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

Environmental Assessment

June 2022 Oil and Gas Lease Parcel Sale

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June 2022

U.S. Department of the Interior
Bureau of Land Management
Montana / Dakotas State Office
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The Bureau of Land Management's mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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1 Introduction

1.0 Summary of Proposed Project

This environmental assessment was prepared to thoroughly examine the potential environmental impacts of the proposed action and alterative actions in order to support informed decision-making. This analysis is consistent with the purpose and goals of NEPA; the requirements of the Council on Environmental Quality's (CEQ) implementing NEPA regulations at 40 CFR Parts 1500-1508; longstanding federal judicial and regulatory interpretations; the Department of the Interior's NEPA regulations (43 CFR Part 46); and Administration priorities and polices including Secretary's Order No. 3399 requiring bureaus and offices to use "the same application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect."

This environmental assessment (EA) has been prepared to disclose and analyze the potential environmental consequences from leasing 29 nominated lease parcels encompassing approximately 6,849.16 Federal mineral acres located across the Montana/Dakotas BLM in the Miles City Field Office (MCFO), North Dakota Field Office (NDFO), U.S. Army Corps of Engineers, and within the administrative boundary of the Dakota Prairie Grasslands (DPG) McKenzie Ranger District. The parcels would be included as part of a competitive oil and gas lease sale tentatively scheduled to occur during the June of 2022. The proposed parcels are located in Fallon, Powder River, Richland, and Roosevelt Counties in Montana, and McKenzie, Mountrail, and Williams Counties in North Dakota. Refer to parcel maps in **Appendix C**.

The Bureau of Land Management (BLM) Montana/Dakotas State Office conducts Oil and Gas Federal mineral estate lease auctions for lands managed by the Federal Government, whether the surface is managed by the Department of the Interior (BLM or Bureau of Reclamation (BOR)), United States Forest Service (USFS), or other departments and agencies. These auctions also include split estate lands, where the BLM holds subsurface mineral rights, but a party other than the Federal Government owns the surface estate. The Montana/Dakotas State Office has historically conducted four lease sales per year. The BLM's authority to conduct these lease sales is based on various laws including the Mineral Leasing Act of 1920, as amended, and the Federal Land Policy and Management Act of 1976. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 Sec. 5102(a)(b)(1)(A) directs the BLM to conduct quarterly oil and gas lease sales in each state whenever eligible lands are available for leasing.

Members of the public file Expressions of Interest (EOI) to nominate parcels for leasing by the BLM. The BLM may also nominate a parcel if an existing well is draining Federal minerals or for other reasons. From these EOIs and BLM nominations, the Montana/Dakotas State Office prepares a preliminary parcel list and provides them to the field offices for review. The BLM also reviews parcels located in designated greater sage-grouse habitat to guide development to lower conflict areas and protect important habitat consistent with conservation objectives in the 2015 Rocky Mountain Region Record of Decisions and the applicable Approved Resource Management Plans (ARMPs), a court order in the U.S. District Court for the District of Montana (case 4:18-cv-00069-BMM filed 5/22/20), and Montana/Dakotas Instruction Memorandum MT-2020-018. Montana/Dakotas BLM reviews the parcels, and evaluates:

1. if they are in areas open to leasing;
2. if new information has come to light which might change previous analyses conducted during the land use planning process;
3. Whether there are site specific resource concerns that warrant not leasing a particular parcel,
4. if there are special resource conditions of which potential bidders should be made aware; and,
5. which stipulations should be identified and included as part of a lease.

If the decision is made to offer lease parcels, the Montana/Dakotas State Office would publish a Notice of Competitive Oil and Gas Lease Sale (Sale Notice) at least 45 days before the auction is held. The Sale Notice will identify applicable lease stipulations for each parcel.

The offering and subsequent issuance of oil and gas leases would not result in immediate ground disturbance. However, once a lease is sold the lessee maintains the right 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.

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 Conditions of Approval (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. 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).

BLM Montana / Dakotas has prepared this Environmental Assessment for the June 2022 oil and gas lease sale, which considers three alternatives:

- Alternative A: No Action
    - The nominated parcels would not be offered for lease as part of a competitive oil and gas lease sale.
- Alternative B: Proposed Action
    - The BLM would offer 29 nominated lease parcels encompassing approximately 6,849.16 Federal mineral acres as part of a competitive oil and gas lease sale in the Miles City Field Office, North Dakota Field Office, U.S. Army Corps of Engineers, and within the administrative boundary of the Dakota Prairie Grasslands McKenzie Ranger District.
- Alternative C: Defer Six Parcels for Resource Concerns
    - The BLM would defer parcels MT-2022-06-0247, -0249, -0250, -0251, -0252 and -0253 within the Miles City Field Office. As a result, the BLM would offer 23 nominated lease parcels encompassing approximately 3,405.80 Federal mineral acres as part of a competitive oil and gas lease sale in the Miles City Field Office, North Dakota Field Office, U.S. Army Corps of Engineers, and within the administrative boundary of the Dakota Prairie Grasslands McKenzie Ranger District.

The BLM assigned lease stipulations to the parcels to address resources concerns. A Federal oil and gas lease would be issued for a 10-year period and would remain valid for as long thereafter as oil or gas is produced in paying quantities, required payments are made and lease operations are conducted in compliance with regulations and approved permits. If a lessee fails to produce oil and gas by the end of the initial 10-year period, does not make annual rental payments, or does not comply with the terms and conditions of the lease, the BLM will terminate the lease. The lessee can relinquish the lease. The oil and gas resources could be offered for sale at a future lease sale. Drilling of wells on a lease would not be permitted until the lessee or operator secures approval of a drilling permit and a surface use plan as

specified in 43 CFR 3162. This requires additional environmental reviews, by the BLM, at the time of application.

NEW

There have been additions to this EA in response to comments received during the public scoping period:

- See section 1.6, Issues Identified but Eliminated from Further Analysis for a discussion regarding the Oil and Gas Administration and Royalty Rates;
- See section 2.3: Alternatives Considered but Not Analyzed in Detail for additional alternatives considered;
- See section 3.3.2 Air Resources, Environmental Effects – No Action Alternative for an amended analysis.
- See section 3.3.7 Air Resources, Mitigation Strategies for an amended analysis;
- See section 3.5 Greater Sage Grouse for an amended categorization for parcel MT-2022-06-0243. The BLM had this parcel previously listed as Category 3; The BLM has reviewed the parcel and has updated the analysis to reflect that the parcel is in Category 5.
- See section 3.6 Issue 5 Socioeconomic Conditions, Environmental Justice, and Human Health for additional analysis;
- See section 3.7 Issue 6, Water Resources, Groundwater, for additional analysis;
- See section 4.0, Summary of Consultation and Coordination, for the addition of **Table 31** Tribes and Agencies Contacted;
- See section 4.1 Summary of Public Participation for the addition of the Section 208 Report discussion;

1.1 Purpose and Need

The purpose and need for this action are to respond to EOIs to lease parcels of land for oil and gas development as mandated by Federal laws, including the Mineral Leasing Act of 1920, as amended, Federal Land Policy and Management Act of 1976, and Federal Onshore Oil and Gas Leasing Reform Act of 1987.

Offering parcels for competitive oil and gas leasing provides opportunities for private individuals or companies to explore and develop federal oil and gas resources after receipt of necessary approvals, and to sell the oil and gas in public markets.

1.2 Decision to be Made

Based on this review and public comment, the BLM will determine whether to make lands available for leasing, and, if so, identify stipulations that would be included with specific lease parcels at the time of lease sale.

1.3 Land Use Plan Conformance

Pursuant to 40 CFR § 1508.28 and § 1502.21, this EA is tiered to the information and analysis and conforms to the decisions contained in the Miles City Resource Management Plan (RMP) of September 2015 and the North Dakota RMP of April 1988. These plans are the governing land use plans for their respective geographic areas. The lease parcels to potentially be offered for sale are within an area determined to be open to oil and gas leasing in the RMPs. An electronic copy of these planning documents is available via the internet on the BLM e-Planning page: https://www.blm.gov/programs/planning-and-nepa/eplanning.

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 (WORC) et al. v. BLM, Case 4:16-cv-00021-BMM, filed 3/23/18)*) with respect to consideration of the amount of coal made available for lease and consideration of climate change impacts. On July 31, 2018, the District Court issued an order directing the BLM to prepare a Supplemental EIS for the RMP, and to complete comprehensive environmental analysis in compliance with the Court's March 26, 2018, Order, and all existing procedural requirements under NEPA and the Administrative Procedures Act (APA) for any new or pending leases of coal, oil, or gas resources in the planning areas subject to the Buffalo RMP and the Miles City RMP. Miles City prepared a Supplemental EIS and approved a Resource Plan Amendment in November 2019, but it was later set aside as unlawful in an order from the U.S. District Court for the District of Montana Great Falls Division on 10/16/20 (Case 4:20-cv-00062-BMM, finding that the Acting BLM Director had not been properly appointed to the position and did not have the authority to resolve protests on the RMP amendment). The BLM has prepared the June 2022 Oil and Gas Lease Sale EA in compliance with the terms of the WORC Order, NEPA, and the APA.

This EA is also tiered to the information and analysis and conforms to the decisions contained in the Dakota Prairie Grasslands Final Environmental Impact Statement (July 2002) and Oil and Gas Leasing Record of Decision (June 2003). This conformance applies only to the parcels located within the administrative boundaries of the U.S. Forest Service.

This EA is also tiered to the information and analysis and conforms to the decisions contained in the USACOE Garrison Dam/Lake Sakakawea Project Oil and Gas Management Plan (June 2020). This conformance applies only to the parcels located within the administrative boundaries of the USACOE Garrison Dam/Lake Sakakawea Project.

1.4 Relationship to Statutes, Regulations, Other NEPA Documents

The mandate of the BLM is derived from various laws, including the MLA and the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, to promote the exploration and development of oil and gas on the public domain. Additionally, the Federal Onshore Oil and Gas Leasing Reform Act of 1987 states lease sales shall be held for each State where eligible lands are available at least quarterly and more frequently if the Secretary of the Interior determines such sales are necessary.

Purchasers of oil and gas lease parcels are required to comply with all applicable Federal, State, and local laws and regulations, including obtaining all necessary permits prior to any lease development activities. Stipulations attached to the lease, restrictions deriving from specific, nondiscretionary statues, and such reasonable measures may be required to minimize adverse impacts to other resource values (43 CFR 3101.1-2).

The regulations, policies, and plans utilized in preparing this EA include, but are not limited to the following:

- 43 CFR 3100 – Oil and Gas Leasing
- BLM Manual 3120 – Competitive Leasing
- BLM Competitive Leasing Handbook (H-3120-1)
- Directional Drilling into Federal Mineral Estate from Well Pads on Non-Federal Locations (WO IM 2018-014)

This EA was prepared to thoroughly examine the potential environmental impacts of the proposed action and alterative actions in order to support informed decision-making. This EA is consistent with the purpose and goals of NEPA; the requirements of the Council on Environmental Quality's (CEQ) implementing NEPA regulations at 40 CFR Parts 1500-1508; longstanding federal judicial and regulatory interpretations; the Department of the Interior's NEPA regulations (43 CFR Part 46); and Administration priorities and polices including Secretary's Order No. 3399 requiring bureaus and offices to use "the same application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect."

1.5 Issues Identified for Analysis

Analysis issues include resource issues that could potentially be affected by oil and gas leasing. The BLM focuses its analysis on "issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). Consistent with Title 43 Code of Federal Regulations 3131.3, the BLM identified site-specific resource concerns and lease stipulations for proposed parcels through a preliminary review process conducted prior to a 30-day public scoping period. After scoping was completed, the BLM identified issues of concern identified by the public, determined how to address those concerns in this EA, and reviewed and edited lease stipulations as necessary. The following resources/issues will be analyzed in detail in this EA:

1.5.1 Issue 1 – Air Resources

What types of emissions would be generated from subsequent oil and gas development of leased parcels? What quantity of air pollutants would be produced based on the assumptions for analysis? How would air pollutant emissions from subsequent development of leased parcels affect air quality?

- Indicator: Tons per well and tons per year of PM_{10}, $PM_{2.5}$, NO_X, SO_2, CO, VOCs, HAPs

How would air emissions from subsequent development of leased parcels affect visibility at Class I Airsheds?

- Indicator: Change in deciviews, which is a unit of measurement to quantify human perception of visibility. It is derived from the natural logarithm of atmospheric light extinction coefficient. One deciview is roughly the smallest change in visibility (haze) that is barely perceptible.

1.5.2 Issue 2 – Greenhouse Gases

How would future potential development of nominated lease parcels contribute to greenhouse gas (GHG) emissions and climate change?

- Indicator: Metric tonnes (t) or megatonnes (Mt), and social cost of GHGs ($)

1.5.3 Issue 3 – Big Game (Pronghorn)

What are the effects of potential oil and gas development on parcels that may be offered for lease in

state identified pronghorn antelope winter range?

- Indicator: Assess baseline condition of open road density and oil and gas well density for the Fallon and Powder River County parcels and assess how development of up to four oil or gas wells would affect those metrics.

1.5.4 Issue 4 – Greater Sage-Grouse

What are the effects to greater sage-grouse habitat if the parcels nominated in the June 2022 lease sale are leased and subsequently developed for oil or gas production?

- Indicator: Complete the greater sage-grouse habitat prioritization process and categorization exercise for the proposed parcels as outlined in Montana/Dakotas Instruction Memorandum MT-2020-018. Identify active leks within 3.1 miles of proposed parcels and determine whether existing disturbance is present. Qualitatively describe effects of potential future development on habitat.

1.5.5 Issue 5 – Socioeconomic Conditions, Environmental Justice, and Human Health

How would the leasing and potential development of these parcels affect local economic activity and revenues for federal, local, and state governments?

Would Environmental Justice populations be disproportionally adversely affected by the leasing of the proposed parcels?

- Indicator: Total revenue income and bonus bids over 10-year lease term

- Indicator: Disproportionate impacts from leasing parcels

- Indicator: Population groups of concern

Executive Order 12898 (Feb. 11, 1994), Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, provides that BLM shall identify and address 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. McKenzie County, ND meets the threshold for identifying Environmental Justice populations, and Williams County, ND is just below the threshold.

- Indicator: Opportunity for meaningful involvement

Meaningful public engagement focuses on empowering vulnerable and affected populations to participate in decisions that have the potential to affect their lives, regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

1.5.6 Issue 6 – Water Resources

What are the effects of potential oil and gas development, including hydraulic fracturing, on parcels that may be offered for lease on surface and groundwater quality and quantity?

- Indicator: Characterize the affected environment in the watersheds where parcels are proposed. Quantify estimated acres of surface disturbance and million gallons water used. Qualitatively assess effects to surface and groundwater resources from oil and gas development.

1.6 Issues Identified but Eliminated from Further Analysis

The following resources/issues are not present and not considered in this EA: lands and realty conflicts, locatable and salable minerals, forest and woodland, cave and karst resources, wilderness study areas, ACECs, and wild and scenic rivers. Other resource issues BLM considered but eliminated from further analysis due to environmental impacts previously analyzed through prior NEPA reviews and/or lease notices or stipulations that were applied to avoid and minimize impacts are discussed below:

Cultural Resources: The application of lease terms, cultural resource lease stipulations and the cultural resource lease notices (CR 16-1, STD 16-3, LN 14-2, LN 14-14, LN 14-33, NSO 11-84, NSO 11-88, NSO 11-89, DPG 13d [McKenzie RD]) at leasing provides protection to cultural resources. The BLM will not approve any ground disturbing activities that may affect such properties or resources until it completes its obligations associated with the stipulations that are applied to each respective parcel as well as applicable requirements of the National Historic Preservation Act and any 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.

Paleontology: The application of lease terms and the paleontological lease notices (STD 16-3, LN 14-3, and LN 14-12) at leasing provides protection to paleontological resources. The paleontological lease notice LN 14-12 is applied to those lease parcels that fall within geological units with a PFYC Class of 3 or higher. Leased lands that fall into this category could require professional assessment which may include a field survey prior to surface disturbance. The results of the assessment and survey by a BLM-permitted paleontologist will serve as the basis for a mitigation plan during development. If the inventory resulted in the identification of paleontological resources, mitigation measures such as avoidance, professional monitoring, development of an Unanticipated Resource Discovery Plan or salvage would be initiated by BLM and the operator.

Within the administrative boundaries of the USFS Dakota Prairie Grasslands, lease notice DPG 13d (McKenzie RD) and paleontological lease stipulation DPG CSU 16-1 are applied to protect these resources.

Native American Religious Concerns: The BLM applied CR 16-1 to all parcels that may have possible historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O 13007, or other statutes and executive orders. The purchaser of a lease is entitled to develop the parcel consistent with lease stipulations and must have an approved Application for Permit to Drill (APD), including a plan of operations and a review and consideration of Native American religious concerns, before ground disturbing activities can begin. The BLM may require modification to exploration or development proposals to protect unevaluated, eligible, or other such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Soils Resources and Vegetation: Stipulations including CSU 12-24, CSU 12-53, CSU 12-59, NSO 11-69, and DPG NSO 14-1, in addition to the Standard Lease STD 16-3, have been applied to applicable parcels to mitigate any impacts associated with leasing or development of these parcels. At the time of

exploration or development the APD surface use plan of operations will include design features and mitigation measures to reduce, avoid, or minimize potential impacts to soil and vegetative resources consistent with the RMP for the respective planning area.

Riparian – Wetland Habitats: Stipulations including CSU 12-5, CSU 12-25, NSO 11-33, NSO 11-70, NSO 11-125, and DPG CSU 16-2, in addition to the Standard Lease STD 16-3 and DPG 13d, have been applied to applicable parcels to mitigate any impacts associated with leasing or development of these parcels. At the time of exploration of development, the APD surface use plan of operations will include design features and mitigation measures to reduce, avoid, or minimize impacts to riparian-wetland areas, consistent with the RMP for the respective planning area. Additionally, all stipulations related to setback distances from the edge of the wetlands, streams, and rivers will be adhered to and consistent with the RMP for the respective planning area. USACOE NSO lease stipulations COE 18-1, 18-2, 18-3 and 18-4 were applied to all parcels within the USACOE Garrison Dam/Lake Sakakawea Project. The USACOE stipulations require that all development occur off lease, outside of riparian and wetland areas. At the time of exploration of development, the APD surface use plan of operations will include design features and mitigation measures to reduce, avoid, or minimize impacts to riparian-wetland areas, consistent with the Oil and Gas Management Plan for the USACOE Garrison Dam/Lake Sakakawea Project.

Visual Resources: BLM is required to manage for visual resources on BLM owned surface lands. Each RMP contains Visual Resource Management (VRM) requirements and considerations specific for the geographical location to which they apply. VRM practices and standards will be implemented consistent with the respective RMP they are subject to. New oil and gas development would implement, as appropriate for the site, Best Management Practices (BMP's) to maintain visual qualities where possible. This includes, but would not be limited to, proper site selection, reduction of visibility, minimizing disturbance selecting color(s)/color schemes that blend with the background and reclaiming areas that are not in active use. Repetition of form, line, color, and texture when designing projects would reduce contrasts between landscape and development. The application of stipulation CSU 12-56 and Standard Lease Stipulation STD 16-3 would be sufficient at the leasing stage to notify operators that additional measures may be necessary to reduce visual impacts from potential future development (at the APD stage). This provides for the protection and conservation of the visual resources on public lands. BLM visual resource classifications are only applied to BLM surface. For non-federal surface lands where there are federal minerals (commonly referred to as split estate), BLM does not have the authority to manage for VRM.

