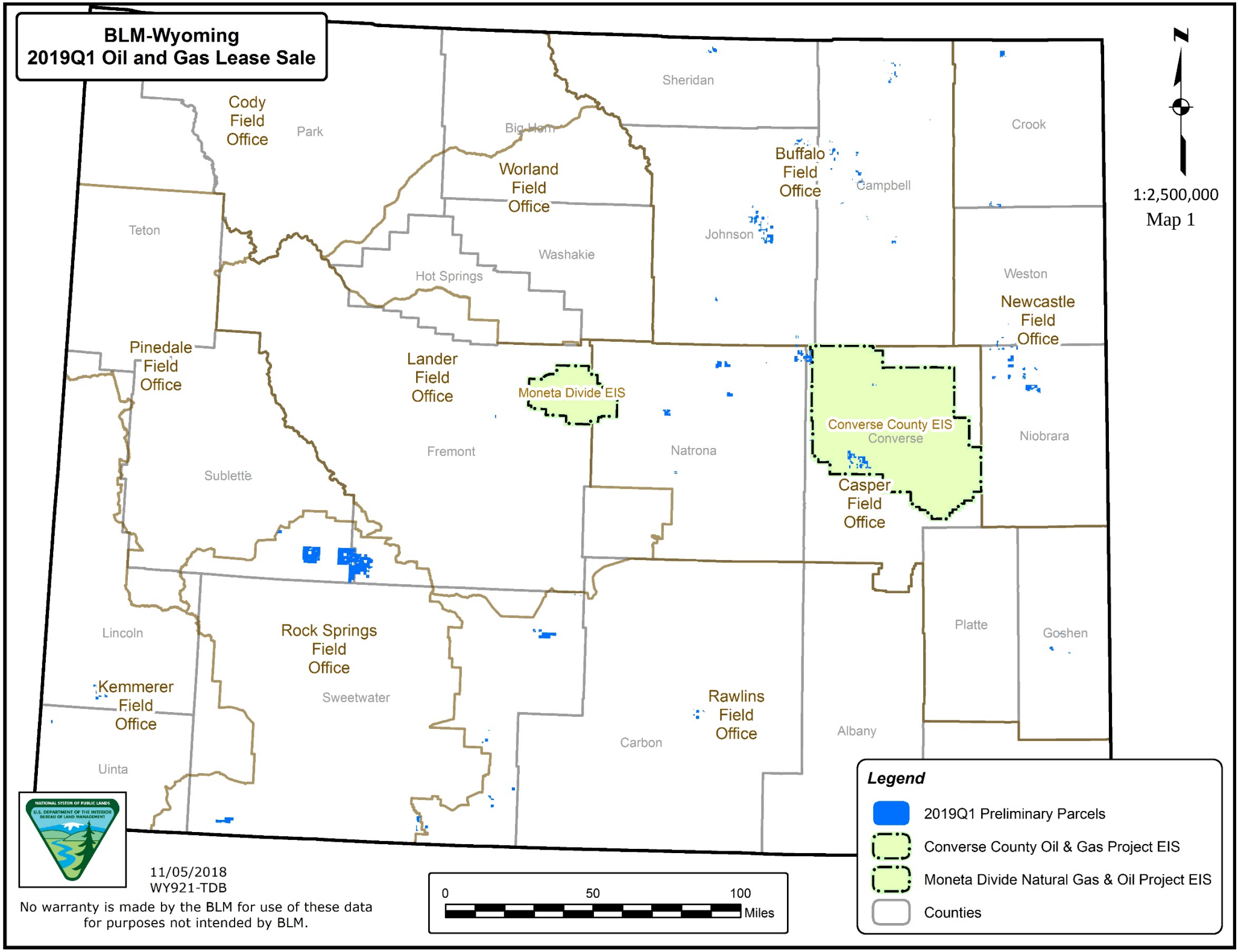
1. Introduction

1.1 Introduction

As required under the Mineral Leasing Act of 1920, as amended (MLA), the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (FOOGLRA), and Title 43 Code of Federal Regulations (CFR) 3120.1-2(a), the BLM-Wyoming State Office (WSO) conducts a quarterly competitive lease sale for nominated oil and gas lease parcels. A Notice of Competitive Oil and Gas Lease Sale (Sale Notice), which lists parcels to be offered at the auction, is published by the WSO at least 45 days before the auction is held. Applicable lease stipulations for each parcel are identified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary is made during the BLM's land use planning process in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA). Surface management/use for mineral extraction on non-BLM administered surface overlying federal minerals will be determined by the BLM in consultation with the appropriate surface management agency or the private surface owner at the time such surface use is proposed by the leaseholder or their designated operator.

After the end of the nomination period during which the WSO accepted Expressions of Interest (EOIs) for this lease sale, the WSO prepared a draft list of lease sale parcels (the "preliminary parcel list") for this portion of the sale. The WSO submitted the draft list of lease sale parcels to the applicable BLM field and district offices for initial review and processing (see Map 1). Interdisciplinary Teams (IDTs) in each field office, in coordination with their district office, have reviewed the parcels to determine 1) if they are located in areas open to leasing under the approved RMP; 2) the appropriate stipulations required under the approved RMP; 3) whether new information or changed circumstances are present since the land use plan was approved; 4) necessary coordination requirements with other Federal or State agencies; and 5) if there are special conditions of which potential bidders should be made aware. The IDT relied on personal knowledge of the areas involved and reviewed existing databases (including Geographic Information System (GIS) data and digital aerial imagery) and file information to determine the appropriate stipulations. Where the BLM personnel determined field visits were necessary, field visits were made to those parcels where the BLM had legal access.

This Environmental Assessment (EA) has been prepared by the BLM to document its review of the proposed parcels, as well as to disclose the anticipated impacts of leasing the proposed parcels, to the extent reasonably foreseeable. The BLM will address all timely public comments on the EA through responses that will be published to the BLM's e-Planning website for this sale (see cover page) on or around the time the Sale Notice is published.


BLM-Wyoming
2019Q1 Oil and Gas Lease Sale
Cody Field Office
Park
Big Horn
Sheridan
Crook
Worland Field Office
Buffalo Field Office
Campbell
Johnson
Teton
Washakie
Hot Springs
Weston
Newcastle Field Office
Pinedale Field Office
Lander Field Office
Moneta Divide EIS
Converse County EIS
Converse
Niobrara
Fremont
Natrona
Sublette
Casper Field Office
Lincoln
Rock Springs Field Office
Platte
Goshen
Kemmerer Field Office
Sweetwater
Rawlins Field Office
Albany
Carbon
Uinta
N
1:2,500,000
Map 1
Legend
2019Q1 Preliminary Parcels
Converse County Oil & Gas Project EIS
Moneta Divide Natural Gas & Oil Project EIS
Counties
0
50
100
Miles
11/05/2018
WY921-TDB
No warranty is made by the BLM for use of these data for purposes not intended by BLM.

1.2 Background

The MLA gives the BLM responsibility for oil and gas leasing on about 700 million acres of BLM, national forest, and other federal lands. The BLM seeks to ensure that mineral resources are developed in an environmentally-responsible manner.

As required by 43 CFR § 3120.1-2, the BLM WSO conducts quarterly competitive oil and gas lease sales. Interested parties file Expressions of Interest (EOIs) to nominate parcels for leasing by the BLM. Additional information on the competitive lease sale process is available on-line at:

https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing

The Secretary of the Interior has broad authority and discretion under the MLA, FOOGLRA, and FLPMA to administer oil and gas leasing and lease operations on public lands.

If a BLM decision-maker determines that a resource requires mitigation in the form of new allocation decision or additional lease stipulations, generally the RMP must first be updated or amended.

The offering and subsequent issuance of oil and gas leases is strictly an administrative action, which, in and of itself, does not cause or directly result in any surface disturbance. The issuance of an oil and gas lease, however, does grant to the lessee the rights to occupy, explore for, and develop oil and gas resources from the lease consistent with the lease terms and conditions and upon approval of a site-specific permit by the BLM authorized officer. These lease operations can result in surface-disturbance and other impacts.

Our regulations at 43 CFR § 3162.5-1(a) state: "The operator shall conduct operations in a manner which protects the mineral resources, other natural resources, and environmental quality. In that respect, the operator shall comply with the pertinent orders of the authorized officer and other standards and procedures as set forth in the applicable laws, regulations, lease terms and conditions, and the approved drilling plan or subsequent operations plan. Before approving any Application for Permit to Drill submitted pursuant to § 3162.3-1 of this title, or other plan requiring environmental review, the authorized officer shall prepare an environmental record of review or an environmental assessment, as appropriate. These environmental documents will be used in determining whether or not an environmental impact statement is required and in determining any appropriate terms and conditions of approval of the submitted plan."

The BLM cannot determine at the leasing stage whether or not a nominated parcel will actually be leased, or if it is leased, whether or not the lease would be explored or developed.

According to the Tenth Circuit Court of Appeals, site-specific NEPA analysis at the leasing stage may not be possible absent concrete development proposals. Whether such site-specific analysis is required depends upon a fact-specific inquiry. Often, where environmental impacts remain unidentifiable until exploration narrows the range of likely well locations, filing of an Application for Permit to Drill (APD) may be the first useful point at which a site-specific environmental appraisal can be undertaken. (*Park County Resource Council, Inc. v. U.S.*

Department of Agriculture, 10th Cir., April 17, 1987). In addition, the Interior Board of Land Appeals (IBLA) has decided that "BLM is not required to undertake a site-specific environmental review before issuing an oil and gas lease when it previously analyzed the environmental consequences of leasing the land..." (*Colorado Environmental Coalition, et al.*, IBLA 96-243, decided June 10, 1999). However, when site-specific impacts are reasonably foreseeable at the leasing stage, NEPA requires the analysis and disclosure of such reasonably foreseeable site specific impacts. (*N.M ex rel. Richardson v. BLM*, 565 F.3d 683, 718-19 (10th Cir. 2009)). The BLM has not received any site-specific development proposals concerning the proposed lease parcels addressed in this EA. This site-specific environmental documentation would provide analysis for the well pad location(s). Additional mitigation and Best Management Practices (BMPs) may be applied as Conditions of Approval (COAs) at that time.

Once a parcel is sold and the lease is issued, the lessee has the right to use as much of the leased lands as is necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease, restrictions derived from specific nondiscretionary statutes, and other reasonable measures to minimize adverse impacts (see 43 § CFR 3101.1-2).

In accordance with BLM Handbook H-1624-1 ("Planning for Fluid Mineral Resources" January 28, 2013), the Federal Government retains certain rights when issuing an oil and gas lease. While the BLM may not unilaterally add a new stipulation to an existing lease that it has already issued, the BLM can subject development of existing leases to reasonable conditions, as necessary, through the application of COAs at the time of permitting. The new constraints must be in conformance with the applicable land use plan and not conflict with rights granted to the holder under the lease. The Interior Board of Land Appeals has made clear that, when making a decision regarding discrete surface-disturbing oil and gas development activities following site-specific environmental review, the BLM has the authority to impose reasonable measures not otherwise provided for in lease stipulations, to minimize adverse impacts on other resource values. See 30 U.S.C. § 226(g); 43 CFR § 3101.1-2. See also *Yates Petroleum Corp*., 176 IBLA 144 (2008); *National Wildlife Federation*, 169 IBLA 146, 164 (2006).

Oil and gas leases are issued for a 10-year period and continue for so long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and/or gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease, then ownership of the minerals leased revert back to the federal government and may be offered for lease again, all else equal. If a lessee fails to pay rentals timely, or fails to pay the full amount due, the lease can be reinstated following payment of the late fees and publication of a notice in the Federal Register.

Upon cessation of lease operations, if approved, the BLM's regulations and the terms of the lease agreement require the lessee to plug the well(s) and abandon any facilities on the lease. The surface must be reclaimed to the satisfaction of the BLM authorized officer, in accordance with Onshore Oil and Gas Order No. 1.

1.3 Purpose and Need

It is the policy of the BLM as derived from various laws, including the Mineral Leasing Act of 1920, as amended (MLA) and the Federal Land Policy and Management Act of 1976 (FLPMA) to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs. Continued sale and issuance of lease parcels in conformance with the approved Resource Management Plans (RMPs) would allow for continued production of oil and gas from public lands and reserves.

The need is to respond to Expressions of Interest, as established by the Federal Onshore Oil & Gas Leasing Reform Act of 1987 (FOOGLRA), MLA, and FLPMA.

1.3.1 Decisions to Be Made

Decisions to be made based on this analysis include which parcels are located in areas open or closed to leasing, which parcels would be offered for lease, which parcels would be deferred, and what stipulations will be placed on the parcels that would be offered for lease at the First-Quarter 2019 competitive oil and gas lease sale, in conformance with the approved RMPs.

1.4 Tiering and Conformance with BLM Land Use Plans and Other Environmental Assessments

Pursuant to 40 CFR § 1508.28 and § 1502.21, this EA tiers to the Final Environmental Impacts Statements (FEISs) prepared for each Field Office RMP, and any subsequent amendments or updates, and incorporates by reference the relevant portions of the FEISs. The impacts analysis in the FEISs for the effects from oil and gas leasing and development incorporates the Reasonably Foreseeable Development (RFD) scenarios (i.e., the level of oil and gas development projected for the life of the plan based on historically and projected trends).

The EA conforms to the approved RMPs (43 CFR § 1610.5) and Records of Decision (RODs) for the applicable planning areas, as amended or updated, including:

High Plains District (HPD)

- The Proposed RMP and FEIS for the Buffalo Field Office (BFO) (May 2015) and the RMP/ROD signed on September 21, 2015, and the Fortification Creek RMP Amendment EA, FONSI, and DR signed on August 5, 2011.
- The Proposed RMP and FEIS for the Casper Field Office (CFO) Planning Area (June 2007) and the RMP/ROD approved on December 7, 2007, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.
- The FEIS for the Newcastle Field Office (NFO) RMP (June 1999) and the RMP/ROD approved on August 25, 2000, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.

Wind River/Bighorn Basin District (WRBBD)

- The Proposed RMP and FEIS for the Lander Field Office (LFO) Planning Area (February 2013), and the RMP/ROD signed on June 26, 2014.
- The Bighorn Basin Proposed RMP and FEIS (May 2015); the Rocky Mountain Region ROD and Worland Field Office (WFO) RMP signed on September 22, 2015; and the Rocky Mountain Region ROD and Cody Field Office (CYFO) RMP signed on September 22, 2015.

High Desert District (HDD)

- The Proposed RMP and FEIS for the Rawlins Field Office (RFO) Planning Area (January 2008) and the RMP/ROD approved on December 24, 2008, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.
- The Proposed RMP and FEIS for the Green River (Rock Springs Field Office, or RSFO) Planning Area (April 1996) and the RMP/ROD approved on August 8, 1997, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.
- The Proposed RMP and FEIS for the Pinedale Field Office (PFO) Planning Area (August 2008) and the RMP/ROD approved on November 26, 2008, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.
- The Proposed RMP and FEIS for the Kemmerer Field Office (KFO) Planning Area (August 2008) and the RMP/ROD approved on May 24, 2010, as amended by the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (May 2015), and the RMP/ROD approved on September 21, 2015.

The field office RMPs, as revised or amended, include allocation decisions which identify lands as either open or closed to fluid mineral leasing, and (if open) provide stipulations that are attached to new leases to mitigate effects of potential development operations.

This EA serves to verify conformance with the approved RMPs and disclose the affected environment, the anticipated impacts and proposed mitigation of potential and reasonably-foreseeable impacts. The EA provides evidence for determining whether to prepare an EIS or to support a "Finding of No Significant Impact" (FONSI). An EIS would be prepared for the project if the decision maker determines that this project has significant impacts not already disclosed and analyzed in other NEPA documents, such as the RMP EISs, based upon the analysis in the EA. A FONSI documents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects). The RMP EISs have already evaluated potentially significant impacts arising from the BLM's land use planning decisions. See 43 CFR § 46.140(c). Therefore, the BLM anticipates a "finding of no new significant impacts" (FONNSI). When a FONNSI is reached, a Decision Record (DR) may be signed approving the selected alternative, which could be the proposed action, another alternative, or a combination thereof.

1.5 Relationship to Statutes, Regulations, and Other Plans or Decisions

The proposed action and alternatives are consistent with other plans, programs, and policies of other federal agencies, the State of Wyoming, local governments, and affected Tribes, to the extent practical, including but not limited to the following:

- Federal Land Policy and Management Act of 1976, as amended [43 U.S. Code § 1701 et seq.]
- Mineral Leasing Act of 1920, as amended [30 U.S.C. § 181 et seq.]
- Federal Onshore Oil & Gas Leasing Reform Act of 1987 [30 U.S.C. § 181 et seq.]
- The National Environmental Policy Act [42 U.S.C. 4321 et seq.]
- Clean Air Act [42 U.S.C. § 1857 et seq.], as amended and recodified [42 U.S.C. § 7401 et seq.]
- Clean Water Act [33 U.S.C. § 1251 et seq.]
- Endangered Species Act [16 U.S.C. § 1531 et seq.]
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Migratory Bird Treaty Act [16 U.S.C. § 703 et seq.]
- National Trails Systems Act [16 U.S.C. § 1241 et seq.]
- National Landscape Conservation System Act [16 U.S.C. § 7202]
- National Historic Preservation Act of 1966, as amended [54 U.S.C. § 300101 et seq.]
- Protection of Historic Properties (36 CFR § 800)
- Native American Graves Protection and Repatriation Act of 1990 [25 U.S.C. § 3001 et seq.] and 43 CFR § 10
- American Indian Religious Freedom Act of 1978 [42 U.S.C. 1996]
- Native American Trust Resource Policy standards are presented in the Department of the Interior Comprehensive Trust Management Plan dated March 28, 2003
- Wild and Scenic Rivers Act of 1968, as amended [16 U.S.C. § 1271 et seq.]
- Bald and Golden Eagle Protection Act of 1940, as amended [16 U.S.C. § 668 et seq.]
- Paleontological Resources Preservation Act of 2009 [16 U.S.C. §470aaa et seq.]

In an opinion and amended order on March 26, 2018, the U.S. District Court for the District of Montana found that the BLM violated NEPA in the Final EISs for the Buffalo and Miles City RMPs (*Western Organization of Resource Councils et al. v. BLM*). The Court found:

1. "NEPA requires BLM to conduct new coal screening and consider climate change impacts to make a reasoned decision on the amount of recoverable coal made available in the RMPs." (Order at page 46);
2. "BLM must supplement the [RMP FEISs] with an analysis of the environmental consequences of downstream combustion of coal, oil, and gas open to development under each RMP." (Order at page 47); and

3. “BLM violated NEPA where it failed to justify its use of [Global Warming Potentials, or GWPs] based on a 100-year time horizon rather than the 20-year time horizon of the RMPs. BLM also violated NEPA where it failed to acknowledge evolving science in this area in the Buffalo PRMP and FEIS.” (Order at page 48).

The Court ordered the BLM to comply with these findings “at the lease-level and permit-level for any pending or future coal, oil, or gas developments in the Buffalo RMP and the Miles City RMP until BLM produces the supplemental environmental analyses for the Buffalo RMP and Miles City RMP that comply with NEPA and the APA.” The BLM believes that the proposed First-Quarter 2019 competitive oil and gas lease sale complies with the Court’s order by satisfactorily addressing these issues in this EA (see sections 3.3.9 and 4.2.2.2 addressing “Greenhouse Gas Emissions and Climate” including estimates and discussion relating to downstream combustion of oil and gas, and discussion on GWPs).

1.6 Scoping

In order to identify preliminary issues for analysis (see the BLM’s NEPA Handbook H-1790-1 at page 41), the BLM conducted internal scoping. The BLM personnel listed in Attachment 5.7 provided information and input for this EA. Through the BLM’s internal scoping, and in light of the numerous EAs the BLM has prepared for oil and gas lease sales in Wyoming, this EA will not analyze issues that are already satisfactorily addressed in the RMP FEISs, to which it tiers.

1.7 Public Participation

Aside from public participation during preparation of the approved RMP EISs, public participation was initiated when this project was entered into the BLM-Wyoming e-Planning database on November 5, 2018 (https://go.usa.gov/xPpEv). A news release was issued on November 13, 2018 notifying the public that this EA is being posted on the BLM Wyoming website for a 30-calendar day public comment period. As required by BLM leasing policies, where parcels include split estate lands, a notification letter was sent to the surface owner(s) identified by the party submitting the EOI.

All substantive comments on the EA will be reviewed and addressed before the BLM reaches its decision.

2. Description of Alternatives, Including Proposed Action

2.1 Introduction

A preliminary parcel list of 146 parcels (comprised of approximately 163,963.72 acres) was prepared by the WSO and sent to the applicable field and district offices for review. A portion of a single parcel (46.00 acres) was identified as overlapping with an existing oil and gas lease. This portion of the parcel is deleted from this sale and will not be considered further. A summary of the deleted parcel is provided, below:

Table: Deleted Parcel

Office	Preliminary Parcel Number	Acres Reviewed	Acres Deleted	Partial/Entire Deletion	Acres Analyzed
BFO	WY-191Q-023	1,293.47	(46.00)	Partial	1,247.47
Total Acres Deleted:			**46.00**		

As a result, the BLM will evaluate the remaining 146 parcels or portions of parcels (comprised of 163,917.72 acres) in the alternatives, below.

2.2 No Action Alternative

Under the No Action Alternative, BLM Wyoming would not offer the 146 parcels nominated and located in areas open to leasing under the approved RMPs, which contain approximately 163,917.72 acres, at the First-Quarter 2019 lease sale. This would mean that the Expressions of Interest would be rejected and no lease parcels would be offered at the First-Quarter 2019 lease sale. Choosing the No Action alternative would not prevent future leasing in these areas consistent with land use planning decisions and subject to appropriate stipulations, identified in the respective land use plans.

2.3 Proposed Action Alternative

Under the Proposed Action Alternative, 146 parcels would be offered at the First-Quarter 2019 lease sale. These parcels contain approximately 163,917.72 acres of federal minerals that are open to oil and gas leasing under the applicable RMP RODs, as amended, including the BLM's Wyoming Approved Resource Management Plan Amendment (ARMPA) for Greater Sage-Grouse ROD (September 21, 2015). Some of the proposed lands to be offered include parcels with split estate private surface ownership.

Standard lease terms and conditions would apply (see BLM Form 3100-11). Lease stipulations (as required by 43 CFR § 3101.1-3) are added to each parcel as identified by the applicable approved RMPs. Refer to Attachment 5.1 for a list of the parcels, legal land descriptions, parcel acreages, BLM field office jurisdiction(s), and the proposed notices and stipulations attached to each.

In conformance with regulations in 43 CFR § 3120.2-1, sold oil and gas leases would be issued for a ten-year period and would continue for as long thereafter as oil and 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, the lease would terminate.

2.4 BLM-Modified Alternative

A total of 20 proposed parcels intersect the Wyoming Game and Fish Department's (WGFD's) designated migration corridor for the Sublette mule deer herd. Nineteen of these parcels are located within the RSFO's planning area (along the Red Desert to Hoback – RD2H – corridor segment; see Map 2), and one is located within the PFO's planning area (along the Mesa-Ryegrass – MRG – corridor segment; see Map 3). Another proposed parcel intersects the WGFD's designated migration corridor for the Platte Valley mule deer herd, within the RFO's planning area (see Map 4). Thus, a total of 21 parcels intersect the designated mule deer herd migration corridors.

During initial coordination between the WGFD and BLM on the proposed lease sale parcels,[1] the WGFD requested that the BLM consider deferring two entire parcels in the RSFO and portions of the two parcels in the PFO and RFO that intersect designated big game migration corridors.

The WGFD manages the mule deer populations in Wyoming, including by setting the herd population objectives. The BLM manages mule deer habitats on public lands in Wyoming to support the mule deer population objectives set by the WGFD.

Under the BLM-Modified Alternative, the BLM would defer two entire parcels (preliminary parcels -117, and -121) until the RSFO RMP revision is completed; in addition, the BLM would defer two portions of parcels in the RFO and PFO for further analysis, potentially including amendments to the approved land use plans. All parcels that would be offered and that intersect designated big game migration corridors will include a special lease notice to facilitate development of avoidance and other mitigation measures to protect the corridor. This approach is consistent with Secretarial Order 3362 ("Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" dated February 9, 2018).

In addition, the BLM IDT identified a single parcel (-141) located in the KFO's planning area that intersects an active coal lease and mining operations (Westmoreland's Kemmerer Mine; Lease WYW061422, within logical mining unit WYW133410). During the BLM's review of the proposed parcels, BLM Coal Program personnel identified lands for deferral to avoid potential conflicts between coal leasing/mining and oil & gas operations (see Map 5). Deferral of these lands is in conformance with the approved RMP governing administration of the subject lands. In addition, previous BLM-Wyoming guidance encourages a case-by-case approach to

[1] This coordination was completed in accordance with the BLM – WGFD Memorandum of Understanding WY-131 entitled "Oil and Gas Coordination Procedures…" and signed on September 3, 2013.

consideration of potential conflicts and their resolution (see BLM-WY IM WY-98-118;[2] see also guidance dated April 21, 2017 entitled "Suggested District Office – Field Office Coordination Steps to Avoid Potential Conflicts between Proposed Oil & Gas Leases and Existing or Proposed Coal Leases"). In accordance with the WSO's April 21, 2017 guidance, the BLM would defer these lands under this alternative until: coal mining operations have ceased on the lands and would not conflict with development of oil and gas operations, or when the BLM concludes that coal mining and oil and gas operations may be compatible on the same lands (for example, if it is determined that directional drilling from outside the coal mining area is feasible and would not conflict with the existing coal mining operations).

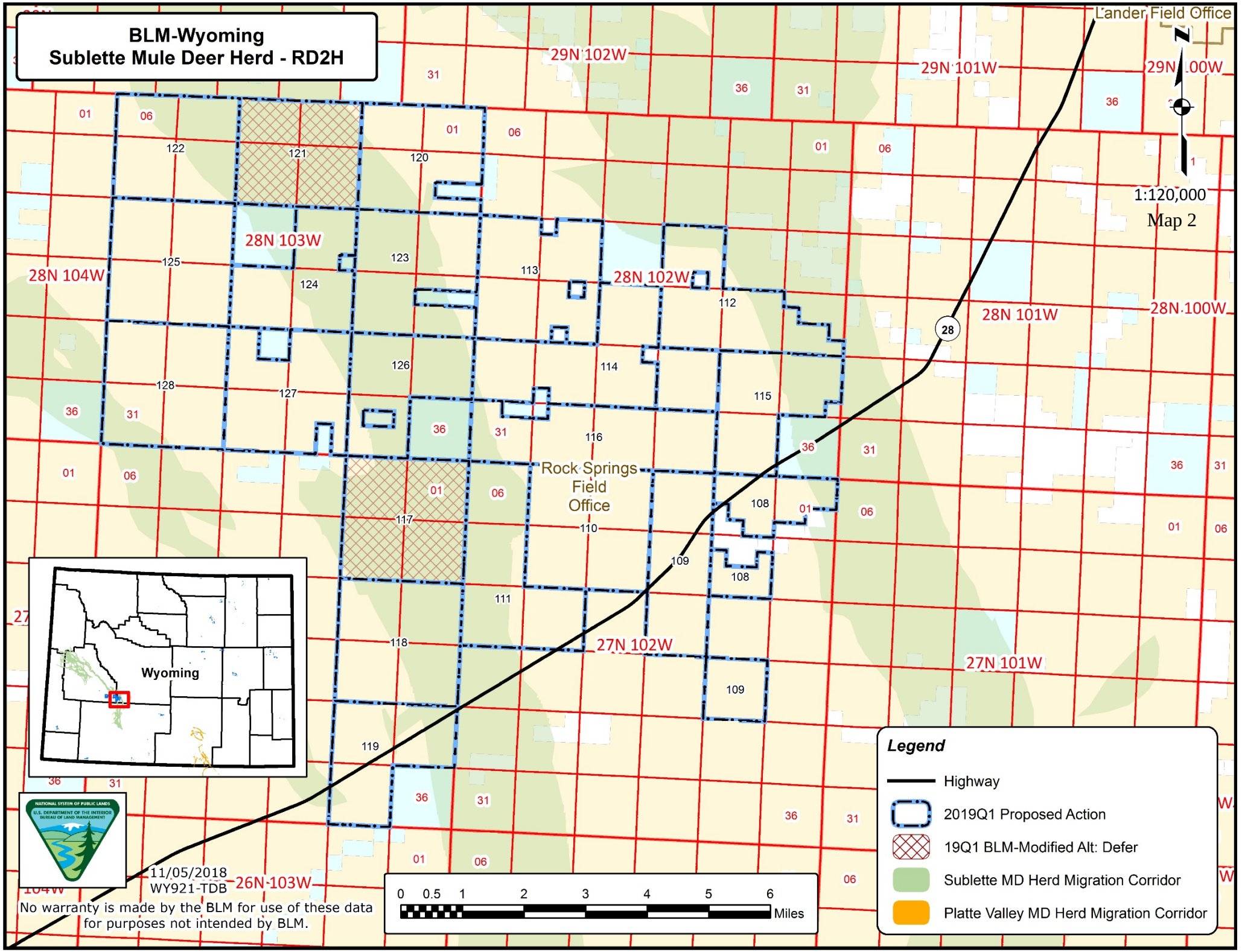
The BLM-Modified alternative is identical to the Proposed Action Alternative, but includes the deferral of the following parcels or portions of parcels, as described below:

Table: BLM-Modified Alternative Deferrals

Preliminary Parcel Number	Reason Deferred	Field Office	Partial or Entire Deferral	Deferred Acres/Legal Description
WY-191Q-094	WGFD-designated big game migration corridor conflict.	RFO	Partial (80.00 acres)	T.0200N, R.0830W, 06th PM, WY Sec. 022 E2NW;
WY-191Q-117	WGFD-designated big game migration corridor conflict.	RSFO	Entire (2,554.76 acres)	T.0270N, R.1030W, 06th PM, WY Sec. 001 LOTS 1-4; 001 S2N2,S2; 002 LOTS 1-4; 002 S2N2,S2; 011 ALL; 012 ALL;
WY-191Q-121	WGFD-designated big game migration corridor conflict.	RSFO	Entire (2,193.78 acres)	T.0280N, R.1030W, 06th PM, WY Sec. 003 LOTS 1-4; 003 S2; 004 LOTS 1-4; 004 S2; 009 ALL; 010 ALL;
WY-191Q-138	WGFD-designated big game migration corridor conflict.	PFO	Partial (80.08 acres)	T.0330N, R.1080W, 06th PM, WY Sec. 031 LOTS 4; Sec. 031 SESW;
WY-191Q-141	Potential conflicts with coal leasing and mining operations.	KFO	Partial (960.82 acres)	T.0190N, R.1170W, 06th PM, WY Sec. 004 LOTS 5-6; 004 S2NE,SE; 010 ALL;
Total Acres Deferred			**5,869.44 acres**	

[2] "Mitigation of Mineral Development Conflicts with Emphasis upon Coal and Oil and Gas," dated December 13, 1988. This policy states, in part: "The BLM recognizes that occasional developmental conflicts between operators in the mineral industries are inevitable. Such conflicts, however, are normally settled by the companies involved in the coincidental mineral operations… If the operators cannot reach a mutually acceptable working agreement in settling problems of simultaneous oil and gas and coal development operations, any unresolved conflicts… will be handled by the appropriate office on a case-by-case basis…"

As a result, under this alternative, a total of 144 parcels would be offered at the First-Quarter 2019 lease sale, comprised of approximately 158,048.28 acres, with the applicable lease stipulations required under the approved RMPs.


BLM-Wyoming
Sublette Mule Deer Herd - RD2H
Lander Field Office
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28N 102W
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28N 100W
27N 102W
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Rock Springs Field Office
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Map 2
Wyoming
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Highway
2019Q1 Proposed Action
19Q1 BLM-Modified Alt: Defer
Sublette MD Herd Migration Corridor
Platte Valley MD Herd Migration Corridor
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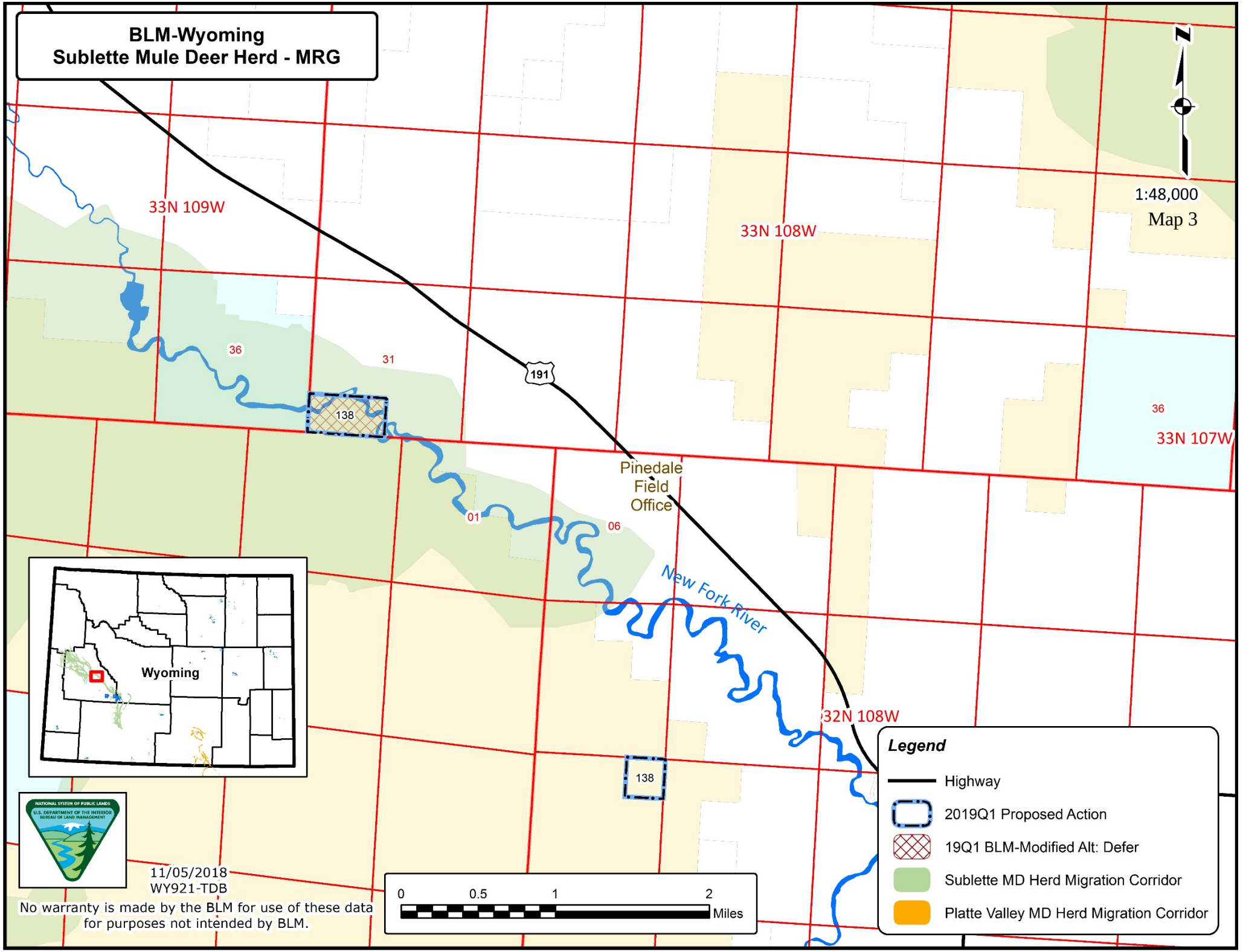
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Map 3
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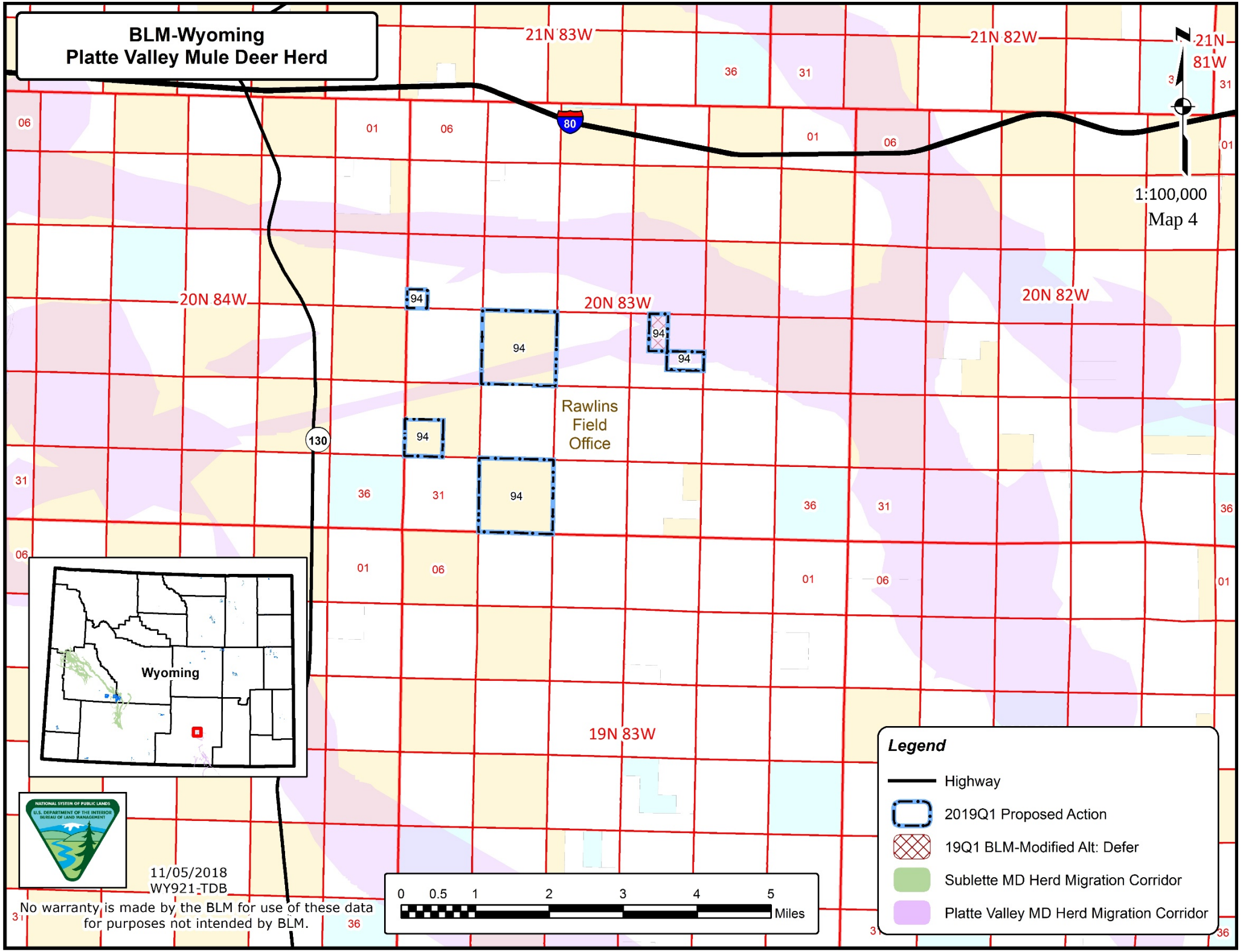
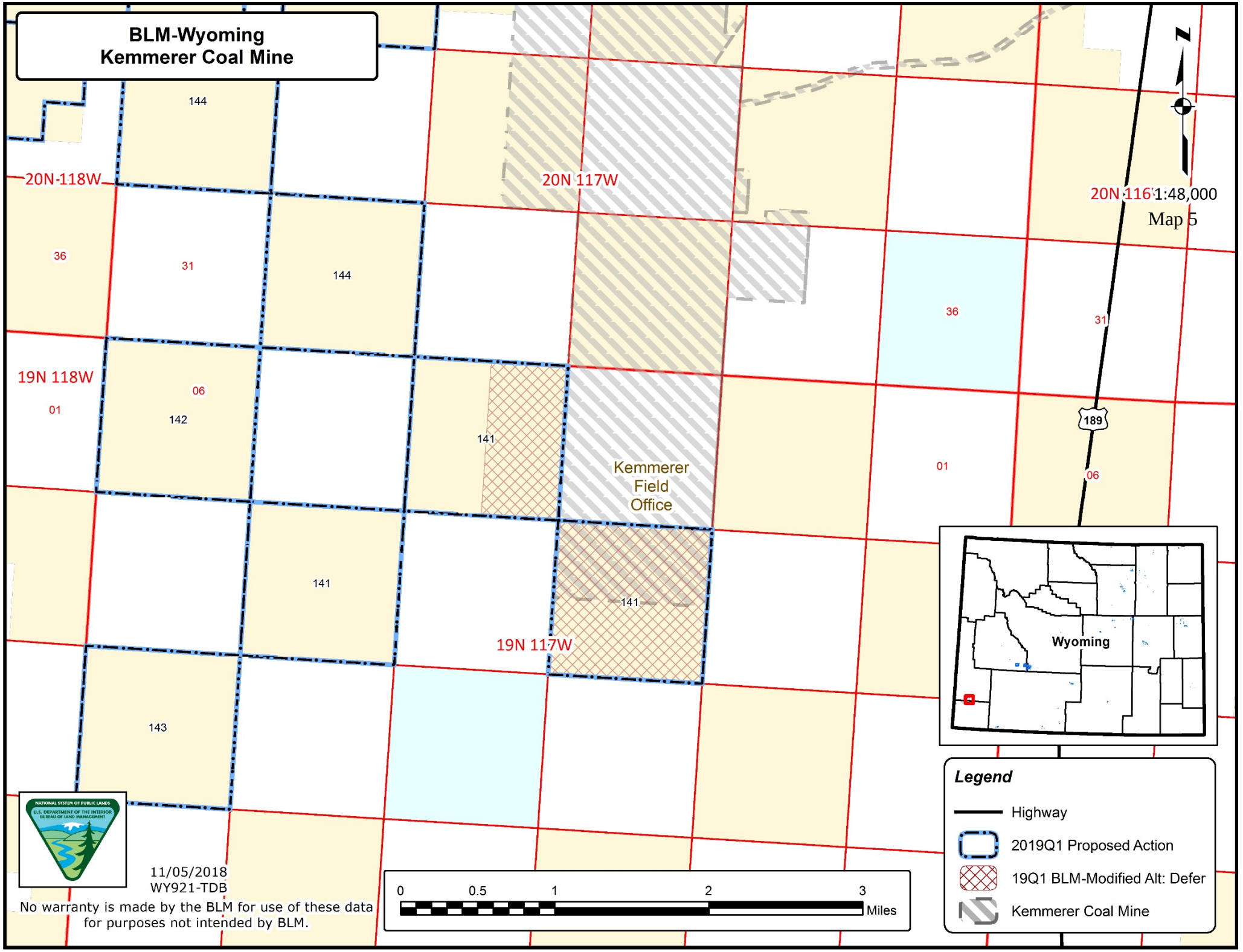
No warranty is made by the BLM for use of these data
for purposes not intended by BLM.


BLM-Wyoming
Platte Valley Mule Deer Herd
21N 83W
21N 82W
21N 81W
20N 84W
20N 83W
20N 82W
19N 83W
80
130
94
Rawlins Field Office
1:100,000
Map 4
Wyoming
Legend
Highway
2019Q1 Proposed Action
19Q1 BLM-Modified Alt: Defer
Sublette MD Herd Migration Corridor
Platte Valley MD Herd Migration Corridor
0 0.5 1 2 3 4 5
Miles
11/05/2018
WY921-TDB
No warranty is made by the BLM for use of these data for purposes not intended by BLM.


BLM-Wyoming
Kemmerer Coal Mine
20N-118W
20N 117W
20N 116W
19N 118W
19N 117W
144
36
31
144
36
31
01
06
142
141
141
Kemmerer
Field
Office
01
06
189
141
143
N
1:48,000
Map 5
Wyoming
Legend
Highway
2019Q1 Proposed Action
19Q1 BLM-Modified Alt: Defer
Kemmerer Coal Mine
0
0.5
1
2
3
Miles
11/05/2018
WY921-TDB
No warranty is made by the BLM for use of these data
for purposes not intended by BLM.

2.5 Alternatives Considered and Eliminated from Further Analysis

Offering Subject to Standard Lease Terms and Conditions

Offering all nominated parcels with only the standard lease terms and conditions on the BLM's lease form was considered as a means to reduce constraints to oil and gas development on public lands. Such an alternative is not in conformance with the approved RMPs where the applicable RMP prescribes stipulations in accordance with FLMPA's Section 102(a)(8) mandate to manage the public lands to protect resource values. Therefore, this alternative was not analyzed in detail.

Offering Subject to No Surface Occupancy (NSO) Stipulations

An alternative was considered that would offer all parcels located in areas open to leasing with a NSO stipulation. This alternative was not carried forward to detailed analysis because it is not in conformance with the approved RMPs and would only prohibit surface occupancy for oil and gas development; other non-oil and gas occupancy may not be similarly constrained. This alternative would unnecessarily limit oil and gas occupancy in areas where the approved RMPs have determined that less restrictive stipulations would adequately mitigate the anticipated impacts under our mandate of multiple-use and sustained yield.

Deferring All Parcels Located in Greater Sage-Grouse Habitats

An additional alternative was considered but not analyzed in detail which would defer offering all parcels located within Greater Sage-Grouse Priority Habitat Management Areas (PHMAs) and/or General Habitat Management Areas (GHMAs). This alternative was not analyzed in detail because it would not be in conformance with the approved RMPs. Further, this alternative would effectively, if temporarily, close areas to oil and gas leasing and development where the field office RMPs have determined that these lands are open to leasing with applicable stipulations to conserve Greater sage-grouse and their habitats.

3. Affected Environment

3.1 Introduction

This section describes the present conditions of various environmental resources that could be affected under the action alternatives, if lands are leased, and if oil and gas exploration and development operations are eventually authorized by the BLM. Descriptions of the affected environment in this section focus on the relevant major resources or issues.

For a complete and detailed description of the affected environment, please refer to the applicable RMP FEISs.

3.2 RMP Special Designations

3.2.1 Wilderness and Wilderness Study Areas

Wilderness Study Areas (WSAs) are managed according to a non-impairment standard. Under this standard, these lands are managed in a manner so as not to impair the suitability of such areas for preservation as wilderness. At present, the BLM manages these lands in accordance with the approved RMPs and the Interim Management Policy for Lands Under Wilderness Review until Congress either designates each WSA as "wilderness" or releases it from consideration and the land reverts to multiple-use management. None of the parcels carried forward for analysis in this sale are located within a WSA, though several parcels are located adjacent to WSAs (including the Fortification Creek WSA located in the BFO and the Whitehorse Creek WSA located in the RSFO).

3.2.2 Lands with Wilderness Characteristics (LWCs)

Wilderness characteristics are resource values that include naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive and unconfined recreation. Areas evaluated for wilderness characteristics generally occur in undeveloped locations of sufficient size (typically greater than 5,000 contiguous acres) to be practical to manage for these characteristics.

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 under Section 201 of FLPMA to "...maintain on a continuing basis an inventory of all public lands and their resource and other values...." This

includes reviewing lands to determine if they possess wilderness characteristics (see Attachment 5.5).

Among the proposed First-Quarter 2019 parcels, two parcels in the HDD meet the criteria for LWCs. A single parcel is partially within the PFO and partially within the RSFO, and another parcels is located within the RFO. Eleven parcels in the RSFO were included in citizen-proposed wilderness; all were evaluated but failed to meet the applicable criteria for LWCs.

Table: Parcels within LWCs

Field Office	Preliminary Parcel Number	LWC Polygon
RFO	-104	Adobe Town Fringe Area C
PFO	-137	WYD01-6300-603

Proposed parcels containing LWCs would be managed in accordance with the applicable RMP decisions.

3.2.3 Areas of Critical Environmental Concern (ACECs)

Parcels offered for sale are subject to the stipulations shown in Attachment 5.1, which includes protecting the relevant and important ACEC values, where present.

Included in this sale, the 7 parcels are located within the RSFO's South Pass Historic Landscape ACEC.

3.2.4 Special Management Areas (SMAs)

Two parcels are located within the RFO's Adobe Town Dispersed Recreation Use Area (DRUA).

Twenty-three parcels in the RSFO intersect the Wind River Special Recreation Management Area (SRMA) – West. A single parcel (-138) in the PFO is located within the Green and New Fork Rivers SRMA.

3.3 Air Resources

In addition to the air quality information in the RMPs referenced in Section 1.4, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the base RMPs were prepared. Ongoing scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2) methane (CH_4); nitrous oxide (N_2O); water vapor; and several trace gasses 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 are believed to contribute to overall climatic changes, typically referred

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

Air quality, climate, and visibility are the components of air resources which include applications, activities, and management of the air resource. The BLM must consider and analyze the potential effects of authorized activities on air resources as part of the planning and decision making process. The approved RMPs all address air quality issues, impacts, and potential mitigation. It is important to reiterate the offering and issuing leases is an administrative action, and the offering and the issuing of leases, in and of themselves, does not create air quality impacts.

3.3.1 Air Quality

Regional air quality is influenced by the interaction of meteorology, climate, the magnitude and spatial distribution of local and regional air pollutant sources (including natural sources), and chemical properties of emitted air pollutants. The following sections summarize the existing climate and air quality within the area potentially affected by the parcels under consideration for leasing.

A variety of pollutants can affect air quality; these pollutants and their effects on health, visibility, and ecology are described in the following sections, along with data on existing air quality conditions found within the subject field offices.

The EPA has delegated regulation of air quality to the State of Wyoming and is administered by the Wyoming Department of Environmental Quality (WDEQ). Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (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. Currently, the WDEQ Air Quality Division (AQD) does not have regulations regarding greenhouse gas emissions, although these emissions are regulated indirectly by various other regulations.

Pollutant concentration can be defined as the mass of pollutant present in a volume of air and is reported in units of micrograms per cubic meter (μg/m3), parts per million (ppm), or parts per billion (ppb). The State of Wyoming has used monitoring to determine that the HDD's planning areas are currently in compliance with Wyoming and Federal ambient air quality standards for all criteria pollutants with the exception of the Upper Green River Basin (UGRB) which includes portions of the KFO and RSFO, and all of the PFO. The UGRB is a designated nonattainment area for the 2008 ozone standard.

For the most part, the counties that lie within the jurisdictional boundaries of the HPD (Natrona, Converse, Platte, Goshen, Niobrara, Weston, Crook, Campbell, Sheridan and Johnson) are

classified as in attainment for all state and national ambient air quality standards as defined in the Clean Air Act. The one exception is the City of Sheridan, which was designated as nonattainment for PM10 in 1991 (56 FR 11101). On April 4, 2018, EPA removed the City of Sheridan as a nonattainment zone and approved their limited maintenance plan while re-designating them as in attainment of the NAAQS for PM10 (83 FR 06848).

The counties that lie within the jurisdictional boundaries of the WRBBD (Park, Big Horn, Washakie, Hot Springs, Fremont, Natrona, Carbon, Sweetwater) are classified as in attainment for all state and national ambient air quality standards.