Recreation: No direct impacts to recreational opportunities would occur as a result of offering leases for sale. The leasing action would be considered in compliance with all relevant recreation regulations, protocols, and policies. Impacts on recreation from potential future exploration and development would be analyzed at the APD stage and included design features, and mitigation would be integrated to avoid or minimize potential impacts to recreation consistent with the RMP for the respective planning area.

Wildlife:

Aquatic Species and Terrestrial Wildlife: The BLM screened parcels for sensitive species and species of concern and applied timing limit, controlled surface use, and no surface occupancy lease stipulations to avoid/minimize impacts to species. BLM applied lease stipulations CSU 12-26, CSU 12-27, CSU 12-29, NSO 11-73, NSO 11-78, DPG NSO 14-1, DPG NSO 14-5, DPG TL 15-1, and DPG TL 15-8 to protect aquatic and terrestrial wildlife in the proposed lease parcels. In addition, the BLM placed various lease notices on parcels that provides notice to a lessee that the BLM may require wildlife surveys at the APD stage, and that protective measures may be necessary. These notices include LN 14-20, LN 14-21, LN 14-37, and LN 14-40. BLM applied lease stipulations COE 18-1, 18-2, 18-3 and 18-4 to protect

wildlife in the proposed lease parcels that are located within the USACOE Lake Sakakawea/Garrison Dam Project. These stipulations require that all development would occur off lease, outside of suitable habitat for sensitive aquatic species. Three parcels, ND-2022-06-0241, ND-2022-06-0545, and ND-2022-06-0242, have been identified by NDFG as lying with the boundary of a Wildlife Management Area. NDFG has recommended that there be no surface occupancy within one mile of the shoreline of Lake Sakakawea and that development should be restricted to existing well pads where possible. The application of the COE lease stipulations, the application of TES 16-2, and additional review during the APD state satisfies the NSO recommendation from the NDGF.

Threatened and Endangered Species: The BLM placed stipulation TES 16-2 (Endangered Species Act Section 7 Consultation) and DPG TES 18a (Threatened, Endangered, and Sensitive Plant or Animal Species Lease Notice) on parcels, which states that 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. Additionally, TES 18a states that a biological evaluation of the leased lands may be required prior to surface disturbance to determine if endangered, threatened, proposed, candidate or sensitive plant or animal species or their habitat are present within the administrative boundaries of the DPG. 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. The BLM completed a screen for threatened and endangered species and habitat presence in proposed parcels and identified applicable stipulations if the species or habitat may be present. Refer to **Table 1** below.

All parcels have been reviewed by the Montana Fish, Wildlife, and Parks and the North Dakota Fish and Game biologists. The BLM has applied additional stipulations in compliance with the recommendations from the state agencies for applicable measures to protect sensitive species. The BLM placed stipulation NSO 11-78 on all applicable parcels to protect federally endangered species pallid sturgeon. In addition, NSO 11-70 prohibits surface occupancy and use in all 100-year floodplains, wetlands, and riparian areas which could provide habitat for Northern long-eared bats and migrating Whooping cranes. NSO 11-75 and NSO 11-76 have been applied to all parcels identified as having habitat for Piping Plover and Least Tern by point observations. CSU 12-29 have been applied to all parcels identified as having the potential for or containing prairie dog habitat or colony.

Table 1. USFWS Listed Species and Habitat occurrence in proposed MT/Dakotas June 2022 Oil and Gas Lease Sale

County/Scientific Name	Common Name	Status	Species Present in Lease Parcels	Suitable Habitat Present	If species and/or habitat are present, identify stipulations that would avoid/minimize impacts to the species.
Richland County, MT					
Scaphirhynchus albus	Pallid Sturgeon	LE	Yes	Yes	NSO 11-78
Charadrius melodus	Piping Plover	LT, CH	Unknown	Unlikely	TES 16-2
Sterna antillarum athalassos	Interior Least Tern	LE	Unknown	Unlikely	TES 16-2
Grus americana	Whooping Crane	LE	Unknown	Unlikely	TES 16-2
Myotis septentrionalis	Northern Long-eared Bat	LT	Unknown	Yes	TES 16-2
Fallon County, MT					
Grus americana	Whooping Crane	LE	No	No	TES 16-2
Myotis septentrionalis	Northern Long-eared Bat	LT	Unknown	Unlikely	TES 16-2
Charadrius melodus	Piping Plover	LT, CH	No	No	TES 16-2
Powder River County, MT					
Grus americana	Whooping Crane	LE	No	Unlikely	NSO, TES 16-2
Myotis septentrionalis	Northern Long-eared Bat	LT	Unknown	Unlikely	NSO, TES 16-2
Scaphirhynchus albus	Pallid Sturgeon	LE	No	No	NSO 11-78
Roosevelt County, MT					
Scaphirhynchus albus	Pallid Sturgeon	LE	Yes	Yes	NSO 11-78
Charadrius melodus	Piping Plover	LT, CH	Unknown	Unlikely	TES 16-2
Sterna antillarum athalassos	Interior Least Tern	LE	Unknown	Unlikely	TES 16-2
Grus americana	Whooping Crane	LE	Unknown	Unlikely	TES 16-2
Myotis septentrionalis	Northern Long-eared Bat	LT	Unknown	Yes	TES 16-2
Mountrail County, ND					
Scaphirhynchus albus	Pallid Sturgeon	LE	No	Yes	TES 16-2, USACOE NSO Stipulations
Charadrius melodus	Piping Plover	LT, CH	No	No	
Calidris canutus rufa	Rufa Red Knot	LT	No	No	
Grus americana	Whooping Crane	LE	No	No	
Myotis septentrionalis	Northern Long-eared Bat	LT	No	No	
Herperia dacotae	Dakota Skipper	LT	No	No	
Williams County, ND					
Scaphirhynchus albus	Pallid Sturgeon	LE	No	No	
Grus americana	Whooping Crane	LE	No	Yes	COA attached to the APD at project level
Charadrius melodus	Piping Plover	LT	No	No	
Calidris canutus rufa	Rufa Red Knot	LT	No	No	
Sterna antillarum athalassos	Interior Least Tern	LE	No	No	
Myotis septentrionalis	Northern Long-eared Bat	LT	No	Unknown	TES 16-2
Scaphirhynchus albus	Pallid Sturgeon	LE	No	No	
McKenzie County, ND					
Scaphirhynchus albus	Pallid Sturgeon	LE	No	No	

Grus americana	Whooping Crane	LE	No	No	COA attached to the APD at project level
Charadrius melodus	Piping Plover	LT	No	No	
Calidris canutus rufa	Rufa Red Knot	LT	No	No	
Myotis septentrionalis	Northern Long-eared Bat	LT	Unknown	Yes	TES 16-2
Sterna antillarum athalassos	Interior Least Tern	LE	No	No	
Herperia dacotae	Dakota Skipper	LT	No	Unknown	TES 16-2
C = Candidate PCH = Proposed Critical Habitat LT = Listed Threatened CH = Designated Critical Habitat LE = Listed Endangered P = Proposed XN = Experimental non-essential population					

2 Alternatives

This EA considers the effects of three alternatives: Alternative A – No Action, and Alternative B – Proposed Action, and Alternative C which defers six parcels due to resource concerns. The Proposed Action is based upon Expressions of Interest (EOIs) that were submitted to the BLM for the June 2022 lease sale.

2.0 Alternative A - No Action Alternative

Under the No Action alternative, none of the EOIs to lease (parcel nominations) would be offered for sale. The No Action Alternative would exclude all parcels from the competitive oil and gas lease sale. No additional natural gas or crude oil would enter the public markets, and no royalties would accrue to the federal or state treasuries from the proposed parcel lands. The No Action Alternative would result in the continuation of the current land and resource uses on the lease parcels and would remain the same as the affected environment described in Chapter 3. Existing Federal leases for oil and gas properties would continue to generate rental income.

2.1 Alternative B - Proposed Action Alternative

The BLM would offer 29 lease parcels encompassing approximately 6849.16 Federal mineral acres as part of a competitive oil and gas lease sale tentatively scheduled to occur on June 2022 in conformance with the existing land use planning decisions. A BLM interdisciplinary team reviewed all the parcels and applied stipulations and lease notices designed to avoid or minimize impacts to resources. These stipulations are summarized below, and detailed in **Appendix A** and **B** of this EA.

- Miles City Field Office: 14 parcels in Fallon, Powder River, Richland, and Roosevelt Counties (6277.03 acres).
- North Dakota Field Office: 1 parcel in Williams County (40 acres).
- Dakota Prairie-Grasslands Administrative Boundary: 2 parcels in McKenzie County (200.8 acres).
- U.S. Army Corps of Engineers: 12 parcels in McKenzie, Mountrail, and Williams Counties (331.33 acres)

<u>No Surface Occupancy Stipulations</u>: BLM placed No Surface Occupancy (NSO) stipulations on all or aliquot portions of parcels to protect Fort Union Historic Site (NSO 11-40), badlands / rock outcrop (NSO 11-69), streams, riparian areas, wetlands and floodplains (NSO 11-33, NSO 11-70), raptor nests (NSO 11-73), pallid sturgeon (NSO 11-78), significant cultural resources/NRHP-eligible properties and districts (NSO 11-84), national historic landmarks/historic battlefields/Lewis and Clark National Historic Trail (NSO 11-88, NSO 11-89). Within the Dakota Prairie-Grasslands administrative boundary, BLM applied NSO stipulations from the DPG Oil and Gas Leasing Decision to protect slopes greater than 40 percent (DPG NSO 14-1), and golden eagle, merlin, and ferruginous hawk nests (DPG NSO 14-5). Refer to **Appendix A** and **B**.

<u>Controlled Surface Use Stipulations</u>: BLM applied CSU stipulations to all or portions of parcels to avoid and/or minimize impacts to riparian areas and wetlands (CSU 12-5, CSU 12-25), air resources (CSU 12-23), sensitive soils (CSU 12-24, CSU 12-59), big game crucial winter range (CSU 12-26), sharp-tailed grouse leks and nesting habitat (CSU 12-27), and black-tailed prairie dogs (CSU 12-29). Within the

Dakota Prairie-Grasslands administrative boundary, BLM applied CSU stipulations from the DPG Oil and Gas Leasing Decision to avoid and/or minimize impacts to paleontological resources (DPG CSU 16-1); water, wetlands, woody draws, riparian areas, and floodplains (DPG CSU 16-2); and high scenic integrity visual resources (DPG CSU 16-6). Refer to **Appendix A** and **B**.

Timing Limitation Stipulations: BLM applied timing limitation (TL) stipulations to all or portions of parcels to protect resources during the time periods when they are most susceptible to impacts from oil and gas activities. Within the Dakota Prairie-Grasslands administrative boundary, BLM applied TL stipulations from the DPG Oil and Gas Leasing Decision to protect sharp-tailed grouse display grounds (DPG TL 15-1) and bighorn sheep habitat (DPG TL 15-8).

Lease Notices: The BLM applied lease notices to the parcels to notify lessees of additional inventory, protection and avoidance requirements for existing/prior land use authorizations (LN 14-1), cultural resources (LN 14-2, LN 14-14, LN 14-33), paleontological resources (LN 14-3, LN 14-12, LN 14-29), greater sage-grouse (LN 14-11, LN 14-37), air resources (LN 14-18), migratory birds (LN 14-20), black-footed ferrets (LN 14-21), setback from occupied residences (LN 14-23), big game (LN 14-40), and special status species (TES 16-2). Within the Dakota Prairie-Grasslands administrative boundary, BLM applied lease notices to the parcels to notify lessees of additional inventory, protection and avoidance requirements for cultural/paleontological resources and floodplains/wetlands (DPG 13d), and special status species (DPG TES 18a, DPG LN 19a). Refer to **Appendix A** and **B**.

Based upon calculations made in the Reasonably Foreseeable Development Scenarios, the BLM estimates that 2-4 new oil wells and 3-4 new gas wells could be drilled in the Miles City Field Office, and one new oil well could be drilled from one new well pad in the North Dakota Field Office from this lease sale. Refer to **Appendix D.**

2.2 Alternative C – Deferral of Six Parcels

Alternative C would be similar to Alternative B, with the following exceptions:

Under Alternative C:

- No parcels located within or adjacent to the migratory corridor for pronghorn would be offered for lease. These parcels would be deferred until the Miles City Field Office RMP is amended to include a lease stipulation that would mitigate impacts to pronghorn crucial winter range and migratory corridors from activities associated with oil and gas development. There is not currently a lease stipulation available that could be applied to these parcels that would adequately mitigate impacts to pronghorn.

- Parcels MT-2022-06-0247, -0249, -0250, -0251, -0252 and -0253, all located within or adjacent to the pronghorn migratory corridor, would not be offered for lease (3,443.36 acres).

- 23 parcels encompassing approximately 3,405.8 Federal mineral acres would be offered for lease in Montana and North Dakota.

Table 2. Alternative C: Parcels by County, Public Domain & Acquired Lands, Development Potential, and Estimated Surface Disturbance[1]

County	Alternative C			Development Potential	Est. # wells	Est. Acres of Surface Disturbance (short / long term)
	# Parcels	BLM Surface	Non-Federal Surface (Split Estate)			
Miles City Field Office						
Fallon	1	161.91	0.00	7-high 1-medium	1 oil 1-2 gas	2.625 – 5.25 ST 0.975 – 1.95 LT
Powder River	5	153.4	2500.61			
Richland	1	0.00	12.40			
Roosevelt	1	5.35	0.00			
Total	**8**	**320.66**	**2513.01**			
		2,833.67				
North Dakota Field Office						
McKenzie	9	0.00	233.97	7-very high 8-high	1	7.1 ST 3.25 LT
Williams	3	0.00	251.07			
Mountrail	3	0.00	87.09			
Total	**15**	**0.00**	**572.13**			
		572.13				
Grand Total	**23**	**320.66**	**3085.14**		**3 - 5**	**9.73 – 12.35 ST** **4.23 – 5.2 LT**
		3405.8				

[1] Total number of wells estimated based on the RFD and rounded to the nearest whole number

2.3 Alternatives Considered but not Analyzed in Detail

NEPA requires the BLM to consider a reasonable range of alternatives to the proposed action. In this EA, the BLM considers two action alternatives in addition to No Action. The alternatives would lease, or not lease parcels based upon specific resource concerns identified during analysis related to big game. The BLM received scoping comments asking for alternatives that did not fall within the range of alternatives already analyzed in the EA, including:

- Defer all parcels in North Dakota that involve the bed of Lake Sakakawea and the bed of the Missouri River. The commentor states that North Dakota owns the bed of the river and at least some of the tracts on the preliminary parcel list overlap the state-owned riverbed.

The Branch of Cadastral Survey has analyzed the parcels on the sale list and identified 12 parcels out of 29 that have an overlapping claim by the state of North Dakota. The 12 parcels aggregate 331.33 acres of Public Domain minerals according to official BLM plats created after 2015, whereby 231.5 acres are in conflict with a North Dakota claim of ownership. The BLM received a favorable ruling by the IBLA upholding the federal source of law for the BLM plats and has also received a partial summary judgement for the plats of Public Domain affirming that state law had adopted the BLM plats. Because both rulings have affirmed the BLM plats for Public Domain, we are going forward offering these parcels for lease.

- An alternative that imposes a minimum bonus bid higher than $2.00 per acre

BLM must comply with existing statutory and policy requirements with respect to lease sales. As the comments note, 43 C.F.R. § 3120.1-2 (c) provides that the national minimum acceptable bid shall be $2 per acre or fraction thereof on the payable on the gross acreage and shall not be prorated for any lands in which the United States owns a fractional interest. BLM is implementing the current regulations regarding minimum bids, which can be updated.

- An alternative that defers offering the proposed lease parcels for sale until at least 50% of all leased federal oil and gas acres in each of the state for which a June 2022 sale is proposed are put into production

The BLM has evaluated a reasonable range of alternatives to inform its decisions as to which parcels should be available for leasing based on proximity to existing development, potential for development and other resource conflicts.

- An Alternative that analyzes and applies best available methane reduction technologies as a stipulation attached to all parcels in the lease sale

Lease Notice 14-18 is applied to every BLM-administered parcel, which provides: The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

2.3.1 General Information and Appendices

Appendix A provides a list of all the parcels by parcel number, and identifies the size, legal descriptions, and associated stipulations. **Appendix B** provides a description of Lease Stipulations and **Appendix C** identifies the location of each parcel.

Table 3 identifies the number of parcels that would be offered by field office and county, acres of federal minerals (public domain or acquired lands) and summarizes development potential and estimated acres of surface disturbance based upon a sale specific Reasonably Foreseeable Development (RFD) scenario (see **Appendix D**).

The terms and conditions of the standard federal lease and federal regulations would apply to the parcels offered for sale in the Proposed Action. Stipulations shown in **Appendix A** would be included with the identified parcel offered for sale. Standard operating procedures for oil and gas development include measures to protect the environment and resources such as groundwater, air, wildlife, cultural resource concerns, and others specified in the respective RMP for each planning area.

Lease stipulations would be attached to the parcels to address site specific concerns or new information not previously identified in the land use planning process. Once sold, the lease purchaser would have the right to use as much of the leased lands as is reasonably necessary to explore and drill for all the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101.1-4).

Conditions of Approval (COAs) would be attached to permits issued to explore and develop the parcels to address site specific concerns or new information once an APD is analyzed in future NEPA documents.

Standard operating procedures, best management practices (BMPs), and COAs can change over time to meet RMP objectives, resource needs or land use compatibility.

A Federal oil and gas lease would be issued for a 10-year period and would remain valid for as long thereafter as oil or gas is produced in paying quantities, required payments are made and lease operations are conducted in compliance with regulations and approved permits. If a lessee fails to produce oil and gas by the end of the initial 10-year period, does not make annual rental payments, or does not comply

with the terms and conditions of the lease, the BLM will terminate the lease. The lessee can relinquish the lease. The oil and gas resources could be offered for sale at a future lease sale.

Drilling of wells on a lease would not be permitted until the lessee or operator secures approval of a drilling permit and a surface use plan as specified in 43 CFR 3162. This requires additional environmental reviews, by the BLM, at the time of application.

For the split-estate lease parcels, the BLM would provide courtesy notification to private landowners that the Federal oil and gas estate under their surface will be included in this lease sale. Prior to approval of the APD, (or Sundry Notice to conduct new surface disturbing activities), the operator must certify as part of the complete application that it has made a good faith effort to reach an agreement with the private surface owner. If the surface owner and operator fail to reach an agreement, the operator must file a bond (determined by BLM, minimum of $1,000) with BLM for the benefit of the surface owner to cover compensation for reasonable and foreseeable loss of crops and damages to tangible improvements. The BLM will advise the surface owner of appeal rights and will review the value of the bond if the surface owner appeals.

Upon cessation of lease operations, 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.

Table 3. June 2022 Lease Sale: Parcels by County, Public Domain & Acquired Lands, Development Potential, and Estimated Surface Disturbance[1]

County	Alternative B			Development Potential	Est. # wells	Est. Acres of Surface Disturbance (short / long term)
	# Parcels	BLM Surface	Non-Federal Surface (Split Estate)			
Miles City Field Office						
Fallon	1	161.91	0.00	13-high 1-medium	2-4 oil 3-4 gas	15.80-18.4 ST 5.85 – 6.83 LT
Powder River	11	1067.53	5029.84			
Richland	1	0.00	12.40			
Roosevelt	1	5.35	0.00			
Total	**14**	**1234.79**	**5042.24**			
		6277.03				
North Dakota Field Office						
McKenzie	9	0.00	233.97	7-very high 8-high	1	7.1 ST 3.25 LT
Williams	3	0.00	251.07			
Mountrail	3	0.00	87.09			
Total	**15**	**0.00**	**572.13**			
		572.13				
Grand Total	**29**	**1234.79**	**5614.37**		**6-8**	**22.9 – 25.5 ST** **9.1 – 10.08 LT**
		6,849.16				

[1] Total number of wells estimated based on the RFD and rounded to the nearest whole number

3 Affected Environment and Environmental Consequences

This chapter describes the affected environment (i.e., the physical, biological, and socioeconomic values and resources) and environmental consequences to resources that could be affected by implementation of the proposed action. This analysis is tiered to the respective RMP for each geographic location of the nominated parcels, and the analysis of the reasonably foreseeable effects of oil and gas development contained in those RMPs are incorporated by reference into this analysis.

Each RMP determined which areas are available for oil and gas leasing and under what conditions those leases would be offered and sold. All the lease parcels included in the proposed action are within areas that are open to oil and gas leasing in their respective RMP.

The act of leasing parcels would not cause direct effects to resources because no surface disturbance would occur. The only direct effects of leasing are the creation of valid existing rights and impacts related to revenue generated by the lease sale receipts.

Future lease exploration and development activities proposed through individual APD submission would be subject to future BLM decision-making and NEPA analysis. Upon receipt of an Application for a Permit to Drill (APD), the BLM would initiate a site-specific NEPA analysis that considers the reasonably foreseeable effects of a specific action. At that time, detailed information about proposed wells and facilities would be provided for particular leases. In all potential exploration and development scenarios, the BLM would require the use of BMPs documented in "Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development" (USDOI 2007), also known as the *Gold Book*, available online at https://www.blm.gov/programs/energy-and-minerals/oil-and- gas/operations-and-production/the-gold-book. The BLM could also identify Conditions of Approval (COAs), based on site-specific analysis that could include moving the well location, restrict timing of the project, or require other reasonable measures to minimize adverse impacts (43 CFR 3101.1-2 Surface use rights; Lease Form 3100-11, Section 6) to protect sensitive resources, and to ensure compliance with laws, regulations, and land use plans.

BLM resource specialists prepared this EA to document the analysis of the lease parcels and recommended appropriate stipulations based upon professional knowledge of the areas involved, review of current databases, scientific literature, and file information. The analysis focuses on the resource impact indicator(s) identified for each resource issue in Chapter 1.

At the time of this review, it is unknown whether or not a particular parcel will be sold, and a lease issued. It is also unknown when, where, or if future well sites, roads, and facilities might be proposed. Therefore, the types, magnitude and duration of potential impacts cannot be precisely quantified at this time and would vary according to many factors.

The BLM analyzed potential impacts from oil and gas development in the Final Environmental Impact Statement (FEIS) for each of the applicable ARMPs based upon potential well densities discerned from the Reasonably Foreseeable Development (RFD) Scenario developed for each Field Office. The BLM utilized information from the RFD in the ARMP to estimate the number of possible oil and gas wells that could be drilled and produced on parcels in the June 2022 sale. The sale specific RFD was used to analyze effects of the proposed action. Refer to **Appendix D** for a detailed description of the sale specific RFD.

3.0 General Setting

The analysis area varies by resource, and generally includes the 29 lease parcels of Federal minerals for oil and gas leasing, covering approximately 6,849.16 Federal mineral acres in Fallon, Powder River,

Richland, and Roosevelt Counties in Montana, McKenzie, Mountrail, and Williams Counties in North Dakota, as well as a larger area around the parcels to capture all reasonably foreseeable effects. The temporal scale of effects includes the 10-year period of a lease term, unless the lease is held by production, in which case the temporal scale is extended to the life of the producing well. If the lease parcels are developed, short-term impacts would be stabilized or mitigated rapidly (within two to five years). Long-term impacts are those that would substantially remain for more than five years.

3.0.1 Geologic Formations

Powder River Basin

Eleven parcels are located in Powder River County, Montana. They are on the eastern edge of Powder River Basin roughly 8 miles to the west and parallel to Bell Creek Field. They are surrounded by numerous conventional dry holes and a handful of successful oil fields dating back to the 1960's.

Major Fields in Powder River County include Leary Field, Wright Creek Field, and Bell Creek Field, all of which produce from the Muddy Formation; Rumph Field, which produces from the Minnelusa Formation; and the Ute Field (WY), which produces from the Muddy and Minnelusa Formations. These fields are conventional stratigraphic or structural traps that were developed with vertical wells in the 1960's. Recently in the past 10 years, the majority of activity has been optimizing secondary recovery methods (water flooding) and testing tertiary recovery (CO_2 flooding).

Williston Basin/Cedar Creek Anticline

Roosevelt County in Montana and McKenzie, Mountrail, and Williams Counties in North Dakota contain 18 parcels that are within the Williston Basin unconventional Bakken/Three Forks development area. Fallon County, Montana, contains one parcel that is on the eastern flank of the Cedar Creek anticline. The Cedar Creek Anticline has seen continual development since gas was discovered in 1912 and oil discovered deeper in 1951. Recent activity within the past 10 years has focused on oil development with the use of horizontal wells. The Williston Basin parcels are surrounded by horizontal Bakken/Three Forks development wells which have also been predominantly drilled in the past 10 years. The Bakken/Three Forks is a true unconventional reservoir where the wells target organic rich shale intervals. The Cedar Creek Anticline area produces from intercrystalline porosity within the different dolomite formations. Both the Bakken/Three Forks intervals within the Williston Basin and also the Red River interval in the Cedar Creek Anticline is at similar depths and have been developed with horizontal wells.

3.1 Methodology and Assumptions

Analysis of issues brought forward in this assessment was completed using reasonably foreseeable development (RFD) scenarios created for the proposed lease parcels. RFD scenarios for the proposed lease parcels were developed using the Minerals Appendices from the RMPs for the respective field offices. The RMPs contain the number of potential oil and gas wells that could be drilled and produced in each field office area, and this was used to analyze the potential number of wells drilled for the nominated lease parcels. These well numbers are only an estimate based on historical drilling, geologic data, resource expertise, and current development in the area.

3.2 Issue 1 – Air Resources

3.2.1 Affected Environment

The Environmental Protection Agency (EPA) uses an Air Quality Control Region, a metropolitan area or a county as the geographic area designated as meeting or not meeting National Ambient Air Quality

Standards (NAAQS). A 50 km (31.1 miles) radius around a proposed action is often used for regulatory compliance because this distance is the air dispersion modeling limit for American Meteorological Society / EPA Regulatory Model (AERMOD), a near-field regulatory model that is used to predict compliance with the NAAQS. However, for activities with intermittent and short-term emissions, the radius of effects could be lower than 50 km. For air quality the effects analysis area is considered at a 50 km (31.1 miles) radius beyond the proposed lease parcels.

The EPA has the primary responsibility for regulating air quality, including six nationally regulated ambient air pollutants including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb). EPA has established NAAQS for criteria pollutants (EPA, 2019b). The NAAQS are protective of human health and the environment. Compliance with the NAAQS is typically demonstrated by monitoring for ground-level atmospheric air pollutant concentrations. Areas where pollutant concentrations are below the NAAQS are designated as attainment or unclassifiable, and air quality is generally considered to be good. Locations where monitored pollutant concentrations are higher than the NAAQS are designated nonattainment, and air quality is considered unhealthy.

The EPA has delegated air quality monitoring, permitting and regulation activities under the Clean Air Act (CAA) to individual states. Tribal governments have the authority to develop and implement air quality programs through the Tribal Authority Rule under the provisions of CAA. In Montana, the Department of Environmental Quality (MT DEQ) adopted the NAAQS, conducts ambient air quality monitoring, and develops permitting and registration requirements as well as implementing emission standards for equipment involved in oil and gas development (MT DEQ, 2019). In North Dakota, the Department of Environmental Quality (ND DEQ) Division of Air Quality (ND DoAQ) maintains federal delegation of responsibility for EPA programs, protecting North Dakota's air quality and other regulatory responsibilities under the CAA (ND DoAQ, 2020). Both ND DoAQ and MT DEQ have developed a network of ambient monitoring sites to assess NAAQS compliance.

Air pollutant concentrations are reported using design values. A design value is a statistic that describes the air quality status of a given location relative to the level of the NAAQS. Design values are used to designate and classify nonattainment areas, as well as to assess progress towards meeting the NAAQS. Design values that are representative for the airshed where parcels are located are provided in **Table 4**. Counties without monitoring stations that can be used to establish a design value have an unclassifiable attainment status and are assumed to have good air quality and pollutant concentrations below the NAAQS. All lease parcels are in areas that are designated attainment or unclassifiable for each NAAQS.

Table 4. 2017 to 2019 Criteria Pollutant Design Values

Pollutant	Location	Averaging Time	Concentration	NAAQS	% of NAAQS
PM2.5 (µg/m3)	Powder River, MT	Annual	7	12	56%
PM2.5 (µg/m3)	Richland, MT	Annual	5	12	40%
PM2.5 (µg/m3)	McKenzie, ND	Annual	4.1	12	34%
PM2.5 (µg/m3)	Powder River, MT	24-hour	23	35	66%
PM2.5 (µg/m3)	Richland, MT	24-hour	15	35	43%
PM2.5 (µg/m3)	McKenzie, ND	24-hour	15	35	43%
O3 (ppm)	Richland, MT	8-hour	0.058	0.070	83%
O3 (ppm)	McKenzie, ND	8-hour	0.057	0.070	81%
NO2 (ppb)	Powder River, MT	Annual	5	53	9%
NO2 (ppb)	Richland, MT	Annual	1	53	2%
NO2 (ppb)	McKenzie, ND	Annual	1	53	2%
NO2 (ppb)	Richland, MT	1-hour	11	100	11%
NO2 (ppb)	McKenzie, ND	1-hour	10	100	10%
SO2 (ppb)	Richland, MT	1-hour	7	75	9%
SO2 (ppb)	McKenzie, ND	1-hour	5	75	7%
SO2 (ppb)	Williams, ND	1-hour	14	75	19%
Source: EPA Design Values https://www.epa.gov/air-trends/air-quality-design-values (accessed 9/30/2021)					

Oil and gas development and associated construction and production activities can result in emissions that can affect ambient concentrations of PM_{10}, $PM_{2.5}$, O_3, CO, NO_x, and in some fields, release H_2S and SO_2. Although no Federal Ambient Air Quality Standards exists for H_2S, the state of North Dakota has developed H_2S standards in response to historically high petroleum sulfur content (during the 1980s in particular) and associated high H_2S. Emissions of H_2S have reduced substantially over time as production from these older sites has declined. The Bakken formation, the focus of the most recent oil and gas activity in the state, has been found to result in very low H_2S emissions when compared to legacy (non-Bakken) operations (ND DoAQ, 2019). The CAP SO_2 is released when gas containing H_2S is combusted. Under the CAA, the EPA also regulates emissions of hazardous air pollutants (HAPs), also referred to as federal air toxics, that are suspected to cause **cancer** or other serious health effects. The EPA's current list includes 187 HAPs. The emissions of HAPs are regulated by industrial source categories that must install emissions control equipment. The EPA is required to develop regulations for all industries that emit one or more HAPs in substantial quantities (EPA 2020a).

HAPs are also released from oil and gas operations, including well drilling, well completion, and venting. New equipment emissions standards such as Maximum Achievable Control Technologies (MACT) and New Source Performance Standards (NSPS) are used to control HAPs' emissions. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethyl benzene, isomers of xylene (BTEX) compounds, and normal-hexane (n-hexane). The EPA National Toxics Assessment tool cab be used to evaluate impacts from existing HAP emissions across the nation. In Montana and North Dakota, the total cancer risk is within the acceptable range of risk (100 in 1 million as identified in 40 CFR § 300.430). The noncancer respiratory hazard index for Montana and North Dakota is below 1.0, indicating that it is unlikely that air toxics will cause adverse noncancer health effects over a lifetime of exposure.

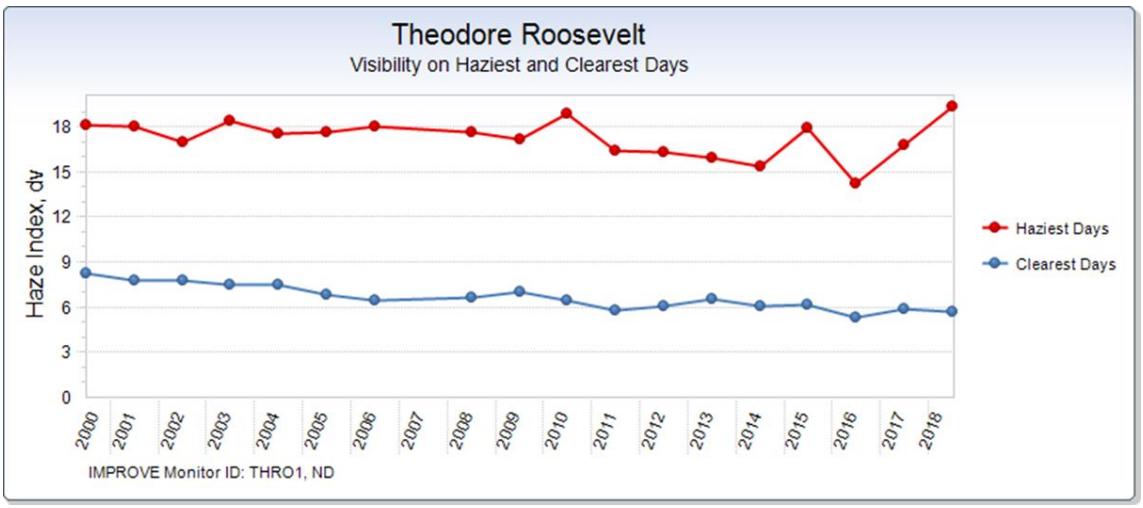
The parcels in this lease sale are located within Prevention of Significant Deterioration (PSD) Class II areas and some are near (within 50 km) of Class I areas (Theodore Roosevelt National Park and Medicine Lake Wilderness Area). The CAA PSD requirements give more stringent air quality and visibility protection to national parks and national wilderness that are designated as Class I areas, but PSD does not prevent emission increases. Federal Land Managers are responsible for defining specific Air Quality

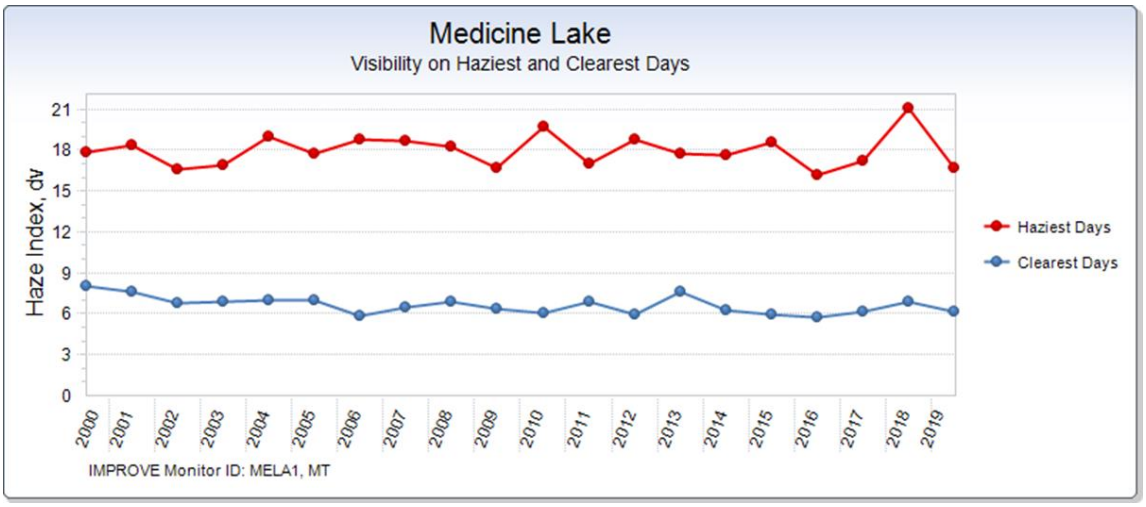
Related Values (AQRVs), including visual air quality (haze), and acid (nitrogen and sulfur) deposition, for an area and for establishing the criteria to determine and adverse impact on the AQRVs. AQRVs do not have threshold standards, but Federal land managers have identified levels of concern.

Atmospheric visibility is a measure of how far and how well an observer can see a distant and varied scene. The visual range is the greatest distance in miles that a person can see a large dark object viewed against the horizon sky. Light extinction or attenuation is a nonlinear measure of visibility and occurs in the atmosphere as a result of scattering and absorption. Pollutants from natural and anthropogenic sources contribute to haze by scattering and absorbing light. A deciview (dv) is a unit of measurement used to quantify human perception of visibility. It is calculated from the natural logarithm of atmospheric light extinction. One (1) deciview is roughly the smallest change in visibility (haze) that is barely perceptible. Because visibility at any one location is highly variable seasonally throughout the year, it is characterized by three groupings: the clearest 20% days, average 20% days, and haziest 20% days.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) program has collected visibility data at the Theodore Roosevelt National Park (TRNP) and Medicine Lake Wilderness Area **(Figure 1**) (Federal Land Manager Environmental Database, 2020). Average visual range is 60 to 90 miles (100 to 150 kilometers) in many Class I areas in the western United States, equivalent to 13.6 to 9.6 deciview (dv), or about 50 to 70 percent of the visual range that would exist without anthropogenic air pollution from stationary and mobile sources (64 Fed. Reg. 35714). From 2000 to 2018, visibility data at TRNP has shown an improving trend for the clearest and haziest days. At Medicine Lake the visibility data shows an improving trend for the clearest days and no meaningful trend for the haziest days. The measurement at IMPROVE sites in the region show that improvements in visibility, since the first decade of the twenty-first century, by approximately 1 dv for the haziest days and 2 dv for the clearest days.

Figure 1. Visibility Trends at TRNP-SU, North Dakota





Visibility Trend Source: Federal Land Manager Environmental Database, 2020

Atmospheric deposition occurs when gaseous and particulate air pollutants are deposited on the ground, water bodies or vegetation. The pollutants may settle as dust or get washed from the atmosphere in rain, fog, or snow. When air pollutants such as sulfur and nitrogen are deposited into ecosystems, they may cause acidification, or enrichment of soils and surface waters. Atmospheric nitrogen and sulfur deposition may affect water chemistry, resulting in impacts to aquatic vegetation, invertebrate communities, amphibians, and fish. Deposition can also cause chemical changes in soils that alter soil microorganisms, plants, and trees. Although nitrogen is an essential plant nutrient, excess nitrogen from atmospheric deposition can stress ecosystems by favoring some plant species and inhibiting the growth of others. Information on wet and dry deposition at Class I areas within the analysis area can be found at EPA's Clean Air Status and Trends Network monitoring program at https://www.epa.gov/castnet/castnet-site-locations.

In addition to oil and gas emissions sources, air quality and AQRVs are influenced by industrial sources, motor vehicles, agricultural practices, long-range transport, and natural sources such as wildfire smoke. Oil and gas processing and refining facilities are permitted by local, state, tribal and federal environmental agencies and report their pollutant emission inventories annually to the EPA. Additionally, each proposed new and modified emission facility is required to demonstrate NAAQS compliance with modeling or monitoring. The compliance requirements and air monitoring network throughout Montana and North Dakota by MT DEQ and ND DoAQ ensure that an area remains in NAAQS compliance.

The criteria pollutant emissions from the end use of oil and gas, including from this lease sale, would be in the EPA's National Emission Inventory. Projections of regional air quality resulting from oil and gas development on BLM lands is well documented in several BLM reports. Air quality projections from potential oil and gas development have also been analyzed in several analyses, including the Air Resource Management Plan, the 2008 *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Amendment of the Powder River and Billings Resource Management Plans,* and the *Montana/Dakotas State Office PGM Modeling Study Air Resource Impact Assessment – Final report* (BLM 2016).