Relevant air quality monitoring stations are show in the table, below:

Table: Air Quality Monitoring Stations

County	Site Name	Type of Monitor Type	Parameter	Operating Schedule	Location	
					Longitude	Latitude
Campbell	Thunder Basin	SPM	O3, NOx and Met	Hourly	-105.3000	44.6720
	South Campbell County	SPM	O3, NOx, PM10 and Met	1/3 (PM10) and hourly (NOx and O3)	-105.5000	44.1470
	Belle Ayr Mine	SPM	NOx and PM2.5	1/3 (PM2.5) and hourly (Ox)	-105.3000	44.0990
	Wright	SPM	PM10	1/6	-105.5000	43.7580
	Gillette	SLAMS	PM10	1/6	-105.5000	44.2880
	Black Thunder Mine	SPM	PM2.5	1/3	-105.2000	43.6770
	Buckskin Mine	SPM	PM2.5	1/3	-105.6000	44.4720
	Fortification Creek	WARMS	PM2.5,Nitrate,Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide, Meteorology	1/3 (PM2.5) and 1/7 (others)	-105.9198	44.33953
	South Coal	WARMS	PM2.5 and Meteorology		-105.8378	44.9401
	Thunder Basin	IMPROVE	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	1/3	-105.2874	44.6634
Converse	Antelope Mine	SPM	PM2.5	1/3 (PM2.5) and hourly (NOx)	-105.4000	43.4270
Johnson	Buffalo	WARMS	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology	1/3 (PM2.5) and 1/7 (others)	-106.0189	44.1442
	Cloud Peak (stopped monitoring during 2014)	IMPROVE	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology	1/3	-106.9565	44.3335
Natrona	Casper	SLAMS	PM10 and PM 2.5	1/3	-106.3256	42.8516
Sheridan	Sheridan-Highland Park	SLAMS	PM10 and PM2.5	1/3 (PM10); 1/3 and 1/6 (PM2.5)	-107.0000	44.8060
	Sheridan-Police Station	SLAMS	PM10 and PM2.5	1/1 (PM10) and 1/3 & 1/6 (PM2.5)	-107.0000	44.8330

County	Site Name	Type of Monitor Type	Parameter	Operating Schedule	Location	
					Longitude	Latitude
	Sheridan	WARMS	PM2.5, Ozone, Nitrate, Ammonium, Nitric Acid, Sulfate and Sulfur Dioxide, Meteorology	1/3 (PM2.5) and 1/7 (others)	-106.8472	44.9336
Weston	Newcastle	WARMS	PM2.5, Nitrate, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide and Meteorology, ozone	1/3 (PM2.5) and 1/7 (others)	-104.1919	43.8731
	Newcastle	NADP	Wet deposition of ammonium, sulfate, metals	Weekly	-104.1917	43.873
Park	Cody	SLAMS	PM10	Jan. 3	-109.073/ 44.532	
	North Absaroka (managed by USFS)	IMPROVE	PM2.5, NO3-, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	Jan. 3; Hourly Meteorology	-109.382/ 44.745	
	Yellowstone National Park – Tower Falls	NADP/NTN	Wet Deposition Ions, Precipitation, pH	Weekly (Ions); Daily (Precip)	-110.42/ 44.917	
Fremont	Lander	SLAMS	PM2.5	Jan. 3	-108.733/ 42.833	
	Sinks Canyon	NADP/NTN	Wet Deposition Ions, Precipitation, pH	Weekly (Ions); Daily (Precip)	-108.85/ 42.734	
	South Pass City	NADP/NTN	Wet Deposition Ions, Precipitation, pH	Weekly (Ions); Daily (Precip)	-108.832/ 42.494	
Big Horn	Basin	WARMS CASTNet	Ozone, NO3-, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	Jan. 7 (Speciated); Hourly (O3, Met)	-108.041/ 44.28	
Campbell	Thunder Basin	SPM	Ozone, Nitrogen Oxides & Met	Hourly	-105.3/ 44.672	
	Thunder Basin	IMPROVE	PM2.5, NO3-, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	Jan. 3 (Speciated); Hourly Met.	-105.287/ 44.663	
Johnson	Buffalo	WARMS	PM2.5, NO3-, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	Jan. 3 (PM2.5); 1/7 (others); Hourly Met	-106.019/44.144	
	Cloud Peak (Monitoring stopped during 2014)	IMPROVE	PM2.5, NO3-, Ammonium, Nitric Acid, Sulfate, Sulfur Dioxide & Meteorology	Jan. 3 (Speciated); Hourly Met	-106.956/44.333	
Sublette	Boulder	SPM	O_3, PM_{10}, NO_2	Hourly	-109.753/42.719	
Sublette	Daniel South	SPM	O_3, PM_{10}, NO_2	Hourly	-110.055/42.791	
Sublette	Juel Spring	SPM	O_3, NO_2	Hourly	-109.563/42.373	
Sublette	Pinedale	SPM	O_3, $PM_{2.5}$, NO_2	Hourly	-109.885/42.853	
Sweetwater	Moxa Arch	SPM	O_3, PM_{10}, NO_2	Hourly	-109.788/41.751	
Sweetwater	Wamsutter	SPM	O_3, PM_{10}, NO_2	Hourly	-108.024/41.678	
Fremont	South Pass	SPM	O_3, PM_{10}, NO_2	Hourly	-108.720/42.528	
Uinta	Murphy Ridge	SPM	O_3, PM_{10}, NO_2	Hourly	-111.042/41.369	

County	Site Name	Type of Monitor Type	Parameter	Operating Schedule	Location	
					Longitude	Latitude
Teton	Jackson	SLAMS	PM10, PM2.5	1/3	-110.79799/43.45776	
Sweetwater	Rock Springs	SLAMS	PM10, PM2.5	1/3	-109.22013/41.59259	
Laramie	Cheyenne	NCore	O_3 NO NO_2 SO_2 PM_{10} $PM_{2.5}$	Hourly for all expect 1/3 for PM2.5	-104.77842/41.18235	

3.3.2 Criteria Air Pollutants

Criteria air pollutants are those for which national concentration standards have been established. If the air quality in a geographic area meets the NAAQS, it is designated an attainment area; areas that do not meet the NAAQS are designated nonattainment areas and must develop comprehensive state plans to reduce pollutant concentrations to a safe level. Attainment/nonattainment status is determined separately for each criteria pollutant. Five of the six criteria pollutants for which the EPA has established NAAQs are:

- Carbon monoxide (CO): CO is an odorless, colorless gas formed during combustion of any carbon-based fuel, such as during the operation of engines, fireplaces, and furnaces. Because carbon monoxide data are generally collected only in urban areas where automobile traffic levels are high, recent data are often unavailable for rural areas.
- Nitrogen dioxide (NO_2): NO_2 is a highly reactive compound formed at high temperatures during fossil fuel combustion. During combustion, nitrogen monoxide (NO) is released into the air which reacts with oxygen in the atmosphere to form NO_2. NO plus NO_2 forms a mixture of nitrogen gases, collectively called oxides of nitrogen (NOx). NOx emissions can convert to ammonium nitrate particles and nitric acid, which can cause visibility impairment and atmospheric deposition. NOx can contribute to "brown cloud" conditions and ozone formation, and can convert to ammonium (NH_4), nitrate particles (NO_3), and nitric acid (HNO_3). Internal combustion engines are a major source of NOx emissions.
- Ozone: Ozone is a gaseous pollutant that is not emitted directly into the atmosphere but is formed in the atmosphere from complex photochemical reactions involving NOx and reactive volatile organic compounds (VOCs). Common sources of VOCs include automotive and heavy equipment emissions, paints and varnishes, oil and gas operations, and wildfires. Ozone is a strong oxidizing chemical that can burn the lungs and eyes and damage plants. Ozone is a severe respiratory irritant at concentrations in excess of the federal standards.
- Particulate matter (PM): PM is small particles suspended in the air that settle to the ground slowly and may be re-suspended if disturbed. Ambient air particulate matter standards are based on the size of the particle. The two types of particulate matter are:
    - PM_{10} (particles with diameters less than 10 micrometers): small enough to be inhaled and capable of causing adverse health effects.
    - $PM_{2.5}$ (particles with diameters less than 2.5 micrometers): small enough to be drawn deeply into the lungs and cause serious health problems. These particles are a primary cause of visibility impairment.

- Sulfur dioxide (SO_2) and sulfates (SO_4): SO_2 and SO_4 form during combustion from trace levels of sulfur in coal or diesel fuel. SO_2 also participates in chemical reactions and can form sulfates and sulfuric acid in the atmosphere.

The Wyoming DEQ has also established WAAQS, which are state-specific air quality standards for criteria pollutants. The standards and relevant averaging periods are summarized below:

Table: NAAQS/WAAQS

Pollutant	Averaging Time	National Ambient Air Quality Standards (NAAQS)			Wyoming Ambient Air Quality Standards (WAAQS)		
		Primary			Primary		
		(ppm)	(ppb)	(ug/m^3)	(ppm)	(ppb)	(ug/m^3)
Carbon Monoxide	1 hour	**35** [a]	35,000	40,000	**35**	35,000	40 (mg/m^3)
	8 hour	**9** [a]	9,000	10,000	**9**	9,000	10 (mg/m^3)
Lead	Rolling 3-month	---	---	**0.15**	---	---	**0.15**
Nitrogen Dioxide	1 hour	0.1	**100** [b]	189	0.1	**100**	189
	Annual (Arithmetic Mean)	0.053	**53**	100	0.053	**53**	100
PM_{10}	24 hour	---	---	**150** [c]	---	---	**150**
	Annual (Arithmetic Mean)	None			---	---	**50**
$PM_{2.5}$	24 hour	---	---	**35** [d]	---	---	**35**
	Annual (Arithmetic Mean)	---	---	**12.0** [e]	---	---	**12.0**
Ozone	8 hour	**0.070** [f]	70	147	**0.075**	75	147
Sulfur Dioxide	1 hour	0.075	**75** [g]	197	0.075	**75**	197
Hydrogen Sulfide	1/2 hour average	---	---	---	0.05	50	**70** [h]
	1/2 hour average	---	---	---	0.03	30	**40** [i]

Note: **Bold** indicates the standard as written in the corresponding regulation. Other values are conversions.
[a] Not to be exceeded more than once per year.
[b] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
[c] Not to be exceeded more than once per year on average over 3 years.
[d] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
[e] To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 12.0 $\mu g/m^3$. (effective December 14, 2012)
[f] To 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 0.070 ppm.
[g] To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb (effective June 22, 2010).
[h] not to be exceeded more than two times per year.
[i] not to be exceeded more than two times in any five consecutive days.

3.3.3 Ozone

Ozone is formed in the lower atmosphere by a series of reactions involving sunlight and precursor emissions of nitrous oxide (NO_X) and Volatile Organic Compounds (VOCs). Ozone and its precursors can be transported both into and out of the analysis region.

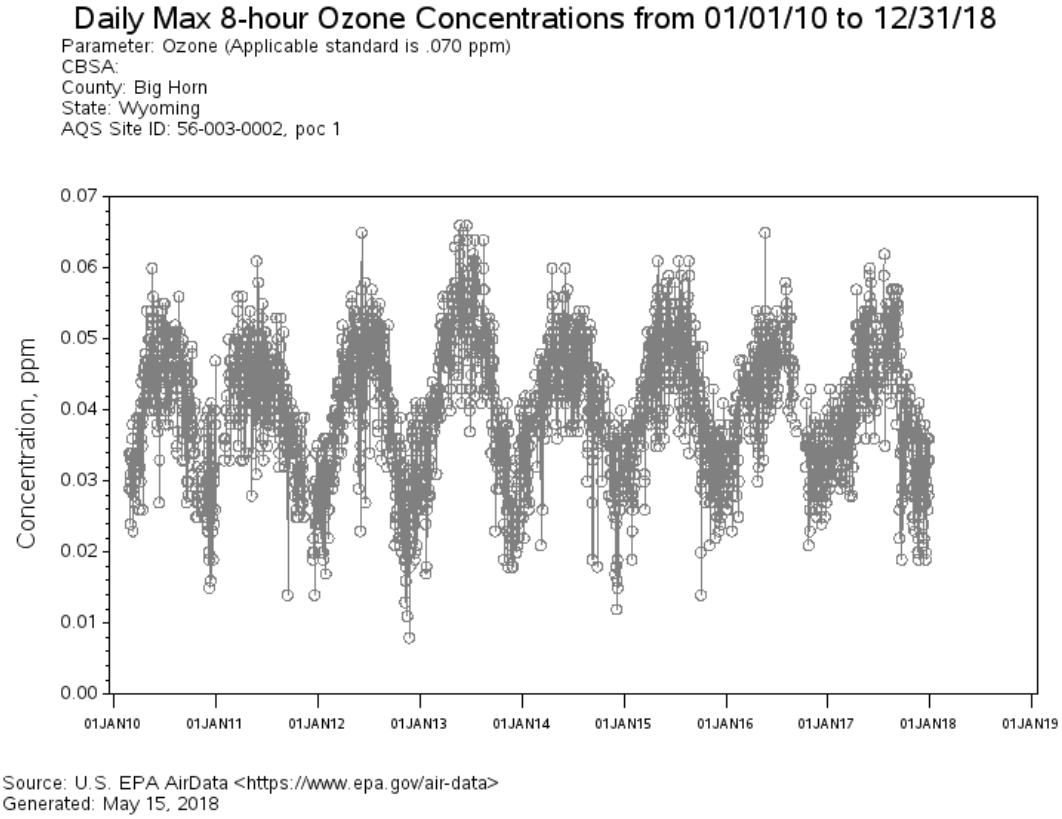
The Upper Green River Basin has been designated as a marginal nonattainment area for ozone. The designated nonattainment area includes Sublette County and portions of Lincoln and Sweetwater counties. This designation was based on ozone data for 2008 through 2010. Compliance with the 8-hour ozone NAAQS is based on the ozone "design value," which is defined as the 3-year average of the annual fourth-highest observed 8-hour average ozone concentration. An ozone design value is first calculated for each monitoring site within a given area. The area-wide ozone design value is then defined as the maximum over all sites within the area. If the design value exceeds the 8-hour ozone NAAQS of 70 parts per billion (ppb), the area is designated nonattainment.

Ozone is currently measured at several sites within southwestern Wyoming. All sites have sufficient data to calculate one or more 3-year design values. Ozone design values for each of these sites, for three recent 3-year design value periods (2013–2015, 2014-2016, and 2015-2017), are listed in the table, below. The general data trend in design values for all sites is a decrease from the 2012-2014 to the 2014-2016 design period, with an increase at all sites during the 2015-2017 design period. The figure after the table, below, displays 2010-2017 hourly ozone data from various Wyoming ozone monitors. This data shows no increasing or decreasing trend over the period.

Table: Ozone Design Values for Ozone Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	Ozone Design Value (ppb)			NAAQS (ppb)
			2013-2015	*2014-2016*	*2015-2017*	
Big Piney	56-035-0700	Sublette	61	61	63	70
Boulder	56-035-0099	Sublette	58	58	62	70
Cheyenne NCore	56-021-0001	Laramie	65	63	63	70
Daniel South	56-035-0100	Sublette	62	62	62	70
Juel Spring	56-035-0700	Sublette	62	60	62	70
Moxa	56-037-0300	Sweetwater	67	66	67	70
Murphy Ridge	56-041-0101	Uinta	63	61	62	70
Pinedale	56-035-0101	Sublette	59	58	61	70
Thunder Basin	56-005-0123	Campbell	59	58	60	70
Wamsutter	56-037-0020	Sweetwater	61	55	53	70

Source: REF 1018
NAAQS National Ambient Air Quality Standards
ppb parts per billion



Ozone Nonattainment Designation

On April 30, 2012, the EPA formally recognized Wyoming's UGRB as an ozone nonattainment area with a marginal classification. As a result of the nonattainment designation, the BLM must comply with General Conformity regulations in 40 CFR 93 Subpart B and Chapter 8, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR). Per these regulations, the BLM must demonstrate that new actions occurring within the nonattainment area will conform with the Wyoming State Implementation Plan (SIP) by demonstrating that they will not: (1) cause or contribute to a new violation of the ozone standard; (2) interfere with provisions in the SIP for maintenance of any standard; (3) increase the frequency or severity of any existing violation; or(4) delay timely attainment of any standard or any required interim emissions reductions or other milestone. The BLM must first conduct an applicability analysis to determine if this Federal action will require a conformity determination. A conformity determination must be completed for a Federal action if the total of direct and indirect emissions from the proposed project exceeds the *de minimis* levels specified in 40 CFR 93.153(b) and WAQSR Chapter 8, Section 3. For a marginal nonattainment area, the *de minimis* threshold is 100 tons/year of NO_x or VOCs (the precursor pollutants that form ozone in the atmosphere). Federal actions estimated to have an annual net emissions increase less than the *de minimis* levels are not required to demonstrate conformity under the General Conformity regulations.

In accordance with the Federal and State Conformity regulations, the General Conformity requirement does not apply to actions where the emissions are not reasonably foreseeable such as lease sales made on a broad scale followed by exploration and development plans. There are no direct effects from the proposed oil and gas lease sale because it is primarily an administrative action that only conveys the mineral rights to the potential lessee. Subsequent development proposals by lease holders will require to submittal of plans for any exploration or development that may occur and a site specific EA or EIS would be prepared to identify mitigation measures necessary to avoid undue degradation to the environment prior to approval any development activities. General Conformity is addressed at the proposal stage when emission generating activities are reasonably foreseeable and can be quantified.

Twenty-two of the preliminary parcels for the First-Quarter 2019 lease sale intersect the Upper Green River Basin Ozone Non-Attainment Area (O_3NAA).

On August 27, 2015, the EPA published a Federal Register Notice finding that the Upper Green is attaining the ozone standard as of July 20, 2015 attainment date (see http://www.gpo.gov/fdsys/pkg/FR-2015-08-27/pdf/2015-21196.pdf). Formal re-designation of the area to attainment has not yet occurred.

3.3.4 Nitrogen Dioxide

Nitrogen dioxide (NO_2) is currently measured at several monitoring sites across Wyoming. Relevant NAAQS for NO_2 include (1) the 1-hour NO_2 NAAQS, which requires the 3-year average of the 98th percentile daily maximum 1-hour NO_2 concentration to be less than 100 ppb; and (2) the annual NO_2 NAAQS, which requires the annual average NO_2 concentration to be less than 53 ppb. One-hour NO_2 design values for each of these sites, for 2013–2015, and 2014–2016, and 2015-2017 are listed in the table, below. Data from all sites show design values well below the NAAQS.

Table: 1-Hour Design Values for NO_2 Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	3-Year Average 98th Percentile 1-Hour NO_2 (ppb)			NAAQS (ppb)
			2013-2015	*2014-2016*	*2015-2017*	
Big Piney	56-035-0700	Sublette	--	8	8	100
Boulder	56-035-0099	Sublette	14	12	14	100
Cheyenne NCore	56-021-0001	Laramie	36	35	32	100
Daniel South	56-035-0100	Sublette	--	3	3	100
Juel Spring	56-035-0700	Sublette	11	10	9	100
Moxa	56-037-0300	Sweetwater	20	20	20	100
Murphy Ridge	56-041-0101	Uinta	12	12	13	100
Pinedale	56-035-0101	Sublette	19	20	24	100
Thunder Basin	56-005-0123	Campbell	9	8	8	100
Wamsutter	56-037-0020	Sweetwater	35	32	32	100

Source: REF 1018

Table: 1-Hour Design Values for NO_2 Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	3-Year Average 98th Percentile 1-Hour NO_2 (ppb)			NAAQS (ppb)
			2013-2015	*2014-2016*	*2015-2017*	

NAAQS National Ambient Air Quality Standards
NO_2 nitrogen dioxide
ppb parts per billion

3.3.5 Sulfur Dioxide

Sulfur dioxide (SO_2) is currently measured at the Moxa site (Sweetwater County) and the Cheyenne NCore site (Laramie County). This site was established in 2010. The corresponding SO_2 design values are 17, 17 and 18 ppb for 2013–2015, 2014-2016, and 2015-2017, respectively, as listed in the table, below. The SO_2 design values are well below the NAAQS.

Table: Three-Year Average 99th Percentile Daily Maximum 1-Hour SO_2 Values for Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	3-Year Average 99th Percentile 1-Hour SO_2 (ppb)			NAAQS (ppb)
			2013–2015	*2014-2016*	*2015-2017*	
Moxa	56-037-0300	Sweetwater	18	21	21	75
Cheyenne NCore	56-021-0100	Laramie	10	9	9	75

Source: REF 1018
NAAQS National Ambient Air Quality Standards
ppb parts per billion
SO_2 sulfur dioxide

3.3.6 Carbon Monoxide

Carbon monoxide (CO) is not routinely monitored within the region. CO was measured at the Murphy Ridge site (in Uinta County) during 2008. Based on these measurements, the daily maximum 1-hour CO value was 870 ppb (0.87 parts per million [ppm]) and the daily maximum 8-hour average CO value was 690 ppb (0.69 ppm). These values are well below the NAAQS limits of 35,000 and 9,000 ppb (35 and 9 ppm), respectively. Therefore, CO does not appear to be a pollutant of concern for the region. Note, however, that CO monitoring is limited to one site.

The 2011 National Emission Inventory indicates that CO emissions in the region are primarily from area (mostly oil and gas–related) and on-road mobile sources. CO concentrations are expected to be greatest near human-made CO sources such as oil and gas development areas, population centers, and roadways, but CO is not a primary air quality concern for the region.

3.3.7 Lead

Lead is not routinely monitored and is not a primary air quality concern for the region.

3.3.8 Particulate Matter

Particulate matter, PM_{10} and $PM_{2.5}$, are pollutants of concern within the region. At the regional scale, it is expected that fugitive dust sources are the dominant contributors to PM_{10} and $PM_{2.5}$ concentrations. Fugitive dust is likely to occur naturally across the region, especially during high-wind events. Post-burn vegetative conditions associated with wildfires are also sources of fugitive dust. At the local level, concentrations are expected to be highest near towns, unpaved roads that experience high volumes of traffic, areas with depleted vegetative cover, and areas downwind of human-made sources of precursor emissions such as SO_2 and NO_2 that may react to form secondary $PM_{2.5}$.

Recent PM_{10} data are available for six monitoring sites within the region. Under the PM_{10} NAAQS, the maximum 24-hour average PM_{10} concentration cannot exceed 150 micrograms per cubic meter ($\mu g/m^3$) more than once per year on average over 3 years. WDEQ also requires the annual PM_{10} concentration to be less than 50 $\mu g/m^3$. Maximum 24-hour PM_{10} concentrations for monitoring sites within the area are listed in the table, below:

Table: Maximum 24-Hour PM_{10} Concentrations for Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	Maximum 24-Hour Average PM_{10} ($\mu g/m^3$)				NAAQS ($\mu g/m^3$)
			2014	*2015*	*2016*	*2017*	
Boulder	56-035-0099	Sublette	31	40	40	55	150
Cheyenne NCore	56-021-0100	Laramie	34	78	34	117	150
Daniel South	56-035-0100	Sublette	26	36	27	51	150
Gillette	56-005-1002	Campbell	25	39	40	48	150
Lander	56-013-1003	Fremont	62	53	30	41	150
Moxa	56-037-0300	Sweetwater	67	53	41	94	150
Murphy Ridge	56-041-0101	Uinta	39	60	42	51	150
Rock Springs	56-037-0007	Sweetwater	39	54	41	91	150
Wamsutter	56-037-0020	Sweetwater	41	47	32	61	150

Source: REF 1018
NAAQS National Ambient Air Quality Standards
PM_{10} particulate matter less than 10 microns in diameter
$\mu g/m^3$ micrograms per cubic meter

PM_{10} concentrations are often heavily influenced by wildfire activity in the region as well as transport from areas outside of Wyoming. Therefore, while there are no violations of the PM_{10} NAAQS, PM_{10} is an air quality concern for the region.

Recent $PM_{2.5}$ data are available for two monitoring sites within the region. The NAAQS for $PM_{2.5}$ include (1) the 24-hour $PM_{2.5}$ NAAQS, which requires the 3-year average of the 98^{th} percentile 24-hour average $PM_{2.5}$ concentration to be less than 35 $\mu g/m^3$; and (2) the annual $PM_{2.5}$ NAAQS, which requires the 3-year average of the annual average $PM_{2.5}$ concentration to

be less than 12 µg/m^3. The 24-hour $PM_{2.5}$ design values are listed in the table, below, as are the annual $PM_{2.5}$ design values in the subsequent table.

Table: 24-Hour $PM_{2.5}$ Design Values for Monitoring Sites in WY Compared with the NAAQS

Site Name	ID	County	3-Year Average 98th Percentile 24-Hour $PM_{2.5}$ (µg/m^3) (2015-2017)	NAAQS (µg/m^3)
Cheyenne NCore	56-021-0100	Laramie	14	35
Lander	56-013-1003	Fremont	23	35
Pinedale	56-035-0101	Sublette	16	35
Rock Springs	56-037-0007	Sweetwater	19	35

Source: REF 1018
NAAQS National Ambient Air Quality Standards
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
µg/m^3 micrograms per cubic meter

Table: Annual $PM_{2.5}$ Design Values for Monitoring Sites in Wyoming Compared with the NAAQS

Site Name	ID	County	3-Year Average 98th Percentile 24-Hour $PM_{2.5}$ (µg/m^3) (2015-2017)	NAAQS (µg/m^3)
Cheyenne NCore	56-021-0100	Laramie	4.1	12
Lander	56-013-1003	Fremont	6.8	12
Pinedale	56-035-0101	Sublette	5.1	12
Rock Springs	56-037-0007	Sweetwater	5.1	12

Source: REF 1018
NAAQS National Ambient Air Quality Standards
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
µg/m^3 micrograms per cubic meter

The 24-hour $PM_{2.5}$ design values are below the NAAQS for both sites. The annual $PM_{2.5}$ design values are also below the NAAQS for both sites.

3.3.9 Greenhouse Gas Emissions and Climate

The HDD is located in a semi-arid, mid-continental climate regime typified by dry, windy conditions, limited rainfall, and long, cold winters (Trewartha and Horn 1980). The HDD region is subject to strong, gusty winds that are often accompanied by snow and blizzard conditions during the winter. Winds frequently originate from the west to northwest, and the mean annual wind speed is 9 miles per hour but can have sustained winds greater than 40 miles per hour.

The climate in the HPD is generally temperate and is a semi-arid region with long cold winters and short summers. The major factors controlling climate in the planning area are elevation, strong westerly winds, moisture flow, and mountainous barriers to the west. Wind speed and direction are highly variable because of the effect of local topography in the planning area. Wind speeds are generally strong and gusts above 40 miles per hour are not unusual.

The climate in the WRBBD is designated as a combination of Intermountain Semi-Desert and Southern Rocky Mountain Steppe. Summers are generally short and hot and winters long and

cold. Precipitation has historically been low, though greater at higher elevations, and distributed across the year, with the exception of the drier summer months. Wind speeds are variable but strong.

In general, wind strength and frequency affects dispersion of noises, odors, and transport of dust and other airborne elements. Therefore, Wyoming's strong winds increase the potential for atmospheric dispersion of pollutants.

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. "Global warming" refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change. Climate is both a driving force and limiting factor for ecological, biological, and hydrological processes, and has great potential to influence resource management.

It is accepted within the scientific community that global temperatures have risen at an increased rate and the likely cause is gases that trap heat in the atmosphere, referred to as greenhouse gases (GHGs). The Intergovernmental Panel on Climate Change (IPCC, 2007) concluded that "warming of the climate system is unequivocal" and "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." Extensive research and development efforts are underway in the field of Carbon Capture and Sequestration (CCS) technology, which could help direct management strategies in the future. The IPCC has identified a target worldwide "carbon budget" to estimate the amount of CO_2 the world can emit while still having a likely chance of limiting global temperature rise to 2°C above pre-industrial levels. The international community estimates this budget to be 1 trillion tonnes of carbon and also acknowledges that varying amounts of this budget have already been consumed (IPCC, 2014).

In 2009, based primarily on the scientific assessments of the USGCRP, the National Research Council, and the IPCC, the EPA issued a finding that the changes in our climate caused by elevated concentrations of greenhouse gases in the atmosphere are reasonably anticipated to endanger the public health and public welfare of current and future generations.

GHGs are composed of molecules that absorb and re-radiate infrared electromagnetic radiation. When present in the atmosphere the gas contributes to the greenhouse effect. Some GHGs such as CO_2 occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The primary GHGs that enter the atmosphere as a result of anthropogenic activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Fluorinated gases are powerful GHGs that are emitted from a variety of industrial processes including production of

refrigeration/cooling systems, foams and aerosols. Fluorinated gases are not primary to the activities authorized by the BLM and will not be discussed further in this document.

GHGs are often presented using the unit of Metric Tons of CO_2 equivalent (MT CO_2e) or Million Metric Tons (MMT CO_2e), a metric to express the impact of each different greenhouse gas in terms of the amount of CO_2 making it possible to express greenhouse gases as a single number. For example, 1 ton of methane would be equal to 28 tons of CO_2 equivalent, because it has a global warming potential (GWP) 28 times that of CO_2. As defined by EPA, the GWP provides "ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of CO_2." The GWP of greenhouse gas is used to compare global impacts of different gases and used specifically to measure how much energy the emissions of one ton of gas will absorb over a given period of time (e.g. 100 years), relative to the emissions of one ton of CO_2. The GWP accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere. The GWP provides a method to quantify the cumulative effects of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent for the GHGs.

- Carbon dioxide (CO_2), by definition, has a GWP of 1 regardless of the time period used because it is the gas being used as the reference. CO_2 remains in the climate system for a very long time; CO_2 emissions cause increases in the atmospheric concentrations of CO_2 that will last thousands of years (EPA, 2016).
- Methane (CH_4) is estimated to have a GWP of 28-36 times that of CO_2 over 100 years. CH_4 emitted today lasts about a decade on average, which is much less time than CO_2. But CH_4 also absorbs much more energy than CO_2. The net effect of the shorter lifetime and higher energy absorption is reflected in the GWP. The methane GWP also accounts for some indirect effects, such as the fact that methane is a precursor to ozone, and ozone is in itself a greenhouse gas (EPA, 2016).
- Nitrous Oxide (N_2O) has a GWP of 265-298 times that of CO_2 for a 100-year timescale. N_2O emitted today remains in the atmosphere for more than 100 years, on average (EPA, 2016). Table 3.3. contains GHGs regulated by EPA and global warming potentials.

The Center for Climate Strategies (CCS) prepared the Wyoming Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) for the WDEQ through an effort of the Western Regional Air Partnership (WRAP). This inventory report presents a preliminary draft 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 a starting point for revising the initial estimates as improvements to data sources and assumptions are identified.

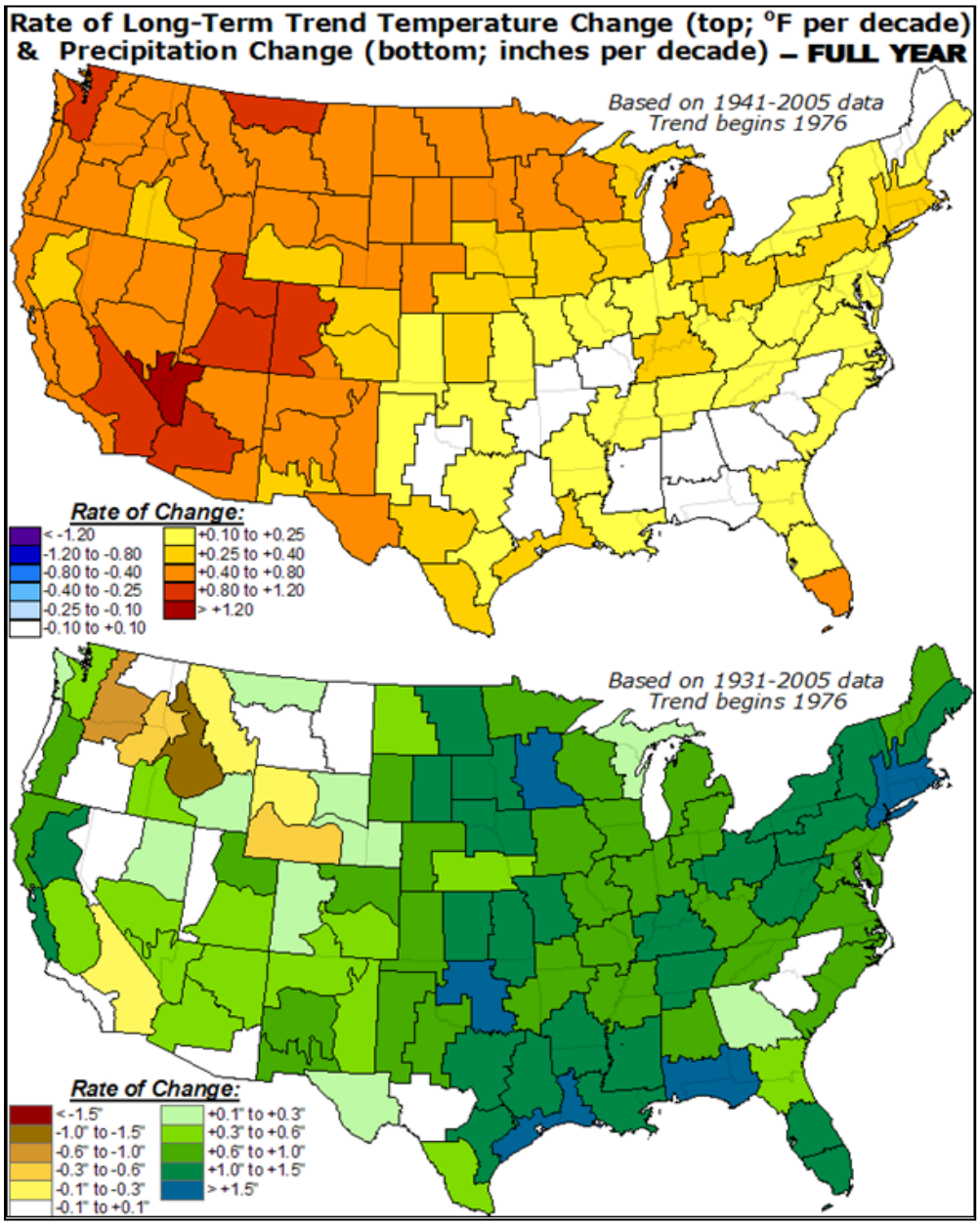
The CCS inventory report discloses that activities in Wyoming accounted for approximately 56 million metric tons (MMt) of *gross* carbon dioxide equivalent (CO_2e) emissions in 2005, an amount equal to 0.8% of total U.S. gross GHG emissions. These emission estimates focus on activities in Wyoming and 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 MMtCO_2e in 2005. Wyoming's per capita emission rate is more than four times greater than the national average of 25 MtCO_2e/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.

According to EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016 Executive Summary*, on a global basis "approximately 32,294 MMT of CO_2 were added to the atmosphere through the combustion of fossil fuels in 2015, of which the United States accounted for approximately 15 percent. Within the United States, fossil fuel combustion accounted for 93.5 percent of CO_2 emissions in 2016 (EPA, 2018). Between 1990 and 2016, CO_2 emissions from fossil fuel combustion increased from 4,740.3 MMT CO_2e to 4,966.0 MMT CO_2e, a 4.8 percent total increase over the twenty-seven-year period. Conversely, CO_2 emissions from fossil fuel combustion decreased by 780.9 MMT CO_2e from 2005 levels, a decrease of approximately 13.6 percent between 2005 and 2016. From 2015 to 2016, these emissions decreased by 83.2 MMT CO_2e (1.6 percent). In 2016, total gross U.S. greenhouse gas emissions were 6,511.3 million metric tons (MMT) of CO_2e. Total U.S. emissions have increased by 2.4 percent from 1990 to 2016, and emissions decreased from 2015 to 2016 by 1.9 percent (126.8 MMT CO_2e). The decrease in total greenhouse gas emissions between 2015 and 2016 was driven in large part by a decrease in CO_2 emissions from fossil fuel combustion. The decrease in CO_2 emissions from fossil fuel combustion was a result of multiple factors, including: (1) substitution from coal to natural gas and other non-fossil energy sources in the electric power sector; and (2) warmer winter conditions in 2016 resulting in a decreased demand for heating fuel in the residential and commercial sectors… Relative to 1990, gross emissions in 2016 are higher by 2.4 percent, down from a high of 15.7 percent above 1990 levels in 2007. Overall, net emissions in 2016 were 11.1 percent below 2005 levels." (*Id.* at page ES-10).

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. Temperatures in western Wyoming are expected to increase by 0.25 to 0.40 degrees Fahrenheit per decade while temperatures in surrounding locations in Utah, Wyoming, and Colorado are expected to increase by 0.40 to 1.2 degrees Fahrenheit per decade (see figure, below). Precipitation across western Wyoming is expected to decrease by 0.1 to 0.6 inches per decade with the largest decrease expected in southwestern Wyoming. The eastern portions of the state are experted to get warmer and wetter.

Long-term Temperature (top) and Precipitation (bottom) Trends in the United States from NOAA Climate Prediction Center

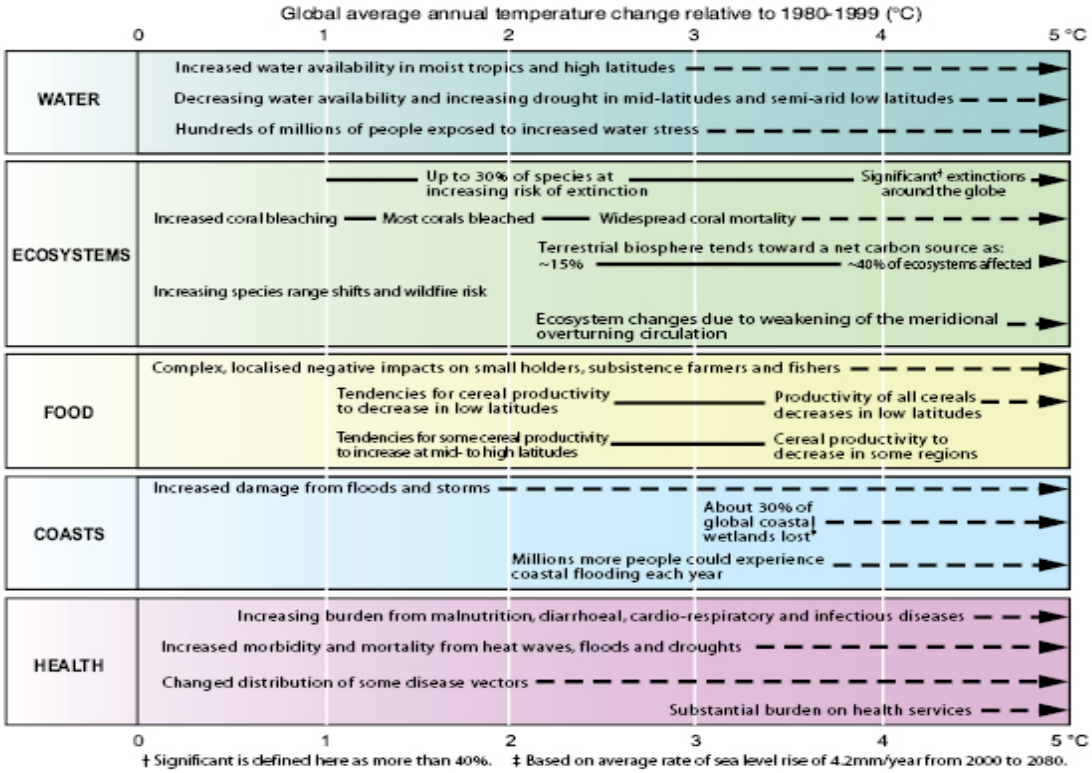


(http://www.cpc.noaa.gov)

The next figure, taken from the IPCC's Fourth Assessment Report, indicates varying responses of the natural world to increasing temperatures as a result of increasing global temperatures.

Examples of Impacts Associated with Global Average Temperature Change

(Impacts will vary by extent of adaptation, rate of temperature change and socio-economic pathway).



A number of the existing authorized activities within the BLM-Wymoing field offices generate GHG emissions. Oil and gas development activities can generate CO_2 and NH_4 (during processing). Carbon dioxide emissions result from the use of combustion engines for OHV and other recreational activities. Wildland fires also are a source of CO_2 and other GHG emissions, and livestock grazing is a potential source of methane. Other activities 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.

Consistent with current guidance, this EA includes a qualitative and quantitative analysis of possible greenhouse gas emissions that could occur as a result of reasonably foreseeable oil and gas development associated with the parcels being offered for lease. Additional information about potential emissions would also be available and calculated as part of subsequent site-specific reviews at the APD stage, where necessary.

3.4 Geology and Mineral Resources

Two parcels nominated in the HDD have approved mining activities within the parcel boundaries.

Table: HDD Parcels with Existing Mining Activities

Office	WY-191Q-	Mine Type
KFO	141	Coal
KFO	143	Sand & Gravel

3.4.1 Master Leasing Plans (MLPs)

None of the proposed parcels are located within an MLP.

3.4.2 Designated Development Areas (DDAs)

The single parcel located in the LFO (-106) is located within a DDA under the approved RMP.

3.5 Soils

Soils within Wyoming are generally considered to be highly erodible from both wind and water action regardless of slope with the exception of depositional soils. Soils in Wyoming are especially dependent on vegetative cover to prevent erosion; ground cover and root systems anchor the soil, recycle nutrients, and add scarce organic matter.

Please refer to the RMP FEISs for a more detailed description of the soil resources in the planning areas.

3.6 Solid and Hazardous Wastes

Should a parcel be leased and developed, generation and temporary storage of waste materials (solid and liquid) would likely occur. Waste materials would be managed in accordance with Onshore Oil and Gas Order Nos. 1 & 7, the Resource Conservation and Recovery Act (RCRA), applicable WDEQ regulations, and Wyoming Oil and Gas Conservation Commission (WOGCC) rules. Fluid handling would be evaluated at the development stage and fluids associated with any subsequent drilling, completions and/or production would either be treated, evaporated, or transferred to a WDEQ-authorized commercial treatment, storage, or disposal facility; solids would be treated on site or transferred to a WDEQ-authorized facility.

3.7 Water Resources

Surface water hydrology within the area is typically influenced by geology, soil characteristics, precipitation and vegetation. Anthropogenic factors that currently affect surface water resources include livestock grazing management, private, commercial and industrial development, recreational use, drought, and vegetation control treatments.

Groundwater hydrology within the area is influenced by geology and recharge rates. Groundwater quality and quantity can be influenced by precipitation, water supply wells and various disposal activities. Groundwater quality across the applicable field offices varies with

depth from potable waters with low total dissolved solids (TDS) to highly saline, non-potable sources. Most of the groundwater in Wyoming is used for industrial, domestic and livestock/irrigation purposes. The information contained in Attachment 5.6, Hydraulic Fracturing White Paper (see section entitled *Operational Issues/Water Availability and Consumption Estimates*) is incorporated by reference.

Several parcels contain land with private surface overlying federal minerals (i.e., split-estate). The private surface lands have or have the potential to contain private residences and associated facilities such as domestic water supply wells. Otherwise, there are no known domestic or municipal water supply sources on or in the general vicinity of the available parcels, although there may be stock, industrial supply, or monitoring wells present.

3.8 Vegetation

Please refer to the approved RMP FEISs for a more detailed description of the vegetation resources in the planning areas, including for sensitive or Threatened and/or Endangered plant species.

Infestations of noxious weeds can have a negative impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Locally, regionally, and nationally noxious weeds infestations cause decreased quality of agricultural products due to high levels of competition from noxious weeds; decreased quantity of agricultural products due to noxious weed infestations; and increased costs to control and/or prevent the noxious weeds.

3.9 Livestock Grazing/Wild Horses

The proposed parcels are, in many cases, used for livestock grazing as they are located in primarily rural areas with large blocks of federal public domain lands. The proposed parcels could contain range improvement structures such as reservoirs, water wells, and fences.

Several of the parcels are also located within BLM wild horse Herd Management Areas (HMAs). See: https://www.blm.gov/programs/wild-horse-and-burro/herd-management/herd-management-areas/wyoming and the applicable RMPs.

3.10 Wildlife, Fish, and Special Status Species (Plants and Animals)

3.10.1 Special Status Species

Parcels proposed for lease may contain habitat for sensitive species.

Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires that the BLM ensure that any action authorized, funded, or carried out by the BLM is not likely to jeopardize the continued existence of any federally designated Threatened or Endangered (T&E) species.

The BLM Special Status Species Policy outlined in BLM Manual 6840 and BLM-Wyoming IM WY-2010-027 ("Update of the Bureau of Land Management, Wyoming, Sensitive Species List – 2010"), is to conserve listed species and the ecosystems on which they depend, while ensuring that actions authorized or carried out by the BLM are consistent with the conservation needs of special status species and minimize the likelihood and need for federal listing under the ESA.

By BLM policy, the BLM will conference with the FWS on species proposed for federal listing where the BLM determines its actions may affect listed or candidate species. Section 7 consultation with the FWS is normally completed at the time the RMPs are revised or amended, and when determined necessary for site-specific authorizations.

The BLM is responsible for managing BLM-designated sensitive plant species on public lands (see http://www.blm.gov/wy/st/en/programs/pcp/species/sensitive.html).

3.10.2 Greater Sage-Grouse

Conservation of the Greater sage-grouse (*Centrocercus urophasianus*) and their habitats has been a critical land-management issue for the BLM, the public, and the BLM's partner agencies across the West.

Sage-grouse currently occupy approximately about one-half of their historic distribution. On October 2, 2015, the U.S. Fish and Wildlife Service (FWS) published its finding that listing of sage-grouse under the Endangered Species Act of 1973 was not warranted. The FWS's finding was based, in part, on the conservation strategies developed in Wyoming and other states which led the FWS to conclude that "the primary threats to greater sage-grouse have been ameliorated by conservation efforts implemented by Federal, State, and private landowners." (80 FR 59858, dated October 2, 2015). As the FWS also acknowledged (*id.* at page 59882):

> *The key component of the Wyoming Plan is the application of State regulatory measures associated with the Wyoming Plan on all lands in Wyoming… The Federal Plans in the State incorporate the Wyoming strategy,*[3] *thereby ensuring implementation of the strategy on Federal land surfaces and subsurface regardless of the need for a State permit (see further discussion below). The completion of the Federal plans also facilitates greater coordination between the State and Federal agencies in implementing and monitoring the Wyoming Plan. This addition to the Wyoming Plan further increases the value of this effort in conserving sage-grouse by covering all lands in the State with a single regulatory framework to reduce affects to sage-grouse in the most important habitats in the State. Therefore, the strategy conserves sage-grouse through an effective regulatory mechanism for conservation.*

[3] On August 1, 2008, the Wyoming Governor issued Executive Order 2008-2, establishing a "core population area strategy" for sage-grouse in Wyoming. This Executive Order has since been re-issued (June 2, 2011 as EO 2011-5 and, most recently, on July 29, 2015 as EO 2015-4). The BLM and State of Wyoming use identical core population area boundaries; see https://eplanning.blm.gov/epl-front-office/projects/lup/36597/130805/159604/RMP_Maint_2017-001_Sage-Grouse_Core_V4.pdf

For BLM-administered public lands in Wyoming, the BLM adopted the State's sage-grouse conservation strategy by revising and amending its RMPs. The State of Wyoming's Core Area Protection strategy for sage-grouse "is based on the identification of important habitat areas for Greater sage-grouse and a set of actions that when taken are intended to ensure the long-term survival of Greater sage-grouse populations in Wyoming." (State of Wyoming Governor's Executive Order 2015-4, at Attachment A, page 5). The important habitat areas referred to in Executive Order (EO) 2015-4 are the Core Population Areas (CPAs) designed by the State of Wyoming's Sage-Grouse Implementation Team (SGIT). These CPAs encompass approximately 83% of the sage-grouse population within the State (see 80 FR 59882) as identified by peak male lek attendance, and were mapped by the SGIT to:[4]

> *...assimilate*[] *the highest sage-grouse density areas identified* [in published conservation studies] *as they were identified as the most productive habitats for sage-grouse in Wyoming. In addition, the mapping of Core Areas considered current and potential energy development and encapsulated areas historically low in production* [citation omitted]…

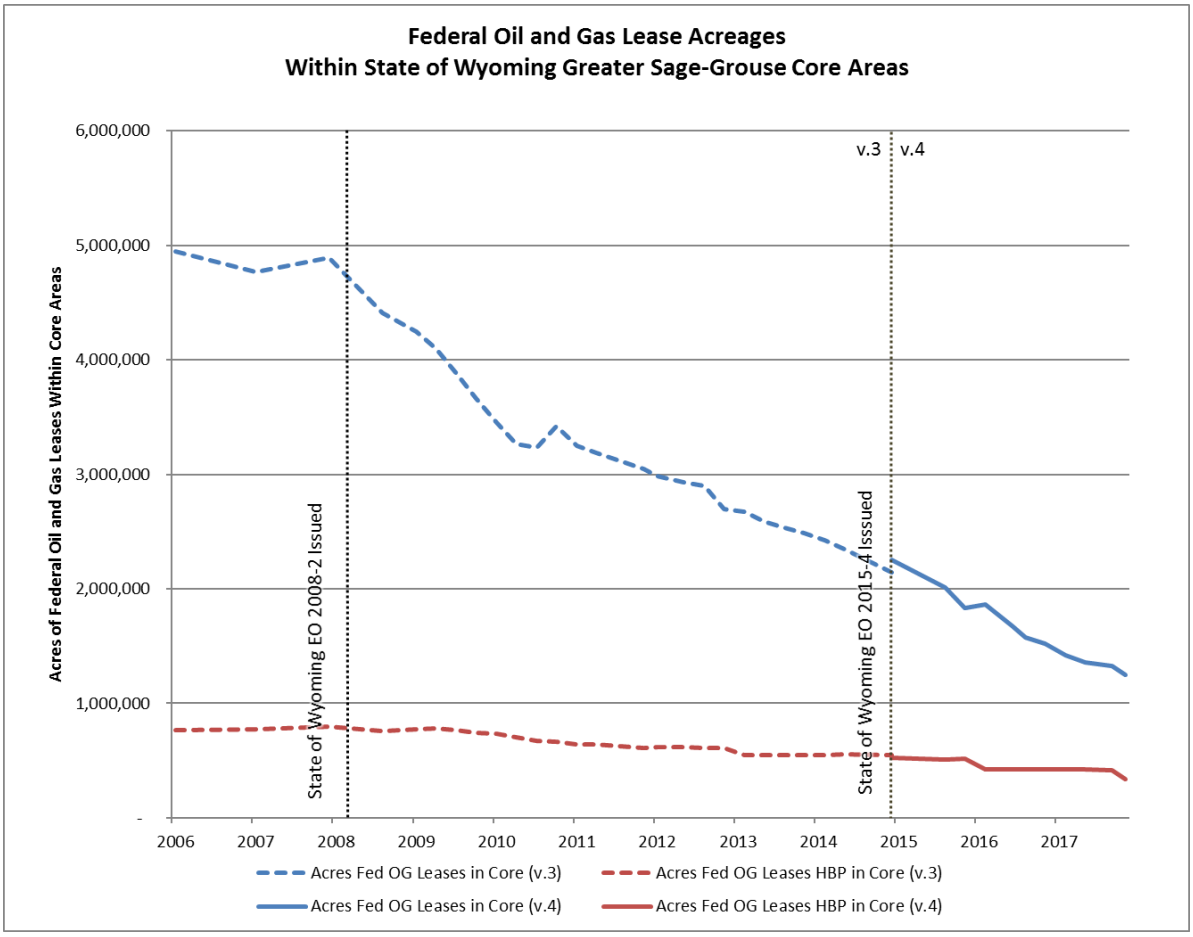
Recent scientific publications[5] indicate that though strategies such as this "may be successful at limiting sage-grouse range-wide population declines, if implemented, [] the conservation measures are not expected to reverse the declines, particularly where active oil and gas operations are present." However, these publications also "support the conclusion that overall the Wyoming Governor's Executive Order is helping safeguard critical sage-grouse habitats at the State-wide scale."