The Miles City Field Office (MCFO) Air Resource Management Plan evaluated near field impacts to air quality from oil and gas development as well as projections of visibility within the region. This air emissions analysis resulted in the inclusion of the *Appendix I - Miles City Field Office Air Resource Management Plan: Adaptive Management Strategy for Oil and Gas Resources*. The adaptive management strategy focuses on oil and gas activity because aggregated emissions from multiple small sources at well

sites were shown to potentially cause air quality and AQRV impacts under certain circumstances. BLM's Best Management Practices in Air Resources Environmental Effects section of this EA lists the methods used to reduce air pollution.

The BLM conducted a photochemical grid modeling (PGM) study according to commitments outlined in the MCFO Air Resource Management Plan to assess regional impacts to air quality from future oil and gas development. The results are incorporated by reference from the *Montana/Dakotas State Office PGM Modeling Study Air Resource Impact Assessment – Final report* (Montana/Dakotas Photochemical Grid Modeling Study (DOI-BLM-MT-0000-2018-0004-OTHER_NEPA). The PGM study evaluated potential air quality AQRV impacts due to future oil and gas activity on BLM-MT/DK administered mineral estate in Montana, North Dakota, and South Dakota.

The results of the PGM Study are applicable to this EA as the development potential for the proposed lease sale was included within the reasonably foreseeable development (RFD) scenarios analyzed in the PGM study. The results show that none of the modeling (emissions and impact) scenarios yielded values in excess of the NAAQS or state ambient air quality standards for O_3, $PM_{2.5}$, PM_{10}, SO_2, NO_2 or CO and impacts to air quality and public health are expected to be minimal in future years at the predicted rate of oil and gas development across the region. However, the modeling study predicted impacts to air quality related values at Class I areas in eastern Montana and western North Dakota. A portion of the predicted impacts to visibility can be attributed to future federal oil and gas development and are predicted to be in excess of 0.5 and 1.0 dv thresholds at the Theodore Roosevelt, Fort Peck and Medicine Lake Class I areas. The modeling study also predicted the potential for small impacts due to atmospheric deposition of nitrogen compounds in the same region. As mentioned previously observations have shown an improving trend to visibility at Class I areas in Montana and North Dakota. The National Park Service (NPS, 2021) evaluated deposition conditions at Theodore Roosevelt with nitrogen deposition being fair (2.3 kilograms per hectare per year (kg/ha/yr)) with a degrading trend, and sulfur deposition as good (0.7 kg/ha/yr) with an unchanging trend.

3.2.2 Environmental Effects —No Action Alternative

Under the No Action Alternative, there would be no impact on air resources and greenhouse gas emissions compared to the proposed action. If the parcels are not available to be leased and potential development on the proposed parcels would not occur, then no increase in estimated emissions would be expected from potential oil and gas development. The No Action Alternative would result in the continuation of already-approved land uses and would not result in new impacts related to exploration of the proposed oil and gas lease parcels.

3.2.3 Environmental Effects—Proposed Action Alternative

Any potential effects to air quality from the sale of lease parcels would occur at such time that any issued leases are developed. Please note, this proposed action does not authorize or guarantee the number of wells analyzed herein. If leased, drilling of wells on a lease would not be permitted until the BLM approves an Application for Permit to Drill (APD). Any APDs received would be subject to site specific NEPA review. However, development assumptions have been made in this EA to inform the decision since an issued lease must be developed to keep it from expiring.

It is important to note that at the leasing stage, there is a degree of speculation and uncertainty about the amount of air pollutant emissions (including GHGs) that could occur since specific design details are not known. The type of petroleum product, depth of geologic play, drilling and completion methodology, equipment and vehicle make, model, engine size, project acreage, and construction plans are among several variables required to generate meaningful emissions estimates. These factors determine the concentration, duration, and characteristics of associated pollutants. Therefore, the BLM may conduct

additional analysis for air quality impacts at the APD stage if development is proposed in the future on any of the lease parcels offered in this sale.

The analysis of air resources in this EA includes a discussion of short-term and long-term impact to air quality from potential oil and gas development on the lease parcels. Short-term impacts would occur from the construction of the well, well pad, access roads, pipeline, and from other single occurrence activities. Long-term impacts would result from reoccurring operational activities if a well goes into production.

During well development, there could be emissions from earth-moving equipment, vehicle traffic, drilling, and completion activities. NO_2, $PM_{2.5}$, SO_2, and CO would be emitted from vehicle tailpipes. Fugitive dust concentrations would increase with additional vehicle traffic on unpaved roads and from wind erosion in areas of soil disturbance. Drill rig and fracturing engine operations would result mainly in NO_2 and CO emissions, with lesser amounts of SO_2. These temporary emissions would be short-term during the drilling and completion phases.

During well production there could be continuous emissions from separators, condensate storage tanks, and daily tailpipe and fugitive dust emissions from operations traffic. During the operational phase of a well, NO_2, CO, VOC, and HAP emissions would result from the long-term use of storage tanks, pumps, separators, and other equipment. Additionally, road dust (PM_{10} and $PM_{2.5}$) would be produced by vehicles servicing the wells.

The effects from oil and gas development on air resources were analyzed in the MCFO RMP/SEIS. This EA refers to the MCFO RMP air analysis as the emissions analyzed are representative of the proposed parcels and the conditions, assumptions, and methodology, and environmental effects described in the RMP air analysis are still valid. The MCFO 2019 Final SEIS/RMPA was prepared in response to a United States District Court, District of Montana opinion and order (Western Organization of Resource Councils, et al. V. BLM).

Air quality within a short distance from construction, drilling and completion activities would be temporarily affected by increased dust levels, exhaust gas emissions from rigs and vehicle engines, and other activities related to the surface disturbance prior to drilling, and during the drilling/completion of the gas wells. Flaring or venting of produced gas may be necessary during drilling, completion, and testing operations and would be conducted in compliance with BLM and state requirements.

Potential emissions of PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOC and HAPs are given in **Table 5** and **Table 6.** The construction and production emissions are listed separately in the emission tables. The construction process is short-term and would be completed within a few months after initiation and emissions would be intermittent. The production and maintenance emissions occur throughout the life of the well. Calculations are based on typical development and production scenarios as estimated for the MCFO RMP air analysis. The calculations for pollutant emissions use the number of wells that may be developed within 10 years if the parcels were leased. EPA specified Tier 4 engine emission factors are used due to previous near field air emissions modeling using AERMOD indicating potential exceedance of the 1-hour NO_2 NAAQS, but non-Tier 4 engines could be used if current NO_x to NO_2 conversion factors and modeling demonstrate compliance with the NO_2 NAAQS.

Table 5. Estimated Air Pollutant Emissions from Well Development and Production

Activity	# of Wells [1]		PM_{10}		$PM_{2.5}$		NOx[4]		SO_2	
	Oil	Gas	Emission Factor[2] (tons/well)	Estimated Emissions (tons)	Emission Factor[2] (tons/well)	Estimated Emissions (tons)	Emission Factor[2] (tons/well)	Estimated Emissions (tons)	Emission Factor[2] (tons/well)	Estimated Emissions (tons)
Miles City Field Office										
Construction (short-term)	3		0.51	1.53	0.06	0.18	0.53	1.60	0.11	0.32
Operations & Maintenance per year (long-term)	3		0.08	0.25	0.03	0.09	0.50	1.50	0.0005	0.0015
Construction (short-term)		4	0.21	0.82	0.03	0.12	0.17	0.68	0.0030	0.01
Operations & Maintenance per year (long-term)		4	0.02	0.09	0.01	0.04	0.22	0.86	0.0003	0.0012
North Dakota Field Office										
Construction (short-term)	1		0.51	0.51	0.06	0.06	0.53	0.53	0.11	0.11
Operations (long-term)	1		0.08	0.08	0.03	0.03	0.50	0.50	0.0005	0.0005
Total Estimated Emissions:				**3.29**		**0.52**		**5.68**		**0.44**

Table 6. Estimated Air Pollutant Emissions from Well Development and Production (cont.)

Activity	# of wells [1]		CO		VOC		HAPs	
	oil	gas	Emission Factor[2] (tons/well)	Estimated Emissions (tons)	Emission Factor[2] (tons/well)	Estimated Emissions (tons)	Emission Factor[2] (tons/well)	Estimated Emissions (tons)
Miles City Field Office								
Construction (short-term)	3		2.76	8.27	0.36	1.07	0.03	0.10
Operations & Maintenance per year (long-term)	3		1.00	3.00	0.95	2.85	0.08	0.24
Construction (short-term)		4	1.23	4.92	0.07	0.27	0.01	0.03
Operations & Maintenance per year (long-term)		4	0.47	1.87	0.15	0.60	0.01	0.06
North Dakota Field Office								
Construction (short-term)	1		2.76	2.76	0.36	0.36	0.03	0.03
Operations (long-term)	1		1.00	1.00	0.95	0.95	0.08	0.08
Total Estimated Emissions:				**21.82**		**6.09**		**0.53**

3.2.4 Environmental Effects—Alternative C

Under Alternative C, six parcels in the Miles City Field Office would not be offered. The estimated number of wells for Alternative C would be two wells (1 oil and 1 gas) in the Miles City Field Office, and one well in the North Dakota Field Office. Emissions of criteria pollutants, HAPs, and GHG's would be approximately 55% lower than emissions under Alternative B. Effects on air resources would be essentially the same or slightly less than those discussed for Alternative B. Potential impacts to air quality are discussed further under Alternative B and.

3.2.5 Reasonably Foreseeable Actions

It should be noted that the Montana and Dakotas PGM modeling study mentioned in the affected environment analyzed potential impacts from all reasonably foreseeable oil and gas development within the region over a 20-year period. These leases are not expected to occur contemporaneously and are not located near each other. The lease sale would represent only a small fraction of the potential development that was included in the PGM modeling study and would be expected to have little to no impact on air quality, visibility, or atmospheric deposition. Additional detailed information on estimated air pollutant emissions can be found in the Air Resource Technical Support Document (ARTSD) for Emission Inventories, Near-Field Modeling, and Visibility Screening, October 2014.

Emissions from oil and gas development have the potential to impact visibility in Class I areas. The MCFO RMP assessed visibility impacts from the exhaust from drill rig engines on Class I areas located approximately 1 km away. Predicted impacts on color difference and contrast were less than thresholds used to identify impacts. The MCFO RMP further analyzed far-field visibility impacts on Class I areas using the CALPUFF model. The CALPUFF predicted visibility impacts are estimated to be below 0.5 change in deciviews (Δdv) at each Class I and Class II area analyzed. This threshold is included in guidance developed by the National Park Service, US Forest Service, and the FWS (FLAG 2010). At each receptor and for each year, zero days are predicted to occur when the 98th percentile change in deciviews would equal or exceed 0.5. Predicted impacts were 9-26 percent of the 0.5 threshold, much below the requirement for further analysis. Based on the results of the MCFO RMP modeling, oil and gas development is not considered to directly contribute to regional haze or result in visibility impairment. At the APD stage when site specific information is known, such as well pad location and construction equipment specifications, impacts can be further analyzed and mitigated if necessary.

3.2.6 Mitigation of Impacts

BLM Best Management Practices (BMPs)

The BLM encourages industry to incorporate and implement BMPs to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. In addition, Lease Notice LN 14-18 would be applied to all parcels included in this proposed lease sale for conservation of air resources. The lease notice states, "*The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the NEPA, FLPMA, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.*"

If additional analysis shows impacts, additional control measures may include:

- Use of a Tier 4 non-road diesel engine that meets EPA NO_x emission standards or equivalent for each diesel-fueled non-road engine with greater than 200 horsepower design rating to be used during drilling or completion activities;
- Reduction in fugitive dust from roads and construction areas by using water, dust suppressants, surfacing, and other means;
- Developing strategies to minimize or eliminate venting using the most efficient means possible, using low or no bleed pneumatics, and promoting instrument air driven equipment, or equipment that is actuated by other means;
- Using intelligent design and siting of dehydrators so that the number of distributed dehydrators can be reduced, and larger more efficient dehydrators can be used and promote designs that consider cost effective controls for dehydrator vents; and
- Capturing beneficial use or destruction of separated gas from the oil/condensate/produced water streams.

One or more of the following measures could be imposed at the development/APD stage if additional analysis showed the potential for significant impacts to air quality:

- Emission control equipment with minimum 95 percent volatile organic compound (VOC) control efficiency on petroleum storage tank batteries;
- Low-emitting drill rig engines, such as Tier 4 diesel engines or natural gas or electric drill rig engines;
- Gas or electric turbines for compression rather than internal combustion engines;
- Replacement of older internal combustion engines with low-emitting engines that meet EPA New Source Performance Standards;
- Water or chemical suppressant application and reduced speed limits to control fugitive dust emissions;
- Multi-well pads to reduce surface disturbance and traffic;
- Replacement of diesel-fired pump jack engines with electrified engines;
- Reinjection of waste gas into no-producing wells or other underground formations; and
- Forward looking infrared (FLIR) technology to detect fugitive VOC and methane emissions and repair leaking equipment quickly; and
- Additional technologies for reducing methane emissions as recommended by EPA's natural gas STAR program.

3.3 Issue 2 – Greenhouse Gases

The proposed leasing action could lead to emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), the three most common greenhouse gases associated with oil and gas development. These GHG emissions would be emitted from leased parcels if developed, and from the consumption of any fluid minerals that may be produced. However, the BLM cannot reasonably determine at the leasing stage whether, when, and in what manner a lease would be explored or developed. The uncertainty that exists at the time the BLM offers a lease for sale includes crucial factors that would affect actual GHG emissions and associated impacts, including but not limited to the future feasibility of developing the lease, well density, geological conditions, development type (vertical, directional, or horizontal), hydrocarbon characteristics, specific equipment used during construction, drilling, production, abandonment

operations, production and transportation, and potential regulatory changes over the 10-year primary lease term.

For the purposes of this analysis, the BLM has evaluated the potential effects of the proposed leasing action on climate change by estimating and analyzing potential GHG emissions from projected oil and gas development on the parcels proposed for leasing using estimates based on past oil and gas development and available information from existing development within the State.

Additional discussion of climate change science and predicted impacts as well as the reasonably foreseeable and cumulative GHG emissions associated with BLM's oil and gas leasing actions are included in the BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (2020) (hereinafter referred to as the Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to fossil fuels produced on lands and mineral estate managed by the BLM. The Annual GHG Report is incorporated by reference as an integral part of the analysis for this proposed lease sale and is available at https://www.blm.gov/content/ghg/.

3.3.1 Affected Environment

Climate change is a global process that is affected by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from a single proposed land management action cannot be accurately translated into its potential effect on global climate change or any localized effects in the area specific to the action. Currently, global climate models are unable to forecast local or regional effects on resources. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to climate change from GHG emissions over time. GHGs influence the global climate by increasing the amount of solar energy retained by land, water bodies, and the atmosphere. GHGs can have long atmospheric lifetimes, which allows them to become well mixed and uniformly distributed over the entirety of the Earth's surface no matter their point of origin. Therefore, potential emissions from the proposed action can be compared to state, national and global GHG emission totals to provide context of their significance and potential contribution to climate change impacts.

Table 7 shows the total estimated GHG emissions from fossil fuels at the global and national scales over the last five years. Emissions are shown in megatonnes (Mt) per year of carbon dioxide equivalent (CO_2e). Chapter 3 of the Annual GHG Report contains additional information on greenhouse gases and an explanation of CO_2e.). **Table 8** shows the calculated GHG emissions (in megatonnes of CO2e) for all federal fossil fuels (includes offshore oil and gas production) based on current 2020 production data obtained from the Department of the Interior's Office of Natural Resources Revenue (ONRR), as well as the percent contribution from federal fossil fuels to total U.S. fossil fuel GHG emissions. **Table 9** shows GHG emissions data from the largest greenhouse gas emitting facilities as reported to the U.S. Environmental Protection Agency (EPA) through its Greenhouse Gas Reporting Program (GHGRP) for those states associated with this potential leasing action**. Table 9** also shows energy-related CO2 emissions reported by the U.S. Energy Information Administration (EIA) in its annual State Energy-Related Carbon Dioxide Emissions Tables (EIA, 2021a). State energy-related CO2 emissions include emissions from fossil fuel use across all sectors (residential, commercial, industrial, transportation, and electricity generation) and are released at the location where the fossil fuels are consumed.

Additional information on current state, national, and global GHG emissions as well as the methodology and parameters for estimating emissions from BLM fossil fuel authorizations and cumulative GHG emissions is included in the Annual GHG Report (see Chapters 4, 5, and 6).

Table 7 Global and U.S. GHG Emissions 2015 - 2019 (Mt CO2/yr)

Scale	2015	2016	2017	2018	2019
Global	52,700	52,800	53,500	55,300	59,100
U.S.	5,249	5,153	5,083	5,244	5,107

Source: Annual GHG Report, Chap. 6, Table 6-1.
Mt (megatonne) = 1 million metric tons.

Table 8. 2020 Federal Fossil Fuel GHG Emissions and Percent Federal Contribution (Mt CO2e/yr)

	U.S. Total	Federal Total [1]	% Contribution of Federal Emissions
Coal	1,248.1	490.9	39.34
Oil	2,363.2	516.4	21.86
Gas	2,726.4	316.2	11.61
Total	6,337.7	1,324.3	20.9

1. Federal Total includes emission estimates for both on-shore and off-shore oil and gas production for 2020 based on current ONRR production data found in https://revenuedata.doi.gov/downloads/production/

Table 9 State GHG Emissions

State	EPA - GHGRP Large Emitters ($Mt\ CO_2/yr$)			EIA Energy-related CO_2 Emissions (Mt/yr)
	Total Reported	Power Plants	Petroleum and Natural Gas Systems	
Montana	20.9	16.4	0.9	30.7
North Dakota	37.8	28.2	2.4	59.2
South Dakota	6.4	3.3	0	15.6

Sources: Annual GHG Report, Chap. 6, Table 6-3; Energy Information Administration

The continued increase of anthropogenic GHG emissions over the past 60 years has contributed to global climate change impacts. A discussion of past, current, and projected future climate change impacts is described in Chapters 8 and 9 of the Annual GHG Report. These chapters describe currently observed climate impacts globally, nationally, and in each State, and present a range of projected impact scenarios depending on future GHG emission levels. These chapters are incorporated by reference in this analysis.

3.3.2 Environmental Effects—No Action Alternative

Under the No Action Alternative, the parcel(s) would not be leased, and no new foreseeable oil and gas

development would occur on the subject lease parcels. Although no new GHG emissions from the development of these lease parcels would occur under the No Action Alternative, Federal production levels are expected to remain static or even increase in the short-term and non-Federal oil and gas supply would likely increase if the leases are not developed. The most recent short-term energy outlook (STEO) published by the EIA (https://www.eia.gov/outlooks/steo/) describes that the world's oil and gas supply and consumption will increase over the next 24 months (through 2023). The latest STEO projections are not dependent on whether the BLM issues onshore leases for 2022, since these global projections were made prior to new leases being offered and are based on foreseeable short-term global supply and demand and depend on oil and gas development /operations on existing U.S. onshore leases. The latest STEO includes the following projections for the next two years:

- Global liquid fuels consumption will grow by 3.6 million barrels/day (b/d) in 2022 and 1.8 million b/d in 2023.
- U.S. crude oil production averaged 11.2 million b/d in 2021. Production is expected to average 11.8 million b/d in 2022 and to rise to 12.4 million b/d in 2023
- U.S. LNG export capacity increases will contribute to LNG exports averaging 11.5 billion cubic feet/day (Bcf/d) in 2022 and 12.1 Bcf/d in 2023.
- Coal production will increase by 6% in 2022 and then rise 1% to a total of 619 million short tons (MMst) in 2023.

Although electricity-generating capacity from renewable energy sources is anticipated to continue to grow in 2022 and 2023, it will not have a significant impact on short-term supply and demand.

EIA studies and recent U.S. activities regarding short-term domestic "supply disruptions" or sudden increases in demand suggest that reducing domestic supply (in the near-term under the current supply / demand scenario) would lead to the import of more oil and natural gas from other countries, including countries with lower environmental and emission control standards than the United States (EIA, 2021b), or even cause a release from the current U.S. stockpile to meet consumer demand and maintain stable prices.

The EIA 2021 AEO long-term energy outlook for the high U.S. domestic natural gas supply scenario describes a potential 1.2% growth in natural gas-related GHG emissions for the power sector through year 2050 and an almost 3% decline in coal-related emissions over the 30-year period. For the EIA projected low oil and gas supply scenario, power sector related GHG emissions are reduced for both natural gas and coal through the period though at a smaller relative percentage for coal resulting in coal-related emissions still being higher than those associated with natural gas at year 2050 (EIA, 2021c). A detailed discussion of past, present, and projected global and state GHG emissions can be found in Chapter 6 of the Annual Report.

3.3.3 Environmental Effects— Proposed Action Alternative

While the leasing action itself does not directly generate GHG emissions, such emissions are a reasonably foreseeable consequences of oil and gas development. There are three general phases of post-lease development that would generate GHG emissions including 1) well development (well site construction, well drilling, and well completion), 2) production operations (processing, storage, and transport/distribution), and 3) end-use (combustion) of the fuels produced.

The BLM cannot develop a precise emissions inventory at the leasing stage due to uncertainties including the type (oil, gas, or both) scale, and duration of potential development, the types of related equipment (drill rig engine tier rating, horsepower, fuel type), and the mitigation measures that a future lessee may propose in their development plan. In order to estimate reasonably foreseeable on-lease emissions at the leasing stage, the BLM uses estimated well numbers based on State data for past lease development

combined with per-well drilling, development, and operating emissions data from representative wells in the area. The amount of oil or gas that may be produced if the offered parcels are developed is unknown. For purposes of estimating production and end-use emissions, reasonably foreseeable wells are assumed to produce oil and gas in similar amounts as existing nearby wells. While the BLM has no authority to direct or regulate the end-use of the products, for this analysis, the BLM assumes all produced oil or gas will be combusted (such as for domestic heating or energy production). The BLM acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the lease parcels. These sources may include emissions of methane (a more potent GHG than CO2 in the short term) from pipeline and equipment leaks, storage, and maintenance activities. At the leasing stage, these sources of emissions are highly speculative, and the BLM has therefore chosen to assume, for the purposes of this analysis, that all produced oil or gas will be combusted. We note, however, that the potential emissions from these sources have been estimated and are accounted for in the cumulative assessment of GHGs from BLM's fossil fuel leasing program.

The emissions used in this analysis are estimated as described above using the BLM Lease Sale Emissions Tool. Emissions are presented for each of the three phases described above.

- Well development emissions occur over a short period and include heavy equipment and vehicle exhaust, drill rig engine emissions, completion equipment, pipe venting, and emissions from any well treatments such as hydraulic fracturing that may be used.
- Production operations and end-use emissions occur over the entire production life of a well, which is assumed to be 30 years for this analysis based on the productive life of a typical oil/gas field. Production emissions may result from storage tank breathing and flashing, truck loading, pump engines, heaters and dehydrators, pneumatic instruments, or controls, flaring, fugitives, and vehicle exhaust.
- Single well emissions estimate for well development and production operations are based on typical development and production scenarios as estimated for the MCFO RMP air analysis.
- End-use emissions occur from the downstream combustion of produced oil or gas. End-use emissions are estimated by multiplying the estimated ultimate recovery (EUR) of produced oil and gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 CFR § 98). Additional information on emission factors and EUR factors can be found in the Annual GHG Report (Chapter 4).

Table 10 and **Table 11** list the estimated direct and indirect GHG emissions in metric tons (tonnes) for the proposed lease sale over the average 30-year production life of the lease.

Table 10 Estimated Life of Lease Emissions (On-Site) from Well Development and Production Operations (tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e (100-yr)	CO_2e (20-yr)
Well Development	4,006	1.90	0.047	4,089	4,186
Production Operations	23,853	150.77	0.204	29,342	37,176

Source: BLM Lease Sale Emissions Tool

Table 11 Estimated Life of Lease Indirect Emissions from the End-Use Combustion of Produced

	EUR (bbl or mcf)	CO_2	CH_4	N_2O	CO_2e (100-yr)	CO_2e (20yr)
Oil	1,790,046	773,360	31.13	6.225	776,330	777,762
Gas	2,445,575	133,136	2.51	0.251	133,301	133,424
Total End-Use	-	906,497	33.63	6.476	909,631	911,185

Source: BLM Lease Sale Emissions Tool

GHG emissions vary annually over the production life of a well due to declining production over time. **Table 12** provides maximum year and average year emissions over the life of the lease. **Table 7** shows the estimated annual GHG emissions profile over the production life of a typical lease including well development, well operation, end-use, and gross (total of well development, well production, and end-use) emissions.

Table 12 Estimated Direct and Indirect Emissions from the Lease Parcels on an Annual and Life of Lease basis (tonnes)

	CO2	CH4	N2O	CO2e (100-yr)	CO2e (20-yr)
Max Year	85,822	8.41	0.612	86,190	86,442
Average Year	27,481	5.48	0.198	27,737	28,016
Life of Lease	934,356	186.31	6.727	943,061	952,547

Source: BLM Lease Sale Emissions Tool

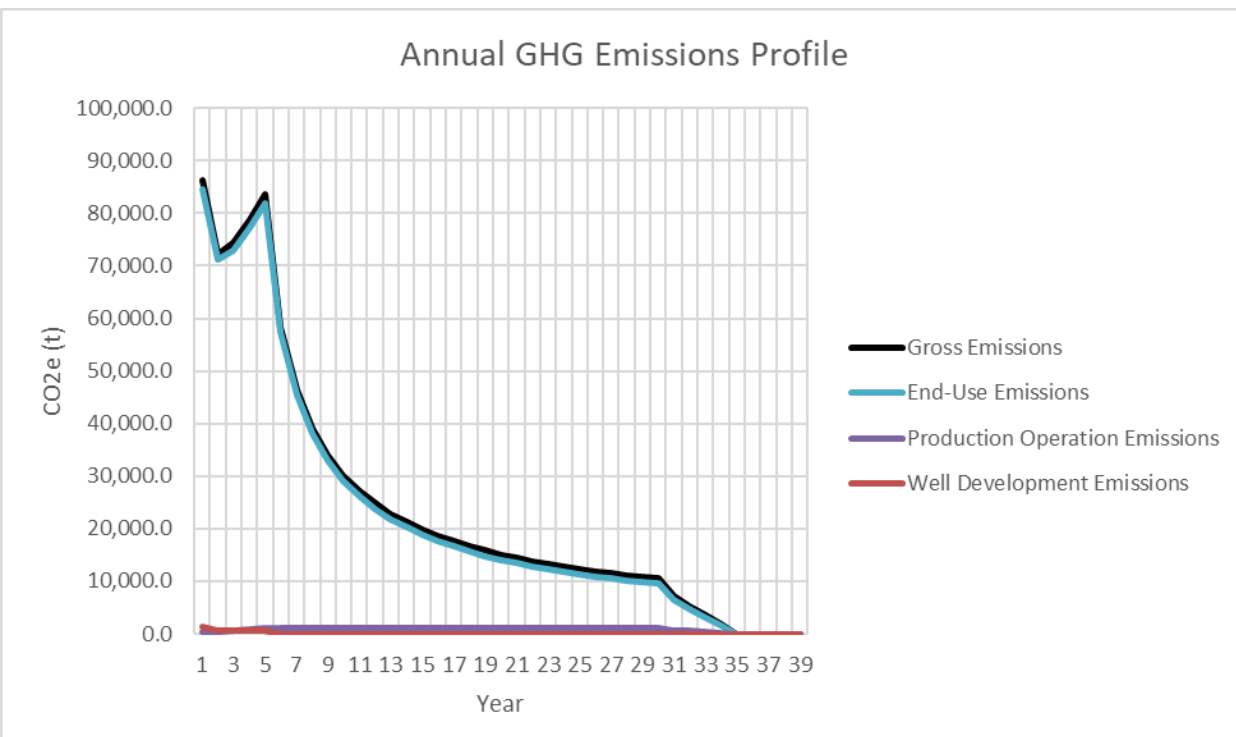


Figure 2 Estimated annual GHG emissions profile over the life of a lease.

Source: BLM Lease Sale Emissions Tool

In order to put the estimated GHG emissions for this lease sale in context, potential emissions that could result from development of the lease parcels for this sale can be put into relatable terms by comparing to other common activities that generate GHG emissions as well as to emissions at state and national scales. The EPA GHG equivalency calculator can be used (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator) to express the potential average year GHG emissions on a scale relatable to everyday life. For instance, the projected average annual GHG emissions from expected development following the proposed lease sale are equivalent to 6,030 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating 6 wind turbines as an alternative energy source or offset by the carbon sequestration of 33,826 acres of forest land.

Table 13 compares estimated maximum and average annual lease-sale emissions to existing State GHG emissions, federal BLM fossil fuel (oil, gas, and coal) emissions, and U.S. fossil fuel and total GHG emissions reported in the EPA Inventory of U.S. GHG Emissions and Sinks: 1990-2019.

Table 13 Comparison of Lease Sale Annual Emissions to Other Sources (megatonnes)

Reference	Mt CO_2e[1] (Per Year)	Average Year % of Reference	Max Year % of Reference
Max Year	0.086	-	-
Average Year	0.028	-	-
MT/ND Federal (Oil & Gas)[2]	31.2	0.089%	0.276%
MT/ND Federal (Oil, Gas and Coal)[2]	62.5	0.044%	0.138%
U.S. Federal (Oil &Gas)[2]	427.7	0.006%	0.020%
U.S. Federal (Oil, Gas and Coal)[2]	918.6	0.003%	0.009%
MT Annual Total[3]	57.9	0.048%	0.148%
0.U.S. Total[3]	6,558.35	0.000%	0.001%

1 – Estimates are based on 100-GWP values with carbon feedbacks provided by AR5.
2 - Federal values come from the BLM Specialist Report on Annual Greenhouse Gas Emissions Table ES-1.
3 - U.S. Total Values comes from the EPA Inventory of U.S. GHG Emissions and Sinks: 1990-2019: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/gas/current; 6,814.8MT CO_2e using AR5 GWP.

Table 14 compares emission estimates over the 30-year life of the lease compared to the 30-year projected Federal emissions in the state and nation from existing wells, the development of approved APDs, and emissions related to reasonably foreseeable lease actions.

Table 14 Comparison of the Life of Lease Emissions to other Federal Oil and Gas Emissions from Existing Wells, Development of Approved APDs, and Other Leasing Actions in the State and Nation (megatonnes).

Reference	Mt CO2e (30-yr)	Life of Lease % of Reference
Life of Lease	0.943	100.000%
MT/ND Reasonably Foreseeable Short-term Federal (O&G)	250.970	0.376%
MT/ND EIA Projected Long-term Federal (O&G)	1,031.097	0.091%
U.S. Reasonably Foreseeable Short-term Federal (O&G)	4,307.510	0.022%
U.S. EIA Projected Long-term Federal (O&G)	13,960.99	0.007%

Source: U.S. and Federal emissions from BLM Lease Sale Emissions Tool and Annual GHG Report Tables 5-17 and 5-18.

In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 0.943 Mt CO_2e over the life of the lease. Compared to emissions from other existing and foreseeable Federal oil and gas development, the life of lease emissions for the Proposed Action is between 0.376% to 0.091% of Federal fossil fuel authorization emissions in the Montana and North Dakota, and between 0.022% to 0.007% of Federal fossil fuel authorization emission in the nation.

3.3.4 Environmental Effects— Alternative C

The emissions for this alternative are derived in **Table 15**, **Table 16**, and **Table 17** and are calculated using the same methodology as described for the Proposed Action emissions. Potential GHG emissions from the Recreational Resources Preservation Alternative could result in GHG emissions of 0.075 Mt CO_2e over the life of the lease. Compared to emissions from other existing and foreseeable Federal oil and gas development, the life of lease emissions for the Recreational Resources Preservation Alternative is between 0.040% to 0.164% of Federal fossil fuel authorization emissions in the states and between 0.003% to 0.010% of Federal fossil fuel authorization emission in the nation. The projected average annual GHG emissions from expected development following the proposed lease sale are equivalent to 2,886 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating 3 wind turbines as an alternative energy source or offset by the carbon sequestration of 16,191 acres of forest land.

Table 15 Estimated Life of Lease Emissions (On-Site) from Well Development and Production Operations (tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e (100-yr)	CO_2e (20-yr)
Well Development	1,502	0.71	0.018	1,533	1,570
Production Operations	8,945	56.54	0.076	11,003	13,941

Table 16 Estimated Life of Lease Indirect Emissions from the End-Use Combustion of Produced

	EUR (bbl or mcf)	CO_2	CH_4	N_2O	CO_2e (100-yr)	CO_2e (20yr)
Oil	776,143	335,320	13.50	2.699	336,608	337,228
Gas	1,145,529	62,362	1.18	0.118	62,439	62,497
Total End-Use	-	397,682	14.67	2.817	399,047	399,725

Source: BLM Lease Sale Emissions Tool

Table 17 Estimated Direct and Indirect Emissions from the Lease Parcels on an Annual and Life of Lease basis (tonnes)

	CO_2	CH_4	N_2O	CO_2e (100-yr)	CO_2e (20-yr)
Max Year	77,296	4.53	0.549	77,622	77,841
Average Year	13,165	2.32	0.094	13,277	13,395
Life of Lease	408,130	71.92	2.911	411,583	415,236

Source: BLM Lease Sale Emissions Tool

3.3.5 Monetized Impacts from GHG Emissions

The "social cost of carbon", "social cost of nitrous oxide", and "social cost of methane" – together, the "social cost of greenhouse gases" (SC-GHG) are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year.

On January 20, 2021, President Biden issued E.O. 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*.[1] Section 1 of E.O. 13990 establishes an Administration policy to, among other things, listen to the science; improve public health and protect our environment; ensure access to clean air and water; reduce greenhouse gas emissions; and bolster resilience to the impacts of climate change.[2] Section 2 of the E.O. calls for Federal agencies to review existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the E.O. and to take appropriate action.

Consistent with E.O. 13990, the Council on Environmental Quality (CEQ) rescinded its 2019 "Draft National Environmental Policy Act Guidance on Considering Greenhouse Gas Emissions" and has begun to review for update its "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews" issued on August 5, 2016 (2016 GHG Guidance).[3] While CEQ works on updated guidance, it

[1] 86 FR 7037 (Jan. 25, 2021).
[2] *Id.*, sec. 1.
[3] 86 FR 10252 (February 19, 2021).

has instructed agencies to consider and use all tools and resources available to them in assessing GHG emissions and climate change effects including the 2016 GHG Guidance.[4]

Regarding the use of Social Cost of Carbon or other monetized costs and benefits of GHGs, the 2016 GHG Guidance noted that NEPA does not require monetizing costs and benefits.[5] It also noted that "the weighing of the merits and drawbacks of the various alternatives need not be displayed using a monetary cost-benefit analysis and should not be when there are important qualitative considerations."[6]

Section 5 of E.O. 13990 emphasized how important it is for federal agencies to "capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account" and established an Interagency Working Group on the Social Cost of Greenhouse Gases (the "IWG"). [7] "). In February of 2021, the IWG published *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under Executive Order 13990*(IWG, 2021).[8] This is an interim report that updated previous guidance from 2016. The final report is expected in January 2022.

In accordance with this direction, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. These numbers were monetized; however, they do not constitute a complete cost-benefit analysis, nor do the SC-GHG numbers present a direct comparison with other impacts analyzed in this document. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

For Federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide (SC-CO_2), methane (SC-CH_4), and nitrous oxide (SC-N_2O) developed by the Interagency Working Group (IWG) on the SC-GHG. Select estimates are published in the Technical Support Document (IWG 2021)[9] and the complete set of annual estimates are available on the Office of Management and Budget's website[10].

The IWG's SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5%, 3%, and 5% (IWG 2021).

As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human

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[4] *Id.*
[5] 2016 GHG Guidance, p. 32, available at: https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf
[6] *Id*.
[7] E.O. 13990, Sec. 5.
[8] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf
[9] IWG 2021. *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, Interim Estimates under Executive Order 13990.* Interagency Working Group on Social Cost of Greenhouse Gasses, February 2021.
[10] https://www.whitehouse.gov/omb/information-regulatory-affairs/regulatory-matters/#scghgs

behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of damages estimated, applying a 3% annual discount rate for future economic effects. This is a low probability, but high damage scenario, represents an upper bound of damages within the 3% discount rate model. The estimates below follow the IWG recommendations.

The SC-GHGs associated with estimated emissions from future potential development of the lease parcels are reported in **Table 18**. These estimates represent the present value (from the perspective of 2021) of future market and nonmarket costs associated with CO_2, CH_4, and N_2O emissions from potential well development and operations, and potential end-use, as described in Subsection 1.2.1. Estimates are calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and BLM's estimates of emissions in each year. They are rounded to the nearest $1,000. The estimates assume development will start in 2023 and end-use emissions complete in 2056, based on experience with previous lease sales.

Table 18 SC-GHGs Associated with Future Potential Development of the Proposed Action

	Social Cost of GHG (2020$)			
	Average Value, 5% discount rate	**Average Value, 3% discount rate**	**Average Value, 2.5% discount rate**	**95th Percentile Value, 3% discount rate**
Development and Operations	$381,000	$1,427,000	$2,154,000	$4,255,000
End-Use	$11,064,000	$42,151,000	$63,958,000	$127,371,000
Total	$11,445,000	$43,578,000	$66,112,000	$131,626,000

The SC-GHGs associated with estimated emissions from future potential development of the lease parcels under Alternative Care reported in **Table 19**. These SC-GHG estimates are calculated using the same methodology as described for the Proposed Action.

Table 19 SC-GHGs Associated with Future Potential Development of Alternative C

	Social Cost of GHG (2020$)			
	Average Value, 5% discount rate	**Average Value, 3% discount rate**	**Average Value, 2.5% discount rate**	**95th Percentile Value, 3% discount rate**
Development and Operations	$147,000	$544,000	$819,000	$1,621,000
End-Use	$5,042,000	$18,892,000	$28,568,000	$56,947,000
Total	$5,189,000	$19,436,000	$29,387,000	$58,568,000

3.3.6 Estimated GHG Emissions for Reasonably Foreseeable Environmental Trends and Planned Actions

The analysis of GHGs contained in this EA includes estimated emissions from those parcels being offered in this lease sale as described above. In addition to this lease sale, the BLM is offering parcels in six other BLM administrative units within the June of 2022. The estimated GHG emissions from parcels being offered in each of those individual sales is contained in the associated EA for each sale. When analyzing the potential impacts from multiple lease sales, it is important to note that it is the actual production of fossil fuel commodities on leased parcels that generates GHG emissions and not the offering of acres or parcels for lease in a particular grouping of lease sales. Parcels offered in a lease sale may or may not be sold and sold parcels may or may not go into production for several years if at all. Typically, lease sales in different BLM administrative units are not offered on the same date and each administrative unit has discretion to defer its sale or defer or add parcels as a result of scoping and protests. The dynamic nature of the lease sale process and independence of each administrative unit for constructing its lease sales, precludes an analysis of potential GHG emissions that could occur from other lease sales that might occur in the same quarter. In addition, combining all of the offered parcels from multiple lease sales that may occur over a 3-month period, assuming all acres will be sold and produce immediately, and estimating GHG emissions from development on the offered acreage based on these assumptions would result in an inflated, unrealistic, quantity of estimated emissions that would not be useful to the decision maker and would not accurately inform the public of the magnitude of probable cumulative emissions and impacts.