On December 27, 2017, WO IM 2016-143 ("Implementation of Greater Sage-Grouse Resource Management Plan Revisions or Amendments -Oil & Gas Leasing and Development Sequential Prioritization") was rescinded and replaced with WO IM No. 2018-026 ("Implementation of Greater Sage-Grouse Resource Management Plan Revisions or Amendments -Oil & Gas Leasing and Development Prioritization Objective"). WO IM 2018-026 specifies that: "The GRSG Plans established an objective to prioritize oil and gas leasing and development outside of GRSG habitat management areas, but to allow for leasing with appropriate stipulations on all BLM mineral estate designated in the GRSG Plans as "open" for leasing. In effect, the BLM does not need to lease and develop outside of GRSG habitat management areas before considering any leasing and development within GRSG habitat. This policy should allow for the BLM to efficiently conduct lease sales and permit oil and gas development while still protecting GRSG and GRSG habitat."

Since the BLM, State of Wyoming, and other partners began development and implementation of the current sage-grouse conservation strategy in 2008, there has been a 74% reduction in the area of Federal oil and gas leases in Core Population Areas. Similarly, there has been a 57%

[4] Gamo, R.S., and Beck, J.L., 2017, Effectiveness of Wyoming's sage-grouse core areas: Influences on energy development and male lek attendance: Environmental Management, v. 59, no. 2, p. 189-203.
[5] Hanser, et al., 2018, Greater sage-grouse science (2015–17)—Synthesis and potential management implications: U.S. Geological Survey Open-File Report 2018–1017, 46 p., https://doi.org/10.3133/ofr20181017 at pages 2, 14.

reduction in the area of Federal oil and gas leases that are Held by Production (HBP) within Core Population Areas:



Data source: BLM GIS Data as of April 2018

The current area of Federal oil and gas leases in Core Population Areas is the lowest since before the BLM adopted its revised and amended RMPs designed to increase conservation of Greater sage-grouse and their habitats. This trend has continued since the 2014-2015 revisions and amendments were finalized.

Maps displaying the location of the proposed oil and gas lease sale parcels in relation to PHMA and GHMA are provided in Attachment 5.4.

3.10.3 Mule Deer Migration Corridors

As described above (see Section 2.4), during initial coordination with the Wyoming Game and Fish Department (WGFD) and during preparation of this EA, the BLM and WGFD met to discuss several proposed lease sale parcels located in areas with the designated[6] Sublette and

[6] See WGFD's "Ungulate Migration Corridor Strategy" (February 4, 2016), available at:

Platte Valley mule deer migration corridors. The BLM and WGFD have agreed to add a Special Lease Notice to offered parcels (see Attachment 5.1), to ensure prospective lessees or their operators are aware of the WGFD's current policies for management of oil and gas development within wildlife habitats, including big game migration corridors:

> *Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.*

The WGFD's assessment of the Sublette mule deer herd notes that the herd population is currently 46% below the WGFD's population objective, and offers the following assessment of the Sublette mule deer herd: "Winter survival, habitat condition and quality on winter ranges, and habitat loss (direct and indirect) from gas and residential development are the primary issues influencing population dynamics in this herd unit. During the past 10 years, this deer herd experienced two winters that resulted in above normal fawn mortality (> 50% loss). Winter conditions experienced in 2016-17 resulted in a significant deer die-off where fawn loss was estimated near 85% and adult mortality near 35%. From the winter of 2010-11, fawn mortality estimates exceeded 70%. Winter fawn mortality estimates average around 30% during most years when winter severity is moderate to average. Current annual growth on key winter browse species has varied among years, but the overall habitat conditions remain poor with some improvement during years with ample moisture during the growing season. Gas field development has and will continue to impact deer numbers within this herd unit. The Pinedale Anticline gas field development overlaps crucial winter range located on the Mesa, where annual population estimates indicate deer numbers have declined by roughly 40% from 2001 – 2016. Studies have demonstrated that deer avoid areas with intensive winter gas development, and combined with direct habitat loss due to development, results in less forage available for wintering deer within and adjacent to gas development.." (WGFD 2017 Big Game Job Completion Report for the Pinedale Region, pages 57-67).

The WGFD's assessment of the Platte Valley mule deer herd notes that the herd population is currently 18% below the WGFD's population objective, and that "[a] large proportion of the mule deer that reside in this herd unit during winter spend the summer and early fall in Colorado which complicates management." (WGFD 2017 Big Game Job Completion Report for the Laramie Region, pages 261-271) The WGFD also highlights the ongoing work to evaluate the migration corridor: "[w]e continued to evaluate migration data from the Platte Valley mule deer radio-collar movement project (Kauffman, et.al. 2015) to identify migration corridors, migration

https://wgfd.wyo.gov/WGFD/media/content/PDF/Habitat/Habitat%20Information/Ungulate-Migration-Corridor-Strategy_Final_020416.pdf

bottlenecks and stopover habitats. WGFD will eventually use this data to assess current and potential threats to maintaining connectivity for important mule deer habitat within this herd unit." (*Id.*).

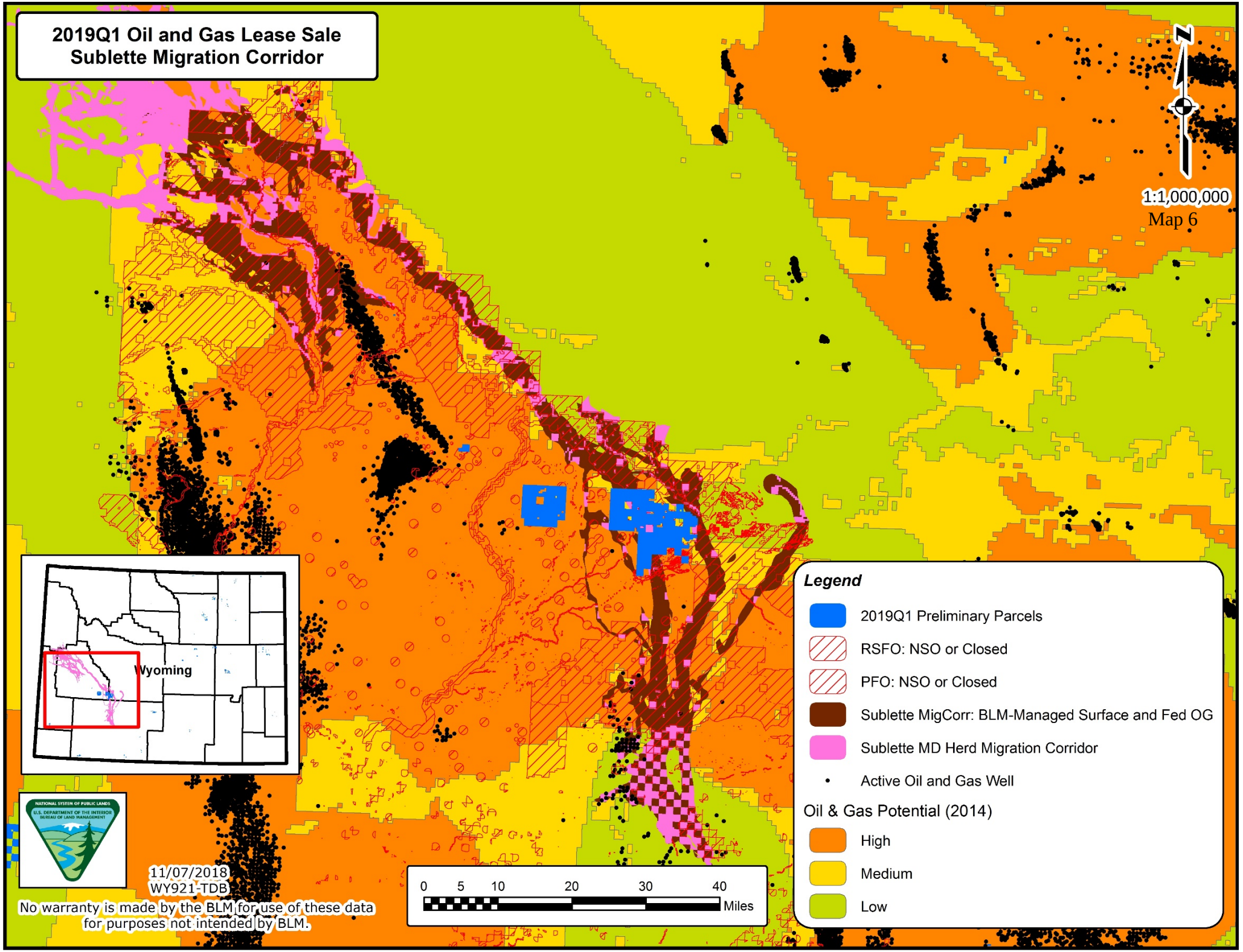
Of the Federal fluid mineral estate where surface operations associated with oil and gas development are managed by the BLM, a large majority of the lands intersecting the Sublette mule deer herd's designated migration corridor are currently closed to oil and gas leasing or would be leased with a No Surface Occupancy (NSO) stipulation:

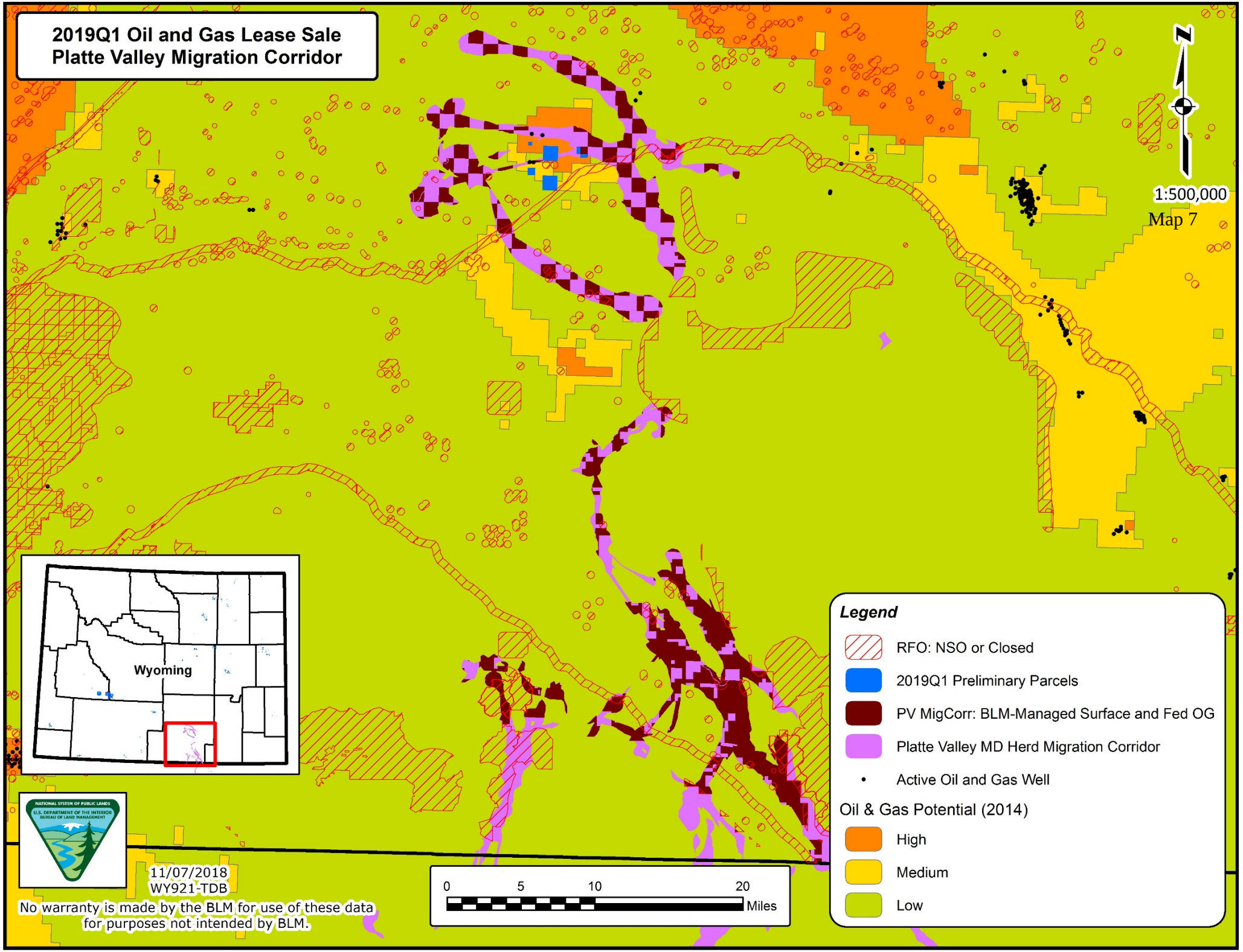
Table: Sublette Herd Migration Corridor – Federal Fluid Mineral Allocations (for lands where the BLM manages surface operations)

Feature	Size (Acres)
Sublette mule deer herd migration corridor	834,143
Lands within migration corridor where BLM manages surface operations associated with Federal oil and gas activities…	461,680
…and where BLM land use plan allocation decision for Federal oil and gas are "closed" or "NSO"	347,489

Of the 461,680 acres of land where the BLM manages surface operations associated with Federal oil and gas activities (i.e., not including lands within the National Forest System) in the Sublette mule deer herd's migration corridor, 75% of the area is currently closed to leasing or requires NSO stipulations (see Map 6). Energy development activities on private and state lands within the corridor are likely to occur, in compliance with local and state rules and regulations.

Of the 61,083 acres of land where the BLM manages surface operations associated with Federal oil and gas activities in the WGFD-managed portion of the Platte Valley herd's migration corridor, 25% of the area is currently closed to leasing or requires NSO stipulations (see Map 7). Energy development activities on private and state lands within the corridor may occur, in compliance with local and state rules and regulations, though the majority of the area has "low" oil and gas potential and there are few existing oil and gas wells in the area. The single proposed parcel intersecting the Platte Valley migration corridor is located adjacent to existing wells in the northern portion of the corridor, within the only small areas identified as "high" or "moderate" oil and gas potential near the corridor.


2019Q1 Oil and Gas Lease Sale
Sublette Migration Corridor
N
1:1,000,000
Map 6
Wyoming
Legend
2019Q1 Preliminary Parcels
RSFO: NSO or Closed
PFO: NSO or Closed
Sublette MigCorr: BLM-Managed Surface and Fed OG
Sublette MD Herd Migration Corridor
Active Oil and Gas Well
Oil & Gas Potential (2014)
High
Medium
Low
0 5 10 20 30 40
Miles
11/07/2018
WY921-TDB
No warranty is made by the BLM for use of these data
for purposes not intended by BLM.


2019Q1 Oil and Gas Lease Sale
Platte Valley Migration Corridor
N
1:500,000
Map 7
Wyoming
Legend
RFO: NSO or Closed
2019Q1 Preliminary Parcels
PV MigCorr: BLM-Managed Surface and Fed OG
Platte Valley MD Herd Migration Corridor
Active Oil and Gas Well
Oil & Gas Potential (2014)
High
Medium
Low
0
5
10
20
Miles
11/07/2018
WY921-TDB
No warranty is made by the BLM for use of these data
for purposes not intended by BLM.

3.11 Cultural and Heritage Resources, Including Paleontology, Traditional Cultural Properties, and Historic Trails

All parcels addressed in this EA have the potential to contain surface and buried archaeological materials, or may be located in an area which could affect the setting of historic sites and Traditional Cultural Properties (TCPs). Once the decision is made by the lessee to develop a lease, an area-specific cultural records review would be completed to determine if there is a need for a cultural inventory of the areas of proposed surface disturbance. Generally, a cultural inventory will be required before new surface disturbance and all historic and archaeological sites that are eligible for listing in the National Register of Historic Places would be either avoided by the undertaking, have adverse effects to sites minimized or mitigated, or have the information in the sites extracted through archaeological data recovery.

Parcels proposed for this sale are located near National Historic Trails (NHTs) or other historic trails, including the Overland Trail, Ft. Washakie Trail, Rawlins to Baggs Road, Lincoln Highway/Union Pacific Railroad Grade, Point of Rocks to South Pass Road, Emigrant Trail, and the Oregon, California, Mormon Pioneer and Pony Express NHTs; the BLM's RMPs provide for additional discussion about trails, including for those listed on the National Register of Historic Places (NRHP).

The parcels addressed in the EA also have a potential to contain vertebrate and non-vertebrate fossils. Where appropriate, applicable lease stipulations have been added to address potential paleontological resources. Post-lease development proposals would be evaluated on a case-by-case basis to determine if paleontological surveys would be required prior to surface disturbance.

3.12 Recreation

Recreational use of public lands and the surrounding areas is typically for hunting, fishing, camping, sightseeing, off-highway vehicle use, and other recreational activities. Tourism is one of Wyoming's largest industries, and much of the state's tourism is attributable to the outdoor recreation supported by the state's open and scenic spaces. Wildlife in Wyoming is associated with a significant amount of the recreational opportunities enjoyed across the state. According to the 2011 National Survey of Fishing, Hunting, and Wildlife-associated Recreation, more than 443,000 people participated in fishing and hunting, and an additional 518,000 people participated in some other form of wildlife watching in Wyoming in 2011 (USFWS 2011).

Some of the public lands proposed for lease are within Special Recreation Management Areas (SRMAs) or Dispersed Recreation Use Areas (DRUAs); refer to the applicable RMP FEISs for additional information on these lands, their resources and uses, and BLM management of activities within these areas.

BLM-administered public lands in Wyoming provide habitat for wildlife and support a wide range of wildlife and non-wildlife related recreational experiences. According to the 2015 Department of Interior report, recreational use of BLM administered lands by state residents and

out of state visitors was estimated to support nearly $173 million in economic activity across the state, and directly and indirectly (including induced) support 1,675 jobs and $52.3 million in labor income for Wyoming residents. Though lands nominated for leasing in this upcoming sale support only a small fraction of the recreational opportunities supported by BLM administered lands across the state, recreation-related visits in these areas contribute to the quality of life of Wyoming residents, stimulate economic activity, and support employment opportunities.

3.13 Visual Resource Management (VRM)

The BLM Visual Resource Management (VRM) Class objectives are as follows:

- Class I: to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- Class II: to retain the existing landscape character and the level of change to the characteristic landscape should be low. Management activities should not attract the attention of the casual observer. Changes would be required to repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Modifications to a proposal would be required if the proposed change cannot be adequately mitigated to retain the character of the landscape.
- Class III: to partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- Class IV: to provide for management activities which require major modification of the existing landscape character. Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements.

Where applicable, VRM lease stipulations are applied to the proposed parcels in conformance with the approved RMPs.

3.14 Socioeconomics, Environmental Justice, and Public Health and Safety

3.14.1 Socioeconomics

Please refer to the applicable RMP FEISs for additional discussion on socioeconomics within the project area.

The counties within which the proposed parcels are located collectively make up the analysis area in which potential socioeconomic impacts of the proposed lease sale are considered. Over the last decade and half, Wyoming has experienced moderate population growth, increasing by approximately 19% between 2000 and 2015.

The local customs, culture, and history of communities within Wyoming are entwined with the lands and mineral estates administered by the BLM. People derive a wide range of values from their access, use, development, and enjoyment of natural landscapes administered by each field offices. These values contribute to the unique sense of place indicative to rural Wyoming, as well as to the social and economic well-being of households and communities across these five counties. Since BLM management actions could affect future access, use, development, and enjoyment of the natural landscapes they administer, field office land use and leasing decisions can directly affect the social, cultural, and economic well-being of surrounding towns, cities, rural areas.

Wyoming has a long history in mineral development, and typically accounts for between 2% and 3% of U.S. crude oil production (U.S. EIA, 2016). In 2016, the mining sector supported 6% of employment and 12% of labor earnings statewide (BEA 2017s, BEA2017b).

Federal oil and gas leases generate a one-time lease bonus bid, as well as annual rents during the life the lease, or until hydrocarbon production begins on the leased parcel. Nominated parcels approved for leasing are offered by the BLM quarterly at auctions starting at a minimum bid of $2.00 per acre. If parcels do not receive the minimum competitive bid, they may be leased later as noncompetitive leases that do not generate bonus bids. In general, lease sales in Wyoming are highly competitive and parcels with high potential for oil and gas production regularly command bonus bids in excess of the minimum bid.

Rent payments are equal to $1.50 an acre for the first five years and $2.00 an acre for the second five years of the lease. Typically, these leases expire after 10 years unless held by production. During this lease period, annual rental payments are paid on leased parcels until one or more wells are drilled that result in production, then the lessee begins paying annual royalties calculated as a percentage of the value of production from the parcel.

Fifty percent of federal mineral leasing revenues are to go to the Treasury Department, while approximately forty-nine percent are distributed back to the state in which the revenues were generated. In Wyoming, federal mineral receipts distributed back to the state follow a legislatively established, two-tier formula. The first tier covers total annual receipts up to $200 million and the second tier applies to receipts over $200 million per year. Based on the state's legislatively established two-tier formula, Wyoming allocates these revenues to public school districts, the highway and county road fund, cities and towns, the University of Wyoming, capital construction projects, and the state's budget reserve account.

Although the economic activity associated with mineral development, and the public revenues generated from federal mineral leasing and development, play an important role in supporting the economic well-being of communities; resource development can have an adverse effect on other socioeconomic values people derive from these natural landscapes.

3.14.2 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…" (Executive Order 12989). Executive Order 12898 also fully applies to Indian tribes and therefore, it is important to determine whether any Indian tribes are present in the area. The purpose of EO 12898 is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Indian tribes that may experience common conditions of environmental exposure or effects associated with a plan or project.

Minority populations as defined by Council on Environmental Quality (CEQ) guidance under the National Environmental Policy Act (CEQ 1997) include individuals in the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population for environmental justice consideration is identified where "(a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater…" (CEQ 1997). Additionally, "[a] minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ 1997). Calculations are made to identify the "total minority" population which refers to that part of the total population which is not classified as Non-Hispanic White Only by the U.S. Census Bureau. By using this definition of minority population, the percentage is inclusive of Hispanics and multiple race categories and any other minority single race categories. This definition is most inclusive of populations that may be considered as a minority population under EO 12898.

Low-income populations are determined by the U.S. Census Bureau based upon poverty thresholds developed every year. For this project we will use the same criteria for identifying low-income populations for environmental justice considerations as is used for identifying minority populations (50 percent or "meaningfully greater"). We identify low-income population percentages and minority population percentages that are "meaningfully greater" as at least five (5) percentage points higher than for the State of Wyoming. Based on these criteria, the environmental justice populations were identified in the following locations: Albany County (low-income EJ populations), Carbon County (minority low-income populations), Fremont County (minority and low-income EJ populations), Sweetwater County (minority EJ populations), and Teton County (minority EJ populations).

3.14.3 Public Health and Safety

Oil and gas development, as well as other industrial uses, such as coal and trona mining, has been occurring in Wyoming for many decades. Due to the scattered nature and the small area encompassed by the proposed parcels coupled with low population density, industrial safety programs, standards, and state and federal regulations, offering these parcels is not expected to substantially increase health or safety risks to humans, wildlife, or livestock. Parcels that contain

lands with private surface overlying federal minerals (i.e., split-estate) have or have the potential to contain private residences and associated facilities such as domestic water supply wells. Several of these parcels may be used for individual, dispersed, recreational activities.

4. Impacts Analysis

The sale of parcels and issuance of oil and gas leases is strictly an administrative action. Nominated lease parcels are reviewed under the approved RMP, and stipulations are attached to mitigate any known environmental or resource conflicts that may occur on a proposed lease parcel. On-the-ground impacts would not occur until a lessee or their designated operator applies for and receives approval to undertake surface-disturbing lease actions.

The BLM cannot reasonably determine at the leasing stage whether or not a nominated parcel will actually be leased, or if leased, whether or not the lease would be explored or developed or at what intensity development may occur.

As an illustration of the uncertainty as to whether a lease parcel, if issued, will be developed, GIS data (as of April 2018) indicate that most (58%) of Federal oil and gas leases in Wyoming do not have any active wells located within their boundaries. Using the April 2018 GIS data, the active well spacing on individual leases ranges from 5,494.7 acres per well to 0.3 acres per well (μ = 298.9, σ = 438.8). Thus, there exists substantial uncertainty as to whether and to what degree leases will be explored or developed at the leasing stage.

The uncertainty that exists at the time the BLM offers a lease for sale includes crucial factors that will affect potential impacts, such as: well density; geological conditions; development type (vertical, directional, horizontal); hydrocarbon characteristics; equipment to be used during construction, drilling, production, and abandonment operations; and potential regulatory changes over the life of the 10-year primary lease term.

If lands are offered, leased, and a proposal for site-specific lease operations is received by the BLM, additional NEPA compliance documentation and technical analysis would be prepared by the BLM. Aside from the applicable protection measures required under the lease stipulations (see Attachment 5.1), additional mitigation may be applied as COAs at that time to mitigate identified impacts.

As described in Section 1.4, above, this EA tiers to the applicable NEPA compliance documentation, including the RMP FEISs. In the impacts analysis for the alternatives, below, this EA will only address those resources and impacts where the BLM has determined there are new circumstances or information, or where we believe it will be helpful to inform the public about actions that may occur on public lands. This approach comports with the BLM's NEPA Handbook H-1790-1 (at page 28):

> *The tiered EA for the individual action need not re-analyze the effects on resources fully analyzed in the broader EIS, but may instead focus on the effects of the individual action not analyzed in the broader EIS.*

The EAs tiered to the existing field office/resource area RMPs and their respective Environmental Impact Statements (EISs), in accordance with 40 CFR § 1502.20:

Agencies are encouraged to tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review... the subsequent ...environmental assessment need only summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and shall concentrate on the issues specific to the subsequent action.

For additional descriptions of the potential direct, indirect, and the cumulative impacts for the alternatives considered below, please refer to the RMP FEISs referenced in Section 1.4.

4.1 No Action Alternative

Under the No Action Alternative, the proposed lease sale parcels would not be offered at this time. Due to demand for oil and gas, it would be expected that some of these parcels would be re-nominated, offered, and possibly leased in the future, in conformance with approved RMPs.

Under this alternative, none of the proposed parcels would be offered for lease at the oil and gas sale and there would be no subsequent impacts to the existing environment caused by potential oil and gas lease operations. The No Action Alternative would result in the continuation of already-approved land uses, but would not result in impacts relating to exploration and development of these oil and gas lease parcels, because they would not be leased. Other exploration and development activities in the surrounding areas that are currently leased would continue. One specific adverse impact resulting from the No Action Alternative that is foreseen would be to socioeconomics.

4.1.1 Socioeconomics

Under the No Action Alternative, none of the proposed parcels would be offered for lease, resulting in reduced bonus bid revenues and rentals. Since not leasing these minerals would prevent private entities from exploring and developing these minerals, subsequent oil and gas production and generation of royalty revenues would not occur.

The State of Wyoming, as well as many counties and communities within, rely on oil and gas development as an important part of their economic base. The employment and purchasing opportunities associated with developing and producing wells on these leases would also be foregone, as would the opportunity to provide oil and gas resources from these lease parcels to help meet the nation's energy needs. Refer to the applicable RMP FEISs, including Section 4.11 of the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (beginning on page 4-134) for additional discussion of potential socioeconomic impacts.

4.2 Proposed Action Alternative

The Proposed Action Alternative would offer 144 parcels (comprised of 158,048.28 acres) at the BLM-Wyoming's First-Quarter 2019 competitive oil and gas lease sale. Attachment 5.1

describes the stipulations that would be applied to each parcel to mitigate anticipated impacts in conformance with the applicable field office RMPs.

The approved RMPs, as amended, have evaluated the need to protect resources on public lands in accordance with the BLM's multiple-use and sustained yield mandate. Three categories of stipulations are used by BLM-Wyoming (Uniform Format for Oil and Gas Lease Stipulations, March 1989):

- No Surface Occupancy (NSO) stipulation: use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values.
- Controlled Surface Use (CSU) stipulation: use and occupancy are allowed (unless restricted by another stipulation) but identified resource values require special operational constraints that may modify the lease rights.
- Timing Limitation Stipulations (TLS): prohibits surface use during specified time periods to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of site-specific analysis demonstrates the continued need for such mitigation and that less stringent, project specific mitigation measures would be insufficient.

4.2.1 RMP Special Designations

The proposed parcels are located within areas open to leasing under the approved RMPs. Applicable lease stipulations for RMP Special Designations have been added to each parcel to ensure conformance with the approved RMPs. For parcels located in ACECs open to leasing under the approved RMPs, at the time of a site-specific application for lease operations ACEC values will be identified and conditions of approval to mitigate adverse impacts to ACECs may be imposed at that time.

Future oil and gas operations occurring on the proposed parcels could temporarily degrade wilderness characteristics values, where present, and could result in the lands no longer having the conditions that meet the wilderness characteristics criteria. Lease stipulations intended to benefit other resources, such as Greater-sage grouse cumulative surface disturbance and disturbance density limitations, may protect natural settings and values within LWCs. Specific impacts, and appropriate mitigation, would be identified at the time a site-specific proposal for lease operations is submitted to the BLM.

4.2.2 Air Resources

4.2.2.1 Air Quality

Refer to Sections 4.2 (page 4-5) and 4.22.3 of the Wyoming Greater Sage-Grouse Proposed Land Use Plan Amendment and FEIS (Approved Resource Management Plan Amendment, or ARMPA) (beginning on page 4-134) for a discussion of potential impacts to Air Quality, and related values for the HDD, the CFO and the NFO. Refer to Section 4.2.4 (beginning on page 4-7) of the ARMPA FEIS for a discussion of potential impacts to air quality resulting from oil and

gas development, including potential greenhouse gas emissions. The air emissions projections within the ARMPA for oil and gas development were calculated using the latest emissions estimates data from the BFO and LFO EISs (BLM 2010).

See Section 4.1.1 of the BFO RMP FEIS (beginning on page 650), Section 4.1.1 of the Bighorn Basin RMP FEIS (beginning on page 4-6), Section 4.1.1 of the LFO FEIS (beginning on pg. 593) for specific air quality impact analysis in these planning areas.

Additional information regarding air quality related values including Visibility, Hazardous Air Pollutants (HAPs) and Deposition is located in Attachment 5.3.

There can be limitations associated with a quantitative approach given the uncertainties regarding the number, nature, and specific location of future sources and activities. The estimated emissions in the RMP EISs were determined using the following assumptions:

- Emissions from BLM-authorized activities for both construction and operations are calculated for year 2020 and year 2031. Year 2020 was chosen because construction emissions would be at its peak during that year due to peak well construction at each location. Year 2031 was chosen because operational emissions would be at the highest level, while construction emissions would be at the lowest; and
- Appropriate Required Design Features (RDFs) and/or BMPs will be applied; the subject RMPs' analyses disclose the residual impacts that have the potential to occur after application of the RDFs and/or BMPs.

It should be noted that for both of the above assumptions, the pace and timing of mineral development activities is dependent on a variety of factors outside the control of the BLM. These include national and international energy demand and prices, production factors within the planning area, and individual strategic choices made by operators.

The administrative act of offering any of these parcels and the subsequent issuing of leases would have no direct impacts to air quality. Any potential effects to air quality would occur if the leases are developed. Any proposed development project would be subject to additional analysis of possible air effects before approval, when necessary. The analysis may include air quality modeling for the activity in accordance with the National BLM, EPA and NPS Air Quality Memorandum of Understanding (MOU).

Over the last 10 years, the development on federal oil and gas mineral estate in the HDD has resulted in an average of 396 usable wells being completed annually (approximately 5 in KFO, 60 in RFO, 23 in RSFO, and 326 in PFO). These drilling rates have decreased over time. Over the last 10 years, the development on federal oil and gas mineral estate in the WRBBD has resulted in approximately 21 usable wells completed annually (approximately 13 in LFO, and 8 between CYFO and WFO). Finally, over the last 10 years in the HPD, approximately 373 usable wells are completed on an annual basis, including 277 in BFO, 78 in CFO and 18 in NFO. The number of usable completions in the BFO has decreased over time as the coalbed natural gas play has largely ceased production, while new horizontal production is being explored primarily

in the CFO and the southern portion of the BFO. The addition of these wells would incrementally contribute to the total emissions (including GHGs) from oil and gas activities in Wyoming. The amount of contribution is unknown because other wells in the districts are being plugged and abandoned, so a certain amount of this production is replacing other wells that are no longer productive.

Potential impacts of development could include increased airborne particulates associated with the construction of new well pads, pipelines, or roads, exhaust emissions from drilling and completion equipment/activities, compressors, vehicles, and dehydration and separation facilities, as well as releases of GHG and volatile organic compounds during many of these activities. The following sources of emissions are anticipated during oil and gas development should the leases be sold and development proposed and found to be economic:

- combustion engines (e.g., fossil fuel-fired internal combustion engines used to supply electrical or hydraulic power for hydraulic fracturing to drive the pumps and rigs used to drill the well, drill out the hydraulic stage plugs and run the production tubing in the well; generators to power drill rigs, pumps and other equipment; compressors used to increase the pressure of the oil or gas for transport and use; tailpipe emissions from vehicles transporting equipment to the site),
- venting (e.g., fuel storage tanks, vents, and pressure control equipment),
- mobile emissions (e.g., vehicles bringing equipment, personnel or supplies to the location), and
- fugitive sources (e.g., pneumatic valves, tank leaks, dust).

Pollutants associated with the combustion of fossil fuels anticipated to be released during drilling/completion operations include: CO, NO_x SO_x, PM, CO_2, CH_4 and N_2O. Venting may release VOCs/HAPs, H_2S, and CH_4. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells or what type (oil, gas or both) may be proposed for development, the types of equipment needed if a well were to be put into production (e.g., compressor, separator, dehydrator), or what technologies may be employed by a given company. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

During the completion phase, the principal pollutants emitted are VOCs, HAPs, particulate matter and NO_2. VOCs and NO_x contribute to the formation of ozone. During well completion, injected fracturing fluids, formation fluids and reservoir gas are flowed back to the surface. The flowback of formation fluids and reservoir gas will include additional VOCs and methane, along with hazardous air pollutants such as benzene, ethylbenzene, and n-hexane. Pollution also may be emitted from other processes and equipment during production and transportation of oil and gas from the well to a processing facility. Refer to Attachment 5.6, (Hydraulic Fracturing White Paper) for more information, which is incorporated by reference.

The RFD scenario for all four field offices in the HDD, the CFO and the NFO, was updated under the ARMPA (2015), which cumulatively covers nearly 11 million acres of federal fluid minerals. This RFD projects 12,723 wells could be developed during the life of the plans.

The RFD scenario for all three field offices in the WRBBD was updated during the recent planning efforts for the LFO (2014) and the Bighorn Basin (2015), and cumulatively covers nearly 7 million acres of federal fluid minerals. This RFD projects 3,100 wells in the Bighorn Basin and 3,400 wells in the LFO could be developed during the life of the plans.

The RFD scenario for the BFO in the HPD was updated during the recent planning efforts for the BFO RMP revision (2015). This RFD projects 11,018 wells could be developed during the life of the plan. All of the aforementioned RFD projected well numbers include both federal and non-federal wells.

Development density (wells per square mile) and number of wells installed annually depend on a number of variables including market trends, technology available (vertical, directional, or horizontal drilling), the geology of the hydrocarbon-bearing zone, and the application of CSU and NSO stipulations. As a result, the number of wells that could potentially be put into production under a full-field development scenario as a result of offering the leases is unknown. Current APD permitting trends within the field offices confirm that the RFD assumptions are reasonably accurate.

Coal-bed natural gas (CBNG) development currently exists within the RFO. Approximately 8.5 percent of the active wells in the RFO are CBNG wells. Based on the existing development and the RFD for the RFO, CBNG-related emissions can be expected. Although the RFD for the KFO RMP assumes a CBNG development rate of up to 15 wells per year, there currently is no active or proposed CBNG development in the KFO; therefore, there are no expected emissions from CBNG. Several CBNG wells exist in the PFO, but have proven unproductive; therefore, there are no expected emissions from this source although they are included in the estimation of GHG emissions as the geologic potential still remains.

CBNG production does not currently exist within the WRBBD; a total of 14 CBNG wells have been installed in the LFO; all but one were plugged without producing in economical quantities. Although the RFD scenarios for both the LFO and Bighorn Basin RMPs assumes a CBNG development rate of up to 15 wells per year, there is no active or proposed CBNG development in the field offices; therefore, there are no expected emissions although they are included in the estimation of GHG emissions as the geologic potential still remains.

While CBNG production is still occurring the BFO, the most current RFD projects no new CBNG wells will be drilled/completed and active plugging operations of existing wells is ongoing.

4.2.2.2 Greenhouse Gas Emissions and Climate Change

Please refer to the applicable RMP FEIS, including Section 4.2.4 (beginning on page 4-7) of the ARMPA FEIS, Section 4.1.1 (beginning on page 650) of the BFO ARMP for a discussion of potential impacts to air quality resulting from oil and gas development, including potential direct GHG emissions.

The administrative act of leasing would not result in any direct, indirect, or add to cumulative GHG emissions. Nevertheless, the BLM recognizes that GHG emissions are a potential effect of the subsequent fluid mineral exploration and/or development of any leases that are issued. Oil and gas activities may lead to the installation and production of new wells, which may consequently produce GHG emissions. The primary sources of GHG emissions include the following:

- Fossil fuel combustion for construction and operation of oil and gas facilities – vehicles driving to and from production sites, engines that drive drill rigs, etc. These produce CO_2 in quantities that vary depending on the age, types, and conditions of the equipment as well as the targeted formation, locations of wells with respect to processing facilities and pipelines, and other site-specific factors;
- Fugitive CH_4 – CH_4 that escapes from wells (both gas and oil), oil storage, and various types of processing equipment. This is a major source of global CH_4 emissions. These emissions have been estimated for various aspects of the energy sector, and starting in 2011, producers are required under 40 CFR 98, to estimate and report their CH_4 emissions to the EPA; and
- Combustion of produced oil and gas – it is expected that future operations would produce marketable quantities of oil and/or gas. Combustion of the oil and/or gas would release CO_2 into the atmosphere. Fossil fuel combustion is the largest source of global CO_2.

In recent years, many states, tribes, and other organizations have initiated GHG inventories, tallying GHG emissions by economic sector. The EPA provides links to statewide GHG emissions inventories (EPA, 2015). Guidelines for estimating project-specific GHG emissions are available (URS Corporation, 2010), but some additional data, including the projected volume of oil or natural gas produced for an average well, number of wells, and other factors were used to provide GHG estimates.

Wyoming's total GHG emissions are expected to continue to grow to 69 $MMtCO_2e$ by 2020, 56% above 1990 levels. As described in the CCS inventory report, 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 decreased carbon dioxide emissions from venting at processing plants. Additional capture of fugitive emissions will likely result in further reductions in emissions at all points in the production and refining processes for oil and gas products.

Direct Emissions

The Petroleum Association of Wyoming's website (http://www.pawyo.org) reports that in 2016, there were 25,058 producing wells in the state, 42 operational gas processing plants, 6 oil refineries, and over 38,600 miles of crude oil, gas, and petroleum product pipelines located across all land ownership patterns in the state. In 2016, sales of crude oil production totaled 72.5

million barrels, down 17.4% from 2015. Sales of natural gas production in 2016 totaled 1,628 trillion cubic feet down 7.7% from 2015.

Since oil and gas production is market-driven, there are significant uncertainties associated with estimates of future Wyoming GHG emissions from this sector. This is compounded by the fact that there are no regulatory requirements to track CO_2 or CH_4 emissions, although they may be regulated indirectly under other air quality standards.

However, as reported by the Wyoming GHG Inventory and Reference Case Projection CCS (Spring 2007) emissions from the fossil fuel sector grew 101% from 1990 to 2005 and are projected to increase by a further 10% between 2005 and 2020 (if economic incentives remain). The natural gas industry is the major contributor to both GHG emissions and emissions growth, with CH_4 emissions from coal mining second in terms of overall contribution. It is worth noting that a significant portion of the emissions attributed to the natural gas industry are due to vented gas from processing plants, many of which are used for injection in enhanced oil recovery operations. Additionally, many technological advances in emission control technology have been implemented by the oil and gas industry to reduce emission levels.

The average number of oil and gas wells drilled annually in the HDD 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. For additional information on projected emissions of GHGs, please see Wyoming Greater Sage-Grouse Land Use Plan Amendment FEIS pages 4-15 thru 4-20, 4-27 thru 4-28, 4-32 thru 4-33, and 4-36 thru 4-37. As analyzed in the FEIS, total CO_2e emissions for the full RFD under the GRSG ARMPA in 2031 (expected maximum year of construction associated emissions) is projected to be: 1,713,044 metric tonnes (mt) for natural gas wells, 1,558,288 mt for CBNG, 15,649 mt for oil wells, 4,067 mt from horizontal natural gas wells and 161 mt from horizontal oil wells with a total CO_2e of 3.64 million metric tonnes (Mmt). This assumes that all wells projected under the RFD are drilled and producing, and that there are no controls on the waste stream.

The average number of oil and gas wells drilled annually in the WRBBD 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. For additional information on projected emissions of GHGs, please see LFO FEIS pages 593-629 and the Bighorn Basin FEIS beginning at page 4-23. As analyzed in the WRBBD RMP EISs, total CO_2e emissions for the full RFD in the LFO (expected maximum year of associated emissions) is projected to be: 1.11 Mmt and 0.91 MMt in the Bighorn Basin. This assumes that all wells projected under the RFD are drilled and producing, and that there are no controls on the waste stream.

The average number of oil and gas wells drilled annually in the HPD 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. For additional information on projected emissions of GHGs,

please see Wyoming Greater Sage-Grouse Land Use Plan Amendment FEIS pages 4-10 thru 4-39, and the BFO RMP FEIS pages 682-701. As analyzed in the GRSG ARMPA, total CO_2e emissions for the full RFD under the GRSG ARMPA in 2020 (expected maximum year of construction associated emissions) is projected to be: 2,048,154 mt for natural gas wells, 1,466,658 mt for CBNG, 59,641 mt for oil wells, 53,152 mt from horizontal natural gas wells and 14,358 mt from horizontal oil wells, with a total CO_2e of 3.64 Mmt. This assumes that all wells projected under the RFD are drilled and producing, and that there are no controls on the waste stream (ARMPA Table 4-4). Annual emissions for activities in the BFO, as analyzed in the Buffalo ARMP for 2024, are estimated to be 101,448 mt for natural gas, 110,721 mt for coalbed natural gas, 50,099 mt for oil, with a total 262,267 mt CO_2e (RMP Table 4.24).

Assuming these lands are leased and developed to the full potential, as projected by the RFD for the GRSG ARMPA (2015) as it pertains to the HDD, development to the full RFD in the KFO would produce a total of 380,551 mt of CO_2e; the PFO is projected to produce a total of 1,618,329 mt; the RFO is projected to produce a total of 1,147,892 mt, and the RSFO is projected to produce a total of 25,1921 mt. Direct GHG emissions resulting from any future development of these parcels is within the projections identified in the GRSG ARMPA FEIS and includes all emissions generated from construction through the production of the wells and are based on the year 2020 estimates, projected to be the peak period for well development.

Assuming these lands are leased and developed to the full potential, as projected by the RFD for the WRBBD RMPs, development to the full RFD in the LFO would produce a total of 1.11 MMt of CO_2e per year; the Cody and Worland FOs are projected to produce a total of 0.16 MMt of CO_2e per year. Direct GHG emissions resulting from any future development of these parcels is within the projections identified in the FEISs and includes all emissions generated from construction through the production of the wells and are based on the year 2018 estimates, projected to be the peak period for well development.

Assuming these lands are leased and developed to the full potential, as projected by the RFDs for the GRSG ARMPA and Buffalo ARMP in the HPD, development to the full RFD in the CFO would produce a total of 386,924 mt of CO_2e (ARMPA Table 4-6) and the NFO is projected to produce a total of 20,245 mt CO_2e (ARMPA Table 4-14). Direct GHG emissions resulting from any future development of these parcels is within the projections identified in the GRSG ARMPA FEIS and includes all emissions generated from construction through the production of the wells and are based on the year 2020 estimates, projected to be the peak period for well development. The BFO is projected to produce a total of 262,267 mt CO_2e (RMP Table 4.24). Direct GHG emissions resulting from any future development of these parcels is within the projections identified in the BFO's RMP FEIS and includes all emissions generated from construction through the production of the wells and are based on the year 2024 estimates. For the BFO's RMP analysis, GHG emissions were estimated for a 20-year period, beginning with 2005 as the base year, 2015 as the mid-point interim year, and 2024 as the end of this period.

Each GHG has a global warming potential (GWP) that accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere. GWP values allow for a comparison of the impacts of emissions and reductions of different gases. According to the IPCC, GWPs

typically have an uncertainty of ±35 percent. GWPs have been developed for several GHGs over different time horizons including 20-year, 100-year, and 500-year. The choice of emission metric and time horizon depends on type of application and policy context; hence, no single metric is optimal for all policy goals. The 100-year GWP (GWP100) was adopted by the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol and is now used widely as the default metric. In addition, the EPA uses the 100 year time horizon in its Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016 (April 2018), GHG Reporting Rule requirements under 40 CFR Part 98 Subpart A, and uses the GWPs and time horizon consistent with the IPCC Fifth Assessment Report, Climate Change Synthesis Report, 2014 in its science communications. In this EA, the BLM uses GWPs and time horizons consistent with EPA in its GHG emission calculations associated with the proposed action. BLM has also included a comparison of GHG emissions using the 20 year time horizon (GWP20) for illustrative purposes.

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially CO_2 and CH_4) from fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere. For example, CO_2 may last 50 to 200 years in the atmosphere while methane has an average atmospheric life time of 12 years.

The Buffalo Field Office's RMP FEIS estimated the total GHG emissions from oil and gas development on all lands in their planning area in the year 2024 (BFO RMP FEIS at page 694).

Direct emissions of GHGs have been calculated using a GWP100 of 28 for CH_4 and 265 for N_2O in accordance with EPA's current guidance and policy. Total estimated direct GHG emissions were also calculated for illustration purposes using GWP20 of 84 for CH_4 and 264 for N_2O:

GHG	short tons/year (2024)*	metric tons/year (2024)	GWP100	mt CO_2e	GWP20	mt CO_2e
CO_2	209,261	189,838	1	189,838	1	189,838
CH_4	19,456	17,650	28	494,205	84	1,482,616
N_2O	3	3	265	721	264	718
Total CO_2e	618,877	561,436		684,765		1,673,173

*From the BFO RMP FEIS, Page 694

Any incremental contribution to global GHG gases cannot be translated into incremental effects on climate change globally, regionally, or in the area of these site-specific actions. As oil and gas and natural gas production technology continues to improve in the future, it may be feasible to further reduce GHG emissions. Information contained in Attachment 5.6, Hydraulic Fracturing White Paper, is incorporated by reference.

Indirect Emissions

Information on production of oil and gas was provided by the BLM Reservoir Management Group (RMG) and BLM field and district office staff to support analysis within the GRSG ARMPA FEIS. The information used to develop total oil and gas production estimates by year for each alternative and each field office or planning unit, including the number of wells drilled each year by alternative for each field office or planning unit (from the RFD), the percent of wells that were oil versus gas, the percent of wells completed, production decline curves for oil and gas wells, and estimates of cross-production from both oil and gas wells.

As discussed in Appendix N, Social and Economic Impact Analysis Methodology, from the ARMPA FEIS, the procedure to determine total production was as follows: For each year, the number of wells completed was broken down into oil and gas wells based on the breakdown assumptions per field office and planning unit provided by BLM staff. For each well type, the average first year production rate (volume) from the annual decline curves for each field office and planning unit (as provided by RMG) was then applied to determine the total production from first-year wells. In subsequent years, the appropriate average production rates from the decline curves were applied to the number of second year wells, third year wells, and so on. Total production was then summed across all the well age cohorts for each year within the analysis period. Co-production volume was calculated based on the numbers of wells of each type and the co-production rates from the RMG, and added to the total production volume.

Using the above projection, and utilizing the EPA GHG Equivalences Calculator, assuming 100% combustion of the produced fluids, estimate indirect emissions are shown in the table, below:

Table: Statewide Indirect Cumulative GHG Emissions: assumes 100% Combustion (metric tons CO_2)

Oil and Gas Production (Alternative E) - Summary (2016-2020)							
Year	**Gas (MCF)**	**Oil (BBLS)**		**Year**	**Gas (CO_2)**	**Oil (CO_2)**	**Total**
2016	698,316,896	8,249,909		2016	38,209,805.62	3,547,460.73	41,757,266.35
2017	787,612,542	9,347,281		2017	43,095,795.48	4,019,330.96	47,115,126.44
2018	857,779,351	10,266,540		2018	46,935,112.75	4,414,612.22	51,349,724.97
2019	931,096,889	11,175,941		2019	50,946,828.45	4,805,654.80	55,752,483.25
2020	993,733,861	12,012,924		2020	54,374,135.65	5,165,557.29	59,539,692.94
				Total:	233,561,677.95	21,952,615.99	255,514,293.94

Emission Factor Source: EPA GHG Equivalencies Calculator
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
CO_2 emissions generated from oil consumption: 0.43 metric tons CO_2/barrel oil
CO_2 emissions generated from burning natural gas: 0.054717 metric tons CO_2/MCF
Alternative E is the preferred alternative selected in the ARMPA.
* MCF=one thousand cubic feet
* BBLS=barrels

Emission Estimate Uncertainties

Although this EA presents quantified estimates of potential direct and indirect GHG emissions associated with the potential for oil and gas development, there is significant uncertainty in GHG emission estimates due to various unknowns with regard to actual production, how produced substances are used, how regulation of the various GHG parameters by the delegated agencies is applied, and whether any Best Available Control Technologies are utilized at the upstream or downstream activity location(s) and the reader is cautioned that, while based on the best available data, these estimates are highly speculative. For example, the RFD scenario reports prepared for the relevant RMPs disclose variable rates of success over time for wells drilled in these planning areas. Based on both historical and current information, the rate of success for wells being productive, range from a low of 13% to upwards of 90% depending upon the location within the individual field offices, the formations being targeted, price indexes, and technological advances. Where discussed in the RFD reports, success rates are expected to decline due to future exploration of unconventional resources. "From the early 1990's to present, activity has focused almost entirely on very low risk development drilling in and around known field areas, which helped to improve the overall success rate. More future exploratory drilling will be required to discover new resources in the Planning Area and to determine whether its potential coalbed natural gas resource is economic to produce. Since the risk of failure is higher for these types of activities, the success rates could decline slightly in the future." See RFO RFD (2004), pages 4 - 5, KFO RFD (2006), pages 4-7 to 4-19, and PFO RFD (2006), Table 5]. [See Bighorn Basin (2014), pages 24 - 27, and LFO RFD (2006), pages 12-15]. See BFO RFD (2012) pages 16-17, and CFO RFD (2005) pages 7-9.