An assessment of GHG emissions from BLM's fossil fuel authorizations including coal leasing and oil and gas development is included in the BLM Specialist Report on Annual GHG Emissions (referred to as Annual Report, see Chapter 5). The Annual Report includes estimates of reasonably foreseeable GHG emissions related to BLM lease sales anticipated during the calendar year, as well as the best estimate of emissions from ongoing production, and development of parcels sold in previous lease sales. It is, therefore, an estimate of cumulative GHG emissions from the BLM fossil fuel leasing program based on actual production and statistical trends.

The Annual Report provides an estimate of short-term and long-term GHG emissions from lease sale activity across the BLM. The short-term methodology presented in the Annual Report includes a trends analysis of (1) leased federal lands that are held-by-production, (2) approved applications for permit to drill (APDs), and (3) leased lands from competitive lease sales occurring over the next annual reporting cycle (12 months), to provide a 30-year projection of potential emissions from Federal lease actions over the next 12 months. The long-term methodology uses oil and gas production forecasts from the Energy Information Administration (EIA) to estimate GHG emissions out to 2050 that could occur from past, present, and future oil and gas development. For both methodologies, the emissions are calculated using

life-cycle-assessment (LCA) emissions and data factors. These analyses are the basis for projecting GHG emissions from lease parcels that are likely to go into production during the analysis period of the Annual Report and represent both a hard look at GHG emissions from fossil fuel leasing and the best available estimate of reasonably foreseeable cumulative emissions related to any one lease sale or set of quarterly lease sales. **Table 20** shows the cumulative estimated GHG emissions from the development of the projected lease sale acres in 2022 using the methodology described above. The 5-year lease averages include all types of oil and gas development related leases, including leases granted under the Mineral Leasing Act as well as other authorities, that have been issued over the last five years. As such the projections made from the 5-year averages represent the potential for all types of future potential oil and gas leasing activity, and although not at exact acreage levels, would account for the proposed action. However, they may also over-estimate the potential emissions from the 12-month cycle of competitive oil and gas leasing activities if the projected lease sale activity does not actually occur.

Table 20 Reasonably Foreseeable Projected Emissions

State (BLM Administrative Unit)	Annual Report Table 4-8 Projected Lease Acres 2022	Annual Report Figure 5-1 GHG Emissions from Projected Lease Acres 2022 (Mt CO_2e per year)
Alabama (ES)	1	0.00
Alaska	356,021	9.33
Arkansas (ES)	536	0.04
California	184	0.02
Colorado	67,268	10.21
Idaho	1,881	0.03
Kansas (ES)	287	0.02
Kentucky (ES)	37	0.01
Louisiana (ES)	9,334	2.59
Michigan (ES)	5,006	0.17
Mississippi (ES)	2,609	0.06
Montana	60,807	2.48
Nebraska (WY)	19	0.01
Nevada	155,583	0.29
New Mexico	38,926	22.90
North Dakota (MT)	2,477	0.07
Ohio (ES)	681	0.18
Oklahoma (NM)	2,052	0.05
South Dakota (MT)	1,543	0.02
Texas (NM)	1,602	0.09
Utah	141,832	9.13
West Virginia (ES)	42	0.01
Wyoming	562,985	88.87
Total	***1,411,713***	***146.56***

3.3.7 Mitigation Strategies

GHG emissions contribute to changes in atmospheric radiative forcing resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's

surface and act as a positive radiative forcing component. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming. Chapters 8 and 9 of the Annual Report provides a detailed discussion of climate change science, trends, and impacts. The relationship between GHG emissions and climate impacts is complex, but a project's potential to contribute to climate change is reduced as its net emissions are reduced. When net emissions approach zero, the project has little or no contribution to climate change. Net-zero emissions can be achieved through a combination of controlling and offsetting emissions. Emission controls (e.g., vapor recovery devices, no-bleed pneumatics, leak detection and repair, etc.) can substantially limit the amount of GHGs emitted to the atmosphere, while offsets (e.g., sequestration, low carbon energy substitution, plugging abandoned or uneconomical wells, etc.) can remove GHGs from the atmosphere or reduce emissions in other areas. Chapter 10 of the Annual Report provides a more detailed discussion of GHG mitigation strategies.

The Federal government includes several agencies that work responsibly in concert for implementing climate change strategies and meeting U.S. emissions reduction goals all while supporting U.S. oil and gas development and operations. The EPA is the Federal agency charged with regulation of air pollutants and establishing standards for protection of human health and the environment. EPA has issued regulations that will reduce GHG emissions from any development related to the proposed leasing action. These regulations include the New Source Performance Standard for Crude Oil and Natural Gas Facilities (49 CFR 60, subpart OOOOa) which imposes emission limits, equipment design standards and monitoring requirements on oil and gas facilities. A detailed discussion of existing regulations and Executive Orders that apply to BLM management of federal lands as well as current Federal and state regulations that apply to oil and gas development and production can be found in Chapter 2 of the Annual Report.

In addition to these Federal regulations, states have also implemented air quality and greenhouse gas regulations for the oil and gas industry. The Montana Board of Oil and Gas Conservation (MBOGC) implements Montana's oil and gas laws by promoting conservation and waste prevention in the recovery of resources; and regulating oil and gas exploration and production. The Montana Department of Environmental Quality (MDEQ) administers rules and regulations to implement the Montana Environmental Policy Act and the Montana Clean Air Act. MBOGC regulations related to air impacts from oil and gas operations can be found in Title 36, Chapter 22 of the Administrative Rules of Montana (ARM) and include regulation 36.22.1207 which prohibits the storage of waste oil and oil sludge in pits and open vessels. MDEQ rules for air emissions from oil and gas operations can be found in Title 17, Chapter 8 of the ARM and include requirements for controlling VOC vapors with a 95% or greater control efficiency, loading and unloading of hydrocarbon liquids using submerged fill technology, and equipping internal combustion engines with nonselective catalytic reduction or oxidation catalytic reduction.

The North Dakota Department of Mineral Resources - Oil and Gas Division, regulates the drilling and production of oil and gas including regulations that ban the venting of natural gas and require that vented casinghead gas be burned through a flare (North Dakota Administrative Code 43-02-03-45). The North Dakota Industrial Commission (NDIC) has jurisdiction over the volume of gas flared at a well site to conserve mineral resources and established Order No. 24665 for reducing gas flaring. The Order requires producers to submit a gas capture plan with every drilling permit application. The North Dakota Department of Environmental Quality – Division of Air Quality has established permitting and reporting requirement for oil and gas facilities under North Dakota Air Pollution Control Rules Chapter 33.1-15-20 and submerged fill and flare requirements in Chapter 33.1-15-07

The majority of GHG emissions resulting from federal fossil fuel authorizations occur outside of the BLM's authority and control. These emissions are referred to as indirect emissions and generally occur off-lease during the transport, distribution, refining, and end-use of the produced federal minerals. The

BLM's regulatory authority is limited to those activities authorized under the terms of the lease which primarily occur in the "upstream" portions of natural gas and petroleum systems. This decision authority is applicable when development is proposed on public lands and BLM assesses its specific location, design, and proposed operation. In carrying out its responsibilities under NEPA, the BLM has developed Best Management Practices (BMPs) designed to reduce emissions from field production and operations. BMPs may include limiting emissions on stationary combustion sources, mobile combustion sources, fugitive sources, and process emissions occurring on a lease parcel. Analysis and approval of future development may include application of BMPs within BLM's authority, as Conditions of Approval or Lease Stipulations, to reduce or mitigate GHG emissions. Additional measures proposed at the project development stage may be incorporated as applicant-committed measures by the project proponent or added to necessary air quality permits. Additional information on mitigation strategies, including emissions controls and offset options, are provided in Chapter 10 of the Annual GHG Report.

3.4 Issue 3 – Big Game (Pronghorn)

Introduction

What are the effects to pronghorn winter range and migration routes if the parcels nominated in the February 2022 lease sale are leased and subsequently developed for oil or gas production?

In 2015, the BLM approved Record of Decisions and Approved Resource Management Plans and Amendments for the Rocky Mountain Region, which includes the Miles City Field Office. The Miles City field office designated pronghorn antelope a priority species (i.e., Miles City RMP FEIS, p. 3-45 (Vol 1). BLM planning guidance (Handbook 1601-1) provides direction for the designation of priority species and priority habitat for management for fish or wildlife species recognized as significant for at least one factor such as density, diversity, size, public interest, remnant character, or age. For priority species and habitat, H1601-1 provides that the BLM shall:

> Describe desired habitat conditions and/or population for major habitat types that support a wide variety of game, non-game, and migratory bird species; acknowledging the states' roles in managing fish and wildlife, working in close coordination with state wildlife agencies, and drawing on state comprehensive wildlife conservation strategies. Identify actions and area-wide use restrictions needed to achieve desired population and habitat conditions while maintaining a thriving natural ecological balance and multiple- use relationships.

During the 2015 RMP revisions, Miles City coordinated with Montana Fish, Wildlife, and Parks (MTFWP) to identify crucial winter range for big game species. At the time of the RMP revision, data was only available to identify crucial winter range for mule deer. MTFWP identified large blocks of general winter range for pronghorn, but data was lacking to map discrete areas of crucial winter range more accurately in the RMP. The RMP does not identify migration corridors for any big game species.

Consistent with H 1601-1, the BLM developed CSU 12-26 to facilitate long-term maintenance of big game wildlife populations and applies the stipulation to parcels located in crucial winter range, which states:

CSU 12-26: Surface occupancy and use is subject to the following operating constraint: prior to surface occupancy and use within crucial winter ranges for big game wildlife, a plan must be approved by the Administrative Officer that maintains the functionality of habitat.

CSU 12-26 may be subject to a variety of waivers, exceptions, or modifications (WEMs) if the

Administrative Officer finds that:

- The action will not impair the function or suitability of the winter range habitat,
- Portions of the leasehold no longer contains viable winter range,
- Wintering animals no longer occupy significant portions of the area, and/or
- There is no reasonable likelihood of future use (the specific language varies by stipulation).

On November 15, 2018, the BLM issued Secretarial Order 3362: Site Specific Management Activities to Conserve or Restore Big Game Habitat. SO 3362 emphasizes the importance of conserving and improving elk, mule deer, and pronghorn habitat. In particular, S.O. 3362 directs that the BLM "appropriately apply site-specific management activities, as identified in State land use plans, site-specific plans, or the Action Plan that conserve or restore habitat necessary to sustain local and regional big-game populations…" Site-specific management activities that can help conserve or restore big game habitat as outlined in S.O. 3362 include avoiding development in the most crucial winter range or migration corridors during sensitive seasons, minimizing development that would fragment winter range and primary migration corridors, and limiting disturbance of big game on winter range.

For the July 2019 and subsequent lease sales, In the interim, BLM developed Lease Notice 14-40 for MFTWP identified pronghorn general winter range, which states:

Lease Notice 14-40: The lease area may contain habitat for big game winter range and/or migration corridors delineated by Montana Fish, Wildlife and Parks. The lessee/operator is given notice that prior to project-specific approval, the authorized officer may require modifications to exploration and development proposals to conserve or restore habitat necessary to sustain local and regional big-game populations (Secretarial Order 3362, November 15, 2018, and 43 CFR 3101.1-2). The objective of the requirements would be to conserve, restore, minimize, avoid and/or limit activities that could impact habitat for big game winter range and/or migration corridors. Site-specific requirements would be identified during environmental review processes and would be developed into the project proposal as terms and conditions of the subsequent approval.

In 2020 MTFWP initiated several studies of pronghorn seasonal use areas and migration corridors across the state, including distinct populations in Carter and Powder River Counties and Garfield and Rosebud Counties in eastern Montana. On August 2, 2021, MTWF published preliminary results of ongoing pronghorn telemetry research. In the Powder River-Carter Study area, MTFWP fitted 82 female pronghorn with GPS collars and are currently monitoring the movements of 51 of them (27 died and 4 collars malfunctioned) (MTFWP, August 2021). This study identifies pronghorn movements in the vicinity of several of the proposed lease parcels in Powder River County (247, 249, 250, 251, 252, and 253).

Of the 29 nominated parcels in the February 2022 sale:

- Three parcels are in RMP designated crucial big game (mule deer) winter range (247, 250, and 251), which are subject to CSU 12-26.
- Six parcels are in MT Fish, Wildlife and Parks (MTFWP) identified pronghorn general winter range in Powder River County (242, 243, 244, 245, 246, and 249). BLM applied LN 14-40 to these parcels.
- Two parcels (252 and 253) lie between two areas mapped by MTFWP as general pronghorn winter range, but the parcels are not actually in areas identified as winter range. As such, neither CSU 12-26 nor LN 14-40 apply.

- None of the North Dakota or Richland, Roosevelt or Fallon County, Montana parcels contain RMP designated or state- mapped crucial winter range or general winter range for big game.

For the reasons discussed above, this analysis considers effects to pronghorn winter range and migration routes from road density and oil and gas well pad density for the Powder River County Montana Parcels, which are two factors known to affect big game habitat effectiveness.

3.4.1 Affected Environment

Pronghorn antelope are one of the most common big game animals found throughout the State of Montana where adequate habitat remains. In 2021, MTFP estimated there were 132,359 pronghorn distributed across portions of southwestern, central, and eastern Montana, down from 168,821 in 2020. In the summer of 2021, Montana experienced record drought conditions, which may offer a possible explanation for the 22 percent decline in pronghorn population numbers from 2020 to 2021.

MTFWP notes that pronghorn populations were abundant, and at or above regional population objectives/long-term averages (LTAs) throughout their range in Montana during the mid-2000s with harvest totaling 33,500 at the latest peak in 2007. Following widespread blue-tongue virus (BTV) outbreaks in the subsequent two years, then the record cold and snowy winter in 2010-2011, harvest fell to a low of 8,200 in 2013. Pronghorn populations typically rebound quickly with favorable weather conditions, yet numbers of pronghorn in many of FWP administrative region 4, 5, 6, and 7's hunting districts (HDs) are less than 50 percent of population objective despite multiple years of favorable weather and minimal harvest. Powder River lies within Hunting District 7. Unlike most of the state's populations, Carter and Powder River Counties pronghorn populations rebounded quickly and are currently 50 percent above long-term averages (FWP pronghorn proposal, April 2019).

The optimum habitat for pronghorn consists of open, rolling sagebrush grassland, as free from human disturbance as possible. Browse, primarily sagebrush, is vital in the pronghorn diet. Pronghorn utilize the sagebrush grassland habitats almost exclusively during the winter (HiLine FEIS, Volume I; p. 423). In eastern Montana, crucial winter habitat is largely contained within identified greater sage-grouse priority habitat and at lower levels within crucial mule deer winter range (Miles City FEIS, Volume I; p. 3-48). Very little is known about seasonal pronghorn movements and migration across Montana/Dakotas.

In a recent study of migration behavior of pronghorn on their northern range in Alberta and Saskatchewan, Canada and northeastern Montana, Jakes et al. (2018) found that 55 percent of individuals undertook seasonal migrations. Migrating pronghorn captured in Montana or Saskatchewan traveled a mean Euclidean distance of 66.4 km (41.3 miles) in the spring, and 51.8 km (34.2 miles) in the fall. The longest annual migration in the Jakes et al. (2018) study was by an individual migrating a Euclidean distance of 435 km (270.3 miles) and 888 km (551.8 miles) measured pathway distance. Jakes et al. (2018) also documented facultative winter migration, where pronghorn moved from one winter range to another in response to extreme weather events. In another recent study in northeastern Montana, Tack et al. (2019) notes that pronghorn in northeastern Montana have been observed switching between migratory and resident behavior, although losing migration behavior would likely reduce regional populations that are more vulnerable to human- dominated landscapes.

As noted in the FEIS for the HiLine RMP, higher densities of permanent facilities and roads have been found to increase adverse impacts to wildlife although investigations on landscape-level effects have only been completed on a few species. Ungulates predictably avoid areas during active exploration and drilling, moving to denser cover and areas farther from human activity. Kolar (2009) studied resource selection of pronghorn in North Dakota between January 2005 and March 2008. During the summer,

pronghorn were twice as likely to use areas that were greater than 1 km (0.6 mi) from primary roads (paved) and were two times more likely to use areas greater than 3.1 km (1.9 mi) from secondary roads (high grade gravel and maintained county roads) than areas less than 3.1 km (0.6 mi) from secondary roads. Pronghorn avoided secondary roads in the winter and were 7.5 times less likely to select areas within 1 km (0.6 mi) from secondary roads than they were to select areas beyond 3.1 km (0.6 mi) (Kolar 2009.

In a study on factors influencing seasonal migrations of pronghorn across the northern sagebrush steppe, Jakes et al. (2018) found that pronghorn avoided spring stopover sites with increased well densities while they avoided fall migration pathways with increased road densities. Jakes et al. (2018) further identified priority corridors through Canadian Forces Base (CFB) Suffield grassland complex in Alberta Canada, despite a high density of oil/natural gas development. He notes that innovative infrastructure at CFB Suffield keeps most of the oil/natural gas operations underground and close to the limited number of roads on base (Jakes, 2015; p. 176).

Across studies, ungulates showed avoidance responses to human development an average of 1 km (0.62 miles) from the human disturbance (Hebblewhite, 2008, p. 108; Jakes et al. 2020). When they are consistently applied, seasonal use restrictions are a valuable tool for limiting disturbance to wildlife at sensitive times of year. However, seasonal restrictions are currently limited to exploration and drilling phases of oil field development. Oil and gas operations also disturb and displace wildlife throughout a production life of up to 40 years and longer (Wyoming Game and Fish, 2010). A 15-year study of resident pronghorn in the Greater Yellowstone Ecosystem found that mean avoidance distance from well pads in winter habitat increased over time by 22 percent and that pronghorn dispersal from the area increased by 57 percent as the study area was developed from a well density of 0.18 per km^2 (0.11 mi^2) to 5.45 per km^2 (3.39 mi^2) (Sawyer et al. 2018). In the north sagebrush steppe pronghorn populations in Montana and Alberta, Jakes et al. (2020) found that anthropogenic disturbance features, including road, oil, and natural gas well densities, were a primary factor in determining pronghorn migration habitat selection.

Wyoming Game and Fish identified impact thresholds based on well pad densities and acreages of disturbance that correspond to *moderate*, *high*, and *extreme* impacts to habitat effectiveness. **Habitat effectiveness** refers to the degree to which a habitat or its components fulfill specific habitat functions, or the degree to which a species or population is able to continue using a habitat for a specific function. All three levels of impact – moderate, high, and extreme –result in a loss of habitat effectiveness. To the extent reasonable, seasonal use restrictions, standard management practices, and appropriate habitat mitigation could be applied at all levels of development to avoid and minimize impacts. Impact thresholds for crucial pronghorn winter range are identified in **Table 21** below.

Table 21 Impact thresholds for terrestrial resources

Species and Habitat Function	**Category of Impact**		
	Moderate	**High**	**Extreme**
Pronghorn Crucial Winter Range	1-4 well pad locations or <20 acres disturbance per square mile	5-16 well pad locations or 20-80 acres disturbance per square mile	>16 well pad locations or >80 acres disturbance per square mile

Source: Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats, Version 6. Wyoming Game and Fish, April 2010.

- **Moderate Impact:** Impairment of habitat function becomes discernable – however the impact can be significantly reduced or eliminated through seasonal use restrictions, standard or best management practices.

- **High Impact:** Impairment of habitat function increases – the impact will be more difficult or at times impossible to effectively mitigate within the project area. The impact can be reduced, but probably not eliminated through seasonal use restrictions and more intensive management and mitigation practices.
- **Extreme Impact:** Habitat function is substantially impaired or lost – the impact cannot be fully mitigated within the project area but can be partially reduced through seasonal use restrictions and intensive management and mitigation practices.

In a study of wildlife and energy development in the Upper Green River Basin of Wyoming, Beckmann found that pronghorn actually have a higher probability of use closer to well pads, when habitat loss from surface disturbance is less than five percent. Overall, though, probability of use declines as the distance to the nearest well pad increases. On average, habitat patches with the highest probability of use have 3.8 percent surface disturbance due to construction of roads and well-pads versus 5.3 percent and 5.2 percent surface disturbance for patches with high to medium use, respectively (Beckman et al 2011, p. 79 - 84). Beckman et al. (2011) also reported that across all winters except 2005, pronghorn utilized areas closer to gas wells when snow depths were greater, perhaps using associated roads to facilitate movement. In general, barring 2005, the interactive snow depth parameters suggest that when snow is deeper, pronghorn are more likely to use areas closer to disturbance and wells, likely because those disturbed areas are situated in the most crucial pronghorn winter habitat that becomes necessary during winters of high snowfall. Beckman suggested that true impacts of gas field development may only be seen during the most severe winters in the Upper Green River Basin when animals are forced by higher snow depths to utilize other parts of the gas fields (Beckman et. al. 2011, p. 95).

Analysis Methods

BLM assessed baseline condition of open road density and oil and gas well pad density in a 41.3 mi^2 area surrounding the lease parcels, which are metrics reported in the cited literature to influence pronghorn movements and habitat use. The size of the analysis area was selected because it is the mean spring migration distance reported by Jakes et al. (2018) in northeastern Montana, and is a large enough area to capture direct, indirect, and cumulative effects (Jakes et. al. 2018). As seasonal movements of pronghorn in southeastern Montana have not been well documented, this analysis area represents the best available information regarding pronghorn seasonal migration in eastern Montana Migration distances in other places including Wyoming, North Dakota, Idaho, and Alberta, Canada reported both larger and smaller pronghorn migration distances. Although the pronghorn populations for Saskatchewan and northeastern Montana are located in the Northwestern Glaciated Plains ecoregion (characterized by gently rolling grassland plains and hills) and southeastern Montana is located in the Northwestern Great Plains ecoregion (characterized by rolling shale plains moderately dissected with flat-topped buttes and badlands), no reliable migratory data exists for that ecoregion and the Northern Glaciated Plains ecoregion is more representative of habitat types found across eastern Montana than the other ecoregions. Migration distances reported for southwestern Wyoming (Middle Rockies and Wyoming Basin ecoregions) were not used, specifically because pronghorn must travel longer distances around mountains, which are lacking in eastern Montana.

Within this analysis area, BLM used TIGER data to identify open roads; TIGER roads line and shapefile data are an extract of selected geographic and cartographic information from the U.S. Census Bureau's Master Address File / Topologically Integrated Geographic Encoding and Referencing (MAF/TIGER) Database (MTDB). The MTDB represents a seamless national file with no overlaps or gaps between parts, however, each TIGER/Line shapefile is designed to stand alone as an independent data set, or they can be combined to cover the entire nation (https://catalog.data.gov/dataset/tiger-line-shapefile-2017-nation-u-s-primary-roads-national-shapefile). Due to the broad scale coverage of TIGER data across the

nation, it is not going to include every road on the landscape, especially unimproved two track roads. However, it provides a consistent dataset for identifying improved roads across large geographic areas and across state lines. BLM used State of Montana, North Dakota, and Wyoming data to identify all currently producing oil or gas wells. Closed and abandoned wells were excluded because they would have minimal to no effect on big game.

Road Density

The threshold of open road development used in the Billings RMP to minimize impacts to big game winter range and calving areas from roads is 1.0 mi/mi^2. Overall, approximately 43.52 percent (Powder River) of the analysis areas provide areas with road densities less than 1.0 mi/mi^2. Pronghorn are most likely to use these areas. Approximately 17.82 percent (Powder River) of the analysis areas have a road density between 1.01 mi/mi^2 and 1.5 mi/mi^2, which corresponds to a moderate impact. Literature suggests that pronghorn would use these areas to a lesser degree than the areas free from roads but may use roads to facilitate movement during winters with high snowfall. Approximately 38.65 percent of the analysis areas are highly impacted by open roads. There are areas that pronghorn would likely avoid except during extreme winters. Refer to **Table 22** and **Table 23** below and **Appendix G (Wildlife Maps).**

Table 22 Road density within a 41.3 mi^2 analysis area centered around Powder River County parcels

Road Density (mi/mi^2)	Percent of Analysis Area	Degree of Impact
0-0.30	25.39	Very Low
0.31-1.0	18.13	Low
1.01-1.5	17.82	Moderate
1.51-2.0	14.50	High
2.01-5.0	23.58	Very High
5.01-7.2	0.57	

Well Pad Density

Using the thresholds identified by Wyoming Game and Fish, approximately 92.3 percent of the Analysis Areas are free from oil and gas development (i.e., not impacted), approximately 1.75 percent have a low level of impact, 3.43 percent (Powder River Co) are moderately impacted, 2.46 percent are highly impacted, and 0.08 percent rate as extreme impact. Refer to **Table 23** below and **Appendix G (Wildlife Maps).**

Table 23. Well Density in 41.3 mi2 analysis area around the Powder River and Carter County Parcels

Well Density (wells/mi^2)	Percent of Analysis Area	Degree of Impact
0 - 0.2	92.29	None
0.21 - 0.5	0.80	Low
0.51 - 1.0	0.95	Low
1.01 – 5.0	3.43	Moderate
5.01 – 10.0	1.81	High
10.01 –20.0	0.65	High
20.01 – 31.0	0.08	Extreme

Telemetry Data

The BLM reviewed telemetry data from one and a half years of data collected that is part of a three-year study in Powder River County to evaluate pronghorn movements. BLM compared the data to the road density and oil/gas well pad density models, and reviewed data for proximity to the proposed lease parcels. The data indicates that multiple collared pronghorn are occupying the analysis area. Pronghorn 2018 spent the spring/summer north of Hwy 212, and crossed Hwy 212 and Hwy 544 to winter in Wyoming. Pronghorn 2121 spent the spring/summer just south of Hwy 212 and traveled south to winter north of Hwy 544. Pronghorn 2042 spent the spring and summer in/around the Belle Creek oil field and wintered north and south of Hwy 544 in MT and WY. Pronghorn 2122 spent the spring summer south of Hwy 212 and traveled south to winter just west of Biddle, MT, on west side of Hwy 59. Pronghorn form mixed-sex groups with that can number into the hundreds some years in the late/fall winter, so it is a valid assumption that there are additional pronghorn occupying and traveling through the analysis area with the collared individuals. By comparing the preliminary results of the telemetry data with the location of proposed lease parcels, it is apparent that pronghorn are traveling through the middle of six proposed lease parcels, with parcels 247, 249, 250 and 251 to the east of the travel corridor and 252 and 252 to the west of the travel corridor. The telemetry data also validates the road density and oil/gas well pad density models, showing that pronghorn are spending the majority of their time in areas identified as having high habitat effectiveness. Refer to Wildlife Maps in **Appendix G.**

3.4.2 Environmental Effects – Alternative A (No Action)

Under no action, BLM would not hold the June 2022 oil/gas lease sale. None of the parcels would be offered for sale, sold, or subsequently developed. Therefore, there would be no effect to pronghorn general winter range from this action. Pronghorn general winter range would continue to be influenced by baseline open road and well pad density.

Overall, baseline development patterns suggest that high road density reduces habitat effectiveness to a larger degree compared to oil and gas well pad density. More than one-third of the analysis area (38%) is comprised of areas containing high road density compared to less than 5 percent containing high oil and gas well pad density. Preliminary telemetry data suggests that Hwy 212, Hwy 59, and Hwy 544 serve as barriers to pronghorn movements, with numerous individuals residing either north/south or east/west of these highways without crossing them. Only a few individuals were documented crossing these highways to move between spring/summer and winter range. (Powder River-Carter Data Summary Montana Pronghorn Movement & Population Ecology Project, August 02, 2021).

Other disturbances on the landscape may also influence habitat effectiveness. Migratory populations of both sage-grouse and pronghorn in the Northern Great Plains have demonstrated avoidance of cultivated lands (Tack et. al. 2019). In winter, nutrient-rich vegetation is scarce, and the majority of pronghorn's diet consists of evergreen browse, mainly sagebrush species that protrude through the snow. However, during the summer, forage quantity is peaked and pronghorn forage on diverse vegetation, including forbs, legumes, and perennial crops (Jakes, 2015). Within the 41.3 km^2 analysis areas, approximately 9.26 percent of the Powder River County analysis areas are cultivated or altered with some other anthropogenic disturbance. Additionally, fences may serve as a barrier to daily and seasonal pronghorn movements.

While these factors suggest that habitat effectiveness may be reduced across portions of the analysis area, it is important to note that actual pronghorn movements in southeastern Montana are not well documented. Telemetry data is being collected over a period of three years that will be used to identify seasonal ranges and movement corridors and provide demographic data for pronghorn populations.

3.4.3 Environmental Effects - Alternative B (Proposed Action)

Offering parcels for lease would not result in immediate ground disturbance. However, once a lease is sold the lessee maintains valid existing rights to the federal mineral resource. Effects to pronghorn general winter range could occur later in time when a lease is developed. At the leasing stage the specific location and extent of development is unknown. The BLM would complete project specific NEPA analysis when an Application for Permit to Drill (APD) is submitted. It is at this time that project specific avoidance, minimization, and mitigation measures would be identified. This analysis looks at the parcels in aggregate and discusses potential effects from future development on or surrounding the lease parcels should it occur. The one exception to this is on parcel MT-2021-03-0253 where BLM was reviewing an APD before the lease was vacated by the Montana District Court (see sage-grouse analysis). In this case, the proposed well pad and access roads are considered reasonably foreseeable, and the effects of a specific proposal can be analyzed.

As summarized in **Chapter 2/Table 2** and detailed in **Appendix D**, the BLM estimates that one to two oil wells and one to two gas wells could be drilled on the Miles City Field Office parcels, resulting in about 5.25 – 10.50 acres of short-term and 1.95 – 3.9 acres of long-term disturbance. The Power River parcels have high development potential. Parcels 250 and 253 in Powder River County are the most likely to be developed. Refer to **Appendix D**.

Oil and gas development could negatively affect pronghorn by allowing for well development during crucial timing periods, increased road density, and increased well density beyond thresholds found to be detrimental to pronghorn. **LN 14-40** would potentially require avoidance and minimization measures at the APD stage to reduce impacts to MTFWP identified pronghorn winter range.

MTFWP identified pronghorn winter range occurs in discrete patches across both analysis areas, separated by general pronghorn habitat. The Powder River County lease parcels are generally located on the eastern edge of Powder River basin to the west of, and parallel to Bell Creek Field, which is represented by high to very high road density. The distribution of existing roads across the analysis areas suggests that high road density could be reducing habitat effectiveness across portions of pronghorn general winter range (refer to Alternative A above).

Parcels 247, 249, 250, 251 are located in a large block of pronghorn general winter range in Powder River County that is characterized by low road and oil/gas well pad density. Additionally, Parcels 252 and 253 lie between two blocks of winter range in close proximity the other parcels. This area corresponds to sage-grouse habitat that BLM characterized as Category 5 due to lack of disturbance and proximity to lek. BLM quantified the change in road density from a reasonably foreseeable, proposed 2.68-mile access road, Big Jake access road, to a proposed well pad location on Parcel 253 (refer to sage-grouse analysis). If the Big Jake access road is added to access parcel 253, the area of road densities in the analysis area with less than 1.0 mi/mi^2 is reduced from 43.52 to 42.40 percent (**Table 22 and Table** 24). The results of adding a single access road to the proposed well pad show an increase of 1.12 percent from very low/low road density to moderate road density (a change from green/yellow to yellow/light orange on the road density map). Areas highly impacted by roads increases from 38.65 percent to 39.28 percent (**Table 22 and Table** 24**).**

Table 24. Road density within a 41.3 mi2 analysis area centered around Powder River County parcels with Big Jake Access Road included

Road Density (mi/mi^2)	Percent of Analysis Area	Degree of Impact
0-0.30	24.41	Very Low
0.31-1.0	17.99	Low
1.01-1.5	18.31	Moderate
1.51-2.0	14.86	High
2.01-5.0	23.84	Very High
5.01-7.2	0.58	

Based on the road density model and preliminary telemetry data, oil, and gas development on parcels 242, 243, 244, 245, and 246 would be less impactive compared to development on parcels 247, 249, 250, 251, 252, and 253. While located in general winter range, preliminary telemetry data does not show pronghorn traveling through or spending the winter in the vicinity of parcels 242-246, and the road density model shows that a portion of these parcels already have high road density. However, preliminary telemetry data documents pronghorn movement right between the other cluster of parcels, with parcels 247, 249, 250, and 251 on the east side of the travel route, and 252 and 253 on the west side of the travel route. It is important to note that the telemetry data only represents one winter of a three-year study; however, it does show multiple individual traveling through this area. Additionally, the mild winter in 2020-2021 may not accurately delineate areas that are considered crucial winter range. Oil and gas development to the east and west of this travel route could potentially place additional stress on pronghorn migrating between spring/summer and their winter range, result in travel disruptions, or possibly increased risk of mortality. Refer to the wildlife maps in **Appendix G.**

In the Powder River County analysis area, oil/gas development is generally concentrated in the Bell Creek oil field in the southeastern portion of the analysis area, with some isolated, scattered developments elsewhere. The telemetry data shows that one collared individual spent the spring/summer in the oil field but moved to undisturbed habitat for the winter. None of the parcels are located in or adjacent to areas of existing oil/gas development, and oil/gas development would introduce new disturbance to the landscape. Oil/gas development on the cluster of six parcels (247, 249, 250, 251, 252, 253) could reduce habitat effectiveness and the patch size of high quality, undisturbed habitat that is currently being used by pronghorn to move from spring/summer to winter range.

It is worth noting that all of the nominated parcels located in MTFWP pronghorn general winter range are also located in designated GHMA for sage-grouse. Because the area is in GHMA and not PHMA, neither the No Surface Occupancy stipulation nor the density disturbance cap apply. If BLM were to receive an APD for development on any of these parcels, the location a well pad and access road may need to be negotiated to reduce impacts to both pronghorn general winter range and sage-grouse habitat. The BLM may modify the siting of the proposed location by no more than 200 meters consistent with 43 CFR § 3101.1-2. The BLM may approve the application as submitted or with appropriate modifications or conditions or return the application and advise the applicant of the reasons for disapproval if project impacts cannot be adequately mitigated (43 CFR § 3162.3-1 (h)).

3.4.4 Environmental Effects - Alternative C

Under Alternative C, the six Powder River County parcels in the vicinity of a potential pronghorn migration corridor would not be offered for lease including: MT-2021-03-0247, 0249, 0250, 0251, 0252, and 0253. By not offering the parcels for lease in a June 2022 lease sale, development rights would not be conveyed to a third party, and all potential impacts described under Alternative B would be avoided, allowing time for additional data to be collected to further document pronghorn use and movements in this area.

As previously noted, a three-year telemetry study is in progress that will be used to identify seasonal ranges and movement corridors and provide demographic data for pronghorn populations in several areas across Montana, including Powder River and Carter County. Initial results from the first year and a half indicate that pronghorn are traveling from areas locations both north and south of Highway 212, south through the vicinity of these lease parcels, and wintering either just north of Highway 544, or even traveling further south into Wyoming.

Information gained from this project may be used for on-the-ground implementation by FWP, BLM, and partners to manage, protect, and improve important pronghorn habitat and develop strategies to manage pronghorn populations at desired abundances. Estimates of seasonal ranges and movement corridors described in this EA are preliminary and will be finalized at the end of the three-year study. Information gained from this project would be used for on-the-ground implementation by FWP, BLM, and partners to manage, protect, and improve important pronghorn habitat and develop strategies to manage pronghorn populations at desired abundances. BLM could then utilize the data to develop and apply protective stipulations to conserve pronghorn migration corridors and crucial winter range.

3.4.5 Reasonably Foreseeable (Cumulative) Effects

The BLM reviewed previous lease parcels offered for sale since the 2015 ARMPs were approved to identify areas that may be developed in the future. As previously noted, once a lease is sold the lessee maintains valid existing rights to the federal mineral resource. While it is unknown if any particular lease parcels would be developed, it is reasonable to assume that there is continued industry interest to develop oil and gas resources in areas that are currently producing. The MT District Court vacated all the lease parcels from the December 2017 and March 2018 lease sales, however several of them were re-nominated for this sale within the big game analysis areas. Refer to **Appendix G** and Sage-Grouse analysis. While there is not near absolute certainly that all the lease parcels will be developed, the fact that the parcels were re-nominated indicates a strong desire to maintain valid leasing rights to the federal mineral resource. Additionally, BLM was reviewing an APD on of the parcels in pronghorn general winter range when it was vacated, and that development is reasonably foreseeable.

In Powder River County from 2015-2020, BLM offered 46 parcels comprising 32,601 acres within the pronghorn analysis area. Of that, 27 parcels comprising 16,359 acres are located within State of Montana identified pronghorn general winter range (59 percent of parcels comprising 50 percent of the acres). Of the 16,359 acres, BLM applied CSU 12-26 for crucial winter range to 960 acres (about 6 percent). CSU 12-26 requires a lessee/operator to develop a plan to maintain the functionality of habitat.

If previous lease parcels are developed that do not have either the CSU or the LN, oil and gas development could encroach into pronghorn general winter range or a migration corridor without any operating constraints on disturbance. BLM started applying Lease Notice 14-40 to parcels in MTFWP pronghorn general winter range for the July 2019 and subsequent sales. Previous lease parcels in the

Powder River County analysis area are generally located to the west of the Bell Creek oil field in a large block of undeveloped habitat.

As previously noted, the Powder River County parcels are most likely to be developed. The water resources analysis notes that these parcels are surrounded by a numerous conventional dry holes and a handful of successful oil fields dating back to the 1960's. They are likely to be developed with vertical oil and gas wells as it is unlikely that there is sufficient organic rich mudstone with the required pressures and thermal maturity to support horizontal wells.

3.5 Issue 4 – Greater Sage-Grouse

Introduction

What are the effects to sage-grouse habitat if the parcels nominated in the February 2022 lease sale are leased and subsequently developed for oil or gas production?

The greater sage-grouse is an upland game bird native to Montana, North and South Dakota, and eight other western states. Due to habitat loss and fragmentation, the population of sage-grouse has declined across its range. In 2015, the U.S. Fish and Wildlife Service (USFWS) considered it for listing under the federal Endangered Species Act and published a decision on October 2, 2015, that listing was not warranted due to the commitments federal agencies and western states made to institute regulatory mechanisms and habitat protection measures.

The greater sage-grouse is classified as a BLM special status sensitive species. Under Manual 6840 (Special Status Species Management), actions authorized by the BLM shall further the conservation of Bureau sensitive species. Bureau sensitive species are managed consistent with species and habitat management objectives in resource management plans to promote their conservation and to minimize the likelihood and need for listing under the Endangered Species Act. Manual 6840 directs the BLM to incorporate best management practices, standard operating procedures, conservation measures, and design criteria to mitigate specific threats to Bureau sensitive species during the planning of activities and projects.