Oil and Gas Product End Use Uncertainty

The direct and indirect emission estimates above provide an estimate of the full potential for GHGs released into the atmosphere from initial wellsite construction, well drilling and completion, production, and end use. A rough estimate was possible using full field and unconstrained potential well development prepared for the ARMPA EIS. With respect to the rough estimates of indirect CO_2 emissions, it should be noted that it is a difficult to discern with certainty what end uses for the fuels extracted from a particular leasehold are reasonably foreseeable. For instance, some end uses of fossil fuels extracted from federal leases include: refining for transportation fuels, fuel oils for heating and electricity generation, or production of asphalt and road oil. They may also be used in the chemical industry, for the manufacture of medicines and everyday household items, plastics, military defense and for the manufacture of synthetic materials. The BLM does not exercise control over the specific end use of the oil and gas produced from any individual federal lease and has no authority to direct or regulate the end use of the produced products. As a result, the BLM can only provide an estimate of potential GHG emissions by assuming that all produced products would eventually be combusted. The uncertainty about end uses is in addition to the significant uncertainty with regard to the actual levels of development and production that may occur at any given well.

4.2.2.2.1 Climate Change Impacts

The following bullet points summarize potential changes identified by the EPA that are expected to occur at the regional scale, where the proposed action and its alternatives are to take place.

The EPA identifies this area as part of the Mountain West and Great Plains region (http://www.epa.gov/Region8/climatechange/pdf/ClimateChange101FINAL.pdf):

- The region is expected to experience warmer temperatures with less snowfall.
- Temperatures are expected to increase more in winter than in summer, more at night than in the day, and more in the mountains than at lower elevations.
- Earlier snowmelt means that peak stream flow would be earlier, weeks before the peak needs of ranchers, farmers, recreationalist, and others. In late summer, rivers, lakes, and reservoirs would be drier.
- More frequent, more severe, and possibly longer-lasting droughts are expected to occur.
- Crop and livestock production patters could shift northward; less soil moisture due to increased evaporation may increase irrigation needs. Drier conditions would reduce the range and health of ponderosa and lodgepole pine forests, and increase the susceptibility to fire. Grasslands and rangelands could expand into previously forested areas.
- Ecosystems would be stressed and wildlife such as the mountain line, black bear, long-nose sucker, marten, and bald eagle could be further stressed.

Other impacts could include:

- Increased particulate matter in the air as drier, less vegetated soils experience wind erosion.
- Shifts in vegetative communities which could threaten plant and wildlife species.
- Changes in the timing and quantity of snowmelt which could affect both aquatic species and agricultural needs. Projected and documented broad-scale changes within ecosystems of the U.S. are summarized in the Climate Change SIR (2010). Some key aspects include:

    - Large-scale shifts have already occurred in the ranges of species and the timing of the seasons and animal migrations. These shifts are likely to continue (Climate Change SIR 2010). Climate changes include warming temperatures throughout the year and the arrival of spring an average of 10 days to 2 weeks earlier through much of the U.S. compared to 20 years ago. Multiple bird species now migrate north earlier in the year.
    - Fires, insect epidemics, disease pathogens, and invasive weed species have increased and these trends are likely to continue. Changes in timing of precipitation and earlier runoff increase fire risks.
    - Insect epidemics and the amount of damage that they may inflict have also been on the rise. The combination of higher temperatures and dry conditions have increases insect populations such as pine beetles, which have killed trees on millions of acres in western U.S. and Canada. Warmer winters allow beetles to survive the cold season, which would normally limit populations; while concurrently, drought weakens trees, making them more susceptible to mortality due to insect attack.

The Rapid Ecological Assessment for the Wyoming Basin also provides projections of future climatic changes, while cautioning that reasonably foreseeable changes in climate will vary due to natural inter-annual and decadal variability, uncertainty about future greenhouse gas emissions, and the range of uncertainties in the existing global climate models. The authors also recognize that there are differences among climate models in how they represent climate processes and therefore produce different climate projections for a given time period and location even when the same future emissions scenario drives the simulation. Global temperatures, however, are expected to increase (Intergovernmental Panel on Climate Change, 2013) such that warmer temperatures in the future can be expected, although the magnitude and consequences of warming is uncertain, but note that summers are projected to warm more than winters (an increase of 4.5 ºF versus 3.5 ºF) (fig. 5.1 in Lukas and others, 2014) while no statistically significant changes in precipitation are noted, winters may be wetter and summers likely drier. Despite the lack of statistically significant projected changes in precipitation, the temperature increase alone could increase evaporation and plant water demand; thus, even without a decrease in precipitation, water availability for ecosystems could decrease if precipitation remains about average (Carr, 2016).

Methane and Fossil Fuel Emissions

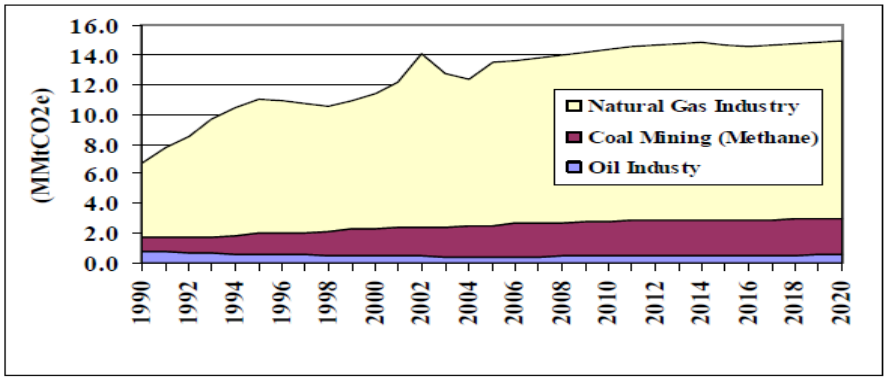
Table E2. Methane Emissions and Projections from the Fossil Fuel Industry

(Million Metric Tons CO2e)	1990	1995	2000	2005	2010	2015	2020
Fossil Fuel Industry	**6.7**	**11.0**	**11.4**	**13.5**	**14.4**	**14.7**	**14.9**
Natural Gas Industry	5.0	9.0	9.2	11.0	11.6	11.8	12.0
Production (CH_4)	0.2	0.3	0.8	1.6	2.3	2.5	2.6
Processing (CO_2 & CH_4)	4.1	7.9	7.7	8.2	7.6	7.6	7.5
Methane Emissions (CH_4)	*1.4*	*1.4*	*1.3*	*1.2*	*1.6*	*1.7*	*1.8*
Vented Gas (CO_2 & CH_4)	*2.6*	*6.5*	*6.4*	*6.9*	*6.0*	*5.9*	*5.7*
Transmission (CH_4)	0.6	0.7	0.6	1.1	1.6	1.6	1.7
Distribution (CH_4)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Oil Industry	0.8	0.6	0.5	0.4	0.5	0.5	0.5
Production (CH_4)	0.7	0.6	0.5	0.4	0.5	0.5	0.5
Refineries (CH_4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal Mining (CH_4)	1.0	1.4	1.8	2.1	2.3	2.4	2.4

The value 0.00 in the above table indicates emissions less than 0.005 MMtCO2e.

Figure E1 displays the CH_4 emissions from coal mining and natural gas and oil systems, on an $MMtCO_2e$ basis.

Figure E1. Fossil Fuel Industry Emission Trends ($MMtCO_2e$)



Source: CCS calculations based on approach described in text.

4.2.2.3 Mitigation of Impacts to Air Resources

The BLM holds regulatory jurisdiction over portions of natural gas and petroleum systems, identified in the EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks document. Exercise of this regulatory jurisdiction has led to development of BMPs designed to reduce emissions from field production and operations. Analysis and approval of future development on the lease parcels may include applicable BMPs as Conditions of Approval (COAs) in order to reduce or mitigate GHG emissions, if necessary and within the authority of the BLM to administer. Additional measures developed at the project development stage may be incorporated as applicant-committed measures by the project proponent, added to necessary State of Wyoming air quality permits, or as COAs in the approved APD or with a programmatic EIS.

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;
- 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 and low-sulfur fuel for diesel-fired drill rig engines; and,
- Adherence to BLM's Notice to Lessees (NTL)-4a concerning the venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered,
- Flaring of hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion;
- Protecting frac sand from wind erosion;
- Implementation of directional and horizontal drilling technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores;
- Performing interim reclamation to reclaim areas of the pad not required for production facilities and to reduce the amount of dust from the pads.

Additionally, the BLM encourages oil and gas natural gas companies to adopt proven cost-effective technologies and practices that improve operation efficiency and reduce natural gas emissions to reduce the ultimate impact from the emissions.

In October 2012, the EPA promulgated air quality regulations for completion of hydraulically fractured gas wells. These rules require air pollution mitigation measures that reduce the emissions of VOCs during gas completions. Mitigation includes a process known as "Green Completion" in which the recovered products are sent through a series of aboveground, closed, separators which then negates the need for flowing back into surface pits as the product is then

immediate sent to gas lines and the fluids are transferred to onsite tanks. Green completions have been required by the WDEQ for many years in the Upper Green River Basin and the requirement was expanded throughout the state of Wyoming in 2015.

EPA Inventory data show that adoption by industry of the BMPs proposed by the EPA Natural Gas Energy Star program has reduced emissions from oil and gas exploration and development. The BLM will continue to 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 authorities and policies, and is determined necessary through the NEPA process.

4.2.3 Geology and Mineral Resources

At the time of a site-specific proposal for development of the lease, Standard Lease Stipulation No. 3 protects the prior rights:

> *Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.*

The oil and gas lessee would conduct its operations, so far as reasonably practicable, to avoid damage to any known deposit of any mineral for which any mining claim is located. The lessee would be required to not endanger or unreasonably or materially interfere with any mining claimant's operations, including any existing surface or underground improvements, workings, or facilities that may have been made for the purpose of mining operations. The provisions of the Multiple Mineral Development Act (30 U.S.C. § 521 et seq.) will apply to the leased lands.

The BLM identified one parcel located in the HDD (-141) that contain lands that could pose potential conflicts with existing coal mining operations and/or pending coal Lease by Applications (LBAs). If these lands were offered, leased, and development was subsequently proposed, the BLM may be required to decide whether to approve oil and gas operations that could impede or substantially complicate the economic recovery of coal under existing leases. If oil and gas operations on these leases were authorized, there could be potential worker safety concerns presented by having coal mining and oil and gas operations occurring simultaneously in the same area. In some cases, the two mineral development activities could not reasonably occur at the same time (such as when coal is being surface-mined at a location where proposed oil and gas facilities would be located).

4.2.3.1 Master Leasing Plan (MLP) Areas

Under previous BLM policy, (WO IM 2010-117, Oil and Gas Leasing Reform), MLP analysis was conducted in several BLM-WY RMPs as a as a tool to facilitate resource protection while allowing for oil and gas development. WO IM 2018-034 was signed and issued January 31, 2018, superseding IM 2010-117 and replacing any conflicting guidance or directive found in the BLM Manual or Handbook. Under the new guidance, no new MLPs will be initiated by the BLM. Though the existing MLPs remain in effect.

Under the Proposed Action, there are not any parcels proposed within MLPs.

4.2.4 Soils

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to soils. Subsequent development of the lease could physically disturb soils within the disturbed project areas. Direct impacts from the construction of well pads, access roads, and reserve pits include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Indirect impacts such as runoff, erosion, and off-site sedimentation could result from construction and operation of well sites, access roads, gas pipelines and facilities.

Contamination of soil from drilling/completion and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity if not adequately identified and addressed. Many of these direct impacts would be mitigated through proper design, construction and maintenance, and implementation of BMPs.

As required in the applicable RMPs, surface disturbance may be restricted or prohibited on steep slopes and within floodplains. Lease Notice No. 1 addresses surface disturbance on slopes greater than 25 percent and is applied to all parcels.

Prior to authorization of surface disturbance on a lease, the BLM will require the lessee or their designated operator to submit a Surface Use Plan of Operations to the BLM. The requirements in the BLM-Wyoming Reclamation Policy would be implemented for all surface-disturbing activities. Stabilization and reclamation of disturbed areas (both interim and final) will be required, in accordance with Onshore Oil and Gas Order No. 1.

Where applicable, operations on federal leases are required to have spill prevention, control, and countermeasure plans in place. Where spills do occur, the BLM will follow its policies (see WY IM 2009-021) and reporting requirements (see NTL-3A) to ensure the site is cleaned up to the applicable standards.

4.2.5 Solid and Hazardous Wastes

Leasing of the parcels will not directly result in the generation, transport, or disposal of solid and hazardous wastes. If leased, and if operations are proposed on these leases, the lessee will be required to comply with applicable environmental regulations that address exploration and production wastes.

Impacts could be in the form of drilling or completion fluid spills, oil and produced water spills, solid wastes or chemical releases, fuel spills, and trash scatter on and off the well pads.

Management of wastes associated with the operations on these lease sale parcels would be regulated under the Resource Conservation and Recovery Act (RCRA), Subtitle C regulations.

Additionally, waste management requirements are included in the Surface Use Plan of Pperations and the drilling plan required for in all APDs. See also BLM-Wyoming Instruction Memorandum WY-2012-007, "Management of Oil and Gas Exploration and Production Pits." Lessees or their operators proposing oil storage would be required to have approved Spill Prevention Control and Countermeasure Plans, if the applicable requirements of 40 CFR 112 are met, and must comply with all requirements for reporting of undesirable events under NTL-3A. Lease bonds would not be released until all facilities have been removed, wells are plugged, and satisfactory reclamation has occurred.

4.2.6 Water Resources

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to water resources. Subsequent development of a lease may lead to surface disturbance from the construction of well pads, access roads, pipelines, and powerlines, which can result in degradation of surface water quality and groundwater quality from point source pollution, nonpoint source pollution, increased surface water runoff and increased erosion. Alteration of natural drainage paths and channel morphology can also occur as a result of surface disturbance associated with the installation of oil and gas wells. Removal of vegetation can also cause water erosion, leading to a loss of channel stability as well as an increase in sedimentation within drainages.

Spills of materials used to drill/complete the wells and or produced formation fluids could result in contamination of the soil, and may potentially impact surface and groundwater resources in the long term if not detected and addressed.

A number of techniques may be used in exploration and development operations to increase or enhance the flow of oil and gas. They include hydraulic fracturing and acid introduction to dissolve the formation matrix and create larger void space(s).

Without a discrete development proposal, the use of hydraulic fracturing in the oil and gas development process cannot be predicted. However, this EA incorporates by reference, in its entirety, the Hydraulic Fracturing White Paper included in Attachment 5.6. This document provides a general discussion of the hydraulic fracturing process and issues associated with its use.

Long-term direct and indirect impacts to the watershed and hydrology could continue for the life of surface disturbance and operations, but would decrease once reclamation of well pads, access roads, pipelines, and other appurtenant facilities has taken place. Interim reclamation of the portion of the well pad not needed for production operation, as well as re-vegetating road ditches, would reduce this long-term impact.

Water depletions potentially affecting T&E aquatic species would require consultation with USFWS, and applicable point-source discharges would require permits under the National Pollution Discharge Elimination System (NPDES) and approval by the BLM prior to disposal of water produced from federal oil and gas leases; potential impacts would be mitigated at that time.

Underground waste disposal is regulated under the Underground Injection Control (UIC) program, which was authorized under the Safe Drinking Water Act. If a drilling/completion proposal is found to not be protective of usable water zones, as required by 43 CFR § 3162.5-2(d) and Onshore Oil and Gas Order No. 2, the proposal could be denied by the BLM. Requirements for groundwater monitoring have been instituted throughout Wyoming by the WOGCC. This monitoring will add a level of certainty regarding the impacts of oil and gas drilling/completion activities on groundwater in Wyoming.

The use of practices such as but not limited to closed-loop mud systems or lined reserve pits would reduce or eliminate seepage of waste fluids into the soil and eventually reaching groundwater. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling/completion/production fluids and other surface sources. Additionally, the use of closed-loop or semi-closed loop drilling systems may be required by the BLM (see BLM-Wyoming Instruction Memorandum WY-2012-007, "Management of Oil and Gas Exploration and Production Pits").

Stormwater Pollution Prevention Plans (SWPPs) are required by the State of Wyoming before any surface disturbance associated with construction actions greater than 1 acre in size. Prior to authorization of surface disturbance on a lease, the BLM will require a Surface Use Plan of Operations be submitted to the BLM, and the BLM authorized officer may require additional erosion control measures to reduce the volume of surface runoff and subsequent sediment transport. Upon abandonment of the wells and/or when access roads are no longer in service, the BLM will require surface reclamation of the disturbed areas as described in Standard Lease Term No. 6 and in accordance with the approved APD or Sundry Notice.

Parcels offered for lease sale are subject to the stipulations shown in Attachment 5.1, including those for the protection of water resources. Additional protections are implemented through standard Lease Notice 1.

4.2.7 Vegetation

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to vegetation. Impacts to vegetation may occur if a lease is issued and the lease is developed. The potential site-specific impacts would be considered by the BLM, including at an onsite inspection, before surface-disturbing activities associated with federal lease operations are authorized.

Should lease operations occur on any of the proposed parcels, the related surface disturbance would result in short- and long-term losses of vegetation. Short-term vegetation loss would include all initial surface disturbance associated with the project until those portions of the well pad and associated roads are no longer needed for production operations, and any associated pipeline disturbances. Long-term vegetation loss would include those portions of the well pad and roads needed for production operations for the life of the well and travel path and shoulders of the access roads. Both short- and long-terms losses of vegetation would result in a

commensurate reduction in forage available for wildlife and livestock. Vegetation loss could also potentially cause a reduction in nesting habitat for ground- or shrub-nesting avian species, and a loss of hiding cover for certain avian and mammal species.

The BLM will require compliance with the Surface Use Plan of Operations and its reclamation plan, which will be evaluated in accordance with the BLM-Wyoming's Reclamation Policy. Lease Stipulation No. 2 is applied for protection of sensitive plants and sensitive species wildlife habitats and could include measures to minimize impacts to vegetation and special status species habitats from future development activities.

The construction of an access road and well pad may unintentionally contribute to the establishment and spread of noxious or invasive weeds. Weed seed or material could be carried to and from the project areas by construction equipment, the drilling rig and transport vehicles, or vehicles and equipment associated with well production activities.

Where weed populations are present, the BLM may require a pest management plan under Onshore Oil and Gas Order No. 1. The BLM may require that certain measures be taken to mitigate potential impacts from spread of weeds. Washing and decontaminating the equipment entering and exiting the construction areas could be used to avoid spread of weeds. Additionally, seed mixes used for reclamation are required to be certified weed-free.

Site-specific surveys for special status plants may be required at the time operations are proposed, to determine the presence/absence of special status plant species or their habitats, and to determine if mitigation measures are necessary. Habitat containing threatened, endangered, proposed, and candidate plant species, as well as those plants listed on the Wyoming-BLM sensitive species list, could limit the location of proposed operations. The sensitive species habitat would be avoided where possible and, in situations where these areas would not be avoided, additional mitigation may be required.

4.2.8 Wildlife, Fish, and Special Status Species (Plants and Animals)

If the proposed parcels are leased, and if subsequent exploration and development operations are proposed, the operations could result in surface-disturbing and disruptive activities. The operations could result in population impacts and habitat fragmentation and loss.

If operations are proposed, the BLM may require additional mitigation measures in order to manage plant and wildlife habitats on public lands in support of the applicable State or Federal management objectives.

Site-specific surveys for special status plants and wildlife may be required at the time operations are proposed to determine the presence/absence of important plant and wildlife resources, including special status species such as nesting birds, sensitive plants, sensitive mammals, amphibians and reptiles.

Well pad, road, and pipeline development in undisturbed areas, could result in habitat fragmentation and direct mortality of wildlife and plant species. Short-term habitat loss would include initial surface disturbance associated with the project. This short-term disturbance typically would be ongoing until those portions of a well pad not needed for production operations, road disturbance outside the shoulders, and the pipeline disturbance are reclaimed. Long-term habitat loss would include those portions of the pad needed for production operations for the life of the well and the running surface of the access roads. Impacts from surface-disturbing activities may also include behavioral changes from increased human activity associated noise and fragmentation.

Impacts to streams, fisheries, riparian habitat, and aquatic species would be mitigated through application of the requirements in Lease Notice No. 1 or special lease stipulations.

As required by the applicable RMPs, wildlife impacts are mitigated through NSO, TLS, and/or CSU stipulations. See Attachment 5.1. In the event the proposed leases are issued and lease operations are proposed, BMPs such as directional and/or horizontal drilling, habitat avoidance, and consolidation of infrastructure may be implemented to mitigate site-specific impacts to wildlife and their habitats. Additionally, the BLM would coordinate with the WGFD and consider their recommendations (such as those in "Recommendations for Development of Oil and Gas Resources within Crucial and Important Habitat" (2010)).

4.2.8.1 Special Status Species

As required by the applicable RMPs, wildlife impacts are mitigated through NSO, TLS, and/or CSU stipulations. See Attachment 5.1. Standard Lease Stipulation No. 2 is applied to all leases and provides protection for current and future threatened, endangered, and 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. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.*

Water depletions for well pad and road construction, well drilling, well completion operations, pipeline hydrostatic testing, and dust abatement could potentially reduce stream flows in the Colorado and Platte River systems, potentially affecting threatened or endangered fish, wildlife and plant species that depend on habitats associated with those river systems. All depletions in these river systems are subject the Fish and Wildlife Service (FWS) mitigation requirements

(including potential depletion fund payments); specific project proposals may be required to undergo consultation with the FWS before any project approval.

4.2.8.2 Greater Sage-Grouse

Approximately 65% of the proposed parcels are located within Priority Habitat Management Areas (PHMAs). Almost all of the remainder are located in General Habitat Management Areas (GHMAs), with only two parcels (1,170.78 acres) located in non-Greater sage-grouse habitats. See Attachment 5.4.

All parcels offered in this sale include Standard Lease Notice 3:

> *The lease may in part, or in total, contain important Greater sagegrouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Greater sage-grouse populations and habitat quality. Such measures shall be developed during the Application for Permit to Drill (APD) on-site and environmental review process and will be consistent with the lease rights granted.*

Parcels offered in PHMAs and GHMAs will be offered subject to the appropriate Greater sage-grouse stipulations (see Attachment 5.1), in conformance with the BLM's recent RMP revisions and amendments to provide for conservation of Greater sage-grouse and their habitats.

The BLM recently initiated an amendment to its sage-grouse RMPs, including the RMPs governing public lands in Wyoming (https://goo.gl/22jKE2). The 90-day public comment period on the Draft RMP amendment and draft EIS ended on August 2, 2018. Until the RMPs are amended, the BLM will continue to ensure its implementation decisions (including this lease sale) conform to the approved RMP.

4.2.8.3 Mule Deer Migration Corridors

If the proposed parcels located in the designated mule deer migration corridors are leased, and if operations are authorized by the BLM, oil and gas activities may adversely affect use of the migration corridors by mule deer. Consistent with DOI Secretary's Order No. 3362, "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" (February 9, 2018), the BLM may require, in coordination with the WGFD, additional measures at the time operations are authorized to mitigate impacts to mule deer migration corridors. These measures may include those described in the WGFD's "Recommendations for Development of Oil and Gas Resources within Crucial and Important Habitat" (2010).

As explained previously (Section 3.10.3), about 75% of the lands within the Sublette mule deer herd's migration corridor where the BLM manages surface operations associated with Federal oil and gas activities are either closed to leasing or require an NSO under the approved RMPs. A smaller proportion of the Platte Valley mule deer herd's migration corridor is similarly encumbered, though the potential for oil and gas development in the vicinity of the corridor is lower. Thus, the current land use allocations and/or limits to potential economically-recoverable

oil and gas resources provide a degree of protection from oil and gas operations for much of the migration corridors, though barriers to migration could still occur in portions of the corridors because of land use activities on Federal and non-Federal lands (including energy development, residential construction, recreation, and other uses). Under the Proposed Action Alternative, a total of 21 parcels would be offered that intersect the migration corridors, with 16,988 acres of the proposed lease sale located within the corridors.

4.2.9 Cultural and Heritage Resources, Including Paleontology, Traditional Cultural Properties, and Historic Trails

If the proposed leases are issued and the BLM receives a proposal for lease exploration and development operations, a cultural records review would be completed to determine if there is a need for a detailed cultural inventory of those areas that could be affected by the subsequent surface disturbing activities. Generally, a cultural inventory will be required and all identified historic and archaeological sites that are eligible for listing in the National Register of Historic Places or potentially eligible to be listed would be either avoided by the undertaking, have adverse effects to sites minimized or mitigated, or have the information in the sites extracted through archaeological data recovery before surface disturbance. Offering lease parcels for sale would not, in and of itself, impact historic or prehistoric resources. Development within the viewshed of contributing segments of National Historic Trails (NHT) could impact the trail setting; however, the extent of potential impacts cannot be determined absent a site-specific proposal for operations.

A site and resource inventory and mitigation process similar to that described for cultural resources also applies to paleontological resources.

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties. Compliance with Section 106 of the NHPA is a non-discretionary action that all federal agencies must perform. The RMPs considered known important cultural sites in identifying stipulations.

The implementing regulations at 36 CFR § 800 allow for a phased approach to compliance with the NHPA. Since it is impossible to determine the type and extent of surface disturbance associated with oil and gas development at the leasing stage, BLM completes its compliance responsibilities when a proponent submits an APD or other application for surface-disturbing activities on the federal lease. Due to this approach, BLM may not be aware of all cultural resources that are located in the proposed lease parcels, though the BLM would complete its phased compliance with NHPA at the time site-specific lease operations are proposed.

Cultural resource specialists review each parcel, including BLM and State Historic Preservation Officer (SHPO) record and file searches for known sites in or near each parcel. When the BLM receives an APD or other proposal for lease operations, a site-specific cultural records review is completed to determine if there is a need for cultural inventory for areas affected by surface-disturbing activities; if so, cultural resource inventory is required prior to new surface disturbance. All sites that are determined to be historic properties (sites that are listed on or are

eligible for listing on the National Register of Historic Places) are avoided or mitigated. If avoidance or mitigation is not possible, proposals may be modified or denied.

Parcels offered for sale are subject to the stipulations shown in Attachment 5.1, including, where applicable, stipulations to protect Sacred, Spiritual, and/or TCPs.

Parcels offered for sale are subject to Special Lease Notice No. 2, which addresses National Historic Trails. All parcels are also offered subject to Standard Lease Stipulation No. 1, protecting historic properties and/or resources:

> *This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) 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.*

The applicable lease stipulations shown in Attachment 5.1 will apply to the proposed parcels, and may include restrictions on surface use or occupancy within certain potential fossil yield classification areas for the protection of fossil resources.

4.2.10 Recreation

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to the recreational use of public land. Subsequent exploration or development of a lease may generate impacts to recreation activities. For split estate lands or public land parcels that are small or land-locked by private or state land, recreation opportunities would be limited or non-existent due to access restrictions. Recreational use on larger blocks of public land and on smaller blocks of public land where there is public access could be impacted by oil and gas operations. The quality of the recreational experience could be diminished by noise and changes in scenic quality arising from oil and gas operations. Recreational activities on split estate lands would be at the discretion and under the control of the private landowner.

Oil and gas operations could cause game animals to move away from the activity. If lease development operations coincide with hunting season, it is expected that hunters could experience reduced success rates. It is also likely that some hunters would experience a diminished quality in their hunting adventure. In addition to facilitating mineral extraction, new oil and gas roads could provide better access to the lease areas for recreational opportunities but can also result in increased poaching activities or wildlife harassment. However, the presence of oil and gas facilities would likely diminish the recreational experience and a decline in

recreational use of an area due to oil and gas development would potentially affect local, state, and regional revenues generated through recreation.

Parcels offered for lease sale are subject to the stipulations and lease notices shown in Attachment 5.1, including those for the protection of recreational settings. Additional mitigation, such as seasonal restrictions, directional drilling, and liquids gathering systems, could be identified at the development stage to further reduce impacts associated with oil and gas development.

4.2.11 Visual Resource Management (VRM)

It is not possible to accurately predict the visual impacts of oil and gas development operations at the leasing stage. Development intensity, terrain, and proximity to key observation points will greatly influence the VRM impacts.

Parcels offered for sale are subject to the stipulations shown in Attachment 5.1, such as protection of VRM Class I and II areas, where applicable. Should leases be issued and operations proposed, the BLM will review the site-specific proposal to ensure conformance with the applicable RMP VRM designations and management decisions. At that time, the BLM may require mitigation to address VRM impacts, such as coloration of above-ground facilities and use of low-profile tanks, where necessary.

4.2.12 Socioeconomics, Environmental Justice, and Public Health and Safety

4.2.12.1 Socioeconomics

In addition to the one-time bonus bids, leasing these parcels for federal mineral exploration would generate rental revenues. If oil and gas production were to begin on any of these leased parcels over the next 10 years, annual rent payments on the parcel held by production would stop, and lessees would instead pay royalties the market value production on that lease. Annual royalty payments on leased parcels would be equal to 12.5% of the value of annual production.

As discussed in above, approximately 51% of revenues generated from the leasing, rents, and production of minerals leased at the subject lease sale would go directly to the U.S. Treasury. The remaining 49% would be distributed to Wyoming and allocated based on its legislatively established two-tier formula to public school districts, the highway and county road fund, cities and towns, the University of Wyoming, capital construction projects, and the state's budget reserve account.

While the act of leasing federal minerals under this alternative would not result any direct surface disturbances, subsequent development of a lease may affect how local residents and land users access, use, develop, and enjoy lands in the vicinity of these leases. As a result, future development may impact the socioeconomic values people derive from these natural landscapes.

Oil and gas exploration, drilling, or production could create additional inconvenience to local businesses and residents due to increased traffic and traffic delays, noise and visual impacts. This would likely be most noticeable in rural areas where oil and gas development has been minimal. The amount of inconvenience would depend on how other land uses are affected, traffic patterns within the area, noise levels, length of time, and season these activities occurred, etc. Creation of new access roads into an area could allow increased public access and potential exposure of private property to vandalism. For split estate leases where the surface is privately owned and the subsurface is federally-owned, surface access agreements, standard lease stipulations, and BMPs could address many of the concerns of private surface owners.

Refer to the applicable RMP FEISs, including Section 4.11 of the ARMPA FEIS (beginning on page 4-134) for additional discussion of potential socioeconomic impacts.

4.2.12.2 Environmental Justice

Some of the counties where leases would be offered may have minority and/or low-income populations that meet the criteria to be considered environmental justice populations. The act of leasing federal minerals would not disproportionately adversely affect environmental justice populations. Potential future impacts associated with oil and gas development could potentially disproportionately adversely affect environmental justice populations depending upon the location and level of activity, which is unknown at this time. The BLM considers input from persons or groups regardless of age, income status, race, or other social or economic characteristics.

4.2.12.3 Public Health and Safety

The act of offering, selling, and issuing federal oil and gas leases does not produce impacts to public health and safety. Subsequent development of a lease may cause impacts. Vehicle and equipment operations associated with the subsequent construction, drilling, and production operations could affect members of the public using the same roads and general areas and/or the employees of the oil and gas drilling, completion or services companies. Releases of gas from the well bore, production facilities and spills could adversely affect members of the public in the vicinity as well as members of the workforce. The level of affect would depend on the circumstances and the technological and safety controls in place.

Split estate lands have the potential for the presence or future development of private residences and associated facilities such as domestic water supply wells. Residences along routes to, or in the vicinity of, active drilling and completion operations would likely experience increased traffic and noise, as well as night lighting. Traffic and drilling operations in close proximity to residences would increase the potential for collisions with the residents, pets, and livestock, as well as an increased potential for fire, hydrocarbon release, and explosions from well blow-out during drilling operations. None of the parcels are located within incorporated areas.

The BLM will require the operator to comply with Onshore Oil and Gas Order No. 2, 43 CFR § 3162.5-1, and all requirements for reporting undesirable events under NTL-3A.

BLM Wyoming has issued policy (IM WY-2015-054, "Fluid Minerals Operations - Mitigation and Setbacks from Occupied Structures") to address setbacks from occupied structures when proposed at the time of lease operations. In addition, other Federal and State of Wyoming public health and safety requirements apply to oil and gas operations.

4.2.13 Cumulative Effects

The cumulative effects are described in the RMP FEISs to which this EA tiers (see Section 1.4).

The BLM holds quarterly oil and gas lease sales, in compliance with the law and our regulations. As a result, numerous oil and gas lease sale parcels are being considered on the public lands around the West at any given time (among other land use plan implementation decisions). The RMP FEISs to which this EA tiers address potential cumulative effects, including as a result of other reasonably foreseeable future actions outside of their respective planning areas. For additional information regarding potential cumulative effects, please refer to the applicable RMP FEISs.

4.3 BLM-Modified Alternative

The impacts of this alternative are identical to the Proposed Action Alternative, but since the entire or partial parcels identified for deferral in this alternative would not be offered at the sale, there would likely be similar or slightly fewer impacts to all resources, fewer adverse impacts to wildlife (big game), and a slight difference in socioeconomic impacts.

For those parcels or portions of parcels deferred under this alternative, the impacts would be identical to the No Action Alternative.

4.3.1 Socioeconomics

For socioeconomics under the BLM-Modified Alternative, there could be a very slight reduction in bonus bid revenues and rentals due to deferral of the 5,869.44 acres (3.7% of the area that would be offered under this alternative). Since not leasing these minerals would prevent private entities from exploring and developing these minerals, subsequent oil and gas production and generation of royalty revenues would not occur from these lands. The slight adverse effects to socioeconomic resources from not leasing these lands may be offset by the potential avoidance of adverse impacts to the existing and proposed coal mining operations.

4.3.2 Mule Deer Migration Corridors

Under the BLM-Modified Alternative, the BLM defers two entire parcels and portions of two others (comprised of 4,908.62 acres) from this sale, adopting the recommendation of the WGFD. The impacts to big game under the BLM-Modified Alternative are similar to the Proposed Action, though deferral of the two parcels and portions of two others is likely to reduce potential impacts to the migration corridor from potential future oil and gas operations, if proposed and authorized. Under this alternative, a total of 17 parcels would be offered that intersect the

Sublette mule deer herd's migration corridor, with 12,020 acres of the lands in the proposed lease sale remaining within the corridor. One additional parcel would be offered that intersects the Platte Valley mule deer herd's migration corridor, with 289 acres remaining within the corridor. Thus, a total of 18 parcels would be offered that intersect the designated mule deer migration corridors.

Deferring these two parcels and portions of two others (under a criterion determined by the WGFD to avoid issuance of leases where a high proportion of the lease intersects the designated migration corridor and after considering other factors) will reduce the potential adverse effects to mule deer using the migration corridor and associated habitats, while balancing the need for other uses on public lands (such as energy production). For the remaining 18 lease sale parcels under this alternative that intersect the designated migration corridors, if leased and if exploration/development operations are proposed at some point in the future, the BLM and WGFD will coordinate to evaluate potential impacts not already adequately mitigated by other coincidental lease terms and conditions (such as timing limitations for big game crucial winter range, disturbance and density limitations for Greater sage-grouse PHMAs, and other restrictions). In accordance with the BLM's regulations at 43 CFR 3101.1-2, the BLM (working with the WGFD) will apply reasonable measures in support of the WGFD's objectives for managing the migration corridor and big game habitats.

5. Attachments

5.1 Lease Sale Parcel List with Proposed Stipulations and Noted Deletions/Deferrals

WY-19Q1-001 160.00 Acres
T.0230N, R.0620W, 06th PM, WY
Sec. 004 W2SW,SESW,SWSE;
Goshen County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-002 1010.78 Acres
T.0240N, R.0630W, 06th PM, WY
Sec. 001 LOTS 4,5;
001 SWNE,S2NW;
028 SW;
029 SESE;
032 NE;
033 NWNE,NW,NWSW,E2SW,SE;
Goshen County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Oregon Trail.

WY-19Q1-003 2235.96 Acres
T.0380N, R.0640W, 06th PM, WY
Sec. 003 LOTS 1-4;
003 S2N2,S2;
004 LOTS 1-4;
004 SESW,S2SE;
005 LOTS 1-4;
005 S2N2,S2;
006 LOTS 1-7;
006 S2NE,SENW,E2SW,SE;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-004 2456.39 Acres
T.0380N, R.0640W, 06th PM, WY
Sec. 007 LOTS 1-3;
007 E2,E2NW,NESW;
008 N2,W2SW,SESW;
009 N2NE,NW,NWSW;
010 SE;
011 ALL;
014 N2,NESE;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-005 284.21 Acres
T.0390N, R.0640W, 06th PM, WY
Sec. 003 LOTS 3,4;
003 NESW,SE;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological

values.

WY-19Q1-006 80.00 Acres
T.0390N, R.0640W, 06th PM, WY
Sec. 003 S2NW;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-007 559.67 Acres
T.0390N, R.0650W, 06th PM, WY
Sec. 001 LOTS 1,2;
001 S2N2,S2;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-008 1825.74 Acres
T.0390N, R.0650W, 06th PM, WY
Sec. 013 NE,E2NW,S2SW,N2SE;
018 LOTS 3,4;
018 E2SW,SE;
019 LOTS 1-4;
019 NE,E2W2,W2SE;
024 N2,W2SW,SE;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-009 2309.68 Acres
T.0400N, R.0650W, 06th PM, WY
Sec. 017 ALL;
019 LOTS 1-4;
019 E2,E2W2;
020 E2E2,NWNE,W2,NWSE;
032 E2,E2W2;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-010 749.63 Acres
T.0400N, R.0650W, 06th PM, WY
Sec. 031 LOTS 2-4;
031 E2,E2W2;
032 W2W2;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological

values.

WY-19Q1-011 160.00 Acres
T.0410N, R.0650W, 06th PM, WY
Sec. 021 SESE;
027 E2NE,NWNE;
Weston County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-012 40.00 Acres
T.0410N, R.0650W, 06th PM, WY
Sec. 030 NESE;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-013 480.00 Acres
T.0410N, R.0650W, 06th PM, WY
Sec. 032 N2N2;
034 W2;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-014 40.00 Acres
T.0420N, R.0650W, 06th PM, WY
Sec. 019 SENW;
Weston County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
CSU (1) Surface occupancy or use may be restricted or prohibited if paleontological sites exist unless paleontological sites are avoided or the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) entire lease; (3) protecting Lance Creek Fossil Area paleontological values.

WY-19Q1-015 520.00 Acres
T.0390N, R.0660W, 06th PM, WY
Sec. 019 E2E2;
020 NE,N2NW,N2SW,SESW;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-016 80.00 Acres
T.0390N, R.0660W, 06th PM, WY
Sec. 020 S2NW;
Niobrara County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-017 1119.92 Acres
T.0410N, R.0660W, 06th PM, WY
Sec. 011 S2SW,SWSE;
028 W2E2,E2NW;
031 LOTS 3,4;
031 E2SW;
033 E2SE;
034 SW;
035 S2NE,N2SW,SESW,SE;
Weston County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-018 240.00 Acres
T.0410N, R.0660W, 06th PM, WY
Sec. 021 NE,W2SE;
Weston County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-019 1058.45 Acres
T.0490N, R.0660W, 06th PM, WY
Sec. 030 LOTS 5-10;
031 LOTS 6;
031 LOT 5,7,8 (EXL 18.25 AC
031 IN RR ROW WYW0119068);
032 LOTS 12;
032 LOT 9 (EXCL 6.55 AC IN RR
032 ROW WYW0119068);
033 LOTS 1,2;
034 LOTS 1-12,14-19,22-24;
Crook County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-020 1871.51 Acres
T.0570N, R.0660W, 06th PM, WY
Sec. 011 S2;
012 SW;
013 W2;
014 ALL;
023 LOTS 1-5;
023 N2N2,SWNW;
024 LOTS 1-4;
Crook County
Newcastle FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_GHMAL
WY_SW_TLS_GHMAL
WY_NFO_TLS_PHMAC
WY_NFO_CSU_PHMAC
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Newcastle Field Office GIS database; (3) protecting nesting raptors.

WY-19Q1-021 39.97 Acres
T.0530N, R.0700W, 06th PM, WY
Sec. 002 LOTS 9;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_TLS_NSSRN
WY_BFO_CSU_GSGRH
WY_BFO_CSU_RN
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_TLS_PHMAL

WY-19Q1-022 903.81 Acres
T.0470N, R.0720W, 06th PM, WY
Sec. 023 LOTS 10,11;
034 LOTS 1-8,11-15;
035 LOTS 3-6,11-14;
Campbell County

Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_GHMAL
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_FQM
WY_BFO_CSU_PD
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-023 1293.47 Acres
T.0560N, R.0720W, 06th PM, WY
Sec. 001 LOTS 5,12,13;
002 LOTS 8-10,15,16,18;
014 W2;
016 LOTS 4-7;
028 LOTS 1,5-10;
033 LOTS 1-11;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_Slopes50
WY_BFO_TLS_NSSRN
WY_BFO_TLS_STG
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSPF
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_NSO_SSP
WY_BFO_CSU_SE
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
*DELETE A PORTION (46.00 ACRES). THIS PORTION IS LOCATED OVER AN EXISTING FEDERAL OIL AND GAS LEASE (EXISTING LEASE WYW186299, ISSUED IN NOVEMBER 2017):
T.0560N, R.0720W, 06TH PM, WY
SEC. 028 LOT 1;

WY-19Q1-024 384.07 Acres
T.0560N, R.0720W, 06th PM, WY
Sec. 015 LOTS 3,4;
023 NW,SE;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_CSU_FQM
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_RN
WY_BFO_TLS_NSSRN

WY-19Q1-025 265.56 Acres
T.0570N, R.0720W, 06th PM, WY
Sec. 030 SWSE;
034 LOTS 1,2;
034 SE;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSPF
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_NSO_SSP
WY_BFO_CSU_RN
WY_BFO_TLS_NSSRN

WY-19Q1-026 2504.60 Acres
T.0340N, R.0730W, 06th PM, WY
Sec. 007 LOTS 3,4;
007 E2SW,SE;
018 LOTS 1,2;
018 E2,E2NW;
019 LOTS 3,4;
019 NE,E2SW,SWSE,N2SE;
020 S2;
T.0340N, R.0740W, 06th PM, WY
Sec. 012 ALL;
013 NE,N2NW,S2SW;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2

Lease Stipulation No. 3
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Oregon Trail.
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bozeman Trail.

WY-19Q1-027 280.00 Acres
T.0390N, R.0730W, 06th PM, WY
Sec. 033 SENE,SE;
034 E2SE;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-028 125.82 Acres
T.0480N, R.0730W, 06th PM, WY
Sec. 018 LOTS 19;
019 LOTS 5;
020 LOTS 13;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-029 2387.82 Acres
T.0340N, R.0740W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2N2,S2;
002 LOTS 1-4;
002 S2N2;
003 LOTS 1,2;
003 S2NE,SE;
004 LOTS 1-4;
004 S2N2;
005 LOTS 3,4;
005 S2NW;
006 LOTS 1-7;
006 S2NE,SENW,E2SW,SE;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bozeman Trail.

WY-19Q1-030 2440.00 Acres
T.0340N, R.0740W, 06th PM, WY
Sec. 007 E2NE,NESE;
008 SW;
011 W2;
014 NENE,SWSW,E2SW,SE;
015 SW;
017 NE,N2NW,SENW;
019 E2;
022 SENW,S2SW,NESW;
023 N2,N2SW,SESW,SE;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Casper Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Oregon Trail.

WY-19Q1-031 1841.12 Acres
T.0350N, R.0740W, 06th PM, WY
Sec. 030 LOTS 5-20;
031 LOTS 5,6,8,9,11-14,16,17,19,
031 LOTS 20;
032 LOTS 2-8,10-13;
033 LOTS 1-8;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_GHMAL
WY_SW_TLS_GHMAL

WY-19Q1-032 437.17 Acres

T.0500N, R.0740W, 06th PM, WY
Sec. 002 LOTS 9,10,14-19;
003 LOTS 12,13,20;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_TLS_NSSRN
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_SW_NSO_GHMAL
WY_BFO_CSU_SE

WY-19Q1-033 487.19 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 002 LOTS 5-8;
003 LOTS 5;
013 LOTS 4,5,12;
T.0510N, R.0740W, 06th PM, WY
Sec. 034 LOTS 10,15,16;
034 LOT 9(EXCL 2.96 AC IN RR
034 ROW WYW0119068);
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_SW_TLS_GHMAL
WY_BFO_NSO_Slopes50
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-034 122.37 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 013 LOTS 13;
023 LOTS 1,2;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-035 163.41 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 017 LOTS 1,8;
022 LOTS 1,5;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-036 41.18 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 023 LOTS 3;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN

WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-037 81.88 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 023 LOTS 4,5;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_R500F
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-038 82.15 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 023 LOTS 6,7;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_TLS_NSSRN
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-039 81.15 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 024 LOTS 4,5;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-040 164.02 Acres
T.0500N, R.0740W, 06th PM, WY
Sec. 024 LOTS 15,16;
025 LOTS 1,2;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-041 504.36 Acres
T.0510N, R.0740W, 06th PM, WY
Sec. 003 LOTS 7,8,10;
T.0520N, R.0740W, 06th PM, WY
Sec. 034 LOTS 1-7,9,10;
034 NENW;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field Office at (307) 684-1100.
WY_SW_NSO_GHMAL
WY_SW_TLS_GHMAL
WY_BFO_TLS_NSSRN
WY_BFO_CSU_FQM
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-042 87.07 Acres
T.0510N, R.0740W, 06th PM, WY
Sec. 034 LOTS 5,6;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_SW_TLS_GHMAL
WY_BFO_CSU_SE

WY-19Q1-043 172.97 Acres
T.0510N, R.0740W, 06th PM, WY
Sec. 034 LOTS 11-14;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_SW_TLS_GHMAL
WY_BFO_CSU_R500F
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-044 160.00 Acres
T.0490N, R.0750W, 06th PM, WY
Sec. 026 N2NE,S2NW;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_NSO_SSRN
WY_BFO_CSU_SE
WY_BFO_TLS_SSRN

WY-19Q1-045 485.45 Acres
T.0510N, R.0750W, 06th PM, WY
Sec. 008 LOTS 1,2,7-10,15,16;
030 LOTS 13,14,19,20;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_TLS_EC
WY_BFO_TLS_NSSRN
WY_BFO_TLS_STG
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_ECWC

WY-19Q1-046 560.49 Acres
T.0520N, R.0750W, 06th PM, WY
Sec. 007 LOTS 8,15,16;
007 LOT 19(EXCL 3.58 AC IN RR
007 ROW UNDER ACT OF
007 03/03/1875;
029 LOTS 1-3,6-10;
030 LOTS 9,16;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_TLS_BGCWEC
WY_BFO_TLS_EC
WY_BFO_TLS_NSSRN
WY_BFO_TLS_STG
WY_BFO_CSU_BGCW
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F

WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_ECWC

WY-19Q1-047 681.78 Acres
T.0520N, R.0750W, 06th PM, WY
Sec. 029 LOTS 5,11-17;
031 LOTS 13,17-20;
032 LOTS 3-5;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_TLS_BGCWEC
WY_BFO_TLS_EC
WY_BFO_TLS_NSSRN
WY_BFO_TLS_STG
WY_BFO_CSU_BGCW
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_ECWC
WY_BFO_CSU_SE

WY-19Q1-048 169.05 Acres
T.0520N, R.0750W, 06th PM, WY
Sec. 033 LOTS 1-3,12;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_TLS_EC
WY_BFO_TLS_NSSRN
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_ECWC

WY-19Q1-049 126.71 Acres
T.0520N, R.0750W, 06th PM, WY
Sec. 033 LOTS 4-6;
Campbell County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_TLS_EC
WY_BFO_TLS_NSSRN
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_ECWC
WY_BFO_CSU_SE

WY-19Q1-050 160.00 Acres
T.0350N, R.0770W, 06th PM, WY
Sec. 001 N2S2;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use within 0.25 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bozeman Trail.
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bozeman Trail.

WY-19Q1-051 767.27 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2N2,SW;
011 S2NW,SW,S2SE;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-052 1068.57 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 004 LOTS 3,4;
004 S2NW,SW;
009 N2,SW,N2SE;
025 NENW,SW;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-053 784.47 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 005 LOTS 2-4;
005 SWNE,S2NW,SW,W2SE;
008 N2;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-054 1480.00 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 012 W2;
013 ALL;
014 N2,N2S2;SWSW;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-055 680.00 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 015 N2,SW,N2SE;
022 E2NE,SENW;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-056 1628.32 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 018 LOTS 1-4;
018 E2,E2W2;
019 LOTS 1-4;
019 E2,E2W2;
020 NW;
021 SW;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
NSO (1) as mapped on the Casper Field Office GIS database (2) protecting the Pine Ridge Eagle Roost.

WY-19Q1-057 1120.00 Acres
T.0400N, R.0770W, 06th PM, WY
Sec. 023 NENE,S2N2,SW,S2SE,NWSE;
024 ALL;
Converse County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY-19Q1-058 160.00 Acres
T.0410N, R.0770W, 06th PM, WY
Sec. 008 E2E2;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_RN

WY-19Q1-059 160.00 Acres
T.0410N, R.0770W, 06th PM, WY
Sec. 008 W2W2;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_RN
WY_BFO_TLS_NSSRN
WY_BFO_CSU_R500F

WY-19Q1-060 320.00 Acres
T.0410N, R.0770W, 06th PM, WY
Sec. 029 SWNE,W2NW,SENW,E2SW,W2SE;
Johnson County
Natrona County
Buffalo FO
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_RN
WY_BFO_TLS_NSSRN

WY-19Q1-061 520.00 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 004 SE;
008 E2NE,NESE;
009 NWNE,NW,NWSW;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-062 1599.74 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 008 NWNE;
013 LOTS 11;
025 LOTS 8,15;
026 N2NE;
027 NW,N2SW,SESW;
028 LOTS 1-3;
028 NE,E2NW,NESW,N2SE;
033 SESE;
034 SENE,W2NE,N2NW,S2;
035 SWSW;
036 LOTS 2-4;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_NSO_Slopes50
WY_BFO_TLS_BGCWEC
WY_BFO_TLS_EC
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_BGCW
WY_BFO_CSU_EC
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_NSO_BEGE
WY_BFO_CSU_ECWC
WY_BFO_CSU_SE

WY-19Q1-063 557.16 Acres

T.0520N, R.0770W, 06th PM, WY
Sec. 008 SWNE,NW,NWSE;
017 LOTS 4;
017 SWNE,S2NW,E2SW,W2SE;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_NSO_SSRN
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-064 636.47 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 011 SENE;
014 SE;
015 LOTS 1-4;
022 NE,E2NW,NWNW;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_BGCWEC
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_BGCW
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_PD
WY_BFO_CSU_ECWC

WY-19Q1-065 933.19 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 017 SWNW,W2SW;
018 LOTS 6-9;
020 W2W2,SESW;
029 NW;
030 N2N2;
031 N2N2;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-066 26.08 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 018 LOTS 5;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F

WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-067 40.00 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 020 NENW;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_CSU_BEGE
WY_BFO_CSU_R500F
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-068 909.22 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 021 S2SE;
022 SWNW,S2;
026 LOTS 1,2,4;
027 E2;
034 NENE;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_PD
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_H20500F

WY-19Q1-069 760.00 Acres
T.0520N, R.0770W, 06th PM, WY
Sec. 027 SWSW;
031 S2N2,N2SE;
032 SENE,N2SW;
033 NE,NESW,N2SE;
034 S2NW;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: (1) There is a single (or multiple) unplugged wellbore(s) and/or other facilities located on this parcel. For more information, please contact a Petroleum Engineer at the Buffalo Field
Office at (307) 684-1100.
WY_BFO_NSO_Slopes50
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_CSU_BEGE
WY_BFO_CSU_FCR
WY_BFO_CSU_FQM
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-070 79.64 Acres
T.0500N, R.0780W, 06th PM, WY
Sec. 033 LOTS 3,4;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_Slopes50
WY_BFO_TLS_NSSRN
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SE

WY_BFO_CSU_SSWLA

WY-19Q1-071 40.00 Acres
T.0400N, R.0790W, 06th PM, WY
Sec. 028 SENW;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Casper Field Office GIS database; (3) protecting nesting Raptors.

WY-19Q1-072 1113.67 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 002 LOTS 5-20;
004 LOTS 19,20;
009 LOTS 1,2,7-10,15,16;
022 LOTS 15,16;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_TLS_PHMAL
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-073 200.54 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 006 LOTS 8,15,16,23;
007 NENE;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_H20500F

WY-19Q1-074 476.34 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 007 LOTS 8-19;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-075 239.05 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 008 LOTS 5-8;
009 LOTS 5,6;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_CSU_PHMA
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_BFO_TLS_PHMAL
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-076 2411.02 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 017 LOTS 1,8,9,16;

022 LOTS 7-14;
026 LOTS 1-15;
026 SESW;
028 LOTS 2,7,9,15,16;
033 LOTS 1,2,7,8;
034 LOTS 1-3,5-8;
035 LOTS 1-16;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_BFO_NSO_SSRN
WY_SW_TLS_GHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_PHMAL
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_PD
WY_BFO_CSU_H20500F

WY-19Q1-077 360.40 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 022 LOTS 1-6;
028 LOTS 1,8,12;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_SSRN
WY_SW_TLS_GHMAL
WY_BFO_TLS_SSRN
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_PD

WY-19Q1-078 635.29 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 023 LOTS 1-16;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_H20500F

WY-19Q1-079 123.21 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 029 LOTS 1,3,8;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-080 202.47 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 029 LOTS 2,4,5,9,16;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2

Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-081 482.62 Acres
T.0470N, R.0790W, 06th PM, WY
Sec. 033 LOTS 3-6,9-16;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-082 684.28 Acres
T.0480N, R.0790W, 06th PM, WY
Sec. 020 LOTS 1-16;
022 LOTS 4;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_TLS_GHMAL
WY_SW_CSU_PHMA
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_GSGRH
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_H20500F

WY-19Q1-083 478.14 Acres
T.0480N, R.0790W, 06th PM, WY
Sec. 030 LOTS 13,20;
031 LOTS 5,12-20;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_CSU_PHMA
WY_BFO_TLS_NSSRN
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR

WY-19Q1-084 80.18 Acres
T.0480N, R.0790W, 06th PM, WY
Sec. 034 LOTS 4,5;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_SSRN
WY_BFO_TLS_NSSRN
WY_BFO_TLS_SSRN
WY_BFO_CSU_H
WY_BFO_CSU_RN
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE
WY_BFO_CSU_R500F

WY-19Q1-085 2253.90 Acres
T.0480N, R.0800W, 06th PM, WY
Sec. 012 LOTS 1-8,10-15;
013 LOTS 9-15;
013 SESE;
021 N2NE;
022 E2,N2NW;
023 LOTS 1,2,7-12,15,16;
024 LOTS 1-8,11-14;
Johnson County
Buffalo FO
Formerly Lease No.

Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_BEGE
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_PD
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-086 1236.59 Acres
T.0480N, R.0800W, 06th PM, WY
Sec. 025 LOTS 3-6,11-14;
026 LOTS 2,7-10,15,16;
027 LOTS 1,2,7-16;
035 LOTS 1,2,7,8;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-087 240.00 Acres
T.0490N, R.0800W, 06th PM, WY
Sec. 035 E2NW,SW;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_BEGE
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_BFO_TLS_EWR
WY_BFO_TLS_NSSRN
WY_SW_CSU_PHMA
WY_BFO_CSU_BEGE
WY_BFO_CSU_FQM
WY_BFO_CSU_GSGRH
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-088 1600.00 Acres
T.0380N, R.0810W, 06th PM, WY
Sec. 017 S2;
020 ALL;
021 ALL;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-089 1809.60 Acres
T.0400N, R.0810W, 06th PM, WY
Sec. 030 LOTS 1-4;
030 W2NE,E2W2,SE;
031 LOTS 1-4;
031 E2,E2W2;
032 ALL;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA

WY-19Q1-090 320.22 Acres

T.0390N, R.0820W, 06th PM, WY
Sec. 003 LOTS 1-4;
003 S2N2;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-091 2200.00 Acres
T.0400N, R.0820W, 06th PM, WY
Sec. 026 W2NE,SENE,W2,SE;
027 E2;
034 ALL;
035 ALL;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA

WY-19Q1-092 520.00 Acres
T.0430N, R.0820W, 06th PM, WY
Sec. 003 SWNW,NWSW,S2SW;
009 NENE;
010 W2NE,NW,NESW,NWSE;
Johnson County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_SW_TLS_PHMAWCA
WY_BFO_TLS_PHMAL
WY_BFO_TLS_PHMAWCA
WY_SW_CSU_PHMA
WY_BFO_CSU_GSGRH
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_VRMII
WY_BFO_CSU_SE

WY-19Q1-093 1600.69 Acres
T.0570N, R.0820W, 06th PM, WY
Sec. 003 SW,W2SE,SESE;
004 LOTS 2;
004 SWNE,SE;
007 SWSE;
008 SENE,E2NW,SWNW,NESW,SE;
009 E2NE,W2SW;
010 N2,N2S2,SESE;
Sheridan County
Buffalo FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_BFO_NSO_Slopes50
WY_BFO_TLS_NSSRN
WY_BFO_CSU_FQM
WY_BFO_CSU_H
WY_BFO_CSU_H20500F
WY_BFO_CSU_PD
WY_BFO_CSU_R500F
WY_BFO_CSU_RN
WY_BFO_CSU_Slopes25to50
WY_BFO_CSU_SLR
WY_BFO_CSU_SSWLA
WY_BFO_CSU_SSWLB
WY_BFO_CSU_SSWLR
WY_BFO_CSU_SE

WY-19Q1-094 1648.78 Acres
T.0200N, R.0830W, 06th PM, WY
Sec. 018 LOTS 4;
020 ALL;
022 E2NW,N2SE;
030 LOTS 3,4;
030 E2SW;
032 ALL;
Carbon County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations

proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
NSO (1) as mapped on the Rawlins Field Office GIS database; (2) protecting historic values within 1/4 mile of contributing segments of the Overland Trail.
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting identified big game migration and transitional ranges.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.
CSU (1) Surface occupancy or use may be restricted or prohibited within the setting contributing to the National Register of Historic Places eligibility unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting historic and visual values of the Overland Trail.
*DEFER A PORTION OF PARCEL -094 (80.00 ACRES). THE WYOMING GAME AND FISH DEPARTMENT HAS RECOMMENDED DEFERRAL OF A PORTION OF THIS PARCEL (PLATTE VALLEY MULE DEER HERD MIGRATION CORRIDOR):
T.0200N, R.0830W, 06TH PM, WY
SEC. 022 E2NW;

WY-19Q1-095 325.41 Acres
T.0330N, R.0840W, 06th PM, WY
Sec. 005 LOTS 1-4;
005 N2S2;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use within 0.25 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bridger Trail.
CSU (1) Surface occupancy or use within 3 miles or visual horizon of the historic trail, whichever is closer, may be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Casper Field Office GIS database; (3) protecting cultural and scenic values of the Bridger Trail.

WY-19Q1-096 2480.00 Acres
T.0370N, R.0850W, 06th PM, WY
Sec. 013 SWSW;
022 NE;
023 E2NE,W2,SE;
024 NE,W2,NWSE;
025 NENE,S2N2,NWNW,S2;
026 ALL;
Natrona County
Casper FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Casper Field Office GIS database; (3) protecting nesting Raptors.
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Casper Field Office GIS database; (3) protecting nesting Raptors within 1/2 mile to 1 mile of an Artificial Nesting Structure (ANS).

WY-19Q1-097 120.00 Acres
T.0260N, R.0900W, 06th PM, WY
Sec. 004 E2SE;
011 NENE;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
TLS (1) Apr 10 to Jul 10; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Mountain plover.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species
CSU (1) Surface occupancy or use may be restricted or prohibited within the setting contributing to the National Register of Historic Places eligibility unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting historic and visual values of the Rawlins to Ft. Washakie Trail.

WY-19Q1-098 1254.56 Acres
T.0240N, R.0910W, 06th PM, WY
Sec. 017 ALL;
018 LOTS 1-4;

018 E2,E2W2;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.

WY-19Q1-099 1029.38 Acres
T.0240N, R.0920W, 06th PM, WY
Sec. 007 LOTS 1-3;
007 W2NE,E2W2,S2SE,NESE;
009 N2,N2S2,SWSW;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting raptor nesting habitat.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.

WY-19Q1-100 2560.00 Acres
T.0240N, R.0920W, 06th PM, WY
Sec. 013 ALL;
014 ALL;
023 ALL;
024 ALL;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.

WY-19Q1-101 1920.00 Acres
T.0240N, R.0920W, 06th PM, WY
Sec. 015 ALL;
021 ALL;
022 ALL;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.

WY-19Q1-102 80.00 Acres
T.0500N, R.0920W, 06th PM, WY
Sec. 007 N2SE;
Big Horn County
Worland FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Lease Notice 1041

WY-19Q1-103 640.00 Acres
T.0150N, R.0940W, 06th PM, WY
Sec. 011 ALL;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3

TLS (1) April 10 to July 10 (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Mountain plover.

WY-19Q1-104 1440.00 Acres
T.0140N, R.0950W, 06th PM, WY
Sec. 010 ALL;
T.0150N, R.0950W, 06th PM, WY
Sec. 028 N2,SE;
034 N2;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting raptor nesting habitat.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting recreational opportunity class setting within the Adobe Town Dispersed Recreation Area.

WY-19Q1-105 890.52 Acres
T.0180N, R.0950W, 06th PM, WY
Sec. 004 LOTS 3,4;
020 ALL;
030 LOTS 1,2;
030 E2NW;
Sweetwater County
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
TLS (1) Apr 10 to Jul 10; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Mountain plover.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting raptor nesting habitat.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.

WY-19Q1-106 225.60 Acres
T.0360N, R.0950W, 06th PM, WY
Sec. 012 LOTS 1-4;
012 E2E2;
Fremont County
Lander FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_LFO_NSO_PSWDDA4031
WY_LFO_NSO_SG25P1014
WY_LFO_CSU_LRPS1013
WY_LFO_CSU_PYFC5058
WY_LFO_CSU_S15TO24P1014

WY-19Q1-107 2358.50 Acres
T.0130N, R.0990W, 06th PM, WY
Sec. 003 LOTS 3;
003 SENW;
004 LOTS 1-4;
004 S2N2,S2;
009 N2,E2SW,SE;
021 W2W2;
024 ALL;
028 W2W2,E2SW,SWSE;
Sweetwater County
Rock Springs FO
Rawlins FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_GHMAL
WY_SW_NSO_PHMAL
WY_SW_TLS_GHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to Jul 31; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting the habitats of identified amphibian/reptile species.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rawlins Field Office GIS database; (3) protecting recreational opportunity class setting within the Adobe Town Dispersed Recreation Area.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs

Field Office GIS database; (3) protecting nesting Raptors.
NSO (1) as mapped on the Rock Springs Field Office GIS database; (2) protecting raptor nesting habitat.

WY-19Q1-108 1314.36 Acres
T.0270N, R.1020W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2N2,N2SW;
002 LOTS 1-4;
002 S2N2,NESW,SE;
011 SENE,SWNW,S2;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-109 2550.49 Acres
T.0270N, R.1020W, 06th PM, WY
Sec. 003 LOTS 1-4;
003 S2N2,S2;
010 ALL;
015 ALL;
023 ALL;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-110 2540.60 Acres
T.0270N, R.1020W, 06th PM, WY
Sec. 004 LOTS 1-4;
004 S2N2,S2;
005 LOTS 1-4;
005 S2N2,S2;
008 ALL;
009 ALL;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-111 2553.57 Acres
T.0270N, R.1020W, 06th PM, WY
Sec. 006 LOTS 1-7;
006 S2NE,SENW,E2SW,SE;
007 LOTS 1-4;
007 E2,E2W2;
017 ALL;
018 LOTS 1-4;
018 E2,E2W2;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game

migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-112 2200.00 Acres
T.0280N, R.1020W, 06th PM, WY
Sec. 015 N2,SW,SESE,N2SE;
022 ALL;
023 ALL;
024 SWNW,SW,W2SE,SESE;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-113 2436.56 Acres
T.0280N, R.1020W, 06th PM, WY
Sec. 017 NE,NENW,S2NW,S2;
018 LOTS 1-4;
018 E2,E2W2;
019 LOTS 1-4;
019 E2,E2W2;
020 NENE,S2NE,NW,N2SW,SWSW
020 SE;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-114 2477.52 Acres
T.0280N, R.1020W, 06th PM, WY
Sec. 021 ALL;
028 SENE,W2NE,W2,SE;
029 N2,N2SW,SESW,SE;
030 LOTS 1-4;
030 E2,E2W2;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-115 1880.00 Acres
T.0280N, R.1020W, 06th PM, WY
Sec. 025 N2,SW,SWSE,N2SE;
026 ALL;
035 ALL;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-116 2439.68 Acres
T.0280N, R.1020W, 06th PM, WY
Sec. 031 LOTS 1-4;
031 S2NE,E2W2,SE;
032 NE,NENW,S2NW,S2;
033 ALL;
034 ALL;
Fremont County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-117 2554.76 Acres
T.0270N, R.1030W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2N2,S2;
002 LOTS 1-4;
002 S2N2,S2;
011 ALL;
012 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
DEFER ALL OF PARCEL -117 (2,554.76 ACRES). THE WYOMING GAME AND FISH DEPARTMENT HAS RECOMMENDED DEFERRAL OF THIS PARCEL (SUBLETTE MULE DEER HERD MIGRATION CORRIDOR).

WY-19Q1-118 2560.00 Acres
T.0270N, R.1030W, 06th PM, WY
Sec. 013 ALL;
014 ALL;
023 ALL;
024 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2

Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-119 1920.00 Acres
T.0270N, R.1030W, 06th PM, WY
Sec. 025 ALL;
026 ALL;
035 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-120 2097.60 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2;
002 LOTS 1-4;
002 S2;
011 ALL;
012 N2,NWSW,S2S2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) May 1 to June 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game parturition areas.
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-121 2193.78 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 003 LOTS 1-4;
003 S2;
004 LOTS 1-4;
004 S2;
009 ALL;
010 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain

big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.
*DEFER ALL OF PARCEL -121 (2,193.78 ACRES). THE WYOMING GAME AND FISH DEPARTMENT HAS RECOMMENDED DEFERRAL OF THIS PARCEL (SUBLETTE MULE DEER HERD MIGRATION CORRIDOR).

WY-19Q1-122 2157.85 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 005 LOTS 1-4;
005 S2;
006 LOTS 1-6;
006 E2SW;SE;
007 LOTS 1-4;
007 E2W2,E2;
008 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-123 2400.00 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 013 ALL;
014 ALL;
023 ALL;
024 N2N2,S2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-124 1880.00 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 015 N2,SW,SWSE,N2SE;
021 ALL;
022 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL

WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-125 2546.28 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 017 ALL;
018 LOTS 1-4;
018 E2,E2W2;
019 LOTS 1-4;
019 E2,E2W2;
020 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-126 1840.00 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 025 ALL;
026 ALL;
035 N2N2,SENE,SWNW,S2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-127 2320.00 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 027 ALL;
028 W2,SE;
033 ALL;
034 N2,SW,E2SE;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs

Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-128 2540.36 Acres
T.0280N, R.1030W, 06th PM, WY
Sec. 029 ALL;
030 LOTS 1-4;
030 E2,E2W2;
031 LOTS 1-4;
031 E2,E2W2;
032 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-129 2177.08 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 001 LOTS 1-4;
001 S2;
002 LOTS 1-4;
002 S2;
003 LOTS 1-3,5;
003 N2SW,SESW,SE;
004 LOTS 1,2,5,6;
004 S2;
005 LOTS 1-4;
005 S2S2;
006 LOTS 1-5;
006 SESW,S2SE;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
NSO (1) as mapped on the Rock Springs Field Office GIS database; (2) protecting raptor nesting habitat.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-130 2336.20 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 007 LOTS 1-4;
007 E2,E2W2;
008 ALL;
009 SENE,N2NW,SWNW,S2;
010 NE,NENW,S2NW,S2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-131 2520.00 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 011 N2,SW,SESE,N2SE;
012 ALL;
013 ALL;
014 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.

Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-132 2513.88 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 015 ALL;
017 ALL;
018 LOTS 1-4;
018 E2,E2W2;
019 LOTS 1-4;
019 E2,E2W2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-133 2560.00 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 020 ALL;
021 ALL;
022 ALL;
023 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-134 2480.00 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 024 N2,SW,SESE,N2SE;
025 NE,N2NW,SENW,S2;
026 ALL;
027 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-135 2176.96 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 028 N2,N2SW,SWSW,SE;
029 ALL;
030 LOTS 1-4;
030 E2,E2W2;
031 E2;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited

to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-136 2560.00 Acres
T.0280N, R.1050W, 06th PM, WY
Sec. 032 ALL;
033 ALL;
034 ALL;
035 ALL;
Sublette County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-19Q1-137 800.14 Acres
T.0290N, R.1070W, 06th PM, WY
Sec. 011 LOTS 9,10,15,16;
012 LOTS 1-16;
Sublette County
Rock Springs FO
Pinedale FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office and Pinedale Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting nesting Raptors.
CSU (1) Surface occupancy or use will be restricted or prohibited to enhance recreation opportunities and protect areas with high recreation values; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting resource values in the Wind River Special Recreation Management Area West.

WY-191Q-138 122.01 Acres
T.0320N, R.1080W, 06th PM, WY
Sec. 018 LOTS 1;
T.0330N, R.1080W, 06th PM, WY
Sec. 031 LOTS 4;
Sec. 031 SESW;
Sublette County
Pinedale FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
Special Lease Notice: This parcel is located within a big game migration corridor designated or currently under review by the Wyoming Game and Fish Department. The lessee or their designated operator will be required to work with the BLM and Wyoming Game and Fish Department to take reasonable measures (see 43 CFR 3101.1-2) to avoid and minimize impacts to maintain big game migration corridor functionality, such as those contained within the "Wyoming Game and Fish Commission Ungulate Migration Corridor Strategy" (February 2016). The BLM will encourage the use of Master Development Plans for operations proposed on this lease parcel in accordance with Onshore Oil and Gas Order No. 1.
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Pinedale Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) November 1 to April 1; (2) as mapped on the Pinedale Field Office GIS database; (3) protecting bald eagle winter use areas.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Pinedale RMP Visual Resource Management Overlay (preferred alternative); (3) protecting Class I and II Visual Resource Management Areas.
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped on the Pinedale Field Office GIS database; (3) protecting 500 feet of or within wetlands, riparian areas, aquatic habitat, and 100-year floodplains.
NSO (1) as mapped on the Pinedale Field Office GIS database; (2) Protecting the Green and New Fork Rivers Special Recreation Management Area.
*DEFER A PORTION OF PARCEL -138 (80.08 ACRES). THE WYOMING GAME AND FISH DEPARTMENT HAS RECOMMENDED DEFERRAL OF A PORTION OF THIS PARCEL (SUBLETTE MULE DEER HERD MIGRATION CORRIDOR):
T.0330N, R.1080W, 06TH PM, WY
SEC. 031 LOTS 4;
SEC. 031 SESW;

WY-19Q1-139 2480.00 Acres
T.0130N, R.1100W, 06th PM, WY
Sec. 025 ALL;
026 ALL;
034 N2,N2SW,SE;
035 ALL;
Sweetwater County
Rock Springs FO
Formerly Lease No.
Stipulations:

Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.

WY-19Q1-140 2400.00 Acres
T.0130N, R.1100W, 06th PM, WY
Sec. 027 ALL;
031 ALL;
032 ALL;
033 N2,N2S2;
Sweetwater County
Rock Springs FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Rock Springs Field Office GIS database; (3) protecting big game crucial winter range.

WY-19Q1-141 1921.68 Acres
T.0190N, R.1170W, 06th PM, WY
Sec. 004 LOTS 5-8;
004 S2N2,S2;
008 ALL;
010 ALL;
Lincoln County
Kemmerer FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting raptors.
TLS (1) Apr 15 to Sept 15 (2) as mapped in the Kemmerer Field Office GIS database; (3) protecting nesting burrowing owls.
TLS (1) April 10 to July 10 (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting mountain plover.
*DEFER A PORTION OF PARCEL -141 (960.82 ACRES). COAL LEASE WYW061422 WITHIN LMU WYW133410 OVERLAPS E½ OF SEC. 4 AND ALL OF SEC. 10 WITHIN LEASE PARCEL WY-19Q1-141. DUE TO UNRESOLVED CONFLICTS BETWEEN COAL MINING AND OIL AND GAS DEVELOPMENT, THESE PORTIONS OF THE PARCEL WILL BE DEFERRED.
T.0190N, R.1170W, 06TH PM, WY
SEC. 004 LOTS 5-6;
004 S2NE,SE;
010 ALL;

WY-19Q1-142 640.72 Acres
T.0190N, R.1170W, 06th PM, WY
Sec. 006 LOTS 8-11;
006 S2N2,S2;
Lincoln County
Kemmerer FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
CSU (1) Surface occupancy or use, pursuant to Section 106 of NHPA and State Protocol, may require additional analysis and assessment to determine effects of any proposed action and subsequent employment of BMPs by the operator to reduce and/or mitigate adverse effects to preserve NHT viewshed settings; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-143 640.00 Acres
T.0190N, R.1170W, 06th PM, WY
Sec. 018 ALL;
Lincoln County
Kemmerer FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting big game crucial winter range.
CSU (1) Surface occupancy or use, pursuant to Section 106 of NHPA and State Protocol, may require additional analysis and assessment to determine effects of any proposed action and subsequent employment of BMPs by the operator to reduce and/or mitigate adverse effects to preserve NHT viewshed settings; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting Class I and/or Class II Visual Resource Management Areas.

WY-19Q1-144 2520.00 Acres
T.0200N, R.1170W, 06th PM, WY
Sec. 019 N2,SW,SWSE,N2SE;
020 ALL;
030 ALL;
032 ALL;
Lincoln County
Kemmerer FO

Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to July 31; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting raptors.
TLS (1) Apr 15 to Sept 15 (2) as mapped in the Kemmerer Field Office GIS database; (3) protecting nesting burrowing owls.
TLS (1) April 10 to July 10 (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting mountain plover.

WY-19Q1-145 360.00 Acres
T.0200N, R.1180W, 06th PM, WY
Sec. 025 NENE,W2NE,NW,N2SW;
Lincoln County
Kemmerer FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_NSO_PHMAL
WY_SW_TLS_PHMAL
WY_SW_TLS_PHMAWCA
WY_SW_CSU_PHMA
TLS (1) Feb 1 to July 31; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting raptors.
TLS (1) Apr 15 to Sept 15 (2) as mapped in the Kemmerer Field Office GIS database; (3) protecting nesting burrowing owls
CSU (1) Surface occupancy or use will be restricted or prohibited unless the operator and surface management agency arrive at an acceptable plan for mitigation of anticipated impacts; (2) as mapped the Kemmerer Field Office GIS database; (3) protecting Winward's goldenweed (Ericameria discoidea var. winwardii).

WY-19Q1-146 323.97 Acres
T.0180N, R.1200W, 06th PM, WY
Sec. 030 LOTS 9,10;
034 E2;
Uinta County
Kemmerer FO
Formerly Lease No.
Stipulations:
Lease Notice No. 1
Lease Notice No. 2
Lease Notice No. 3
Lease Stipulation No. 1
Lease Stipulation No. 2
Lease Stipulation No. 3
WY_SW_TLS_GHMAL
NSO (1) as mapped on the Kemmerer Field Office GIS database; (3) protecting bald eagle winter roosting areas.
TLS (1) Nov 15 to Apr 30; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting big game crucial winter range.
TLS (1) Feb 1 to July 31; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting nesting raptors.
TLS (1) Apr 15 to Sept 15 (2) as mapped in the Kemmerer Field Office GIS database; (3) protecting nesting burrowing owls.
TLS (1) Feb 1 to Aug 15 (2) as mapped in the Kemmerer Field Office GIS database; (3) protecting nesting bald eagles.
TLS (1) Nov 1 to Apr 1; (2) as mapped on the Kemmerer Field Office GIS database; (3) protecting bald eagle winter roosting areas within one mile.

5.1.1 Lease Stipulation Code Index

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_BEGE	CSU (1) Prior to surface disturbance within 1.0 mile of consistently used bald and golden eagle winter roosts and riparian corridors a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that wintering eagles will not be disturbed (as defined by the Bald and Golden Eagle Protection Act). Bald or golden eagles will not be agitated or bothered to a degree that causes or is likely to cause physical injury, or a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) protecting bald and golden eagle winter roosting habitat.
WY_BFO_CSU_BGCW	CSU (1) Prior to surface disturbance within Wyoming Game and Fish Department designated big game crucial winter range, a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that the function and suitability of crucial big game winter ranges will not be impaired; (2) as mapped by the Wyoming Game and Fish Department; (3) ensuring the function and suitability of crucial big game winter range.
WY_BFO_CSU_C100F	CSU (1) Prior to surface disturbance or disruptive activities near an entrance to a significant cave a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction that the action will not destroy, disturb, deface, mar, alter, remove, or harm any significant cave or alter the free movement of any animal or plant life into or out of any significant cave; (2) as mapped by the BLM; (3) protecting significant cave resources (any material or substance occurring naturally in caves, such as animal life, plant life, paleontological deposits, sediments, minerals, speleogens, and speleothems).
WY_BFO_CSU_CLBA	CSU (1) Surface use or occupancy shall not be allowed by oil and gas lessee(s), operating rights holder(s), and/or oil and gas operator(s) on this Federal oil and gas lease to conduct any oil and gas operation, including drilling for, removing, or disposing of oil and/or gas contained in Federal coal lease(s) unless a plan for mitigation of anticipated impacts is developed between the oil and gas and the coal lessees, and the Plan is approved by the BLM Authorized Officer; (2) on areas identified as highly likely to be considered in a Coal Lease By Application as mapped by the US Office of Surface Mining, Wyoming Department of Environmental Quality, US Geological Survey, and/or BLM; (3) protecting the first in time valid existing rights of the coal lessee, the BLM Authorized Officer reserves the right to alter or modify any oil and gas operations on the lands described in this lease ensuring the orderly development of the coal resource by surface and/or underground mining methods, coal mine worker safety, and/or coal production rates or recovery of the coal resource. The oil and gas lessee(s), operating rights holder(s), and/or oil and gas operator(s) of this Federal oil and gas lease shall not hold the United States as lessor, coal lessee(s), sub-lessee(s), and/or coal operator(s) liable for any damage or loss of the oil and gas resource, including the venting of coalbed natural gas, caused by coal exploration or mining operations conducted on Federal coal lease.
WY_BFO_CSU_EC	CSU (1) Prior to surface disturbance within Wyoming Game and Fish Department designated elk calving areas a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that the function and suitability of elk calving areas will not be impaired; (2) as mapped by the Wyoming Game and Fish Department; (3) ensuring the function and suitability of elk calving areas.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_ECWC	CSU (1) Fluid mineral production and byproducts shall be piped out of, and permanent above ground facilities will be located outside of, Wyoming Game and Fish Department designated elk crucial winter range and calving areas unless a mitigation plan (Plan) is submitted by the applicant and approved by the BLM as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that the function and suitability of elk crucial winter range and elk calving areas will not be impaired; (2) as mapped by the Wyoming Game and Fish Department; (3) ensuring the function and suitability of elk crucial winter range and elk calving areas.
WY_BFO_CSU_FCR	CSU (1) Surface-disturbing and disruptive activities shall only be approved with adequate mitigation to ensure compliance with the Fortification Creek Resources Management Plan Amendment (BLM 2011) performance standards. Prior to surface disturbance within the Fortification Creek Planning Area a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate); (2) within the Fortification Creek Planning Area (Map 3-36); (3) protecting the viability of the Fortification elk herd and facilitating ecosystem reconstruction in the stabilization of disturbed areas.
WY_BFO_CSU_FQM	CSU (1) Prior to surface disturbance within 0.25 mile of naturally occurring water bodies containing native or desirable non-native fish species a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that there will not be a local decline in fish abundance or range as a result of the lease operations. Examples of a few of the items to consider are as follows. Spill prevention measures must be used to ensure hydrocarbons and other potentially toxic substances used for lease activities are prevented from entering the watercourse. Sediment control measures must be used to ensure increased sediment contributions are avoided; (2) as mapped by the Wyoming Game and Fish Department and/or BLM; (3) protecting native and desirable non-native fish populations and habitat.
WY_BFO_CSU_GSGRH	CSU (1) All applicable surface disturbances (existing or future, and not limited to fluid mineral disturbances) must be restored, as described in the Buffalo Field Office Resource Management Plan, to the approval of the BLM Authorized Officer; (2) Greater Sage-Grouse Core Population Areas and Connectivity Corridors (Priority Habitat) as mapped on the Buffalo Field Office GIS database; (3) to restore functional Greater Sage-Grouse habitat to support core Greater Sage-Grouse populations.
WY_BFO_CSU_H	CSU (1) Prior to surface disturbance within 3 miles of the Pumpkin Buttes, Cantonment Reno, Dull Knife Battle, and Crazy Woman Battle historic properties, contributing and unevaluated segments of the Bozeman Trail, all rock art sites, all rock shelter sites, and all Native American burials, a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (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 Authorized Officer has approved the Plan or approved it with conditions after consultation with the State Historic Preservation Office, applicable Indian tribes, and other interested parties. The Plan must demonstrate to the Authorized Officer's satisfaction that there will be no adverse effects to National Register of Historic Places eligible or listed historic properties (i.e., the infrastructure will either not be visible or will result in a weak contrast rating); (2) as mapped on the Buffalo Field Office GIS database; (3) ensuring the setting of historic properties.
WY_BFO_CSU_H20500F	CSU (1) Prior to surface disturbance within 500 feet of springs, reservoirs not associated with coal bed natural gas projects, water wells, and perennial streams a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. Storm water and surface runoff will be controlled to minimize erosion (rilling, gullying, piping, mass wasting) and offsite siltation during construction, use/operations, and reclamation. Offsite areas will be protected from accelerated soil erosion. The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation; (2) as mapped by the US Geological Survey's National Hydrologic Inventory and/or as determined by a BLM evaluation of the area; (3) ensuring protection of surface waters and associated riparian habitats by meeting the standards outlined in, Chapter 6 of the BLM's Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office Resource Management Plan Record of Decision.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_PD	CSU (1) Prior to surface disturbance within active prairie dog colonies on BLM-administered surface a special status species occupancy survey must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that activities with active prairie dog colonies on BLM surface would not adversely impact suitable habitat for special status species dependent upon prairie dog colonies; (2) as mapped or determined on the Buffalo Field Office GIS database or from field evaluation, in coordination with the US Fish and Wildlife Service and Wyoming Game and Fish Department; (3) conserving special status species wildlife and the prairie dog colonies on which they depend.
WY_BFO_CSU_PHMAC	CSU (1) Surface occupancy or use will be restricted. The cumulative value of all applicable surface disturbances, existing or future, must not exceed 5 percent of the Disturbance Density Calculation Tool (DDCT) area, as described in the DDCT manual; (2) as mapped on the Buffalo Field Office GIS database; (3) to protect Greater Sage-Grouse designated Priority Habitat Management Areas (Connectivity only) from habitat fragmentation and loss. This lease does not guarantee the lessee the right to occupy the surface of the lease for the purpose of producing oil and natural gas within Greater Sage-Grouse designated PHMAs (Connectivity only). The surface occupancy restriction criteria identified in this stipulation may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on Federal, State, or private lands within designated PHMAs (Connectivity only) or surface disturbance created by other land users. The BLM may require the lessee or operator to enter into a unit agreement or drilling easement to facilitate the equitable development of this and surrounding leases.
WY_BFO_CSU_R500F	CSU (1) Prior to surface disturbance within 500 feet of riparian systems, wetlands, and aquatic habitats a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. Storm water and surface runoff will be controlled to minimize erosion (rilling, gullying, piping, mass wasting) and offsite siltation during construction, use/operations, and reclamation. Offsite areas will be protected from accelerated soil erosion. The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation; (2) as mapped by the US Geological Survey's National Hydrologic Inventory and/or as determined by a BLM evaluation of the area; (3) ensuring protection of surface waters and associated riparian habitats by meeting the standards outlined in, Chapter 6 of the BLM's Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office Resource Management Plan Record of Decision.
WY_BFO_CSU_RN	CSU (1) Prior to surface disturbance within US Fish and Wildlife Service recommended spatial buffers of raptor nests a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that nesting raptors will not be disturbed. Nesting raptors will not be agitated or bothered to a degree that causes or is likely to cause physical injury, a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior, or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior; (2) as mapped on the Buffalo Field Office GIS database or determined by the BLM from field evaluation in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring raptor productivity.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_SE	CSU (1) Prior to surface disturbance on soils with a severe erosion hazard rating a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. The disturbed area will be stabilized with no evidence of accelerated erosion features. The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation; (2) as mapped by the Natural Resources Conservation Service Soil Survey Geographic Database (SSURGO) Order 3 soil survey and/or as determined by a BLM evaluation of the area; (3) ensuring successful reclamation and erosion control on soils with a severe erosion hazard rating in order to meet the standards outlined in Chapter 6 the BLM's Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office Resource Management Plan Record of Decision.
WY_BFO_CSU_Slopes25to50	CSU (1) Prior to surface disturbance on slopes greater than 25% and less than 50% a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. Slope stability is maintained preventing slope failure or mass wasting. The disturbed area will be stabilized with no evidence of accelerated erosion features. The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation; (2) as mapped by the US Geological Survey (USGS) 1:24,000 scale topographic maps, USGS Digital Elevation Models, and/or as determined by a BLM evaluation of the area; (3) ensuring successful reclamation and erosion control on slopes greater than 25% and less than 50% in order to meet the standards outlined in Chapter 6 of the BLM's Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office Resource Management Plan Record of Decision.
WY_BFO_CSU_SLR	CSU (1) Prior to surface disturbance on limited reclamation potential areas a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The Plan must include designs approved and stamped by a licensed engineer. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. The disturbed area will be stabilized with no evidence of accelerated erosion features. The disturbed area shall be managed to ensure soil characteristics approximate an appropriate reference site with regard to erosional features to maintain soil productivity and sustainability. Slope stability is maintained preventing slope failure and erosion. Sufficient viable topsoil is maintained for ensuring successful final reclamation. At locations where interim reclamation will be completed, this will be accomplished by respreading all salvaged topsoil over the areas of interim reclamation. The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation; (2) as mapped by the Natural Resources Conservation Service Soil Survey Geographic Database (SSURGO) Order 3 soil survey and as determined by a BLM evaluation of the area; (3) ensuring successful reclamation and erosion control on limited reclamation potential areas in order to meet the standards outlined in, Chapter 6 of the BLM's Oil and Gas Gold Book, as revised, and the 2015 Buffalo Field Office Resource Management Plan Record of Decision.
WY_BFO_CSU_SSP	CSU (1) Prior to surface disturbance within Ute ladies'-tresses orchid habitat flowering season survey(s) must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that Ute ladies'-tresses orchids will not be harmed and that the habitat on which they depend will be conserved; (2) as mapped or determined by the US Fish and Wildlife Service, Wyoming Natural Diversity Database, the Buffalo Field Office GIS database, or from field evaluation; (3) conserving Ute ladies'-tresses orchids and the habitat on which they depend.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_SSPF	CSU (1) Prior to surface disturbance within special status plant species habitats, flowering season surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that special status plant species will not be harmed and that the habitat on which they depend will be conserved; (2) as mapped or determined by the US Fish and Wildlife Service, Wyoming Natural Diversity Database, the Buffalo Field Office GIS database, or from field evaluation; (3) conserving special status plant species and the habitat on which they depend.
WY_BFO_CSU_SSWLA	CSU (1) Prior to surface disturbance within 1,640 feet (500 meters) of perennial water, vernal pools, playas, and wetlands appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (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 Authorized Officer has approved the Plan or approved it with conditions. The Plan must demonstrate to the Authorized Officer's satisfaction that special status amphibian species will not be disturbed to a degree that causes or is likely to cause physical injury, a decrease in productivity by substantially interfering with normal breeding, sheltering, or hibernation behavior, or site abandonment by substantially interfering with normal breeding, sheltering, or hibernation behavior; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring production of special status amphibian species breeding, sheltering, and hibernation habitat.
WY_BFO_CSU_SSWLB	CSU (1) Prior to surface disturbance within 1,640 feet (500 meters) of cave entrances, mature forest, and rock outcrops appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (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 Authorized Officer has approved the Plan or approved it with conditions. The Plan must demonstrate to the Authorized Officer's satisfaction that special status bat species will not be disturbed to a degree that causes or is likely to cause physical injury, a decrease in productivity by substantially interfering with normal breeding, nursery, roosting, or hibernation behavior, or site abandonment by substantially interfering with normal breeding, nursery, roosting, or hibernation behavior; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring protection of special status bat species breeding, nursery, roosting, and hibernation habitat.
WY_BFO_CSU_SSWLH	CSU (1) Prior to surface disturbance within special status species wildlife habitat an occupancy survey must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that special status wildlife species will not be harmed (any act which actually kills or injures wildlife including habitat modification or degradation that substantially impairs essential behavioral patterns) and that the habitat on which they depend will be conserved; (2) as mapped or determined by the US Fish and Wildlife Service, Wyoming Game and Fish Department, Wyoming Natural Diversity Database, or BLM from field evaluation; (3) conserving special status species wildlife and the habitat on which they depend (BLM 2008 -6840 manual).
WY_BFO_CSU_SSWLR	CSU (1) Prior to surface disturbance within 1,640 feet (500 meters) of south facing rock outcrops, perennial water, vernal pools, playas, and wetlands appropriate surveys must be conducted and a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (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 Authorized Officer has approved the Plan or approved it with conditions. The Plan must demonstrate to the Authorized Officer's satisfaction that special status reptile species will not be disturbed to a degree that causes or is likely to cause physical injury, a decrease in productivity by substantially interfering with normal breeding, basking, sheltering, or hibernation behavior, or site abandonment by substantially interfering with normal breeding, basking, sheltering, or hibernation behavior; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring production of special status reptile species breeding, basking, sheltering, and hibernation habitat.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_CSU_STG	CSU (1) Prior to surface disturbance within 0.25 mile of the perimeter of occupied sharp-tailed grouse leks a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that the function and suitability of sharp-tailed grouse breeding habitat will not be impaired (result in physical injury, a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior, or lek abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior); (2) as mapped by the Wyoming Game and Fish Department; (3) ensuring the function and suitability of sharp-tailed grouse breeding habitat.
WY_BFO_CSU_TCP	CSU (1) Prior to surface disturbance within 3 miles of traditional cultural properties a mitigation plan (Plan) must be submitted by the applicant. The Plan must be approved or approved with conditions by the BLM Authorized Officer prior to surface-disturbing activities after consultation with the State Historic Preservation Office, applicable Indian tribes, and other interested parties. The Plan must demonstrate there will be no adverse effects to National Register of Historic Places eligible or listed historic properties (i.e., proposed infrastructure is either not visible or will result in a weak contrast rating); (2) as mapped on the Buffalo Field Office GIS database; (3) ensuring the setting of traditional cultural properties.
WY_BFO_CSU_VRMII	CSU (1) Prior to surface disturbance within Visual Resource Management (VRM) Class 2 areas, a site-specific plan must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the plan (with conditions, as appropriate). The plan must demonstrate to the BLM Authorized Officer's satisfaction how the operator will meet the following performance standards. A visual contrast rating must demonstrate that VRM Class 2 objectives will be met. Where required by the BLM Authorized Officer, a visual simulation must be prepared and must demonstrate that VRM Class 2 objectives will be met through practices such as siting of permanent facilities. Where present and feasible, existing surface disturbances shall be utilized. New surface disturbances shall be minimized to the extent practicable. All permanent above-ground facilities (such as production tanks or other production facilities) not having specific coloration requirements for safety must be painted or designed using a BLM-approved color; (2) as mapped on the Buffalo Field Office GIS database; (3) protecting VRM Class 2 areas.
WY_BFO_CSU_WHSRMA	CSU (1) Prior to surface disturbance within Special Recreation Management Areas (SRMAs) available for leasing (Weston Hills) a mitigation plan (Plan) must be submitted to the BLM by the applicant as a component of the Application for Permit to Drill (BLM Form 3160-3) or Sundry Notice (BLM Form 3160-5) – Surface Use Plan of Operations. The operator shall not initiate surface-disturbing activities unless the BLM Authorized Officer has approved the Plan (with conditions, as appropriate). The Plan must demonstrate to the Authorized Officer's satisfaction that the proposed action is consistent with the prescribed management for the SRMA; (2) as mapped or determined by BLM; (3) ensuring the recreational opportunities and setting of the SRMA.
WY_BFO_NSO_BEGE	NSO (1) Within 0.5 miles from the edge of consistently used bald or golden eagle winter roosts and Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River, consistently used riparian corridors, as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (2) protecting wintering bald and golden eagles.
WY_BFO_NSO_BEN	NSO (1) Within 0.5 mile of bald eagle nests as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (2) ensuring productivity of bald eagles.
WY_BFO_NSO_BGHMA	NSO (1) Within Wyoming Game and Fish Department Big Game Habitat Management Areas (Ed O. Taylor, Kerns, Bud Love, and Amsden Creek) as mapped by the Wyoming Game and Fish Department; (2) ensuring the function and suitability of Wyoming Game and Fish Department Big Game Habitat Management Areas.
WY_BFO_NSO_H	NSO (1) Within the Pumpkin Buttes, Cantonment Reno, Dull Knife Battle, and Crazy Woman Battle historic properties, contributing and unevaluated segments of the Bozeman Trail, all rock art sites, all rock shelter sites, all Native American burials; as mapped on the Buffalo Field Office GIS database; (2) protecting historic properties.
WY_BFO_NSO_HIP	NSO (1) No surface occupancy or use is allowed on lands containing paleontological resources of high quality or importance as mapped on the Buffalo Field Office GIS database; (2) protecting paleontological resources of high quality or importance.
WY_BFO_NSO_PBACEC	NSO (1) Within the Pumpkin Buttes Area of Critical Environmental Concern as mapped or determined by BLM; (2) protecting the relevant and important values.
WY_BFO_NSO_Slopes50	NSO (1) On slopes greater than 50% as mapped by the US Geological Survey 1:24,000 scale topographic maps, US Geological Survey Digital Elevation Models, and/or as determined by a BLM evaluation of the area; (2) preventing mass slope failure and accelerated erosion.

STIPULATION CODE	STIPULATION LANGUAGE
WY_BFO_NSO_SSF	NSO (1) Within 0.25 mile of any waters containing special status fish species as mapped on the Buffalo Field Office GIS database or from field evaluation, in consultation with the Wyoming Game and Fish Department; (2) protecting special status fish populations and habitat.
WY_BFO_NSO_SSP	NSO (1) Within special status species plant populations as mapped on the Buffalo Field Office GIS database, or determined by BLM from field evaluation, in coordination with the Wyoming Natural Diversity Database and/or US Fish and Wildlife Service; (2) protecting special status species plant populations.
WY_BFO_NSO_SSRN	NSO (1) Within a species specific spatial buffer of special status species raptor nests using US Fish and Wildlife Service Wyoming Ecological Service's recommendations (Appendix Q (p. 633) or www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (2) protecting nest sites of special status raptors.
WY_BFO_NSO_TCP	NSO (1) On lands containing traditional cultural properties as mapped on the Buffalo Field Office GIS database; (2) protecting traditional cultural properties.
WY_BFO_TLS_BEN	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted from Feb 1 to Aug 15 within 1.0 mile of active bald eagle nests; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring productivity of bald eagles.
WY_BFO_TLS_BGCWEC	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted from Nov 15 to Apr 30 within big-game crucial winter range, or from May 1 to Jun 15 within elk calving areas (Wyoming Game and Fish Department 2009); (2) as mapped by the Wyoming Game and Fish Department and evaluated by the BLM; (3) ensuring the function and suitability of crucial big game winter ranges.
WY_BFO_TLS_EC	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted from May 1 to Jun 15 within elk calving areas (Wyoming Game and Fish Department 2009); (2) as mapped by the Wyoming Game and Fish Department and evaluated by the BLM; (3) ensuring the function and suitability of elk calving areas.
WY_BFO_TLS_EWR	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted from Nov 1 to Apr 1 within 1.0 mile from the edge of consistently used eagle winter roosts and the following consistently used riparian corridors: Clear Creek, Crazy Woman Creek, Piney Creek, Powder River, and Tongue River; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) protecting roosting eagles.
WY_BFO_TLS_NSSRN	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted within the US Fish and Wildlife Service Wyoming Ecological Service's recommended spatial buffers and dates of active non-special status species raptor nests. (Appendix Q (p. 633) or www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html); (2) as mapped on the Buffalo Field Office GIS database or determined by BLM from field evaluation in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring raptor nest productivity.
WY_BFO_TLS_PHMAC	TLS (1) Mar 15 to Jun 30; (2) as mapped on the Buffalo Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats (independent of habitat suitability) inside Priority Habitat Management Areas (Connectivity only), within 4 miles of an occupied lek.
WY_BFO_TLS_PHMAL	TLS (1) Mar 15 to Jun 30; (2) as mapped on the Buffalo Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats (independent of habitat suitability) inside designated Priority Habitat Management Areas (Core only). Where credible data support different timeframes for this restriction, dates may be expanded by 14 days prior or subsequent to the above dates.
WY_BFO_TLS_PHMAWCA	TLS (1) Dec 1 to Mar 14; (2) as mapped on the Buffalo Field Office GIS database; (3) to seasonally protect Greater Sage-Grouse winter concentration areas in designated Priority Habitat Management Areas (Core and Connectivity), and outside designated PHMAs (Core and Connectivity) when supporting wintering Greater Sage-Grouse that attend leks within designated PHMAs (Core only).
WY_BFO_TLS_SSRN	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted within US Fish and Wildlife Service recommended spatial buffers and dates (Appendix Q (p. 633) or www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/ Raptors.html) of active raptor nests of special status species; (2) as mapped on the Buffalo Field Office GIS database or determined by field evaluation, in coordination with the Wyoming Game and Fish Department and/or US Fish and Wildlife Service; (3) ensuring productivity of nesting special status raptors.
WY_BFO_TLS_STG	TLS (1) Surface-disturbing and disruptive activities are prohibited or restricted from Apr 1 to Jul 15 (Wyoming Game and Fish Department 2009) within 2 miles of the perimeter of occupied sharp-tailed grouse leks; (2) as mapped by the Wyoming Game and Fish Department and evaluated by the BLM; (3) ensuring the function and suitability of sharp-tailed grouse nesting habitat.

STIPULATION CODE	STIPULATION LANGUAGE
WY_LFO_CSU_BRMLP2024	CSU (1) Surface occupancy or use will be restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting unique plant communities, cultural sites, viewshed, geologic resources, wild horse migration routes, and riparian-wetland resources of the Beaver Rim Master Leasing Plan analysis area.
WY_LFO_CSU_LRPS1013	CSU (1) Surface occupancy or use will be restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting limited reclamation potential soils.
WY_LFO_CSU_PYFC5058	CSU (1) Surface use or occupancy is restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting fossil resources within designated “very high” or “high” potential fossil yield classification areas.
WY_LFO_CSU_RHTEH5018	CSU (1) Surface use or occupancy will be restricted within a 2-mile buffer of Regional Historic Trails and Early Highways; (2) as mapped on the Lander Field Office GIS database; (3) protecting the Regional Historic Trails and Early Highways and their settings.
WY_LFO_CSU_S15TO24P1014	CSU (1) Surface occupancy or use will be restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting areas containing slopes between 15 and 24 percent.
WY_LFO_CSU_SR6124	CSU (1) Surface use or occupancy is restricted within the Sweetwater Rocks viewshed; (2) as mapped on the Lander Field Office GIS database; (3) protecting the Sweetwater Rocks periphery.
WY_LFO_CSU_VRM5066	CSU (1) Surface occupancy or use is restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting VRM Class I and II areas.
WY_LFO_CSU1048	CSU (1) Surface occupancy and use will be restricted; (2) as mapped on the Lander field Office GIS database; (3) protecting 100-year floodplains and riparian-wetland areas.
WY_LFO_CSU2024	CSU (1) Surface occupancy and use will be restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting 100-year floodplains within the Beaver Rim Master Leasing Plan analysis area.
WY_LFO_CSU5025	CSU (1) Surface use or occupancy will be restricted; (2) as mapped on the Lander Field Office GIS database; (3) protecting the Cedar Ridge Traditional Cultural Property periphery.
WY_LFO_NSO_ACEC7059	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting the relevant and important Area of Critical Environmental Concern values.
WY_LFO_NSO_BRH4095	NSO (1) Within 0.25-mile of identified bat maternity roosts and hibernation sites as mapped on the Lander Field Office GIS database; (2) protecting bat maternity roosts and hibernation sites.
WY_LFO_NSO_BRMLP2024	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting unique plant communities, cultural sites, viewshed, and geologic resources in the Beaver Rim Master Leasing Plan area.
WY_LFO_NSO_CG5034	NSO (1) as mapped on the Lander Field Office GIS database; (2) protecting the Castle Gardens cultural site and periphery.
WY_LFO_NSO_HTAC4045	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting wildlife, cultural resources, viewshed, and/or recreational use(s) in the Hudson to Atlantic City area.
WY_LFO_NSO_NTMC7002	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting Congressionally Designated Trails and their settings.
WY_LFO_NSO_OPR4088	NSO (1) Within 200 feet of occupied pygmy rabbit habitat, as mapped in the Lander Field Office GIS database; (2) protecting pygmy rabbit habitat.
WY_LFO_NSO_PSW4031	NSO (1) Within 500 feet of perennial surface waters, riparian-wetland areas, and/or playas, as mapped on the Lander Field Office GIS database; (2) protecting perennial surface waters, riparian-wetland areas, and/or playas outside of Designated Development Areas.
WY_LFO_NSO_PSWDDA4031	NSO (1) Within 500 feet of perennial surface waters, riparian-wetland areas, and/or playas, as mapped on the Lander Field Office GIS database; (2) protecting perennial surface waters, riparian-wetland areas, and/or playas within Designated Development Areas.
WY_LFO_NSO_REC6086	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting developed recreation sites.
WY_LFO_NSO_SG25P1014	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting areas containing slopes greater than 25 percent.
WY_LFO_NSO_YERMO4084	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting desert yellowhead population management areas.
WY_LFO_NSO1045	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting identified sole source aquifers.
WY_LFO_NSO2024	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting 100-year floodplains within the Beaver Rim Master Leasing Plan analysis area.
WY_LFO_NSO2031	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting resources within 0.25-mile of National Register of Historic Places-eligible Native America cultural resource sites.
WY_LFO_NSO4070	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting wildlife parturition areas and viewshed south of Green Mountain.
WY_LFO_NSO5024	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting the Cedar Ridge Traditional Cultural Property.
WY_LFO_NSO5050	NSO (1) As mapped on the Lander Field Office GIS database; (2) protecting Sacred, Spiritual, and Traditional Cultural Properties.
WY_LFO_TLS_BGCW4061	TLS (1) Nov 15 to Apr 30; (2) as mapped on the Lander Field Office database; (3) protecting big game crucial winter range.
WY_LFO_TLS_BGCWP4061	TLS (1) May 1 to Jun 30; (2) as mapped on the Lander Field Office database; (3) protecting big game parturition areas.

STIPULATION CODE	STIPULATION LANGUAGE
WY_LFO_TLS_EWR4062	TLS (1) Nov 15 to Apr 30; (2) as mapped on the Lander Field Office GIS database; (3) protecting elk winter range.
WY_LFO_TLS_FFS4053	TLS (1) Sep 15 to Nov 30; (2) as mapped on the Lander Field Office GIS database; (3) protecting fall spawning habitat within the identified bankfull channel width of fish-bearing streams.
WY_LFO_TLS_FSS4053	TLS (1) Mar 15 to Jul 31; (2) as mapped on the Lander Field Office GIS database; (3) protecting spring spawning habitat within the identified bankfull channel width of fish-bearing streams.
WY_LFO_TLS_MPN4094	TLS (1) Apr 10 to Jul 10; (2) within 0.25-mile of identified mountain plover habitat, as mapped on the Lander Field Office GIS database, (3) protecting mountain plover nesting habitat.
WY_LFO_TLS_PHMAWCA	TLS (1) Dec 1 to Mar 14; (2) as mapped on the Lander Field Office GIS database; (3) seasonally protecting Greater Sage-Grouse winter concentration areas.
WY_LFO_TLS_RN4071	TLS (1) Within 1 mile of bald eagle and ferruginous hawk nests and 0.75-mile of all other active raptor nests during the following time periods, Apr 1 to Aug 31 for northern goshawk, Apr 1 to Sep 15 for burrowing owl, Feb 1 to Aug 15 for bald and/or golden eagles, and Feb 1 to Jul 31 for all other raptors; (2) as mapped on the Lander Field Office GIS database; (3) protecting active raptor nests.
WY_NFO_CSU_PHMAC	CSU (1) Surface occupancy or use will be restricted. The cumulative value of all applicable surface disturbances, existing or future, must not exceed 5 percent of the Disturbance Density Calculation Tool (DDCT) area, as described in the DDCT manual; (2) as mapped on the Newcastle Field Office GIS database; (3) to protect Greater Sage-Grouse designated Priority Habitat Management Areas (Connectivity only) from habitat fragmentation and loss. This lease does not guarantee the lessee the right to occupy the surface of the lease for the purpose of producing oil and natural gas within Greater Sage-Grouse designated PHMAs (Connectivity only). The surface occupancy restriction criteria identified in this stipulation may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on Federal, State, or private lands within designated PHMAs (Connectivity only) or surface disturbance created by other land users. The BLM may require the lessee or operator to enter into a unit agreement or drilling easement to facilitate the equitable development of this and surrounding leases.
WY_NFO_TLS_PHMAC	TLS (1) Mar 15 to Jun 30; (2) as mapped on the Newcastle Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats (independent of habitat suitability) inside Priority Habitat Management Areas (Connectivity only), within 4 miles of an occupied lek.
WY_SW_CSU_PHMA	CSU (1) Surface occupancy or use will be restricted to no more than an average of one disturbance location per 640 acres using the Disturbance Density Calculation Tool (DDCT), and the cumulative value of all applicable surface disturbances, existing or future, must not exceed 5 percent of the DDCT area, as described in the DDCT manual; (2) as mapped on the applicable Field Office GIS database; (3) to protect Greater Sage-Grouse designated Priority Habitat Management Areas (Core only) from habitat fragmentation and loss. This lease does not guarantee the lessee the right to occupy the surface of the lease for the purpose of producing oil and natural gas within Greater Sage-Grouse designated PHMAs (Core only). The surface occupancy restriction criteria identified in this stipulation may preclude surface occupancy and may be beyond the ability of the lessee to meet due to existing surface disturbance on Federal, State, or private lands within designated PHMAs (Core only) or surface disturbance created by other land users. The BLM may require the lessee or operator to enter into a unit agreement or drilling easement to facilitate the equitable development of this and surrounding leases.
WY_SW_NSO_GHMAL	NSO (1) As mapped on the applicable Field Office GIS database; (2) to protect occupied Greater Sage-Grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse in proximity to leks from habitat fragmentation and loss, and protect Greater Sage-Grouse populations from disturbance within a 0.25-mile radius of the perimeter of occupied Greater Sage-Grouse leks outside designated Priority Habitat Management Areas (Core and Connectivity).
WY_SW_NSO_PHMAL	NSO (1) As mapped on the applicable Field Office GIS database; (2) to protect occupied Greater Sage-Grouse leks and associated seasonal habitat, life-history, or behavioral needs of Greater Sage-Grouse in proximity to leks from habitat fragmentation and loss, and protect Greater Sage-Grouse populations from disturbance within a 0.6-mile radius of the perimeter of occupied Greater Sage-Grouse leks inside designated Priority Habitat Management Areas (Core and Connectivity).
WY_SW_TLS_GHMAL	TLS (1) Mar 15 to Jun 30; (2) as mapped on the applicable Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats outside designated Priority Habitat Management Areas (Core and Connectivity), within 2 miles of an occupied lek.
WY_SW_TLS_PHMAL	TLS (1) Mar 15 to Jun 30; (2) as mapped on the applicable Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse breeding, nesting and early brood-rearing habitats (independent of habitat suitability) inside designated Priority Habitat Management Areas (Core only).
WY_SW_TLS_PHMAWCA	TLS (1) Dec 1 to Mar 14; (2) as mapped on the applicable Field Office GIS database; (3) no surface use to seasonally protect Greater Sage-Grouse winter concentration areas in designated Priority Habitat Management Areas (Core only), and outside designated PHMAs (Core only) when supporting wintering Greater Sage-Grouse that attend leks within designated PHMAs (Core only).

5.1.2 Standard Lease Terms, Notices, and Stipulations

BLM Lease Form 3100-11

Form 3100-11
(October 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number

OFFER TO LEASE AND LEASE FOR OIL AND GAS

The undersigned (page 2) offers to lease all or any of the lands in Item 2 that are available for lease pursuant to the Mineral Lands Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351-359), or _____(other).

READ INSTRUCTIONS BEFORE COMPLETING

1. Name
Street
City, State, Zip Code

2. This application/offer/lease is for: *(Check Only One)* ☐ PUBLIC DOMAIN LANDS ☐ ACQUIRED LANDS (percent U.S. interest _____)

Surface managing agency if other than Bureau of Land Management (BLM): _____ Unit/Project _____

Legal description of land requested: *Parcel No.: _____ *Sale Date (mm/dd/yyyy): _____

***See Item 2 in Instructions below prior to completing Parcel Number and Sale Date.**

T.	R.	Meridian	State	County

Total acres applied for_____

Amount remitted: Filing fee $ _____ Rental fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease:

T.	R.	Meridian	State	County

Total acres in lease _____

Rental retained $ _____

This lease is issued granting the exclusive right to drill for, mine, extract, remove and dispose of all the oil and gas (except helium) in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon for the term indicated below, subject to renewal or extension in accordance with the appropriate leasing authority. Rights granted are subject to applicable laws, the terms, conditions, and attached stipulations of this lease, the Secretary of the Interior's regulations and formal orders in effect as of lease issuance, and to regulations and formal orders hereafter promulgated when not inconsistent with lease rights granted or specific provisions of this lease.

NOTE: This lease is issued to the high bidder pursuant to his/her duly executed bid form submitted under 43 CFR 3120 and is subject to the provisions of that bid and those specified on this form.

Type and primary term:

☐ Noncompetitive lease (ten years)

☐ Competitive lease (ten years)

☐ Other _____

THE UNITED STATES OF AMERICA

by _____
(BLM)

_____
(Title) (Date)

EFFECTIVE DATE OF LEASE _____

(Continued on page 2)

4. (a) Undersigned certifies that (1) offeror is a citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or Territory thereof, (2) all parties holding an interest in the offer are in compliance with 43 CFR 3100 and the leasing authorities; (3) offeror's chargeable interests, direct and indirect, in each public domain and acquired lands separately in the same State, do not exceed 246,080 acres in oil and gas leases (of which up to 200,000 acres may be in oil and gas options or 300,000 acres in leases in each leasing District in Alaska of which up to 200,000 acres may be in options, (4) offeror is not considered a minor under the laws of the State in which the lands covered by this offer are located; (5) offeror is in compliance with qualifications concerning Federal coal lease holdings provided in sec. 2(a)2(A) of the Mineral Leasing Act; (6) offeror is in compliance with reclamation requirements for all Federal oil and gas lease holdings as required by sec. 17(g) of the Mineral Leasing Act; and (7) offeror is not in violation of sec. 41 of the Act. (b) Undersigned agrees that signature to this offer constitutes acceptance of this lease, including all terms conditions, and stipulations of which offeror has been given notice, and any amendment or separate lease that may include any land described in this offer open to leasing at the time this offer was filed but omitted for any reason from this lease. The offeror further agrees that this offer cannot be withdrawn, either in whole or in part unless the withdrawal is received by the proper BLM State Office before this lease, an amendment to this lease, or a separate lease, whichever covers the land described in the withdrawal, has been signed on behalf of the United States.

This offer will be rejected and will afford offeror no priority if it is not properly completed and executed in accordance with the regulations, or if it is not accompanied by the required payments.

Duly executed this _____ day of _____ , 20 ____ _____
(Signature of Lessee or Attorney-in-fact)

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212 make it a crime for any person knowingly and willfully to make to any department or Agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

LEASE TERMS

Sec. 1. Rentals--Rentals must be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

(a) Noncompetitive lease, $1.50 for the first 5 years; thereafter $2.00;

(b) Competitive lease, $1.50; for the first 5 years; thereafter $2.00;

(c) Other, see attachment, or

as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources, and the plan contains a provision for allocation of production, royalties must be paid on the production allocated to this lease. However, annual rentals must continue to be due at the rate specified in (a), (b), or (c) rentals for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) must automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

See. 2. Royalties--Royalties must be paid to proper office of lessor. Royalties must be computed in accordance with regulations on production removed or sold. Royalty rates are:

(a) Noncompetitive lease, 12 1/2%;

(b) Competitive lease, 12 1/2 %;

(c) Other, see attachment; or

as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties must be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production must be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee must not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor must lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year must be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge will be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee must be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

(Continued on page 3)

Sec. 3. Bonds - A bond must be filed and maintained for lease operations as required under regulations.

Sec. 4. Diligence, rate of development, unitization, and drainage - Lessee must exercise reasonable diligence in developing and producing, and must prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if deemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee must drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Sec. 5. Documents, evidence, and inspection - Lessee must file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee must furnish detailed statements showing amounts and quality of all products removed and sold, proceeds therefrom, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee must keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee must keep open at all reasonable times for inspection by any representative of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee must maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports costs claimed as manufacturing, preparation, and/or transportation costs. All such records must be maintained in lessee's accounting offices for future audit by lessor. Lessee must maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section will be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. Conduct of operations - Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses must be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee must contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee must immediately contact lessor. Lessee must cease any operations that would result in the destruction of such species or objects.

Sec. 7. Mining operations - To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Sec. 8. Extraction of helium - Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee must include in any contract of sale of gas the provisions of this section.

Sec. 9. Damages to property - Lessee must pay lessor for damage to lessor's improvements, and must save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 10. Protection of diverse interests and equal opportunity - Lessee must pay, when due, all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee must comply with section 28 of the Mineral Leasing Act of 1920.

Lessee must comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractors must maintain segregated facilities.

Sec. 11. Transfer of lease interests and relinquishment of lease - As required by regulations, lessee must file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which will be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Sec. 12. Delivery of premises - At such time as all or portions of this lease are returned to lessor, lessee must place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Sec. 13. Proceedings in case of default - If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease will be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision will not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver will not prevent later cancellation for the same default occurring at any other time. Lessee will be subject to applicable provisions and penalties of FOGRMA (30 U.S.C. 1701).

Sec. 14. Heirs and successors-in-interest - Each obligation of this lease will extend to and be binding upon, and every benefit hereof will inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

(Continued on page 4)

A. General:

1. Page 1 of this form is to be completed only by parties filing for a noncompetitive lease. The BLM will complete page 1 of the form for all other types of leases.

2. Entries must be typed or printed plainly in ink. Offeror must sign Item 4 in ink.

3. An original and two copies of this offer must be prepared and filed in the proper BLM State Office. See regulations at 43 CFR 1821.2-1 for office locations.

4. If more space is needed, additional sheets must be attached to each copy of the form submitted.

B. Special:

Item 1 - Enter offeror's name and billing address.

Item 2 - Identify the mineral status and, if acquired lands, percentage of Federal ownership of applied for minerals. Indicate the agency controlling the surface of the land and the name of the unit or project which the land is a part. The same offer may not include both Public Domain and Acquired lands. Offeror also may provide other information that will assist in establishing title for minerals. The description of land must conform to 43 CFR 3110. A single parcel number and Sale Date will be the only acceptable description during the period from the first day following the end of a competitive process until the end of that same month, using the parcel number on the List of Lands Available for Competitive Nominations or the Notice of Competitive Lease Sale, whichever is appropriate.

Payments: The amount remitted must include the filing fee and the first year's rental at the rate of $1.50 per acre or fraction thereof. The full rental based on the total acreage applied for must accompany an offer even if the mineral interest of the United States is less than 100 percent. The filing fee will be retained as a service charge even if the offer is completely rejected or withdrawn. To protect priority, it is important that the rental submitted be sufficient to cover all the land requested. If the land requested includes lots or irregular quarter-quarter sections, the exact area of which is not known to the offeror, rental should be submitted on the basis of each such lot or quarter-quarter section containing 40 acres. If the offer is withdrawn or rejected in whole or in part before a lease issues, the rental remitted for the parts withdrawn or rejected will be returned.

Item 3 - This space will be completed by the United States.

NOTICES

The Privacy Act of 1974 and the regulations in 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this oil and gas lease offer.

AUTHORITY: 30 U.S.C. 181 et seq.; 30 U.S.C 351-359.

PRINCIPAL PURPOSE: The information is to be used to process oil and gas offers and leases.

ROUTINE USES: (1) The adjudication of the lessee's rights to the land or resources. (2) Documentation for public information in support of notations made on land status records for the management, disposal, and use of public lands and resources. (3) Transfer to appropriate Federal agencies when consent or concurrence is required prior to granting a right in public lands or resources. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION: If all the information is not provided, the offer may be rejected. See regulations at 43 CFR 3100.

BLM-Wyoming Standard Lease Notices (Nos. 1-3) and Lease Stipulations (Nos. 1-3)

LEASE NOTICE NO. 1

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, timing of operations, and specification of interim and final reclamation measures, which may require relocating proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface disturbance activities for up to 60 days.

The lands within this lease may include areas not specifically addressed by lease stipulations that may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and/or other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled or, if absolutely necessary, prohibited. Appropriate modifications to imposed restrictions will be made for the maintenance and operation of producing wells.

1. Slopes in excess of 25 percent.
2. Within 500 feet of surface water and/or riparian areas.
3. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.
4. Within 500 feet of Interstate highways and 200 feet of other existing rights-of-way (i.e., U.S. and State highways, roads, railroads, pipelines, powerlines).
5. Within 1/4 mile of occupied dwellings.
6. Material sites.

GUIDANCE:
The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when one or more of the above conditions exist, surface disturbing activities will be prohibited unless or until the permittee or the designated representative and the surface management agency (SMA) arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

Specific threshold criteria (e.g., 500 feet from water) have been established based upon the best information available. However, geographical areas and time periods of concern must be delineated at the field level (i.e., "surface water and/or riparian areas" may include both intermittent and ephemeral water sources or may be limited to perennial surface water).

The referenced oil and gas leases on these lands are hereby made subject to the stipulation that the exploration or drilling activities will not interfere materially with the use of the area as a materials site/free use permit. At the time operations on the above lands are commenced, notification will be

made to the appropriate agency. The name of the appropriate agency may be obtained from the proper BLM Field Office.

THIS NOTICE APPLIES TO ALL PARCELS

LEASE NOTICE NO. 2

BACKGROUND:

The Bureau of Land Management (BLM), by including National Historic Trails within its National Landscape Conservation System, has recognized these trails as national treasures. Our responsibility is to review our strategy for management, protection, and preservation of these trails. The National Historic Trails in Wyoming, which include the Oregon, California, Mormon Pioneer, and Pony Express Trails, as well as the Nez Perce Trail, were designated by Congress through the National Trails System Act (P.L. 90-543; 16 U.S.C. 1241-1251) as amended through P.L. 106-509 dated November 13, 2000. Protection of the National Historic Trails is normally considered under the National Historic Preservation Act (P.L. 89-665; 16 U.S.C. 470 et seq.) as amended through 1992 and the National Trails System Act. Additionally, Executive Order 13195, "Trails for America in the 21st Century," signed January 18, 2001, states in Section 1: "Federal agencies will...protect, connect, promote, and assist trails of all types throughout the United States. This will be accomplished by: (b) Protecting the trail corridors associated with national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary to ensure that the values for which each trail was established remain intact." Therefore, the BLM will be considering all impacts and intrusions to the National Historic Trails, their associated historic landscapes, and all associated features, such as trail traces, grave sites, historic encampments, inscriptions, natural features frequently commented on by emigrants in journals, letters and diaries, or any other feature contributing to the historic significance of the trails. Additional National Historic Trails will likely be designated amending the National Trails System Act. When these amendments occur, this notice will apply to those newly designated National Historic Trails as well.

STRATEGY:

The BLM will proceed in this objective by conducting a viewshed analysis on either side of the designated centerline of the National Historic Trails in Wyoming, except, at this time, for the Nez Perce Trail, for the purpose of identifying and evaluating potential impacts to the trails, their associated historic landscapes, and their associated historic features. Subject to the viewshed analysis and archeological inventory, reasonable mitigation measures may be applied. These may include, but are not limited to, modification of siting or design of facilities to camouflage or otherwise hide the proposed operations within the viewshed. Additionally, specification of interim and final reclamation measures may require relocating the proposed operations within the leasehold. Surface-disturbing activities will be analyzed in accordance with the National Environmental Policy Act of 1969 (P.L. 91190; 42 U.S.C. 4321-4347) as amended through P.L. 94-52, July 3, 1975 and P.L. 94-83, August 9, 1975, and the National Historic Preservation Act, supra, to determine if any design, siting, timing, or reclamation requirements are necessary. This

strategy is necessary until the BLM determines that, based on the results of the completed viewshed analysis and archaeological inventory, the existing land use plans (Resource Management Plans) have to be amended.

The use of this lease notice is a predecisional action, necessary until final decisions regarding surface-disturbing restrictions are made. Final decisions regarding surface-disturbing restrictions will take place with full public disclosure and public involvement over the next several years if BLM determines that it is necessary to amend existing land use plans.

GUIDANCE:

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when any oil and gas lease contains remnants of National Historic Trails, or is located within the viewshed of a National Historic Trails' designated centerline, surface-disturbing activities will require the lessee, permittee, operator or, their designated representative, and the surface management agency (SMA) to arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

THIS NOTICE APPLIES TO ALL PARCELS

LEASE NOTICE NO. 3

Greater Sage-Grouse Habitat: The lease may in part, or in total, contain important Greater Sage-Grouse habitats as identified by the BLM, either currently or prospectively. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on the Greater Sage-Grouse populations and habitat quality. Such measures shall be developed during the Application for Permit to Drill (APD) on-site and environmental review process and will be consistent with the lease rights granted.

THIS NOTICE APPLIES TO ALL PARCELS

LEASE STIPULATION NO. 1: CULTURAL RESOURCES

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) 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.

THIS STIPULATION APPLIES TO ALL PARCELS

LEASE STIPULATION NO. 2: 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. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

THIS STIPULATION APPLIES TO ALL PARCELS

LEASE STIPULATION NO. 3 MULTIPLE MINERAL DEVELOPMENT

Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.

THIS STIPULATION APPLIES TO ALL PARCELS

5.2 Parcel Resource Values/Stipulation Summary Tables

5.2.1 High Plains District

Combined (all HPD field offices)

Preliminary Parcel WY-191Q-	Coal	Cultural Sites/NHT	Paleo PFYC Class 4/5	Recreation	VRM Class I or II	Socio-Economic	Soils	Lands & Realty	Special Management Areas	Fish CSU	Big Game Crucial Range CSU, TLS	Elk Calving CSU, TLS	Sharp-Tailed Grouse CSU, TLS	Raptor Nesting NSO, CSU, TLS & Special Species Raptor	Bald Eagle Winter Roosts / Nesting NSO, CSU, TLS	Special Status Plant Species CSU, NSO	Greater Sage-Grouse NSO, and/or CSU, TLS (in PHMAs)	Greater Sage-Grouse NSO, and/or CSU, TLS (outside PHMAs)	Prairie Dog Colonies CSU	Special Status Species Amphibians, Reptiles, Bats CSU	Vegetation/ Riparian	Waters	Existing Wells
-001																							
-002		X			X																		
-003			X											X									
-004			X											X									
-005			X											X									
-006			X											X									
-007			X											X									
-008			X											X			X						
-009			X											X			X						
-010			X											X			X						
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-019														X				X					
-020														X			X	X					

Preliminary Parcel WY-191Q-	Coal	Cultural Sites/NHT	Paleo PFYC Class 4/5	Recreation	VRM Class I or II	Socio-Economic	Soils	Lands & Realty	Special Management Areas	Fish CSU	Big Game Crucial Range CSU, TLS	Elk Calving CSU, TLS	Sharp-Tailed Grouse CSU, TLS	Raptor Nesting NSO, CSU, TLS & Special Species Raptor	Bald Eagle Winter Roosts / Nesting NSO, CSU, TLS	Special Status Plant Species CSU, NSO	Greater Sage-Grouse NSO, and/or CSU, TLS (in PHMAs)	Greater Sage-Grouse NSO, and/or CSU, TLS (outside PHMAs)	Prairie Dog Colonies CSU	Special Status Species Amphibians, Reptiles, Bats CSU	Vegetation/ Riparian	Waters	Existing Wells
-021														X			X			X			
-022							X			X				X				X	X	X			
-023							X						X	X		X		X	X	X		X	
-024							X			X				X						X			
-025							X							X		X				X			
-026		X																					
-027																							
-028																				X			
-029		X																X					
-030		X												X									
-031																		X					
-032							X							X				X		X	X	X	
-033							X							X				X		X	X	X	X
-034							X							X				X		X	X	X	
-035							X			X				X				X		X	X	X	
-036							X							X				X		X	X		
-037							X							X				X		X	X		
-038							X							X				X		X	X		
-039							X							X				X		X	X		
-040							X							X				X		X	X		
-041							X			X				X				X		X	X		X
-042							X											X		X	X	X	X

Preliminary Parcel WY-191Q-	Coal	Cultural Sites/NHT	Paleo PFYC Class 4/5	Recreation	VRM Class I or II	Socio-Economic	Soils	Lands & Realty	Special Management Areas	Fish CSU	Big Game Crucial Range CSU, TLS	Elk Calving CSU, TLS	Sharp-Tailed Grouse CSU, TLS	Raptor Nesting NSO, CSU, TLS & Special Species Raptor	Bald Eagle Winter Roosts / Nesting NSO, CSU, TLS	Special Status Plant Species CSU, NSO	Greater Sage-Grouse NSO, and/or CSU, TLS (in PHMAs)	Greater Sage-Grouse NSO, and/or CSU, TLS (outside PHMAs)	Prairie Dog Colonies CSU	Special Status Species Amphibians, Reptiles, Bats CSU	Vegetation/ Riparian	Waters	Existing Wells
-043							X											X		X	X		X
-044							X							X						X			
-045							X		X	X	X	X	X	X				X		X	X		
-046							X		X	X	X	X	X	X					X	X	X	X	
-047							X		X		X	X	X	X					X	X	X	X	
-048							X		X		X	X		X						X	X	X	
-049							X		X		X	X		X						X	X		
-050		X															X	X					
-051																							
-052																							
-053																							
-054																							
-055																							
-056															X								
-057																							
-058							X							X						X			
-059							X							X						X	X		
-060							X							X						X			
-061							X			X				X	X					X	X	X	
-062							X		X	X	X	X		X	X				X	X	X	X	X
-063							X			X				X	X				X	X	X	X	
-064							X		X	X	X			X	X				X	X	X	X	X

Preliminary Parcel WY-191Q-	Coal	Cultural Sites/NHT	Paleo PFYC Class 4/5	Recreation	VRM Class I or II	Socio-Economic	Soils	Lands & Realty	Special Management Areas	Fish CSU	Big Game Crucial Range CSU, TLS	Elk Calving CSU, TLS	Sharp-Tailed Grouse CSU, TLS	Raptor Nesting NSO, CSU, TLS & Special Species Raptor	Bald Eagle Winter Roosts / Nesting NSO, CSU, TLS	Special Status Plant Species CSU, NSO	Greater Sage-Grouse NSO, and/or CSU, TLS (in PHMAs)	Greater Sage-Grouse NSO, and/or CSU, TLS (outside PHMAs)	Prairie Dog Colonies CSU	Special Status Species Amphibians, Reptiles, Bats CSU	Vegetation/ Riparian	Waters	Existing Wells
-065							X			X				X	X				X	X	X	X	X
-066							X			X				X	X				X	X	X	X	
-067							X								X					X	X		
-068							X		X	X				X	X				X	X		X	X
-069							X		X	X				X	X				X	X	X	X	X
-070							X							X				X		X	X		
-071														X									
-072		X					X							X			X	X	X	X	X		
-073		X					X							X			X			X		X	
-074		X															X			X			
-075		X					X							X			X			X			
-076		X					X							X			X	X	X	X		X	
-077		X					X							X			X	X	X	X			
-078		X					X							X				X		X		X	
-079		X					X							X			X	X		X			
-080		X					X							X			X			X			
-081		X					X							X			X			X			
-082							X							X			X	X		X		X	
-083		X					X							X			X			X			
-084		X					X							X						X	X		
-085		X					X			X				X	X		X		X	X			
-086		X					X										X			X			

Preliminary Parcel WY-191Q-	Coal	Cultural Sites/NHT	Paleo PFYC Class 4/5	Recreation	VRM Class I or II	Socio-Economic	Soils	Lands & Realty	Special Management Areas	Fish CSU	Big Game Crucial Range CSU, TLS	Elk Calving CSU, TLS	Sharp-Tailed Grouse CSU, TLS	Raptor Nesting NSO, CSU, TLS & Special Species Raptor	Bald Eagle Winter Roosts / Nesting NSO, CSU, TLS	Special Status Plant Species CSU, NSO	Greater Sage-Grouse NSO, and/or CSU, TLS (in PHMAs)	Greater Sage-Grouse NSO, and/or CSU, TLS (outside PHMAs)	Prairie Dog Colonies CSU	Special Status Species Amphibians, Reptiles, Bats CSU	Vegetation/ Riparian	Waters	Existing Wells
-087							X			X				X	X		X		X	X	X	X	
-088					X												X						
-089																	X						
-090					X												X						
-091																	X						
-092					X		X										X			X			
-093		X					X			X				X					X	X	X	X	
-095					X												X						
-096														X			X						

5.2.2 Wind River/Bighorn Basin District

Worland Field Office

Preliminary Parcel WY-191Q-	LN 1041
-102	X

Lander Field Office

Preliminary Parcel WY-191Q-	WY_LFO_CSU_LRPS1013	WY_LFO_CSU_S15TO24P1014	WY_LFO_NSO_SG25P1014	WY_LFO_NSO_PSWDDA4031	WY_SW_NSO_GHMAL	WY_LFO_CSU_PYFC5058
-106	X	X	X	X	X	X

5.2.3 High Desert District

Preliminary Parcel WY-191Q-	Big Game Crucial Winter Range TLS	GSG DDCT PHMA CSU	GSG/ Sharp-tailed Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/ Nest TLS or NSO	Greater Sage-Grouse winter concentration area or winter habitat TLS	Big Game BirthingTLS/CSU	GSG/ Sharp- Tailed Lek NSO/CSU	Raptor CSU/NSO	Amphib Species CSU	Cult. Res. CSU or NSO	Historic Trails CSU &/or NSO	Adobe Town DRUA CSU	VRM II CSU	Coal/ Trona CSU	SRMA/ SMA/ WHMA CSU or NSO
-94	X	X	X	X							X	NSO /CSU					
-97	X		X	X	X						X	CSU					
-98		X	X	X							X						
-99		X	X	X					X	X	X						
-100		X	X								X						
-101		X	X								X						
-103					X												
-104			X	X	X					X	X			X	X		
-105				X	X					X	X						
-107		X	X	X					X		X			X			
-107			X	X					X	X							
-108		X	X	X									X		X		
-109		X	X										X		X		
-110		X	X												X		
-111		X	X										X		X		
-112	X	X	X														X
-113	X	X	X														X
-114	X	X	X						X								X
-115		X	X										X		X		X
-116		X	X						X								X
-117		X	X														
-118		X	X						X				X		X		
-119		X	X												X		
-120	X	X	X					X									X
-121	X	X	X														X

Preliminary Parcel WY-191Q-	Big Game Crucial Winter Range TLS	GSG DDCT PHMA CSU	GSG/ Sharp-tailed Nesting TLS	B. Owl/ Raptor Nesting TLS	Mountain Plover TLS	Bald Eagle Roost/ Nest TLS or NSO	Greater Sage-Grouse winter concentration area or winter habitat TLS	Big Game BirthingTLS/CSU	GSG/ Sharp- Tailed Lek NSO/CSU	Raptor CSU/NSO	Amphib Species CSU	Cult. Res. CSU or NSO	Historic Trails CSU &/or NSO	Adobe Town DRUA CSU	VRM II CSU	Coal/ Trona CSU	SRMA/ SMA/ WHMA CSU or NSO
-122	X	X	X														X
-123	X	X	X						X								X
-124	X	X	X						X								X
-125	X	X	X	X					X								X
-126	X	X	X						X								X
-127	X	X	X	X					X								X
-128	X	X	X	X													X
-129	X	X	X	X					X	X							X
-130	X	X	X	X													X
-131	X	X	X						X								X
-132	X	X	X														X
-133	X	X	X						X								X
-134	X	X	X														X
-135	X	X	X						X								X
-136	X	X	X						X								X
-137	X	X	X	X													X
-138	X		X			X									X		X
-139	X																
-140	X																
-141	X	X	X	X	X				X								
-142		X	X						X						X		
-143	X	X	X						X						X		
-144		X	X	X	X				X								
-145		X	X	X					X								
-146	X		X	X		X			X								

5.3 Air Resources Attachment: Air Quality Related Values: Visibility, Hazardous Air Pollutants and Deposition

5.3.1 Visibility –Wyoming

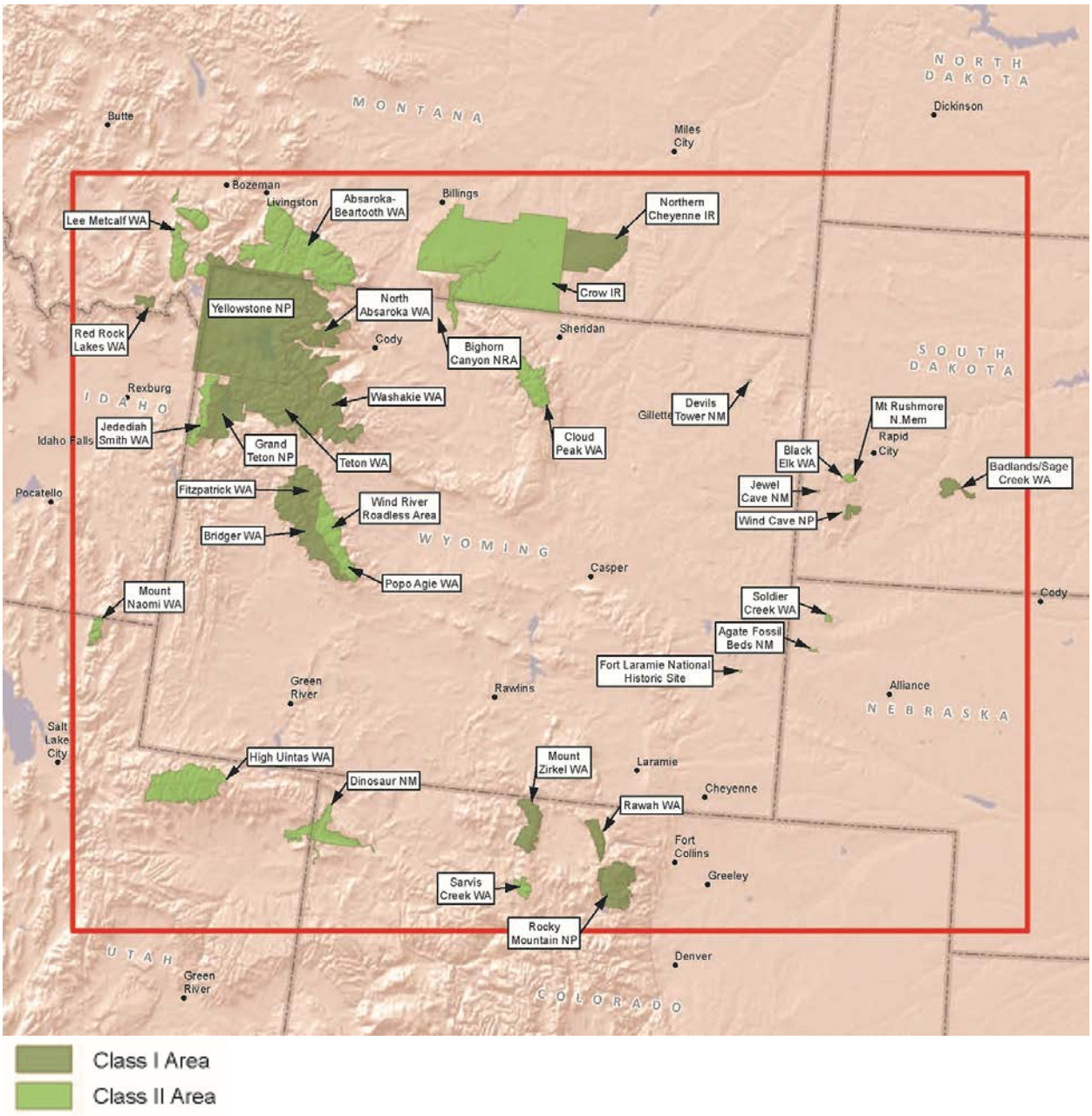
Regional haze is visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area. Visibility impairment is caused by particles and gases in the atmosphere that scatter, distort, or absorb light. The primary cause of regional haze in many parts of the country is light scattering resulting from fine particles (i.e., PM2.5) in the atmosphere. Additionally, coarse particles between 2.5 and 10 microns in diameter can contribute to light extinction. Coarse particles and PM2.5 can be naturally occurring or the result of human activity. The natural levels of these species result in some level of visibility impairment, in the absence of any human influences and will vary with season, daily meteorology, and geography (Malm 1999).

There are several National Parks, National Forests, recreation areas, and wilderness areas within and surrounding the state of Wyoming. National Parks, National Monuments, and some state designated Wilderness Areas are designated as Class I (see figure, below). 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). Under BLM Manual Section 8560.36, BLM-administered 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.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) program was initiated in 1985. This program implemented an extensive long term monitoring program to establish the current visibility conditions, track changes in visibility and determine causal mechanism for the visibility impairment in the National Parks and Wilderness Areas. Observations over time have shown that visibility is not as good as it could be compared to natural background conditions (i.e., visibility is impaired relative to natural background conditions). In 1999, the EPA issued a Regional Haze Rule to protect visibility in over 150 national parks and wilderness areas. The Regional Haze Rule requires states to establish Reasonable Progress Goals for improving visibility, with the overall goal of attaining natural background visibility conditions by 2064.

The Clean Air Act includes "as a National Goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I federal areas in which impairment results from manmade air pollution." The CAA gives federal managers the affirmative responsibility, but no regulatory authority, to protect air quality-related values, including visibility, from degradation. A wide variety of pollutants can impact visibility, including PM, NO_2, NO_3, and SO_4. Fine particles suspended in the atmosphere decrease visibility by blocking, reflecting, or absorbing light. Regional haze occurs when pollutants from widespread emission sources become mixed in the atmosphere and travel long distances.

National Parks, Wilderness Areas, and National Parks

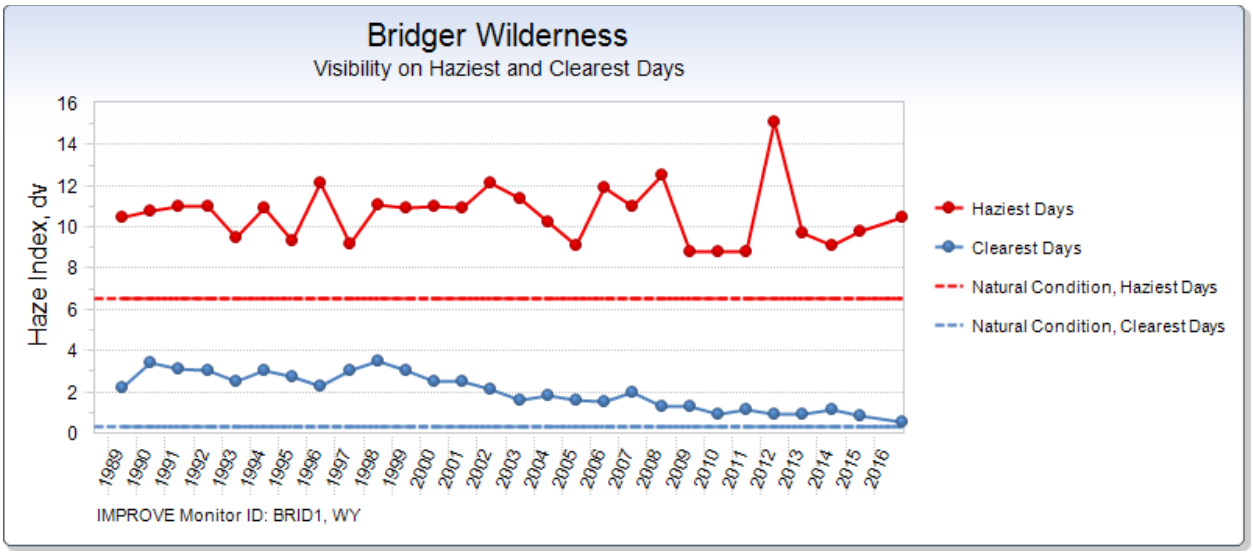


Visibility is expressed as deciviews (dv), which is a measure for describing perceived changes in visibility. Deciview values are calculated from either measured or estimated light extinction values in units of inverse megameters (Mm-1). A dv value of zero indicates a pristine atmosphere.

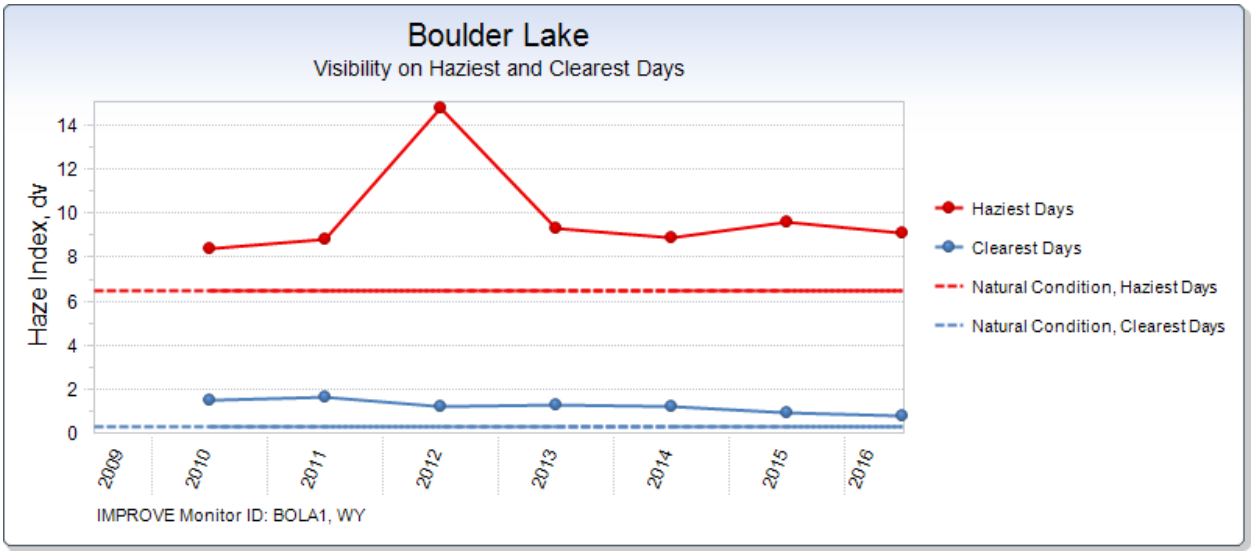
The figures below display annual average visibility in deciviews for the 20 percent best days, 20 percent worst days, and all days for each year during the late 20th and early 21st Century for the following IMPROVE sites: Bridger Wilderness, Boulder Lake, North Absaroka, Thunder Basin, Wind Cave, and Cloud Peak. Note: the 2017 IMPROVE data was not available, and the

monitoring at Cloud Peak stopped in 2014. Generally, the IMPROVE data show a slow increase in visibility on the "Clearest Days" and a near-neutral trend in visibility for the "Haziest Days."

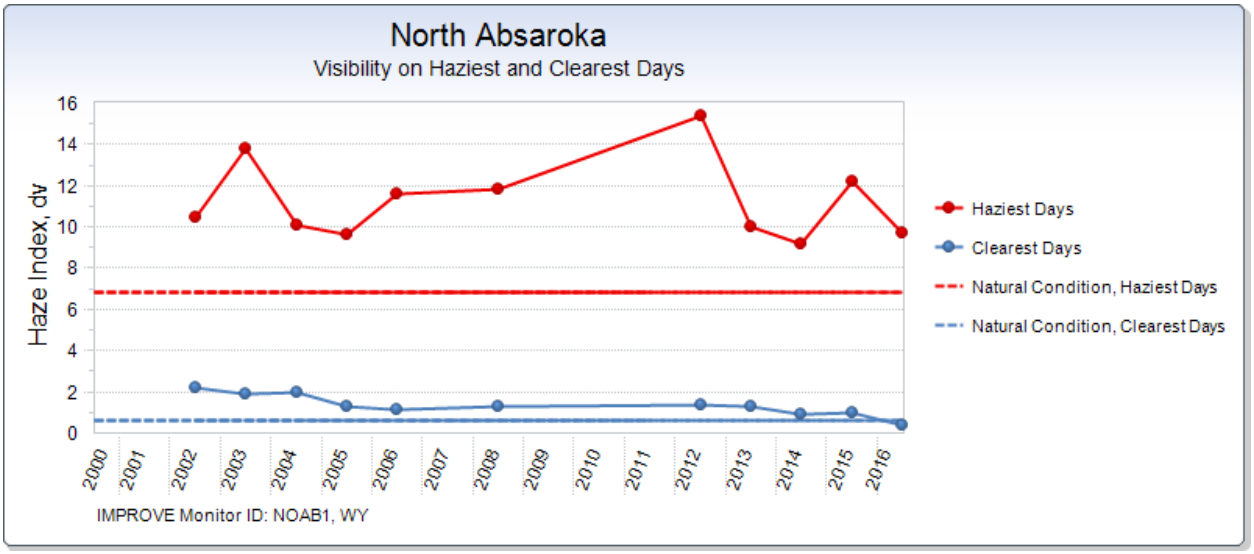
Annual Average Visibility (deciviews) for the Bridger Wilderness IMPROVE Site (1989-2016).



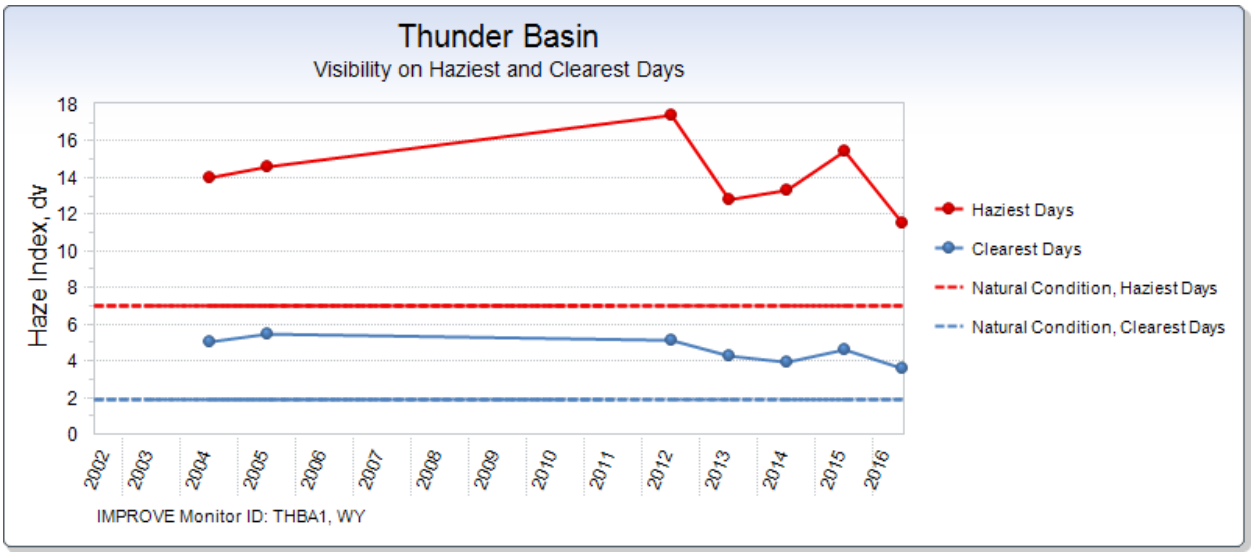
Annual Average Visibility (deciviews) for the Boulder Lake IMPROVE Site (2010-2016).



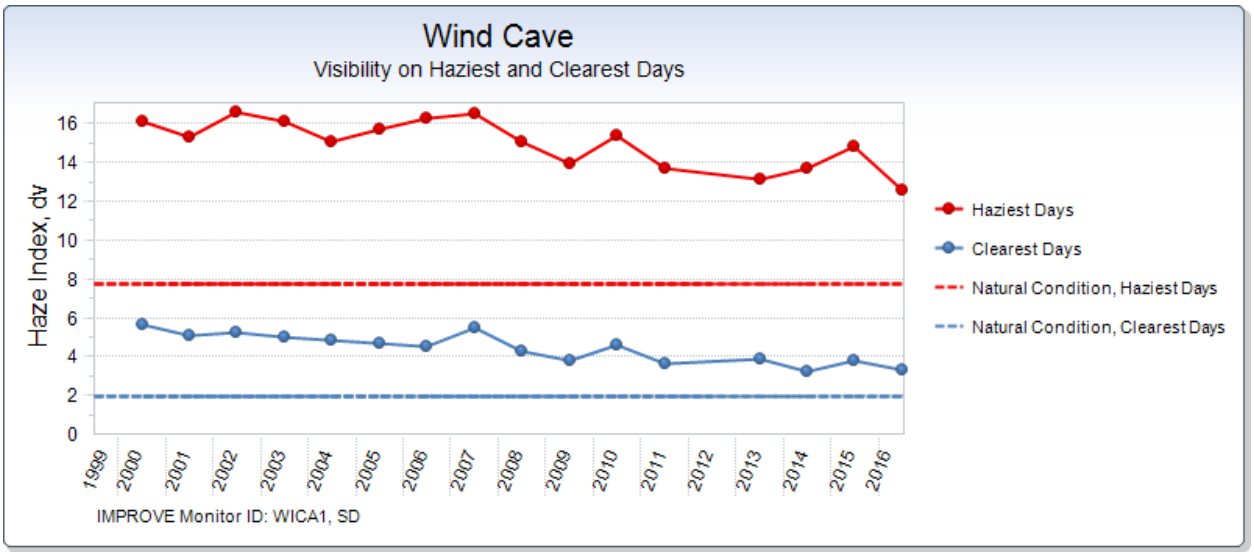
Annual Average Visibility (deciviews) for the North Absaroka IMPROVE Site (2002-2016).



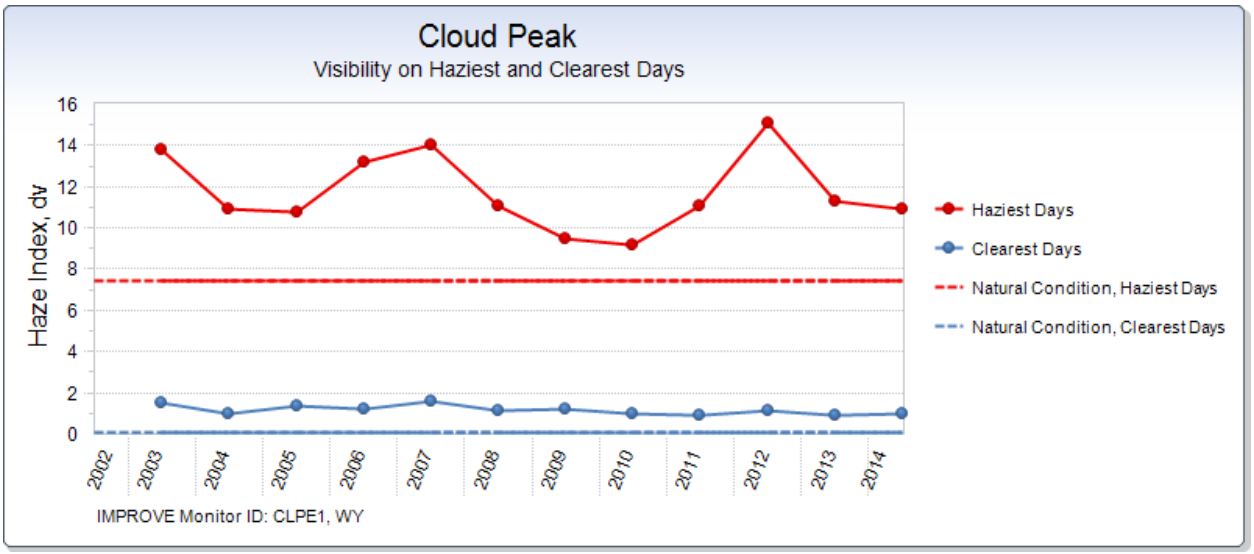
Annual Average Visibility (deciviews) for the Thunder Basin IMPROVE Site (2004, 2005, 2012-2016).



Annual Average Visibility (deciviews) for the Wind Cave, SD IMPROVE Site (1999-2016).



Annual Average Visibility (deciviews) for the Cloud Peak IMPROVE Site (2003-2014).



Source: Federal Land Manager Environmental Database 2018
(http://views.cira.colostate.edu/fed/AqrvMenu.aspx), accessed on 5/8/2018.
IMPROVE background reference: http://vista.cira.colostate.edu/Improve/improve-program/

5.3.2 Hazardous Air Pollutants (HAPs)-High Desert District

Many VOCs are HAPs, and are associated with human-made sources. The 2008 and 2011 National Emission Inventories and later WDEQ emissions inventories, indicate that VOC emissions within the region are primarily from area sources associated with oil and gas development activities. Therefore, HAP concentrations are expected to be greatest near oil and gas development sources and are a potential air quality concern for the region.

HAPs are not routinely monitored within the State of WY except where VOC production is a concern due to non-attainment. Because of the ongoing air quality concerns in the HDD, WDEQ conducted HAP monitoring for several sites in the HDD from February 2009 until March 2010. Table 3-10 summarizes observed HAP concentrations for the Boulder, Daniel South, and Pinedale monitoring sites. Measurements were taken every six days and the values represent averages for the entire monitoring period.

Table: Example HAP Concentrations (micrograms per cubic meter) for Sublette County, Wyoming

Site Name	Annual Average HAP Concentration (µg/m^3)					
	Benzene	***Ethyl-benzene***	***Formalde-hyde***	***Hexane***	***Toluene***	***Xylene***
Boulder	2.12	0.77	0.99	1.29	6.42	4.46
Daniel South	1.25	0.52	1.37	0.81	4.30	2.76
Pinedale	2.13	1.00	1.59	1.47	6.50	6.38

Source: REF 1020
µg/m^3 micrograms per cubic meter

5.3.3 Deposition and Lake Chemistry – Wyoming

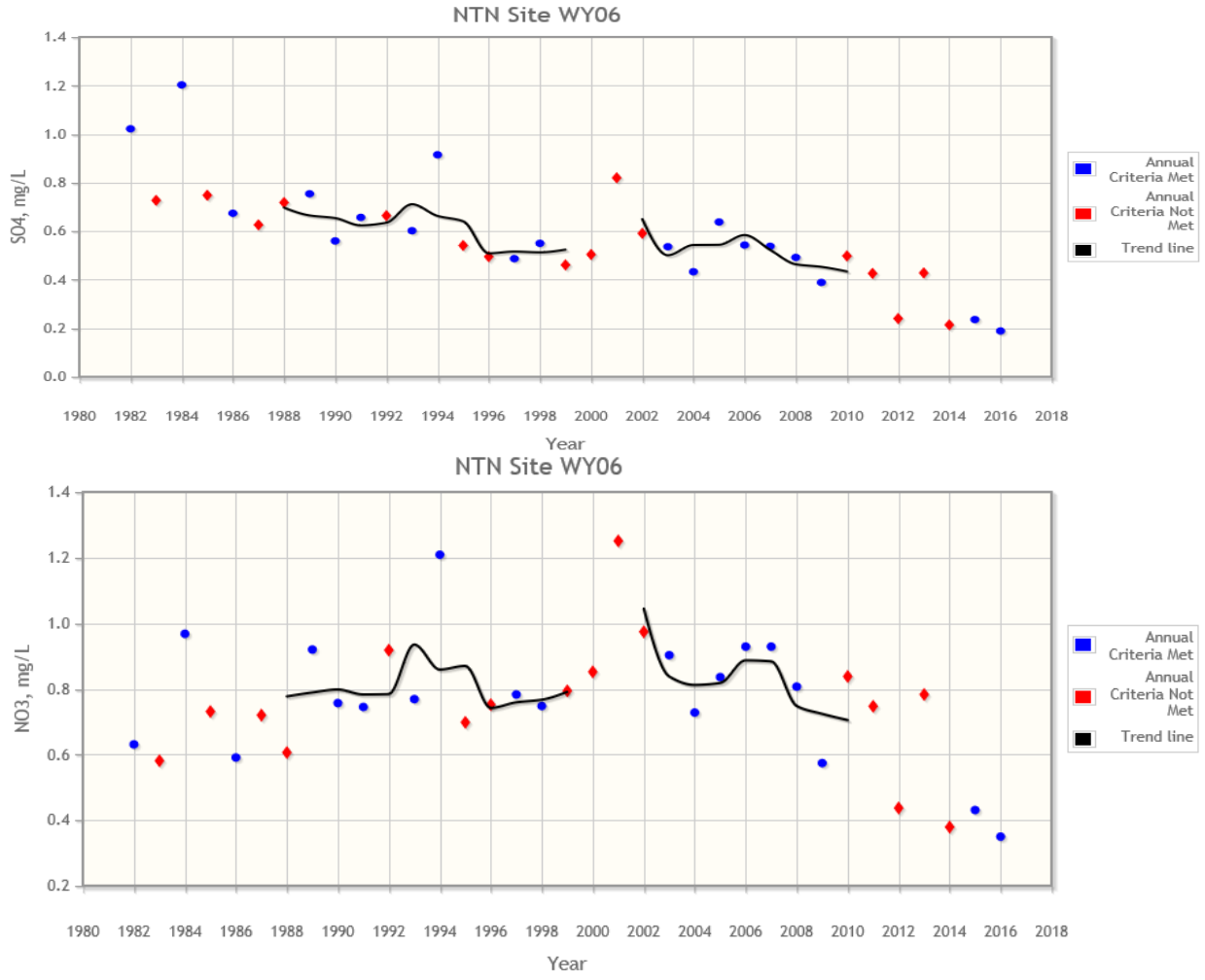
Sulfur and nitrogen compounds that can be deposited on terrestrial and aquatic ecosystems include nitric acid (HNO_3), nitrate (NO_3-), ammonium (NH_4+), and sulfate (SO_4--). Nitric acid (HNO_3) and nitrate (NO_3-) are not emitted directly into the air, but form in the atmosphere from industrial and automotive emissions of nitrogen oxides (NO_x); and sulfate (SO_4--) is formed in the atmosphere from industrial emission of sulfur dioxide (SO_2). Deposition of HNO_3, NO_3-and SO_4--can adversely affect plant growth, soil chemistry, lichens, aquatic environments, and petroglyphs (ancient carvings and/or engravings on rock surfaces). Ammonium (NH_4+) is volatilized from animal feedlots and from soils following fertilization of crops.

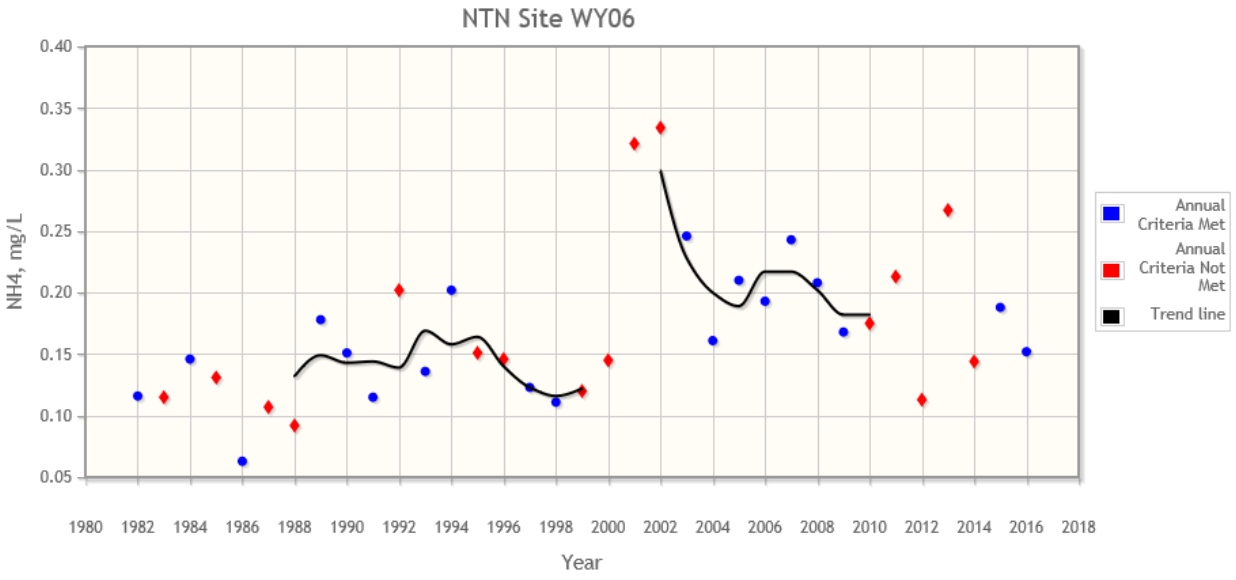
Wet atmospheric deposition is measured at National Atmospheric Deposition Program (NADP) sites: Pinedale, Sink's Canyon, South Pass, Newcastle, and Wind Cave. Dry deposition is measured at three Clean Air Status and Trends Network (CASTNET) sites in Pinedale (Sublette County), Newcastle (Weston County), and Basin (Big Horn County). Wet deposition is characterized by the concentration of nitrate ion (NO_3^-), sulfate ion (SO_4^-), and ammonium (NH_4+) ions in precipitation samples. The figures below display annual average concentration data for nitrate, sulfate, and ammonium ions from precipitation samples for each year during the period from the late 20th to early 21st Century Wyoming and South Dakota NADP sites. For each year, the data represent the average concentration based on all sampling periods. Units are milligrams per liter (mg/L). The data indicate a decrease in sulfate and nitrate ions for all NADP sites in precipitation samples. However, concentrations for the ammonium ion are either steady or slowly increasing at sites.

The figures below display annual average concentration data for Sulfur Dioxide, Particulate Sulfate, Particulate Nitric Acid, Total Nitrate, and Particulate Ammonium for the three Wyoming

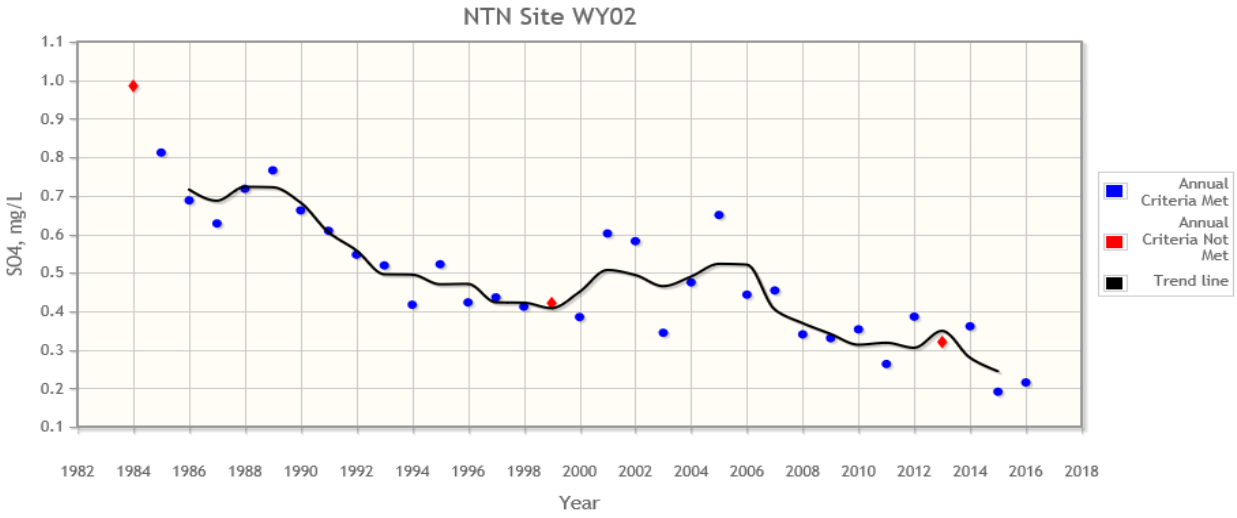
CASTNET sites. The concentration measurements are used to estimate dry deposition. For each year, the data represent the average concentration based on all sampling periods. Units are µg/m^3. The concentration data indicate a decrease for all pollutant species at Pinedale and Newcastle. However, the Basin concentrations increase from 2016 to 2017.

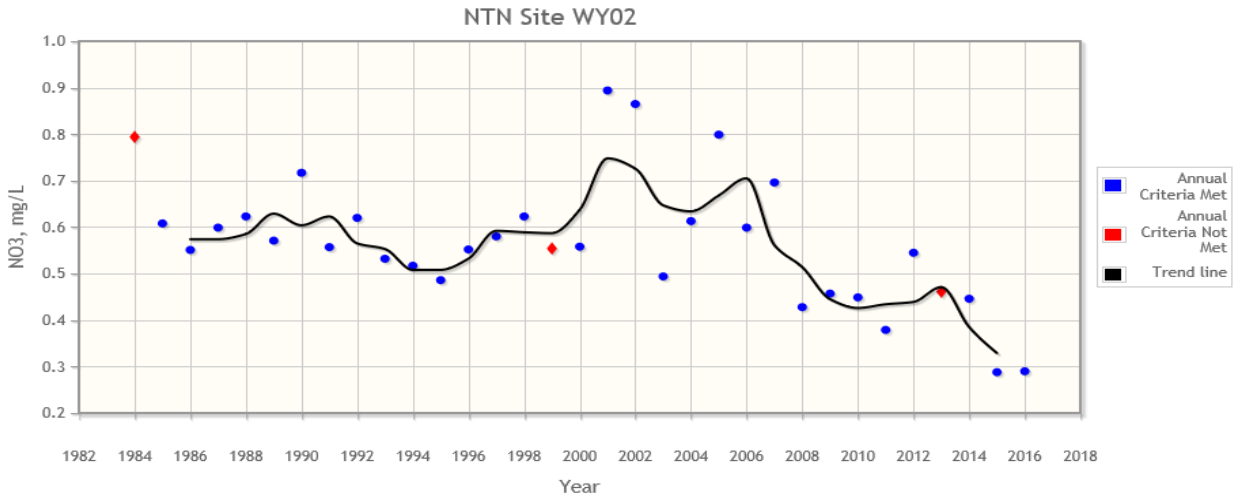
Annual Average Concentration in Wet Deposition (milligrams per liter) for NADP Monitoring Site at Pinedale

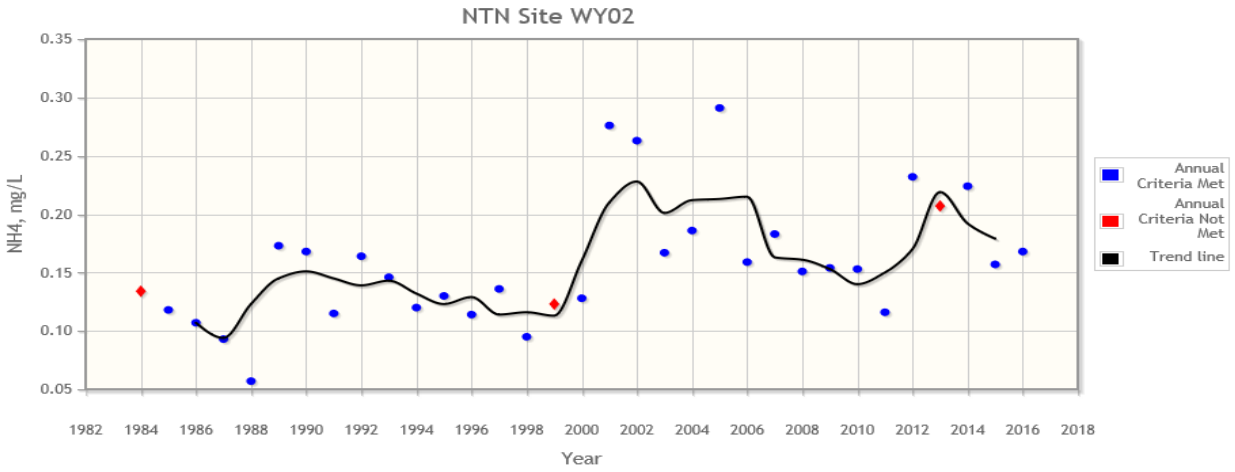




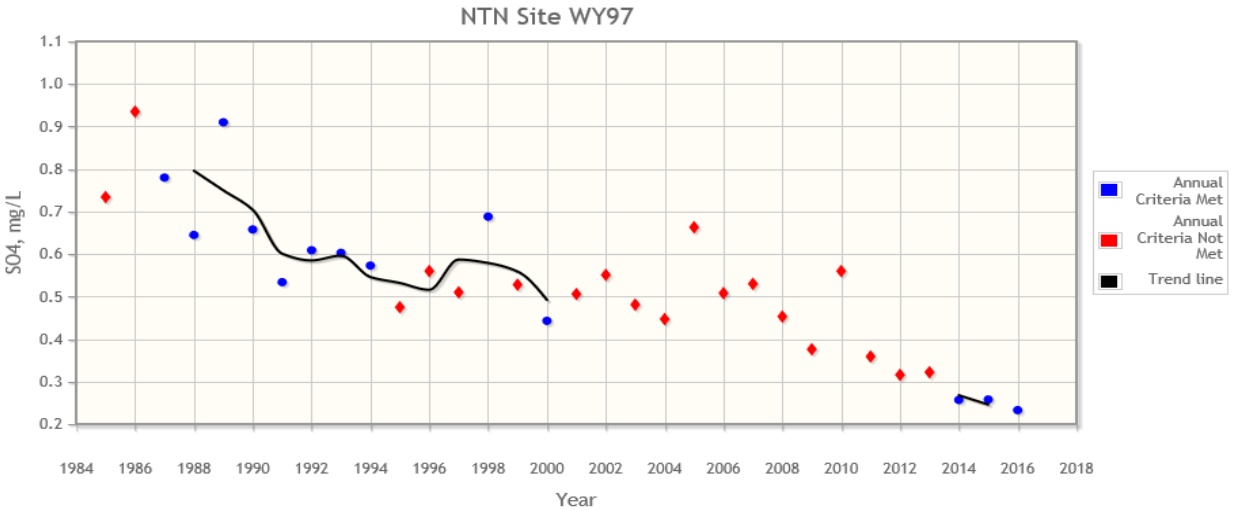
Annual Average Concentration in Wet Deposition (milligrams per liter) for NADP Monitoring Site at Sink's Canyon.

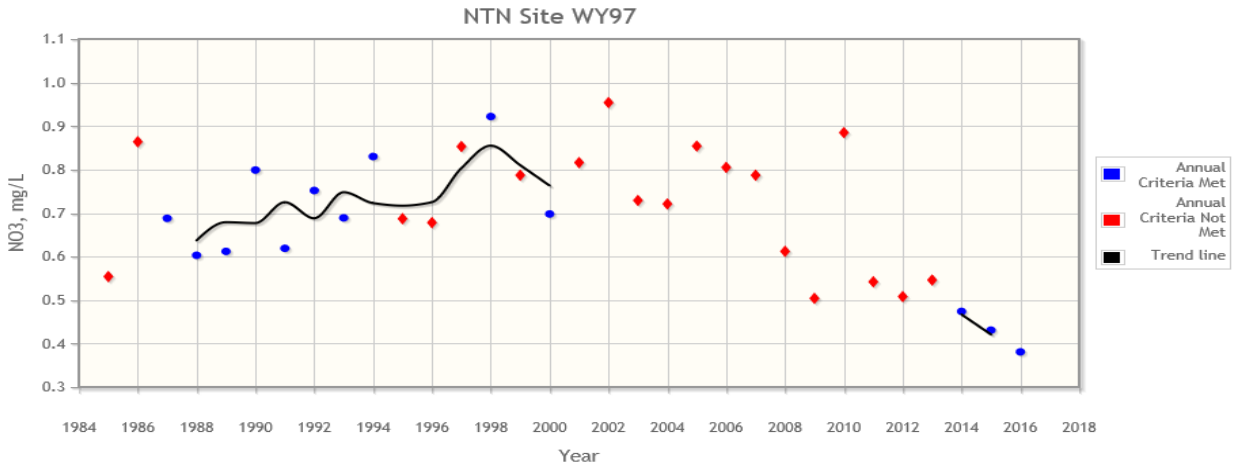


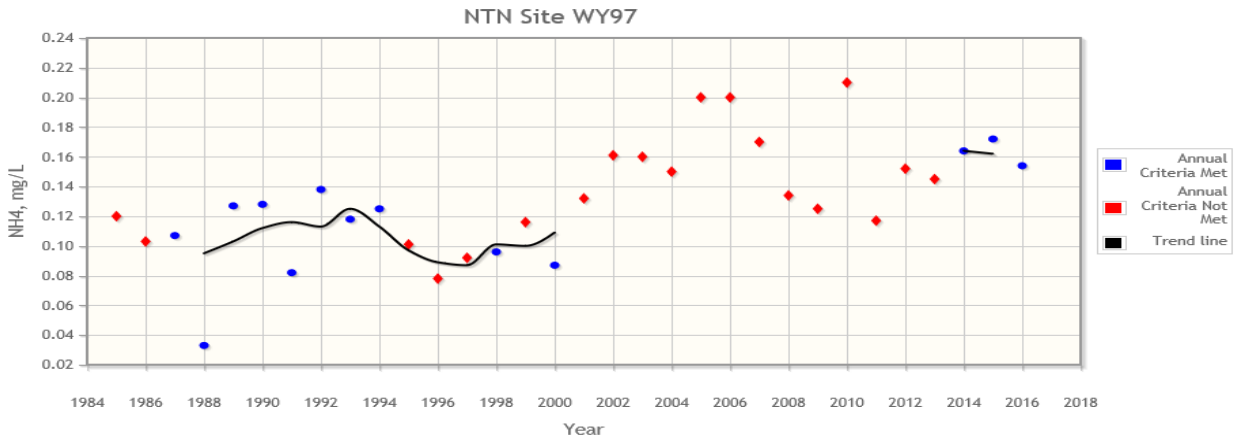




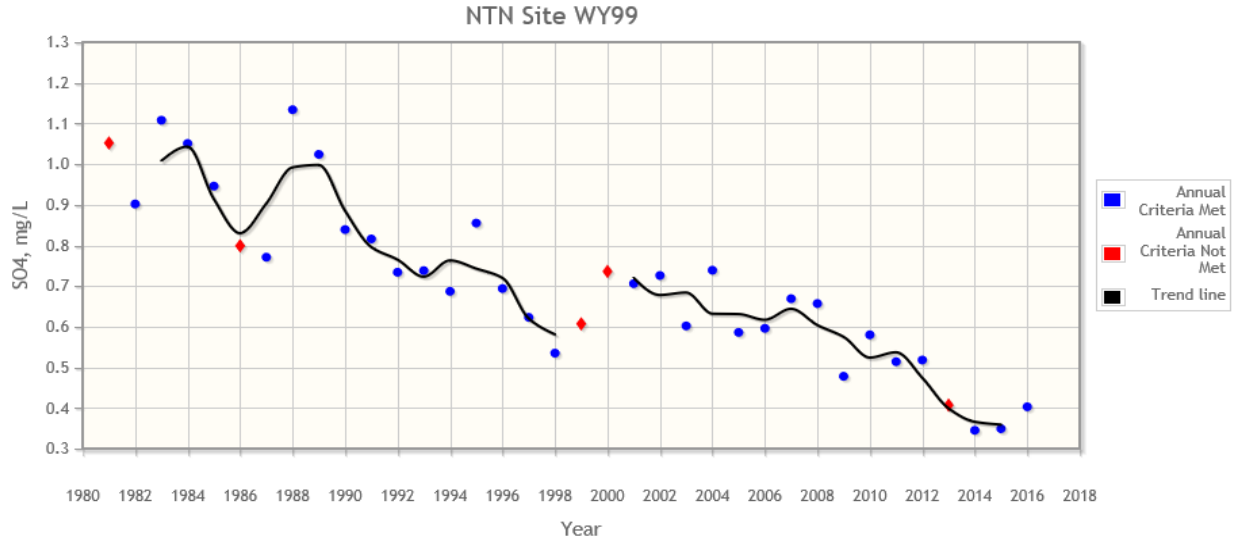
Annual Average Concentration in Wet Deposition (milligrams per liter) for NADP Monitoring Site at South Pass.

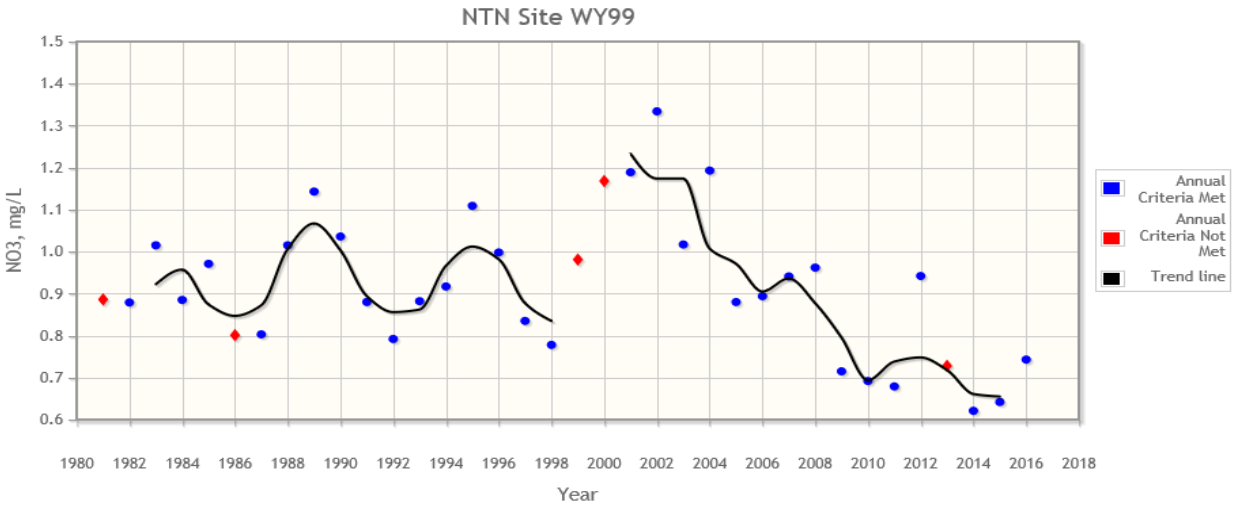


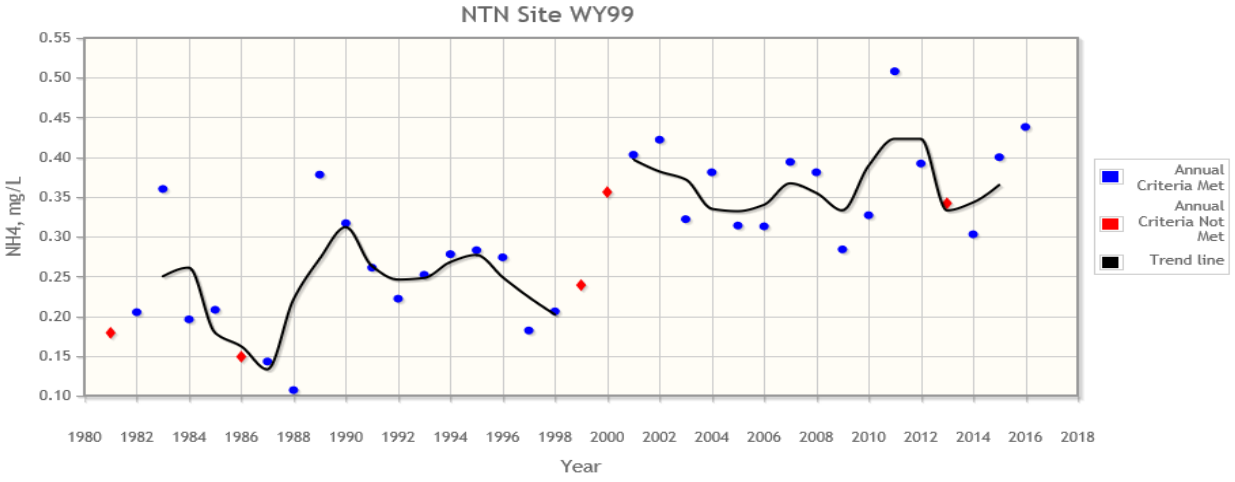




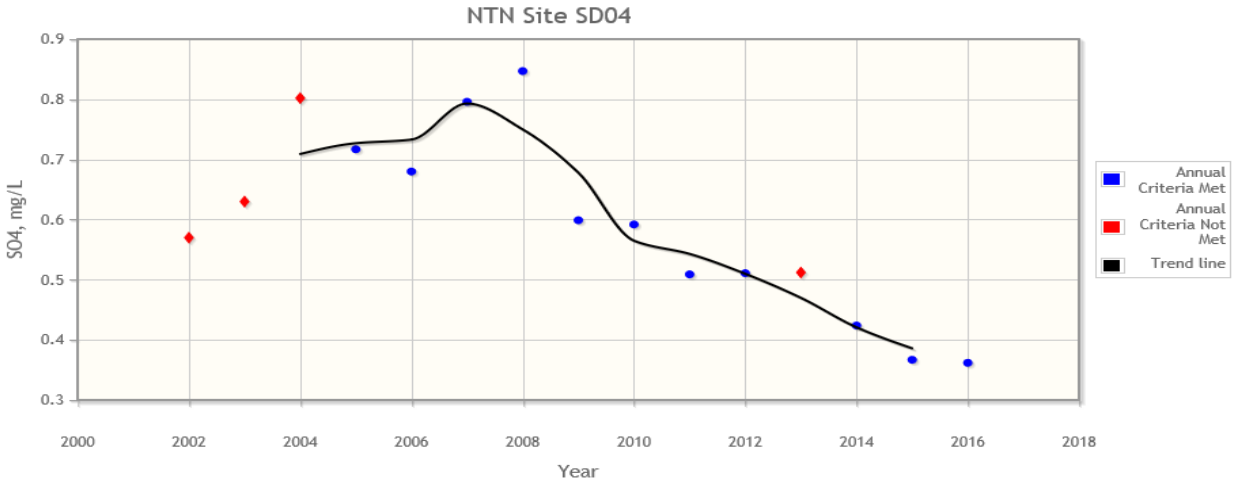
Annual Average Concentration in Wet Deposition (milligrams per liter) for NADP Monitoring Site at Newcastle.

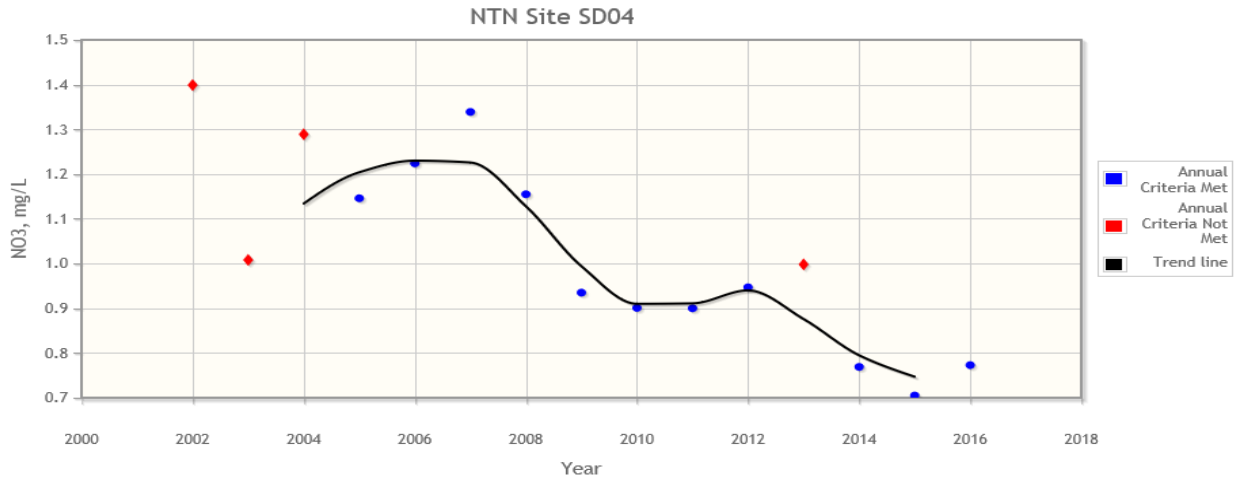


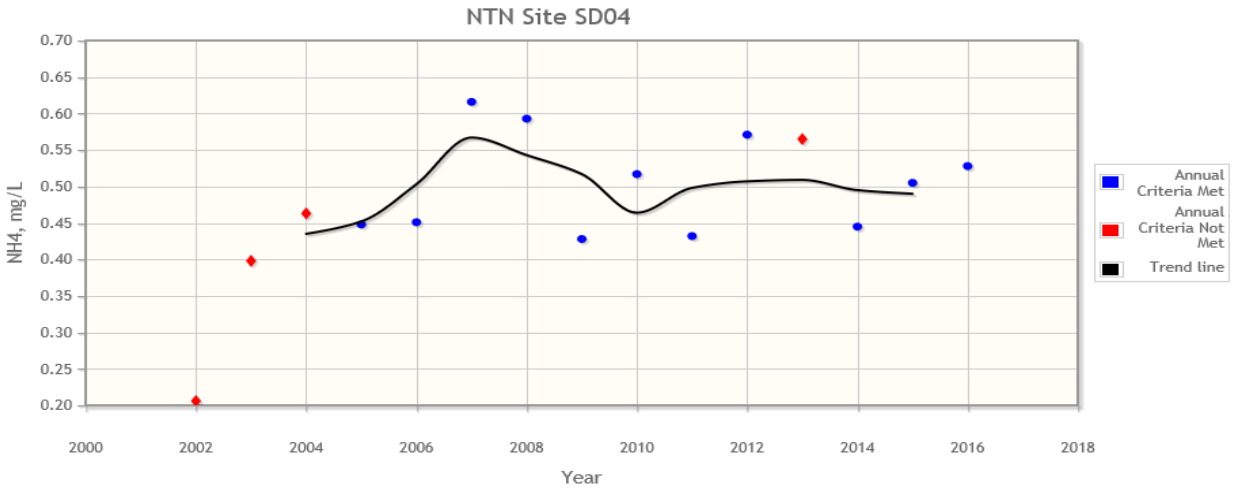




Annual Average Concentration in Wet Deposition (milligrams per liter) for NADP Monitoring Site at Wind Cave, SD.

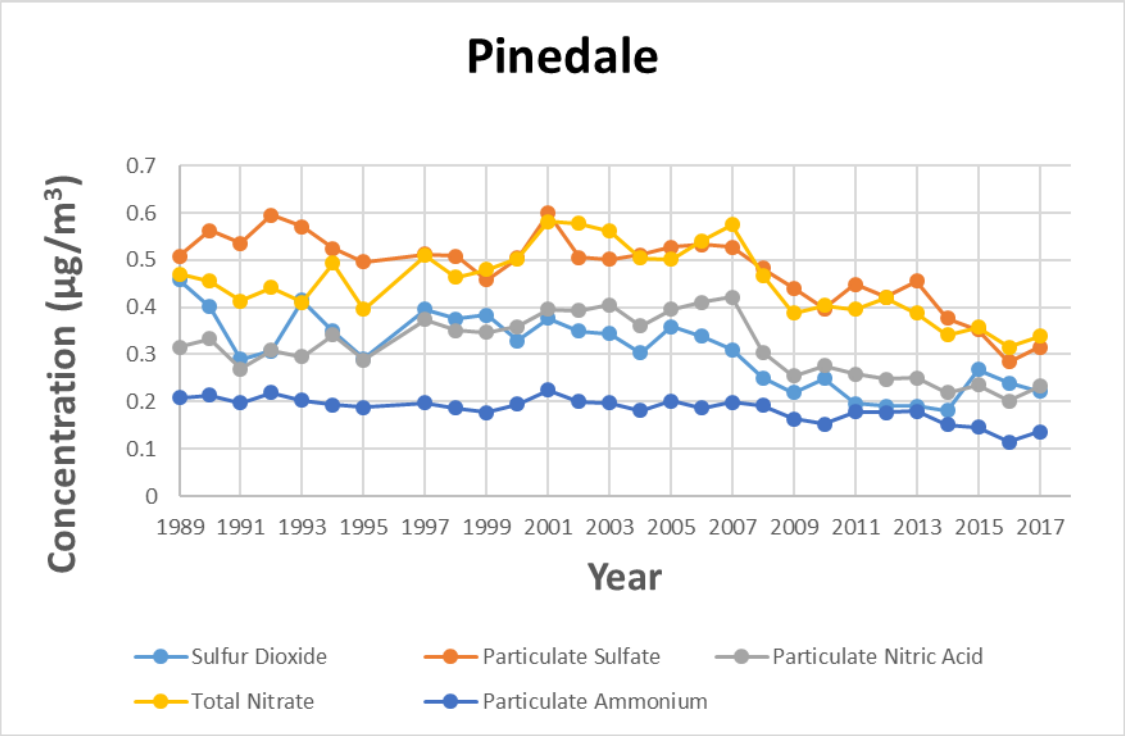




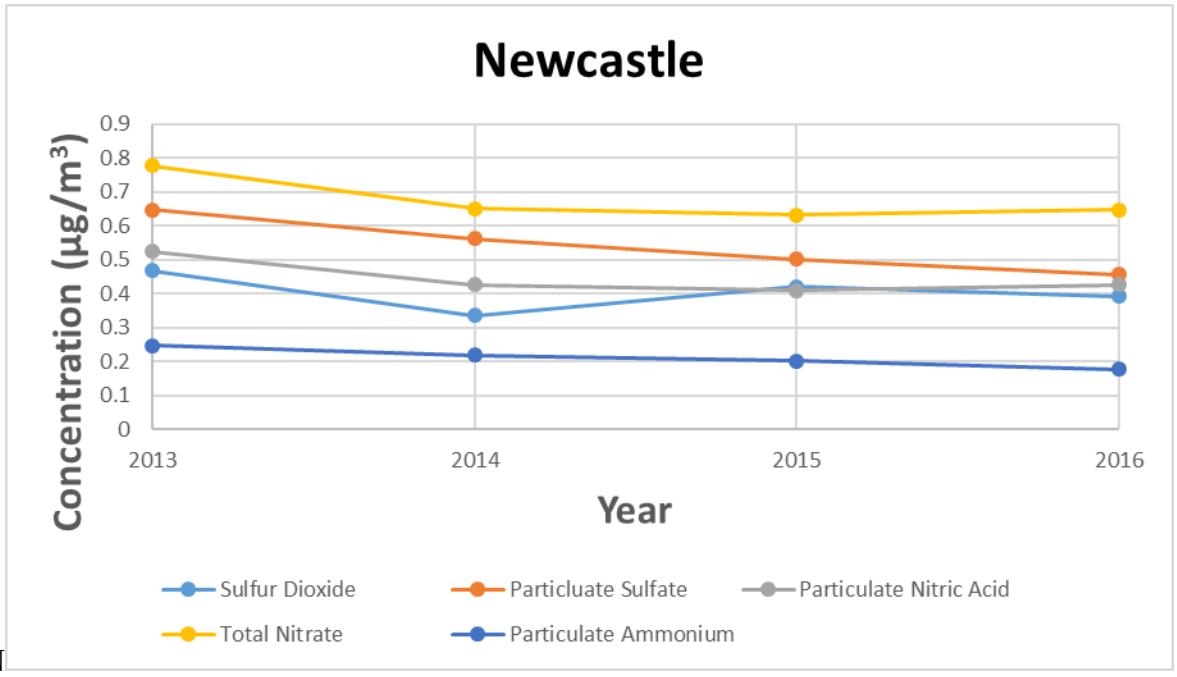


Source: REF 1014

Annual Average Concentration in Dry Deposition (micrograms per cubic meter) for the CASTNET Monitoring Site at Pinedale.

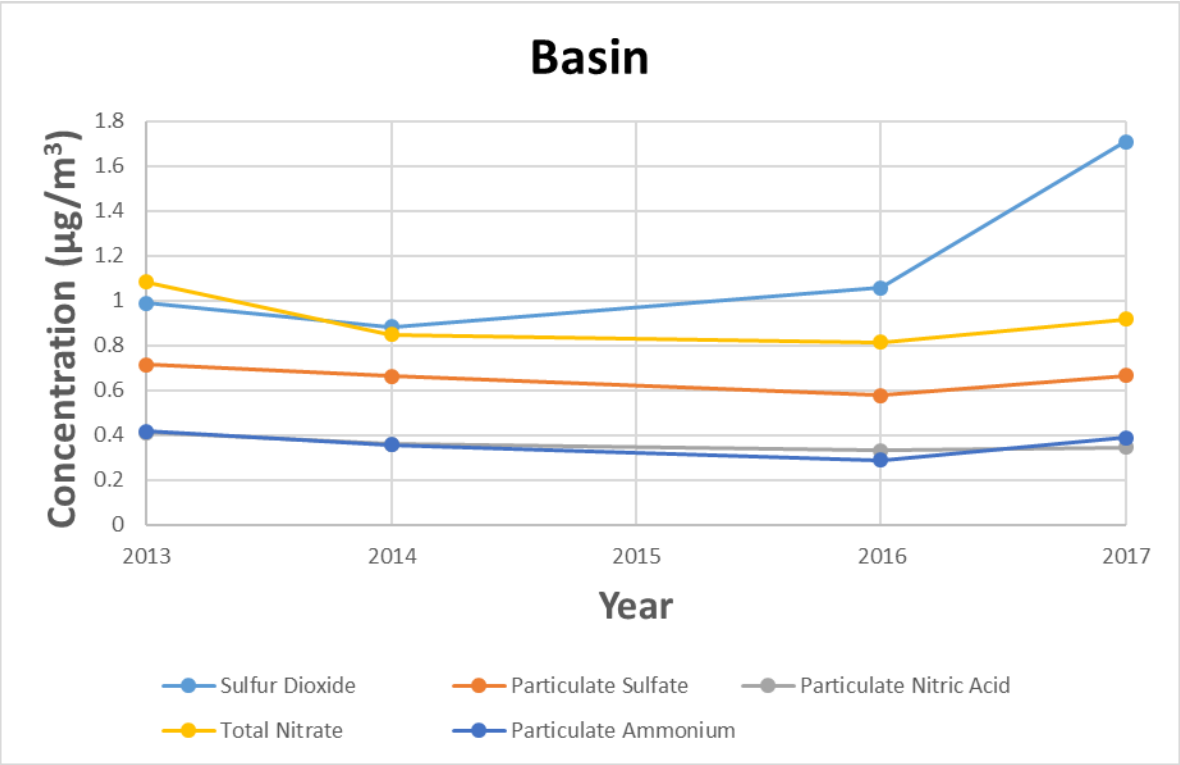


Annual Average Concentration in Dry Deposition (micrograms per cubic meter) for the CASTNET Monitoring Site at Newcastle.



N

Annual Average Concentration in Dry Deposition (micrograms per cubic meter) for the CASTNET Monitoring Site at Basin.



Source: REF 1014

Seven lakes have been identified as being acid sensitive. Applicable thresholds for the assessment of changes in acid neutralizing capacity (ANC) of sensitive lakes include: 10 percent change in ANC for lakes with background ANC values greater than 25 micro equivalents per liter [µeq/L], and less than a 1 µeq/L change in ANC for lakes with background ANC values equal to or less than 25 µeq/L.

Available ANC values for each of the nearest sensitive lakes are provided in the table, below, along with the number of samples used in the calculation of the 10^{th} percentile lowest ANC values. Of the seven lakes listed in the table, below, only Upper Frozen Lake is considered to be extremely sensitive to atmospheric deposition by the USFS since the background ANC is less than 25 µeq/L.

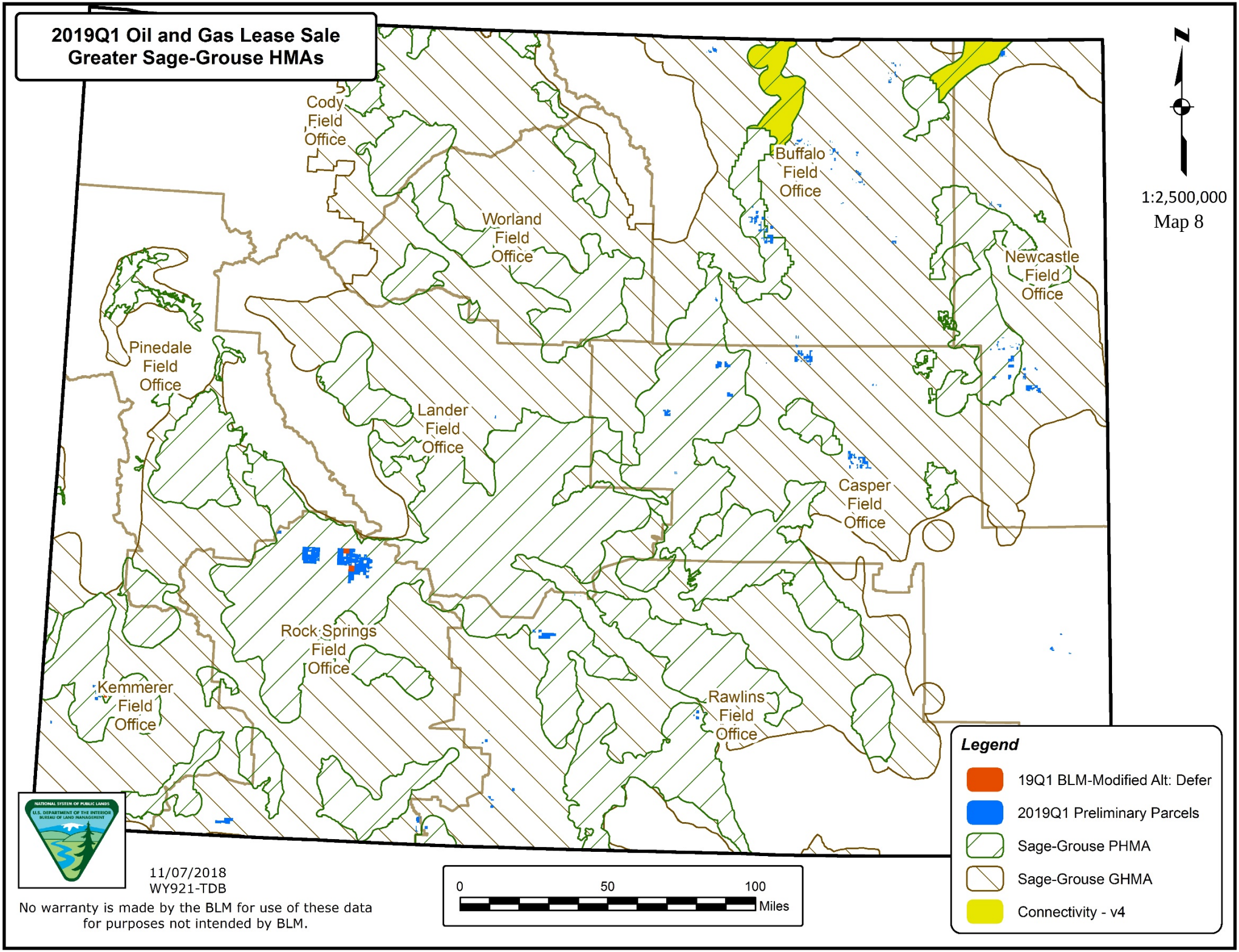
Table: Background ANC Values for Acid Sensitive Lakes

Wilderness Area	Lake	Latitude (Deg, Min, Sec)	Longitude (Deg, Min, Sec)	10th Percentile Lowest ANC Value (µeq/l)	Number of Samples
Bridger	Deep	42°43’10”	109°10’15”	57.7	68
Bridger	Black Joe	42°44’22”	109°10’16”	62.6	78
Bridger	Lazy Boy	43°19’57”	109°43’47”	9.1	5
Bridger	Upper Frozen	42°41’13”	109°09’39”	7.5	12
Bridger	Hobbs	43°02’08”	109°40’20”	69.9	80
Fitzpatrick	Ross	43º23'35"	109º39'29"	53.0	61
Popo Agie	Lower Saddlebag	42º37'24"	108º59'42"	54.6	64
Cloud Peak	Florence Lake	44º20'53"	107º10'50"	70	40
Cloud Peak	Emerald Lake	44º27'26"	107º18'11"	34.4	42

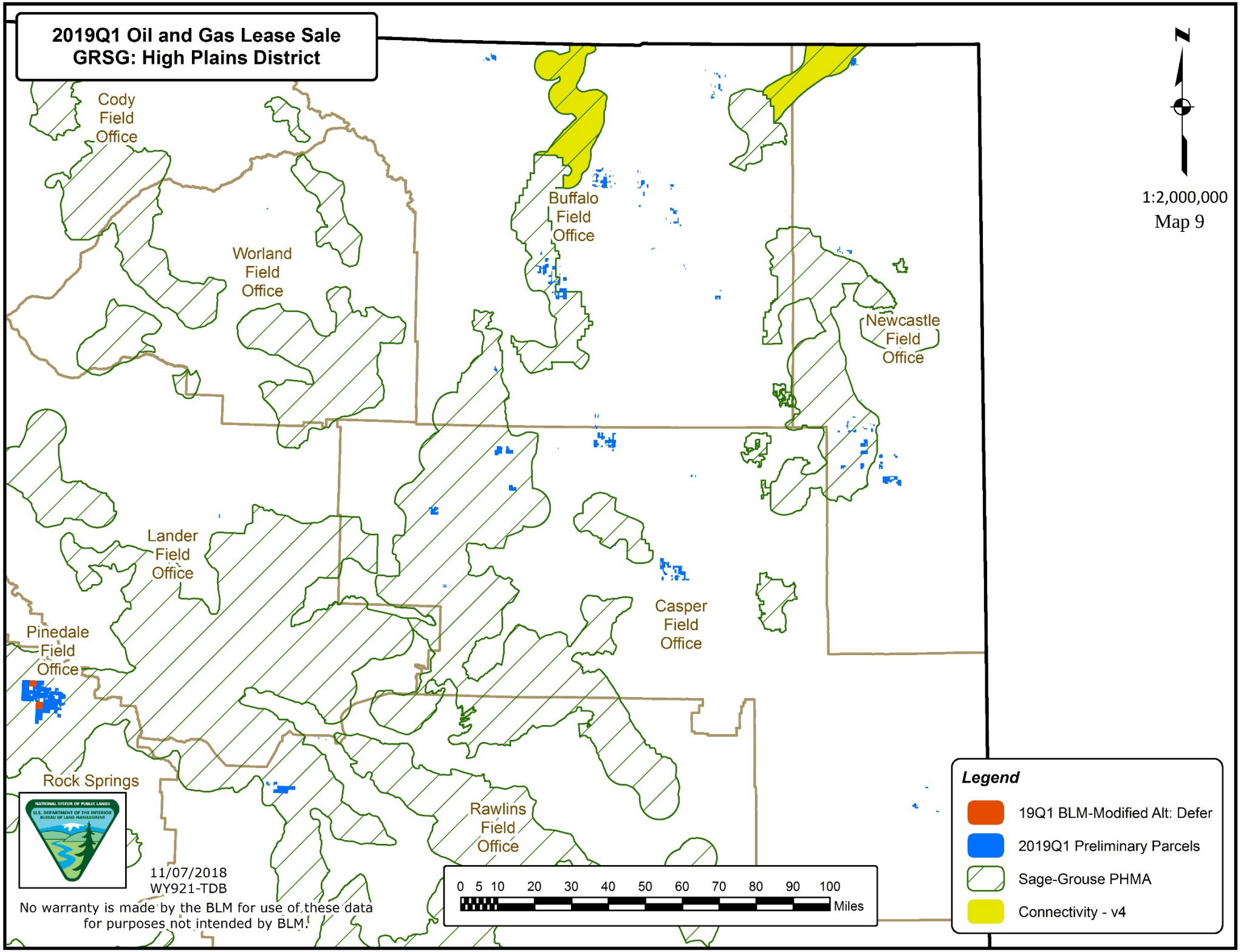
Sources: Source: USFS 2011 and Views (2014b)
ANC Acid Neutralizing Capacity
Deg Degree
Min Minute
Sec Second
µeq/l Microequivalent per liter

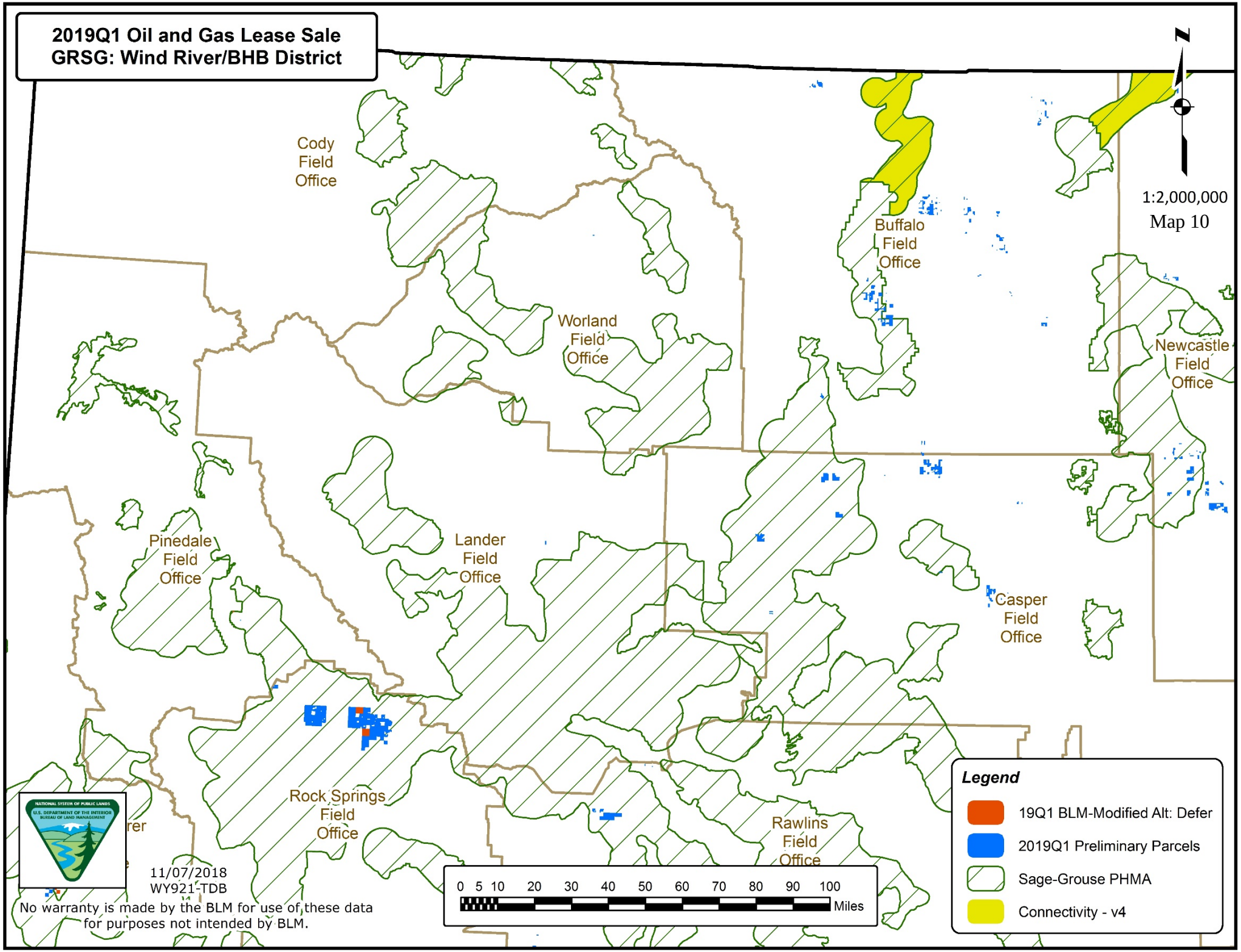
5.4 Greater Sage-Grouse Habitat Maps

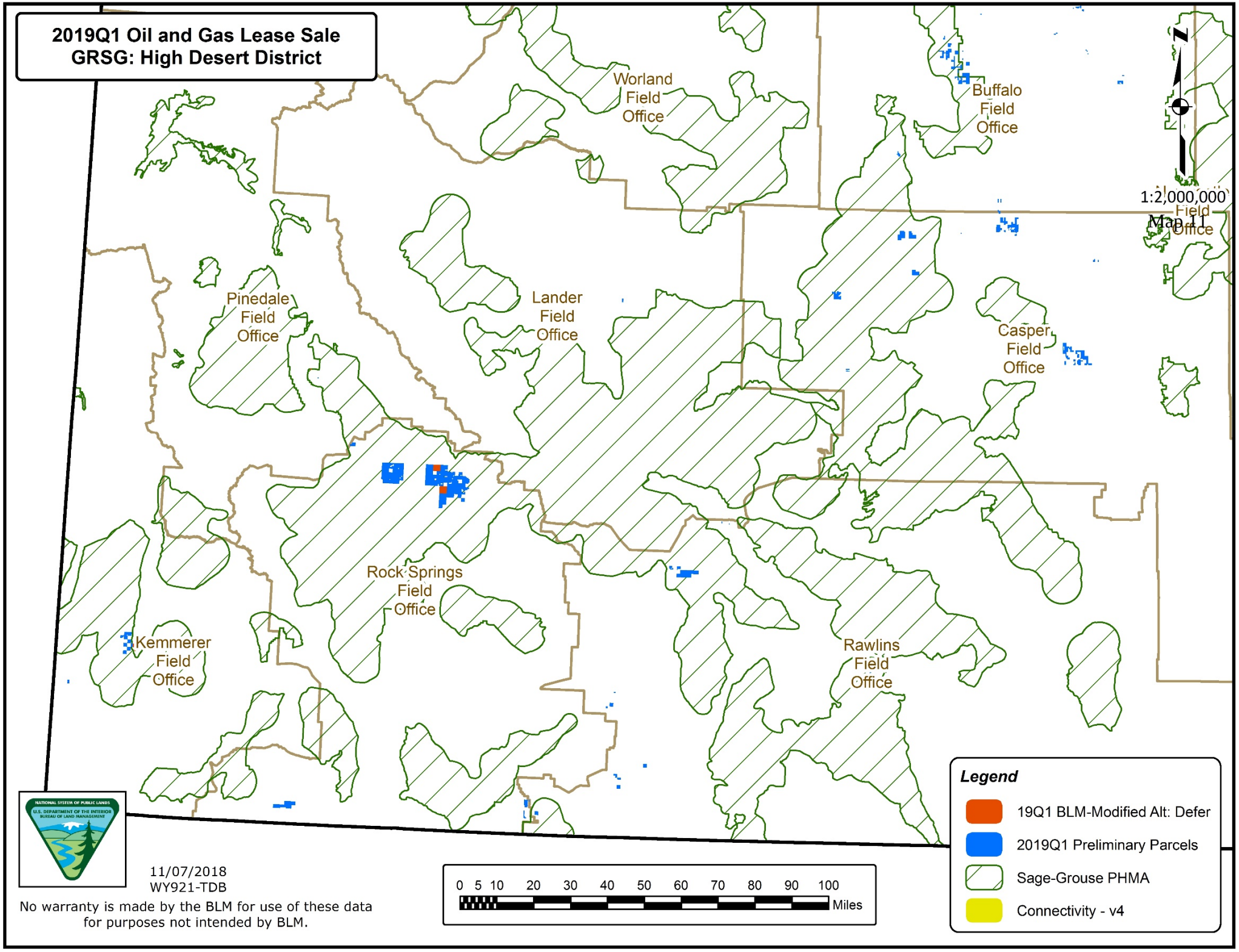
2019Q1 Oil and Gas Lease Sale
Greater Sage-Grouse HMAs



11/07/2018
WY921-TDB


2019Q1 Oil and Gas Lease Sale
GRSG: High Plains District
Cody Field Office
Buffalo Field Office
Worland Field Office
Newcastle Field Office
Lander Field Office
Casper Field Office
Pinedale Field Office
Rock Springs
Rawlins Field Office
1:2,000,000
Map 9
11/07/2018
WY921-TDB
No warranty is made by the BLM for use of these data for purposes not intended by BLM.
0 5 10 20 30 40 50 60 70 80 90 100
Miles
Legend
19Q1 BLM-Modified Alt: Defer
2019Q1 Preliminary Parcels
Sage-Grouse PHMA
Connectivity - v4


2019Q1 Oil and Gas Lease Sale
GRSG: Wind River/BHB District
N
1:2,000,000
Map 10
Cody Field Office
Buffalo Field Office
Worland Field Office
Newcastle Field Office
Pinedale Field Office
Lander Field Office
Casper Field Office
Rock Springs Field Office
Rawlins Field Office
0 5 10 20 30 40 50 60 70 80 90 100
Miles
11/07/2018
WY921-TDB
No warranty is made by the BLM for use of these data for purposes not intended by BLM.
Legend
19Q1 BLM-Modified Alt: Defer
2019Q1 Preliminary Parcels
Sage-Grouse PHMA
Connectivity - v4


2019Q1 Oil and Gas Lease Sale
GRSG: High Desert District
Worland Field Office
Buffalo Field Office
Pinedale Field Office
Lander Field Office
Casper Field Office
Rock Springs Field Office
Kemmerer Field Office
Rawlins Field Office
1:2,000,000
Map 11
Legend
19Q1 BLM-Modified Alt: Defer
2019Q1 Preliminary Parcels
Sage-Grouse PHMA
Connectivity - v4
0 5 10 20 30 40 50 60 70 80 90 100
Miles
11/07/2018
WY921-TDB
No warranty is made by the BLM for use of these data for purposes not intended by BLM.

5.5 Lands with Wilderness Characteristics (LWCs) Review

5.5.1 High Plains District

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-001	No	No	No	No	No	
WY-191Q-002	No	No	No	No	No	
WY-191Q-003	No	No	No	No	No	
WY-191Q-004	No	No	No	No	No	
WY-191Q-005	No	No	No	No	No	
WY-191Q-006	No	No	No	No	No	
WY-191Q-007	No	No	No	No	No	
WY-191Q-008	No	No	No	No	No	
WY-191Q-009	No	No	No	No	No	
WY-191Q-010	No	No	No	No	No	
WY-191Q-011	No	No	No	No	No	
WY-191Q-012	No	No	No	No	No	
WY-191Q-013	No	No	No	No	No	
WY-191Q-014	No	No	No	No	No	
WY-191Q-015	No	No	No	No	No	
WY-191Q-016	No	No	No	No	No	
WY-191Q-017	No	No	No	No	No	
WY-191Q-018	No	No	No	No	No	
WY-191Q-019	No	No	No	No	No	
WY-191Q-020	No	No	No	No	No	
WY-191Q-021	No	No	No	No	No	
WY-191Q-022	No	No	No	No	No	
WY-191Q-023	No	No	No	No	No	
WY-191Q-024	No	No	No	No	No	
WY-191Q-025	No	No	No	No	No	
WY-191Q-026	No	No	No	No	No	
WY-191Q-027	No	No	No	No	No	
WY-191Q-028	No	No	No	No	No	
WY-191Q-029	No	No	No	No	No	
WY-191Q-030	No	No	No	No	No	
WY-191Q-031	No	No	No	No	No	

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-032	No	No	No	No	No	
WY-191Q-033	No	No	No	No	No	
WY-191Q-034	No	No	No	No	No	
WY-191Q-035	No	No	No	No	No	
WY-191Q-036	No	No	No	No	No	
WY-191Q-037	No	No	No	No	No	
WY-191Q-038	No	No	No	No	No	
WY-191Q-039	No	No	No	No	No	
WY-191Q-040	No	No	No	No	No	
WY-191Q-041	No	No	No	No	No	
WY-191Q-042	No	No	No	No	No	
WY-191Q-043	No	No	No	No	No	
WY-191Q-044	No	No	No	No	No	
WY-191Q-045	No	No	No	No	No	
WY-191Q-046	No	No	No	No	No	
WY-191Q-047	No	No	No	No	No	
WY-191Q-048	No	No	No	No	No	
WY-191Q-049	No	No	No	No	No	
WY-191Q-050	No	No	No	No	No	
WY-191Q-051	No	No	No	No	No	
WY-191Q-052	No	No	No	No	No	
WY-191Q-053	No	No	No	No	No	
WY-191Q-054	No	No	No	No	No	
WY-191Q-055	No	No	No	No	No	
WY-191Q-056	No	No	No	No	No	
WY-191Q-057	No	No	No	No	No	
WY-191Q-058	No	No	No	No	No	
WY-191Q-059	No	No	No	No	No	
WY-191Q-060	No	No	No	No	No	
WY-191Q-061	No	No	No	No	No	
WY-191Q-062	No	No	No	No	No	
WY-191Q-063	No	No	No	No	No	
WY-191Q-064	No	No	No	No	No	
WY-191Q-065	No	No	No	No	No	

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-066	No	No	No	No	No	
WY-191Q-067	No	No	No	No	No	
WY-191Q-068	No	No	No	No	No	
WY-191Q-069	No	No	No	No	No	
WY-191Q-070	No	No	No	No	No	
WY-191Q-071	No	No	No	No	No	
WY-191Q-072	No	No	No	No	No	
WY-191Q-073	No	No	No	No	No	
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WY-191Q-076	No	No	No	No	No	
WY-191Q-077	No	No	No	No	No	
WY-191Q-078	No	No	No	No	No	
WY-191Q-079	No	No	No	No	No	
WY-191Q-080	No	No	No	No	No	
WY-191Q-081	No	No	No	No	No	
WY-191Q-082	No	No	No	No	No	
WY-191Q-083	No	No	No	No	No	
WY-191Q-084	No	No	No	No	No	
WY-191Q-085	No	No	No	No	No	
WY-191Q-086	No	No	No	No	No	
WY-191Q-087	No	No	No	No	No	
WY-191Q-088	Yes	No	No	No	No	
WY-191Q-089	Yes	Yes	No	No	No	
WY-191Q-090	No	No	No	No	No	
WY-191Q-091	Yes	Yes	No	No	No	
WY-191Q-092	No	No	No	No	No	
WY-191Q-093	No	No	No	No	No	
WY-191Q-095	No	No	No	No	No	
WY-191Q-096	Yes	No	No	No	No	

5.5.2 Wind River/Bighorn Basin District

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-102	No	No	No	No	No	
WY-191Q-106	No	No	No	No	No	

5.5.3 High Desert District

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-094	No	No	No	No	No	
WY-191Q-097	Yes	No	No	No	No	
WY-191Q-098	Yes	No	No	No	No	
WY-191Q-099	Yes	No	No	No	No	
WY-191Q-100	Yes	No	No	No	No	
WY-191Q-101	Yes	No	No	No	No	
WY-191Q-103	Yes	No	No	No	No	
WY-191Q-104	Yes	Yes	Yes	Yes	Yes	
WY-191Q-105	No	No	No	No	No	
WY-191Q-107	Yes	No	N/A	N/A	Yes (RSFO only)	
WY-191Q-108	Yes	No	N/A	N/A	Yes	
WY-191Q-109	Yes	No	N/A	N/A	Yes	
WY-191Q-110	Yes	No	N/A	N/A	No	
WY-191Q-111	Yes	No	N/A	N/A	No	
WY-191Q-112	No	N/A	N/A	N/A	No	
WY-191Q-113	No	N/A	N/A	N/A	No	
WY-191Q-114	No	N/A	N/A	N/A	No	
WY-191Q-115	No	N/A	N/A	N/A	No	
WY-191Q-116	No	N/A	N/A	N/A	No	
WY-191Q-117	No	N/A	N/A	N/A	No	
WY-191Q-118	No	N/A	N/A	N/A	No	
WY-191Q-119	No	N/A	N/A	N/A	No	
WY-191Q-120	No	N/A	N/A	N/A	No	
WY-191Q-121	No	N/A	N/A	N/A	No	

Parcel No.	More than 5,000 acres of roadless land? (Yes/No)	Imprint of mankind's work substantially unnoticeable? (Yes/No)	Outstanding opportunity for solitude or primitive recreation? (Yes/No)	Contains natural features of scientific, educational, scenic, or historical value? (Yes/No)	In citizen-proposed wilderness? (Yes/No)	Field office Notes or Explanations
WY-191Q-122	No	N/A	N/A	N/A	No	
WY-191Q-123	No	N/A	N/A	N/A	No	
WY-191Q-124	No	N/A	N/A	N/A	No	
WY-191Q-125	No	N/A	N/A	N/A	No	
WY-191Q-126	No	N/A	N/A	N/A	No	
WY-191Q-127	No	N/A	N/A	N/A	No	
WY-191Q-128	No	N/A	N/A	N/A	No	
WY-191Q-129	Yes	No	N/A	N/A	Yes	
WY-191Q-130	Yes	No	N/A	N/A	Yes	
WY-191Q-131	Yes	No	N/A	N/A	Yes	
WY-191Q-132	Yes	No	N/A	N/A	Yes	
WY-191Q-133	Yes	No	N/A	N/A	Yes	
WY-191Q-134	Yes	No	N/A	N/A	Yes	
WY-191Q-135	Yes	No	N/A	N/A	No	
WY-191Q-136	Yes	No	N/A	N/A	No	
WY-191Q-137	No	N/A	N/A	N/A	No	
WY-191Q-138	NO NC	N/A NC	N/A NC	N/A NC	NO	WYD01-6300-0000 WYD01-6300-102 (NOT COMPLETED)
WY-191Q-139	Yes	No	N/A	N/A	Yes	
WY-191Q-140	Yes	No	N/A	N/A	Yes	
WY-191Q-141	No	No	No	No	No	
WY-191Q-142	No	No	No	No	No	
WY-191Q-143	No	No	No	No	No	
WY-191Q-144	No	No	No	No	No	
WY-191Q-145	No	No	No	No	No	
WY-191Q-146	No	No	No	No	No	

5.6 Hydraulic Fracturing White Paper (July 5, 2013)

BACKGROUND

Hydraulic fracturing (HF) is a well stimulation process used to maximize the extraction of underground resources – oil, natural gas and geothermal energy. The HF process includes the acquisition of water/mixing of chemicals, production zone fracturing, and HF flowback disposal.

In the United States, HF has been used since the 1940's. Early on, the HF process utilized pressures that are of a much smaller magnitude than those used today.

The HF process involves the injection of a fracturing fluid and propping agent into the hydrocarbon bearing formation under sufficient pressure to further open existing fractures and/or create new fractures. This allows the hydrocarbons to more readily flow into the wellbore. HF has gained interest recently as hydrocarbons previously trapped in low permeability tight sand and shale formations are now technically and economically recoverable. As a result, oil and gas production has increased significantly in the United States. The state of Wyoming classifies all gas production zones as Class 5 groundwater zones; this means these zones can be highly impacted by oil and gas activities and are exempt from regulation under the Clean Water Act. However, operations within these zones cannot cause other zones to lose their use classification.

Prior to the development of hydrocarbon bearing tight gas and shale formations, domestic production of conventional resources had been declining. In response to this decline, the federal government in the 1970's through 1992, passed tax credits to encourage the development of unconventional resources. It was during this time that the HF process was further advanced to include the high-pressure multi-stage frac jobs used today.

Generally, HF can be described as follows:

1. Water, proppant, and chemical additives are pumped at extremely high pressures down the wellbore.
2. The fracturing fluid is pumped through perforated sections of the wellbore and into the surrounding formation, creating fractures in the rock. The proppant holds the fractures open during well production.
3. Company personnel continuously monitor and gauge pressures, fluids and proppants, 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 formation(s). The wellbore is temporarily plugged between each stage to maintain the highest fluid pressure possible and get maximum fracturing results in the rock.
5. The plugs are drilled or removed from the wellbore and the well is tested for results.
6. The pressure is reduced and the fracturing fluids are returned up the wellbore for disposal or treatment and re-use, leaving the sand in place to prop open the fractures and allow the oil/gas to flow.

OPERATIONAL ISSUES

Wells that undergo HF may be drilled vertically, horizontally, or directionally and the resultant fractures induced by HF can be vertical, horizontal, or both. Wells in Wyoming may extend to depths greater than 20,000 feet or less than 1,000 feet, and horizontal sections of a well may extend several thousand feet from the production pad on the surface[7].

The total volume of fracturing fluids is generally 95-99% water. The amount of water needed to fracture a well in Wyoming depends on the geologic basin, the formation, and depth and type of well (vertical, horizontal, directional), and the proposed completion process.

In general, approximately 50,000 to 300,000 gallons may be used to fracture shallow coalbed methane wells in the Powder River Basin, while approximately 800,000 to 2 million gallons may be used to fracture deep tight sand gas wells in southwestern Wyoming. In the Niobrara oil play, approximately 250,000 gallons may be used to fracture a vertical well, while up to 5 million gallons may be used to fracture a horizontal well.

Proppant, consisting of synthetic or natural silica sand, may be used in quantities of a few hundred tons for a vertical well to a few thousand tons for a horizontal well.

Drilling muds, drilling fluids, water, proppant and hydraulic fracturing fluids are stored in onsite tanks or lined pits during the drilling and/or completion process. Equipment transport and setup can take several days, and the actual HF and flowback process can occur in a few days up to a few weeks. For oil wells, the flowback fluid from the HF operations is treated in an oil-water separator before it is stored in a lined pit or tank located on the surface. Where gas wells are flowed back using a "green completion process" fluids are run through a multi-phase separator, which are then piped directly to enclosed tanks or to a production unit.

Gas emissions associated with the HF process are captured when the operator utilizes a green completion process. Where a green completion process is not utilized, gas associated with the well may be vented and/or flared until "saleable quality" product is obtained in accordance with federal and state rules and regulations. The total volume of emissions from the equipment used (trucks, engines) will vary based on the pressures needed to fracture the well, and the number of zones to be fractured. Emissions associated with a project, and HF if proposed, will be analyzed through a site specific NEPA document to ensure that the operation will not cause a violation of the Clean Air Act.

Under either completion process, wastewaters from HF may be disposed in several ways. For example, the flowback fluids may be stored in tanks pending reuse; the resultant waste may be

[7] See Kemmerer RMP (2010), Pinedale RMP (2008), Green River RMP (1997), Rock Springs RMP Revision, and Rawlins RMP (2008) RFD and/or Mineral Occurrence Reports for specific information on current and projected oil and gas development.

re-injected using a permitted injection well, or the waste may be hauled to a licensed facility for treatment, disposal and/or reuse.

Disposal of the waste stream following establishment of "sale-quality" product, would be handled in accordance with Onshore Order #7 regulations and other state/federal rules and regulations.

FRACTURING FLUIDS

As indicated above, the fluid used in the HF process is approximately 95to 99 percent water and a small percentage of special-purpose chemical additives[8, 9]and proppant. There is a broad array of chemicals that can be used as additives in a fracture treatment including, but not limited to, hydrochloric acid, anti-bacterial agents, corrosion inhibitors, gelling agents (polymers), surfactants, and scale inhibitors. The 1 to 5 percent of chemical additives translates to a minimum of 5,000 gallons of chemicals for every 1.5 million gallons of water used to fracture a well (Paschke, Dr. Suzanne. USGS, Denver, Colorado. September 2011). Water used in the HF process is generally acquired from surface water or groundwater in the local area.

RE-FRACTURING

Re-fracturing of wells (RHF) may be performed after a period of time to restore declining production rates. RHF success can be attributed to enlarging and reorienting existing fractures while restoring conductivity due to proppant degradation and fines plugging.
Prior to RHF, the wellbore may be cleaned out. Cleaning out the wellbore may recover over 50% of the initial frac sand. Once cleaned, the process of RHF is the same as the initial HF. The need for RHF cannot be predicted.

WATER AVAILABILITY AND CONSUMPTION ESTIMATES

The Wyoming Framework Water Plan, A Summary, (Wyoming Water Development Commission, October 2007), indicates that approximately 15 million acre-feet per year of water becomes either surface water or groundwater and is available for use. This estimate includes water that flows into the state and the precipitation that runs off as stream flow or infiltrates as groundwater; it does not include volumes lost to evapotranspiration.

Water flowing out of Wyoming is estimated to be 13,678,200 acre-feet per year. Wyoming's share of this supply under existing water compacts is estimated to be 3,313,500 acre-feet per year; approximately10, 364,700 acre-feet flows downstream out of the state.

The industrial water use sector includes electric power generation, coal mining, conventional oil and gas production, uranium mining, trona mining and soda ash production, bentonite mining,

[8] FracFocus Chemical Registry. Hydraulic Fracturing Water Usage
[9] Chesapeake Energy. 2012. Hydraulic Fracturing Fact Sheet. http://www.chk.com/Media/Educational-Library/Fact-Sheets/Corporate/Hydraulic_Fracturing_Fact_Sheet.pdf (Last accessed March 1, 2012)

gypsum mining, coalbed methane (CBM) production, manufacturing of aggregate, cement, and concrete, and road and bridge construction.

Total current industrial surface water use for Wyoming is estimated to be 125,000 acre- feet per year. Total current industrial groundwater water use is estimated to be 246,000 acre-feet per year.

According to the state water plan, it appears likely that any new water-intensive industrial developments in the state over the next 30 years will fall into the electric power generation and/or chemical products categories. The other two intensive water use industries, primary metals and paper producers, tend to locate near the source of their largest process inputs – metals and wood respectively. The total projected industrial use under the Mid Scenario is 331,000 acre-feet per year. The Mid-Scenario is a middle of the road estimate versus the projected low or high scenarios.

Water needs for future fracturing jobs were estimated for this discussion paper using the current Reasonable Foreseeable Development (RFD) scenario numbers taken from each of the nine Wyoming RMPs and multiplied by the maximum volume of water necessary based on information located at fracfocus.org. The table is provided, below. Based on a statewide RFD of 25,478 non-CBM wells and 18,299 CBM wells, the maximum projected water needs for HF is 401,319 acre-feet of water. This number is an estimate based upon maximum projected water needs per HF job, and assumes that 100% of the water is freshwater.

According to the WOGCC, as of October 26, 2012, there are approximately 4,185 Class II injection wells in the state disposing of oil and gas waste water. Data obtained from the Wyoming Oil and Gas Conservation Commission, for a period ending December 31, 2011, indicates that 1,106,376,299 barrels of water (105,255.53 acre-feet) have been injected into underground formations. These injection wells may also utilize HF depending upon the specific geology of the disposal zone; however, subsequent disposal operations utilize injection pressures below the fracture stress of the receiving formation to ensure containment in the targeted zone. Each formation for which injection is approved must receive an aquifer exemption from the Environmental Protection Agency documenting that the injectate will be properly contained and that the formation receiving the water is not of useable quality (DEQ Class 4 Use).

POTENTIAL SOURCES OF WATER FOR HYDRAULIC FRACTURING

Freshwater-quality water is required to drill the surface-casing section of the wellbore per federal regulations; other sections of the wellbore (intermediate and/or production strings) would be drilled with appropriate quality makeup water as necessary. This is done to protect usable water zones from contamination, to prevent mixing of zones containing different water quality/use classifications, and to minimize total freshwater volumes. With detailed geologic well logging during drilling operations, geologists/mud loggers on location identify the bottoms of these usable water zones, which aids in the proper setting of casing depths.

Several sources of water are available for drilling and/or HF in Wyoming. Because Wyoming's water rights system is based in the prior appropriation doctrine, water cannot be diverted from a stream/reservoir or pumped out of the ground for drilling and/or HF without reconciling that diversion with the prior appropriation doctrine. Like any other water user, companies that drill or hydraulically fracture oil and gas wells must adhere to Wyoming water laws when obtaining and using specific sources of water.

Below is a discussion of the sources of water that could potentially be used for HF. The decision to use any specific source is dependent on BLM authorization at the APD stage and the ability to satisfy the water appropriation doctrine. BLM must also consult in accordance with the Endangered Species Act (ESA) as amended (16 U.S .C. 1531 et seq.) with the U.S Fish and Wildlife Service (FWS on projects resulting in consumptive water use over de minimus levels, in the Platte and Colorado River Basins of Wyoming. Where this is an issue, USFWS was consulted during the preparation of the appropriate RMP and would again be consulted on a case by case basis. From an operators' standpoint, the decision regarding which water source will be used is primarily driven by the economics associated with procuring a specific water source.

Water transported from outside the state. The operator may transport water from outside the state. As long as the transport and use of the water carries no legal obligation to Wyoming, this is an allowable source of water from a water rights perspective.

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, in nearly every case, the use of an irrigation water right is likely limited to irrigation uses and cannot be used for well drilling and HF operations. To allow its use for drilling and HF, the owner of the water right and the operator must apply to change the water right through a formal process.

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) or after treatment that can be used for drilling and HF operations. Such an arrangement 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. The operator may choose to enter into an agreement with a water provider to purchase or lease water that has been used by the public, and then treated as wastewater.
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. But for many municipalities a portion of the water that is discharged has the character of being "reusable." As a result, it is possible that after having been discharged to the stream, it could be diverted by the operator to be used for drilling and HF operations. Such an arrangement would only be appropriate with the approval of the Wyoming State Engineer's Office (WSEO)

and would be allowed only if the water provider's water rights include uses for drilling and HF operations.

New diversion of surface water flowing in streams and rivers. New diversion of surface waters in most 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 vested 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.

Produced Water. The operator may choose to use water produced in conjunction with oil or gas production at an existing oil or gas well. The water that is produced from an oil or gas well is under the administrative purview of the WSEO and is either non-tributary, in which case, it is administered independent of the prior appropriation doctrine; or is tributary, in which case, the depletions from its withdrawal must be fully augmented if the depletions occur in an over-appropriated basin. The result in either case is that the produced water is available for consumption for other purposes, not just oil and gas operations. The water must not be encumbered by other needs and a the operator must obtain a proper well permit from the WSEO before the water can be used for drilling and HF operations.

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 in conjunction with oil or gas production. However, as described above, the operator must obtain the right to use the water for this purpose.

On-Location Water Supply Wells. Operators may apply for, and receive, permission from the WSEO 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 WSEO. Plugging these wells are also under the jurisdiction of the WSEO.

POTENTIAL IMPACTS TO USABLE WATER ZONES

Impacts to freshwater supplies can originate from point sources, such as chemical spills, chemical storage tanks (aboveground and underground), industrial sites, landfills, household septic tanks, and mining activities. Impacts to usable waters may also occur through a variety of oil and gas operational sources which may include, but are not limited to, pipeline and well casing failure, and well (gas, oil and/or water) drilling and construction of related facilities.

Similarly, improper construction and management of open fluids pits and production facilities could degrade ground water quality through leakage and leaching.[10]

Should hydrocarbons or associated chemicals for oil and gas development, including HF, exceeding EPA/WDEQ standards for minimum concentration levels migrate into culinary water supply wells, springs, or usable water systems, it could result in these water sources becoming non-potable. Water wells developed for oil and gas drilling could also result in a draw down in the quantity of water in nearby residential areas depending upon the geology; however it is not currently possible to predict whether or not such water wells would be developed.

Usable groundwater aquifers are most susceptible to pollution where the aquifer is shallow (within 100 feet of the surface depending on surface geology) or perched, are very permeable, or connected directly to a surface water system, such as through floodplains and/or alluvial valleys or where operations occur in geologies which are highly fractured and/or lack a sealing formation between the production zone and the usable water zones. If an impact to usable waters were to occur, a greater number of people could be affected in densely populated areas versus sparsely populated areas characteristic of Wyoming.

Potential impacts on usable groundwater resources from fluid mineral extraction activities can result from the five following scenarios:

- Contamination of aquifers through the introduction of drilling and/or completion fluids through spills or drilling problems such as lost circulation zones.
- Communication of the induced hydraulic fractures with existing fractures potentially allowing frac fluid migration into usable water zones/supplies. The potential for this impact is likely dependent on the local hydraulic gradients where those fluids are dissolved in the water column. To date, this is an unproven theory.
- Cross-contamination of aquifers/formations that may result when fluids from a deeper aquifer/formation migrate into a shallower aquifer/formation due to improperly cemented well casings.
- Localized depletion of unconfined groundwater availability.
- Progressive contamination of deep confined, shallow confined, and unconfined aquifers if the deep confined aquifers are not completely cased off, and geologically isolated, from deeper units. An example of this would be salt water intrusion resulting from sustained drawdown associated with the pumping of groundwater.

The impacts above could occur as a result of the following processes:

<u>Improper casing and cementing.</u>
A well casing design that is not set at the proper depths or a cementing program that does not properly isolate necessary formations could allow oil, gas or HF fluids to contaminate other aquifers/formations.

[10] See Subject RMP, Chapter 4, Environmental Consequences, for additional information

Natural fractures, faults, and abandoned wells.
If HF of oil and gas wells result in new fractures connecting with established natural fractures, faults, or improperly plugged dry or abandoned wells, a pathway for gas or contaminants to migrate underground may be created posing a risk to water quality. The potential for this impact is currently unknown but it is generally accepted that the potential decreases with increasing distance between the production zone and usable water zones. This potential again is dependent upon the site specific conditions at the well location.

Fracture growth.
A number of studies and publications report that the risk of induced fractures extending out of the target formation into an aquifer—allowing hydrocarbons or other fluids to contaminate the aquifer —may depend, in part, on the formation thickness separating the targeted fractured formation and the aquifer. For example, according to a 2012 Bipartisan Policy Center report, the fracturing process itself is unlikely to directly affect freshwater aquifers because fracturing typically takes place at a depth of 6,000 to 10,000 feet, while drinking water aquifers are typically less than 1,000 feet deep. Fractures created during HF have not been shown to span the distance between the targeted l formation and freshwater bearing zones. If a parcel is sold and development is proposed in usable water zones, those operations would have to comply with federal and/or state water quality standards or receive a Class 5 designation from the WDEQ.

Fracture growth and the potential for upward fluid migration, through coal and other geologic formations depend on site-specific factors such as the following:

1. Physical properties, types, thicknesses, and depths of the targeted formation as well as those of the surrounding geologic formations.
2. Presence of existing natural fracture systems and their orientation in the target formation and surrounding formations.
3. Amount and distribution of stress (i.e., in-situ stress), and the stress contrasts between the targeted formation and the surrounding formations.

Hydraulic fracture stimulation designs include the volume of fracturing fluid injected into the formation as well as the fluid injection rate and fluid viscosity; this information would be evaluated against the above site specific considerations**.**

Fluid leak and recovery (flowback) of HF fluids.
It is theorized that not all fracturing fluids injected into the formation during the HF process may be recovered. It is theorized that fluid movement into smaller fractures or other geologic substructures can be to a point where flowback efforts will not recover all the fluid or that the pressure reduction caused by pumping during subsequent production operations may not be sufficient to recover all the fluid that has leaked into the formation. It is noted that the fluid loss due to leakage into small fractures and pores is minimized by the use of cross-linked gels.

Willberg et al. (1998) analyzed HF flowback and described the effect of pumping rates on cleanup efficiency in initially dry, very low permeability (0.001 md) shale. Some wells in this study were pumped at low flowback rates (less than 3 barrels per minute (bbl/min). Other wells

were pumped more aggressively at greater than 3 bbl/min. Thirty- one percent of the injected HF fluids were recovered when low flowback rates were applied over a 5-day period. Forty-six percent of the fluids were recovered when aggressive flowback rates were applied in other wells over a 2-day period. In both cases, additional fluid recovery (10 percent to 13 percent) was achieved during the subsequent gas production phase, resulting in a total recovery rate of 41 percent to 59 percent of the initial volume of injected HF fluid. Ultimate recovery rate however, is dependent on the permeability of the rocks, fracture configuration, and the surface area of the fracture(s).

The ability of HF chemicals to migrate in an undissolved or dissolved phase into a usable water zone is likely dependent upon the location of the sealing formation (if any), the geology of the sealing formation, hydraulic gradients and production pressures. The following discussion, adapted from: Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs; Chapter 3 Characteristics of CBM Production and Associated HF Practices (3-5EPA 816-R-04-003, June, 2004), takes place where there is not a sealing formation between the fractured formation and usable waters; the two zones are separated by approximately 1000’ of earth in the Powder River Basin of Wyoming.

HF Fluids can remain in the subsurface unrecovered, due to “leak off” into connected fractures and the pores of rocks. Fracturing fluids injected into the primary hydraulically induced fracture can intersect and flow (leak off) into preexisting smaller natural fractures. Some of the fluids lost in this way may occur very close to the well bore after traveling minimal distances in the hydraulically induced fracture before being diverted into other fractures and pores. Once “mixed” with the native water, local and regional vertical and horizontal gradients may influence where and if these fluids will come in contact with usable water zones, assuming that there is inadequate recovery either through the initial flowback or over the productive life of the well. Faults, folds, joints, etc., could also alter localized flow patterns as discussed below.

The following processes can influence effective recovery of the fracture fluids:

Check-Valve Effect
A check-valve effect occurs when natural and/ or newly created fractures open and HF fluid is forced into the fractures when fracturing pressures are high, but the fluids are subsequently prevented from flowing back toward the wellbore as the fractures close when the fracturing pressure is decreased (Warpinski et al., 1988; Palmer et al., 1991a). A long fracture can be pinched-off at some distance from the wellbore. This reduces the effective fracture length. HF fluids trapped beyond the “pinch point” are unlikely to be recovered during flowback and oil/gas is unlikely to be recovered during production.

In most cases, when the fracturing pressure is reduced, the fracture closes in response to natural subsurface compressive stresses. Because the primary purpose of hydraulic fracturing is to increase the effective permeability of the target formation and connect new or widened fractures to the wellbore, a closed fracture is of little use. Therefore, a component of HF is to “prop” the fracture open, so that the enhanced permeability from the pressure-induced fracturing persists even after fracturing pressure is terminated. To this end, operators use a system of fluids and

"proppants" to create and preserve a high- permeability fracture-channel from the wellbore deep into the formation.

The check-valve effect takes place in locations beyond the zone where proppants have been placed (or in smaller secondary fractures that have not received any proppant). It is possible that some volume of stimulation fluid cannot be recovered due to its movement into zones that were not completely "propped" open.

Adsorption and Chemical Reactions
Adsorption and chemical reactions can also prevent HF fluids from being recovered. Adsorption is the process by which fluid constituents adhere to a solid surface and are thereby unavailable to flow with groundwater. Adsorption to coal is likely; however, adsorption to other geologic material (e.g., shale, sandstone) is likely to be minimal. Another possible reaction affecting the recovery of fracturing fluid constituents is the neutralization of acids (in the fracturing fluids) by carbonates in the subsurface.

Movement of Fluids Outside the Capture Zone
Fracturing fluids injected into the target zone flow into fractures under very high pressure. The hydraulic gradients driving fluid flow away from the wellbore during injection are much greater than the hydraulic gradients pulling fluid flow back toward the wellbore during flowback and production (pumping) of the well. Some portion of the fracturing fluids could be forced along the hydraulically induced fracture to a point beyond the capture zone of the production well. The size of the capture zone will be affected by the regional groundwater gradients, and by the drawdown caused by producing the well. Site-specific geologic, hydrogeologic, injection pressure, and production pumping details should provide the information needed to estimate the dimension of the production well capture zone and the extent to which the fracturing fluids might disperse and dilute.

Incomplete Mixing of Fracturing Fluids with Water
Steidl (1993) documented the occurrence of a gelling agent that did not dissolve completely and actually formed clumps at 15 times the injected concentration in an induced fracture. Steidl also directly observed, in his mined-through studies, gel hanging in stringy clumps in many other induced fractures. As Willberg et al. (1997) noted, laboratory studies indicate that fingered flow of water past residual gel may impede fluid recovery. Therefore, some fracturing fluid gels appear not to flow with groundwater during production pumping and remain in the subsurface unrecovered. Such gels are unlikely to flow with groundwater during production, but may present a source of gel constituents to flowing groundwater during and after production.

Authorization of any future proposed projects , would require full compliance with local, state, and federal regulations and laws that relate to surface and groundwater protection and would be subject to routine inspections by the BLM and the Wyoming Oil and Gas Commission as described in Memorandum of Understanding WY920-94-09-79, dated September 21, 1994, prior to approval.

GEOLOGIC HAZARDS (INCLUDING SEISMIC/LANDSLIDES)

Potential geologic hazards caused by HF include induced seismic activity. Induced seismic activity could indirectly cause surficial landslide activity where soils/slopes are susceptible to failure.

Landslides involve the mass movement of earth materials down slopes and can include debris flows, soil creep, and slumping of large blocks of material. There are no identified landslides in the project area [Kemmerer RMP (2010), Pinedale RMP (2008), Green River RMP (1997), Rock Springs RMP Revision, and Rawlins RMP (2008) Chapter 2, Affected Environment and/or Summary of the Management Situation Analysis; Wyoming State Geological Survey (2011)].

Earthquakes occur when energy is released due to blocks of the earth's crust moving along areas of weakness or faults. Earthquakes attributable to human activities are called "induced seismic events" or "induced earthquakes." In the past several years induced seismic events related to energy development projects have drawn heightened public attention. Although only a very small fraction of injection and extraction activities at hundreds of thousands of energy development sites in the United States have induced seismicity at levels that are noticeable to the public, seismic events caused by or likely related to energy development have been measured and felt in Alabama, Arkansas, California, Colorado, Illinois, Louisiana, Mississippi, Nebraska, Nevada, New Mexico, Ohio, Oklahoma, and Texas.

A study conducted by the National Academy of Sciences[11] studied the issue of induced seismic activity from energy development. As a result of the study, they found that: (1) the process of hydraulic fracturing a well as presently implemented for shale gas recovery does not pose a high risk for inducing felt seismic events; and (2) injection for disposal of waste water derived from energy technologies into the subsurface does pose some risk for induced seismicity, but very few events have been documented over the past several decades relative to the large number of disposal wells in operation.

The potential for induced seismicity cannot be made at the leasing stage; as such, it will be evaluated at the APD stage should the parcel be sold/issued, and a development proposal submitted.

SPILL RESPONSE AND REPORTING

Spill Prevention, Control, and Countermeasure (SPCC) - EPAs rules include requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires that operators of specific facilities prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan (FRP) rule. Originally published in 1973 under the authority of §311 of the Clean Water Act, the Oil Pollution Prevention regulation sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining

[11] Induced Seismicity Potential in Energy Technologies, National Academy of Sciences, 2012

shorelines, and to contain discharges of oil, the regulation requires the operator of these facilities to develop and implement SPCC Plans and establishes procedures, methods, and equipment requirements (Subparts A, B, and C). In 1990, the Oil Pollution Act amended the Clean Water Act to require some oil storage facilities to prepare Facility Response Plans. On July 1, 1994, EPA finalized the revisions that direct facility owners or operators to prepare and submit plans for responding to a worst-case discharge of oil.

In addition to EPA's requirements, operators must provide a plan for managing waste materials, and for the safe containment of hazardous materials, per Onshore Order #1 with their APD proposal. All spills and/or undesirable events are managed in accordance with Notice to Lessee (NTL) 3-A and Wyoming Information Memorandums 2008-028: *NTL- 3A Reporting Requirements* and 2009-021 *Guidance & Standards for Response to Oil & Gas-Related Spills & Clean-Up Criteria.* Regulations found at 43 CFR 3162.5(c) provide BLM with the necessary regulatory framework for responding to all spills and/or undesirable events related to hydraulic fracturing operations.

PUBLIC HEALTH AND SAFETY

The intensity, and likelihood, of potential impacts to public health and safety, and to the quality of usable water aquifers is directly related to proximity of the proposed action to domestic and/or community water supplies (wells, reservoirs, lakes, rivers, etc.) and/or agricultural developments. The potential impacts are also dependent on the extent of the production well's capture zone and well integrity. Standard Lease Notice No.1 specifies that development is generally restricted within a quarter mile of occupied dwellings and within 500 feet of riparian habitats and wetlands, perennial water sources (rivers, springs, water wells, etc.) and/or floodplains. Intensity of impact is likely dependent on the density of development. Further information related to the rate of development is provided in the Leasing Environmental Analysis under cumulative impacts.

HF White Paper Table									
Field Office (Year of RFD)	Projected Number of CBM wells	Projected Number of Non-CBM/ Conventional Wells	Max Frac Volume CBM (gallons)	Total Est. H2O for CBM	Max Frac Volume Non_CBM (gallons)	Total Est. H2O for Non-CBM	Total Projected H2O for HF (gallons)	Total Projected H2O for HF (barrels)	Total Projected H2O for HF (acre-feet)
BFO (2012)	10,343	3,865	300,000	3,102,900,000	5,000,000	19,325,000,000	22,427,900,000	711,996,824	67,736.09
BHB (2010) (WFO/CYFO)	150	1,890	300,000	45,000,000	5,000,000	9,450,000,000	9,495,000,000	301,428,571	28,676.52
CFO (2005)	700	2,100	300,000	210,000,000	5,000,000	10,500,000,000	10,710,000,000	340,000,000	32,346.03
NFO (2004)	0	30	300,000	0	5,000,000	150,000,000	150,000,000	4,761,905	453.03
LFO (2009)	861	2,566	300,000	258,300,000	5,000,000	12,830,000,000	13,088,300,000	415,501,587	39,528.90
RFO (2004)	4,655	4,655	300,000	1,396,500,000	5,000,000	23,275,000,000	24,671,500,000	783,222,221	74,512.14
RSFO (GRRMP/1991)	300	1,258	300,000	90,000,000	5,000,000	6,290,000,000	6,380,000,000	202,539,682	19,268.69
RSFO (JMH/2002)	50	314	300,000	15,000,000	5,000,000	1,570,000,000	1,585,000,000	50,317,460	4,786.97
KFO (2006)	640	220	300,000	192,000,000	5,000,000	1,100,000,000	1,292,000,000	41,015,873	3,902.06
PFO (2006)	600	8,580	300,000	180,000,000	5,000,000	42,900,000,000	43,080,000,000	1,367,619,046	130,108.96
Total	18,299	25,478		5,489,700,000		127,390,000,000	132,879,700,000	4,218,403,168	401,319

Calculation assumes 100% of HF H2O is freshwater.
Conversion factor: gallons to barrels: *0.0317460317 Conversion factor: barrels to acre feet: /10511.3365126

5.7 EA Preparers/Reviewers, Consultation & Coordination

The following individuals or organizations were involved in consultation on issues in the development of this EA.

5.7.1 Outside Agencies or Individuals

Prior to publication of this EA, letters were sent to landowners by the WSO notifying them that the minerals under their surface lands had been nominated for lease and inviting them to participate in the BLM's review.

Informal scoping letters were also sent to Native American tribal contacts known or identified as having interest or concerns with oil and gas leasing in the area.

When necessary, notice letters were sent to the Forest Service, Douglas Ranger District and to units of the National Park Service in this regional area. The superintendent of the Fort Laramie National Historic Site has identified concerns with oil and gas development in proximity to the Historic Site. Those concerns include activities within the visual setting of the area, effects on visitor experience, and impacts to air quality, water quality and night skies. These are impacts associated with lease development, and will be addressed site specifically if a development proposal is submitted. No new issues were identified that would suggest the need to consider alternatives beyond those being addressed in this EA.

In accordance with the BLM/WGFD Memorandum of Understanding WY131, Appendix 5G, the WSO sent the preliminary parcel list to the WGFD field personnel were provided an opportunity to review the revised preliminary parcel list and send their comments back to the BLM field office. If WGFD field personnel did not have any comments or concerns with the revised preliminary parcel list, they sent an email/letter to the BLM field office that they have reviewed the revised preliminary parcel list, and the WGFD concerns have been met and they have no additional concerns. The BLM field offices reviewed WGFD field personnel concerns and addressed any concerns. The WSO also routinely meets with WGFD Habitat Protection Program personnel as a part of its coordination on oil and gas lease sales.

Under procedures outlined in a memorandum of understanding, the BLM requested comments from the Bureau of Reclamation (BOR) as the surface management agency on any parcels located on lands managed by the BOR.

5.7.2 BLM-Wyoming State Office

Name	Division/Branch	Title
Travis Bargsten	WY921	Physical Scientist
Tyson Finnicum	WY930	Planning and Environmental Specialist
Ryan McCammon	WY930	Physical Scientist, Air Quality
Melissa Hovey	WY930	Physical Scientist, Air Quality
Jenn Dobb	WY930	Economist
Brad Jost	WY930	Wildlife Biologist

5.7.3 BLM-High Desert District

Name	Office	Title
Sonja Hunt	HDD	HDD Energy Resource Advisor
Kelsey Smith	KFO	Natural Resource Specialist
Doug Linn	PFO	AFM, Minerals & Lands
Tim Zebulske	PFO	Supervisory Natural Resource Specialist
Larry Zuckerman	PFO	Natural Resource Specialist
Brian Roberts	PFO	Natural Resource Specialist
Alex Gardener	PFO	Zone Fisheries Biologist
Julian Terry	PFO	Wildlife Biologist
Rob Schweitzer	PFO	Cultural Resources Specialist
Tony Howard	PFO	Range Management Specialist
Jim Glennon	PFO	District Botanist
Tracy Hoover	PFO	Realty Specialist
Tyler Morrison	RFO	Natural Resource Specialist
Michael Korp	RFO	Surface Compliance Technician
Natasha Keierleber	RFO	Archeologist
Frank Blomquist	RFO	Wildlife Biologist
Michael Mischke	RFO	Wildlife Biologist
Ernie Johnson	RFO	Geologist
Andy Mowrey	RFO	Recreation Specialist
Ted Inman	RSFO	Supervisory Natural Resource Specialist

5.7.4 BLM High Plains District

Name	Office	Title
Kathleen Lacko	HPD	Planning and Environmental Coordinator
Randy Sorenson	CFO	Acting Assistant Field Manager, Minerals and Lands
Andrea Meeks	HPD	Solid Mineral Specialist
Debby Green	BFO	Natural Resource Specialist
G.L. “Buck” Damone III	BFO	Lead Archaeologist
Shane Gray	CFO	Natural Resource Specialist
Patrick Walker	CFO	Archaeologist
Eric Schnell	NFO	Physical Scientist
Justin Proffer	NFO	Wildlife Biologist
Alice Tratebas	NFO	Archaeologist
Diane Adams	BFO	GIS Specialist
Don Brewer	BFO	Wildlife Biologist
Wyatt Wittkop	BFO	Wildlife Biologist

5.7.5 BLM-Wind River/Bighorn Basin District.

Name	Office	Title
Rita Allen	WRBBD	WR/BBD District Resource Advisor
Brandi Hecker	CYFO	Natural Resource Specialist
Gretchen Hurley	CYFO	Geologist
Abel Guevara	CYFO	Wildlife Biologist
Destin Harrell	CYFO	Wildlife Biologist

Name	Office	Title
Kierson Crume	CYFO	Archeologist
Rick Tryder	CYFO	Outdoor Recreation Planner
Bradley Johnson	CYFO	Planning & Environmental Coordinator
Debra Larsen	LFO	Land Law Examiner
Leah Yandowh	LFO	Wildlife Biologist
Karina Bryan	LFO	Archaeologist
Jared Oakleaf	LFO	Outdoor Recreation Planner
Sarah Wempen	LFO	GIS Specialist
Kristin Yannone	LFO	Planning & Environmental Coordinator
Holly Elliott	WFO	Planning & Environmental Coordinator
Darci Stafford	WFO	Natural Resource Specialist
Ted Igleheart	WFO	Wildlife Biologist
Tim Stephens	WFO	Wildlife Biologist
Marit Bovee	WFO	Archaeologist
Stacey Moore	WFO	Archaeologist
Hanna Fortney	WFO	Outdoor Recreation Planner
Karen Hepp	WFO	Range Management Specialist

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