This analysis assumes all BLM oil and gas stipulations to conserve habitat would be applied on the lease parcels consistent with provisions in the 2015 Resource Management Plans (RMPs), and that any on or off-lease development could occur consistent with applicable BLM RMPs, state regulations, BLM policy, and recent court orders, including the following:

- **Miles City MT and North Dakota MT Resource Management Plans (RMPs), September 2015**: The RMPs designate areas as open or closed to fluid mineral leasing (resource allocations), and designate specific areas that provide sage-grouse habitat as Priority Habitat Management Areas (PHMAs), General Habitat Management Areas (GHMA), or Restoration Habitat Management Areas (RHMAs) subject to management actions designed to avoid and minimize disturbances associated with proposed projects (i.e., stipulations). Key components of the 2015 RMPs include: PHMA is open to fluid mineral leasing subject to no surface occupancy (NSO) stipulation without waiver or modification and with limited exception, GHMA is open to fluid mineral leasing subject to controlled surface use (CSU) stipulations and NSO around 6/10 mile around lek, and provisions for compensatory mitigation for residual effects.

- **RMP Prioritization Objective & MT District Court Order in Case 4:18-cv-00069-BMM Document 147 Filed 05/22/20.** The court found that BLM allows entities to develop oil and gas resources through a competitive leasing process but may withhold or defer parcels for various reasons, including environmental concerns. The MT District Court determined that the Prioritization Objective in the 2015 RMPs is "intended to guide development to lower conflict areas and as such protect important habitat." The Court found that the December 2017 and March 2018 Lease Sales and BLM Instruction Memorandum 2018-026 violated FLPMA and vacated the subject leases. The Order states BLM must prioritize non-sage-grouse habitat to accomplish two purposes: "to further limit future surface disturbance and encourage new development in areas that would not conflict with sage-grouse habitat."

- **Montana/Dakotas BLM Instruction Memorandum No. MT-2020-018 (8/5/2020)**. This IM provides guidance on prioritizing implementation decisions for BLM oil and gas leasing and development in sage-grouse habitat across the Montana/Dakotas in a manner that is consistent with the 2015 Approved Resource Management Plans (RMPs) and Plan Amendments for Montana / Dakotas RMPs, and the MT District Court Order cited above. This IM provides a framework for BLM to follow when making a decision to lease nominated parcels. In general, Category 7 parcels would not be leased; these lands include nominated parcels within 3.1 miles of a lek in undisturbed habitat.

- **BLM Permanent Instruction Memorandum No. 2018-014 (6/12/2018):** This IM provides guidance for directional drilling into federal mineral estate from well pads on non-federal locations (which could occur under a No Surface Occupancy scenario) and explicitly states that BLM has no jurisdiction to require an APD before an operator may begin pad and road construction or drilling on the non-Federal land, but that APD approval is necessary to drill into the Federal mineral estate.

- **BLM Instruction Memorandum 2021-038 (7/12/2021):** This IM rescinded IM-2019-018 which was the compensatory mitigation policy issued under the previous Administration. The new IM reinstates the BLM's Mitigation Manual Section (MS-1794) and Handbook (H-1794-1). The BLM expects to establish policies which are aligned with EO 13990, SO 3398, and the priorities of the Department. During this interim period offices are instructed to consider and implement compensatory mitigation on a case-by-case basis, in consultation with state office and national office program specialists and the Office of the Solicitor as needed.

- **Montana, Executive Orders 12-2015 and 21-2015:** MT EO 12-2015 and 21-2015 apply to any projects requiring a state permit, technical assistance, or state grant funds in designated sage-grouse habitat and outlines stipulations for land uses and activities occurring in designated sage-grouse habitat, including compensatory mitigation.

- **MT Mitigation Policy Guidance & Habitat Quantification Tool:** On October 4, 2018, the Montana Sage Grouse Oversight Team (MSGOT) approved the Montana Mitigation System Policy Guidance Document for Greater Sage-Grouse and the Habitat Quantification Tool Technical Manual (HQT). The Montana Policy Guidance defines the

processes and information necessary to create, buy, or sell mitigation credits suitable for meeting sage grouse mitigation requirements within the State of Montana. The HQT calculates the functional acres lost on a debit project and gained on a credit project. Functional acres are based on the quality and quantity of affected habitat. For APDs in Montana, BLM adopts any State-required mitigation as a project design feature, including compensatory mitigation to offset residual effects. The Montana Policy Guidance document is consistent with policy guidance in BLM's reinstated Mitigation Manual and Handbook (both of which were in effect at the time MSGOT approved the HQT and Policy Guidance Document in 2018).

- **Voluntary habitat conservation in North Dakota:** The State of North Dakota does not regulate development in sage-grouse habitat; habitat conservation efforts are strictly voluntary. The BLM and USFS manage development/activities on federal lands in sage-grouse habitat consistent with management decisions in federal land use management plans. As described in IM 2018-014 (fee-fee-fed) and IM 2019-018 (compensatory mitigation), the BLM does not have jurisdiction to impose surface requirements off lease, construction of surface facilities including well pads and roads can occur before BLM approves an APD to access federal minerals, and the BLM cannot require compensatory mitigation to address effects to sage-grouse habitat.

3.5.1 Affected Environment

Sage-grouse occupy sagebrush landscapes in southwestern and eastern Montana from the Canadian to the Wyoming border, northwestern South Dakota, and southwestern North Dakota. The Dakotas are on the far eastern edge of greater sage-grouse range and the two states' populations are considered at high risk of extirpation because of their small numbers and isolation.

A recent and comprehensive report from USGS (Coates et al. 2021) indicated that greater sage-grouse populations have experienced an 80% decline since 1965 and a 38% decline since 2002, with the greatest declines occurring in the Great Basin. Coates et al. created a framework for categorizing risks to populations using a Targeted Annual Warning System. In this system, populations are assigned a "warning" status if they display slow decline over two consecutive years and a "watch" status if the display slow decline in three out of four years or a rapid decline in two out of three years. On average in Montana, across the 29 years of data, approximately 3.8 and 1.1 percent of leks per year experienced watches and warnings, respectively. Focusing on watches and warnings from the most recent data used in the study (2019), three counties in Montana had a combined total of 7 leks with watches or warnings: Rosebud (3 watches), Yellowstone (1 warning, 2 watches) and Phillips (1 warning) counties.

In Montana, there are currently about 1,000 confirmed active sage-grouse leks, with long-term average male counts per lek ranging between 26 to 29 males depending upon geographic region (Montana Sage-grouse Habitat Conservation Program 2016 Annual Report, Appendix E). As shown in Figure 1 below, sage-grouse population numbers naturally oscillate across large scales over time; Montana population estimates have ranged from a high of 97,044 in 2006 to a low of 43,887 in 2014 (MTFWP 2021). The August 2021 MT Fish Wildlife and Parks Montana Greater Sage-Grouse Population Report estimates that there were approximately 70,583 (± 8,264) sage-grouse in Montana in Spring 2020. Data from FWP's sage-grouse research project in central Montana suggests hen survival was relatively low in fall 2020 compared to the previous year. This could be one reason why there was a decrease in the number of sage-grouse at leks in spring 2021. The current drought conditions of 2020 brought higher than average

temperatures and below average precipitation in August and September 2020. This could have limited food resources during the critical late summer brood-rearing period. Extreme drought conditions have continued in 2021 and are expected to further decrease sage-grouse number in 2022.

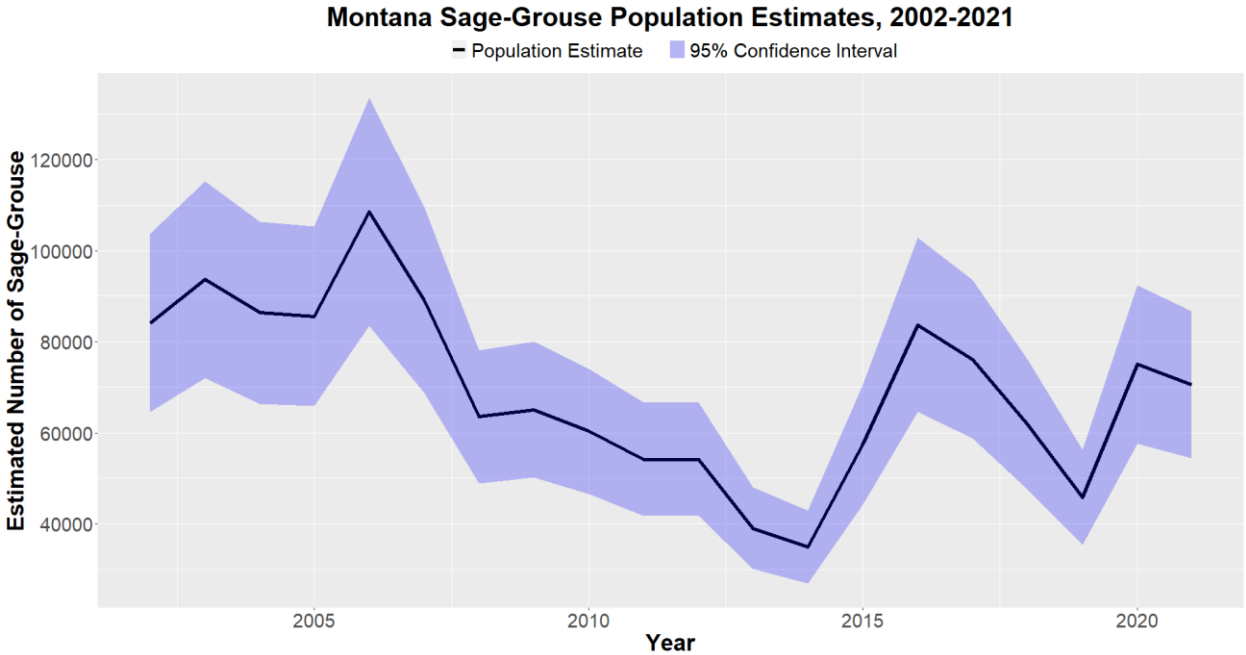


Figure 3: MTFWP Sage-Grouse population estimates (MTFWP August 2021) and associated confidence intervals from *N*-mixture models in Montana, 2002-2021. The confidence intervals, light blue areas, are the range of values that describe the uncertainty around the population estimate, dark blue line.

In North Dakota, there are about 50 sage-grouse leks in Bowman, Slope, and Golden Valley Counties. The population has been significantly impacted by historic habitat loss and more recent West Nile virus impacts over the last ten plus years, with natural mortality levels occurring at a higher rate than recruitment into the population. Population counts from 1997 to 2007 averaged 187.5 males, but from 2008 to 2018, the average number of males dropped to 45.3. In 2018, there were 24 males on six leks (ND Sage-Grouse Lek Database). In 2017, the North Dakota Game and Fish Department translocated 60 sage-grouse from southern Wyoming to Bowman County (40 females and 20 males), with limited success. Many of the birds moved great distances from their release site (Ron Wilson, ND Game and Fish Dept, 2019). None of the February 2022 nominated parcels in North Dakota are in sage-grouse habitat.

This analysis considers impacts to sage-grouse habitat from subsequent oil and gas development over three spatial scales. The largest scale looks at effects to sage-grouse habitat within 4 miles of nominated parcels, which generally corresponds to distances used for detrimental disturbance calculations (DDCT) in PHMA, which encompasses a 4-mile project boundary and a four- mile boundary around occupied leks (Miles City ARMP, Appendix E, p. DIST-4). Note that a project specific DDCT analysis boundary would be identified based on an actual project footprint and proximity to active leks, and this analysis is not calculating DDCT over leased parcel acres. Consideration of impacts within a 4-mile analysis area is also supported in relevant research. **In a study of sage-grouse in southeastern Montana, Foster et al. (2013) found that 59% of sage-grouse nests were within 1.6 km (1 mi.) of a known lek location, 84% within 3.2 km (2 mi.), 93% within 4.8 km (3 mi.), and 97% within 6.43 km (4 mi.).** Additionally, this analysis considers effects to habitat within 2miles of nominated parcels as BLM stipulations in GHMA may restrict or prohibit or restrict surface occupancy and use within 2 miles from the perimeter of an active

lek. This analysis also considers effects to habitat within 3.1 miles as this distance corresponded to lek buffers established in the 2015 ARMPs and the USGS recommended conservation buffer distance for surface disturbance and energy development.

Based upon information in the State of Monta lek database, there are 2 leks in Powder River County within 4 miles of nominated parcels (**Table 25**). Montana Fish, Wildlife and Parks (MTFWP) classified both leks as Confirmed Active as of 2021. Lek PO-035 was last surveyed in 2019 and lek PO-072 was surveyed in 2021. Six parcels are located between 3.1 to 4 miles of these two leks, with one parcel (253) located within 4 miles of both active leks. **Table 25** below identifies leks in relation to the February 2022 lease parcels and summarizes lek trends based on existing monitoring data from MTFWP.

Table 25: Lek Trends Within 2 miles, 3.1 miles and 4 miles of Nominated Parcels

Lek	Population Trends	Parcel w/n 2 miles	Parcel w/n 3.1 miles	Parcel w/n 4 miles
PO-035	FWP Confirmed Active. Signs of lekking observed in 2011. Last GRSG observed in 2005. Last survey 2019.	None	None	MT-2022-06-0247 MT-2022-06-0250 MT-2022-06-0251 MT-2022-06-0253[1]
PO-072	FWP Confirmed Active. Lek surveys were conducted in 2018 and 2021. 2021 lek counts included 29 individual birds (11 male, and 18 female). Signs of lekking first observed in 2018; in 2018 13 males and 12 females were observed.	None	None	MT-2022-06-0249 MT-2022-06-0252 MT-2022-06-0253[1]

[1] MT-2021-03-0253 was previously leased in March 2018 and vacated via court order. It had a pending APD that BLM returned to the applicant. The parcel was renominated for the February 2022 sale.

MTFWP classifies leks as follows:

- **Confirmed Active -** Data supports existence of lek. Supporting data defined as 1 year with 2 or more males lekking on site followed by evidence of lekking (Birds - male, female or unclassified; -OR- Sign - vegetation trampling, feathers, or droppings) within 10 years of that observation.
- **Confirmed Inactive** - A Confirmed Active lek with no evidence of lekking (Birds - male, female or unclassified; -OR- Sign - vegetation trampling, feathers, or droppings) for the last 10 years. Requires a minimum of 3 survey years with no evidence of lekking during a 10-year period. Reinstating Confirmed Active status requires meeting the supporting data requirements.
- **Provisionally Active** – Preliminary data supports existence of an active lek. This status can only apply during the first year of detection. Supporting data defined as 1 observation with 2 or more males lekking on site AND sign of lekking (vegetation trampling, feather, or droppings) or followed by a 2nd observation of 2 or more males lekking within the same survey year.
- **Unconfirmed** - Possible lek. Grouse activity documented. Data insufficient to classify as Confirmed Active status.

The BLM completed a lease parcel prioritization review of the 29 parcels as outlined in Montana/Dakotas IM 2020-018. Two parcels in the Miles City Field Office and all 15 of the North Dakota Field Office nominated parcels are in Category 2 (non-habitat) and are therefore not included in this analysis. Twelve parcels are located in GHMA (none in PHMA). BLM rated eight of them as Category 5 (>3.1 miles from

lek, undisturbed habitat, high/medium RFD) and four of them as Category 3 (>3.1 miles from a lek, disturbed habitat). Consistent with IM 2020-018, the BLM may offer Category 3 parcels for lease as supported by NEPA analysis. Category 3 lands rate second highest priority for leasing unless some other resource value supports a decision not to lease. Category 5 lands provide good habitat but are less valuable to sage-grouse because they are further than 3.1 miles from a lek. A parcel may be offered for lease or not leased as supported by the NEPA analysis. In making its decision, the BLM should consider multiple resource values and any input provided by a state wildlife management agency with respect to state conservation objectives. In balancing multiple uses, Category 5 parcels have higher priority for leasing than Category 6 based upon a high or medium RFD. It is worth noting that the February 2022 lease sale carries forward parcels from the March 2021 lease sale, and the BLM reconfigured parcel boundaries up front on five parcels so that none of them contain Category 7 habitat (within 3.1-mile lek buffer, undisturbed), and eliminated two Category 7 parcels that were located entirely within lek buffers.

Table 26: Nominated Parcels—Miles City Field Office; 14 parcels/ 6,277.03 acres

Category	***Category Reference***	***Total Number of Parcels* (Acres)**			
1	Legal Obligation	0			
2	Non-Habitat	**2 (17.75)**			
Category #	***Category Reference***	***Total Number of Parcels Per Habitat Management Area Type* (Acres)**			
		Restoration	**General**	**Priority**	**Total**
3	Within Existing Disturbance/ Outside 3.1 mile from Lek	0	3 (1400.33)	0	**3 (1400.33)**
4	Within Existing Disturbance/ Within 3.1 mile of Lek	0	0	0	**0**
5	No Existing Disturbance/ Outside 3.1 mile from Lek/ High or Medium RFD	0	9 (4,858.95)	0	**9 (4,858.95)**
6	No Existing Disturbance/ Outside 3.1 mile from Lek/ Low RFD	0	0	0	**0**
7	No Existing Disturbance/ Within 3.1 mile of Lek/ High or Medium RFD	0	0	0	0
8	No Existing Disturbance/ Within 3.1 mile of Lek/ Low RFD	0	0	0	**0**
	TOTAL Nominated Parcels in GRSG Habitat	**0**	12 (6,259.28)	**0**	**12 (6,259.28)**

3.5.2 Environmental Effects - Alternative A No Action

Under No Action, the BLM would not hold the June 2022 oil/gas lease sale. None of the parcels would be offered for sale, sold, or subsequently developed. There would be no impact to sage-grouse from this action. Sage-grouse habitat would continue to be managed by the BLM on federal lands in accordance with existing regulations.

3.5.3 Environmental Effects - Alternative B Proposed Action

The direct, indirect, and cumulative effects of a minerals leasing program were evaluated in the FEIS for the applicable ARMPs in 2015, and that analysis is incorporated by reference into this EA. The North Dakota and Miles City ARMPs both analyzed cumulative effects to sage-grouse for all of WAFWA Management Zone 1 because it encompasses areas with similar floristic conditions containing important GRSG habitat (Miles City FEIS, p. 4-140), and includes four sage-grouse populations in the Dakotas, Northern Montana, Powder River Basin (MT/WY), and the Yellowstone watershed (Miles City FEIS, p. 4-140, North Dakota FEIS, p. 3-6). The FEIS analysis considered effects to population viability across Management Zone 1. On October 16, 2019, the US District Court of Idaho enjoined the BLM from implementing the 2019 sage-grouse plan amendments for Idaho, Wyoming, Colorado, Utah, Nevada/Northeastern California, and Oregon, and the 2015 sage-grouse plans remain in effect. Montana/Dakotas BLM did not amend any of its 2015 sage-grouse plans. Therefore, the cumulative effects analysis for Management Zone 1 in the 2015 plans remains relevant. In the 2015 Record of Decisions, the BLM determined that the sage-grouse stipulations strike a balance between long-term conservation of public land and resources with commodity production, recreation access, and services, and provide a layered management approach that offers the heightened level of protection for sage-grouse in the most valuable habitat (Rocky Mountain ROD Alt D/Billings, page 3-15; Alt E/HiLine and Miles City page 3-19).

Anthropogenic features, including oil and gas well pads, may negatively affect sage-grouse habitat at various spatial scales. Numerous studies have shown that oil and gas development negatively affect sage-grouse lek persistence and attendance, nesting, brood-rearing and winter habitat selection, chick survival, and population growth rates. Several of those studies are briefly summarized below.

- In a study of sage-grouse in western Wyoming, Holloran (2005) observed that greater sage-grouse avoided breeding within or near development boundaries of natural gas fields, and that the number of displaying males declined as distances from leks to gas-field-related disturbance sources decreased (i.e., drilling rigs, producing wells, and main haul roads), and as traffic volumes within 3 km (1.86 mi) of leks increased.
- Holloran et al. (2010) noted that sage-grouse adult males and females exhibited strong fidelity to breeding sites and seasonal ranges, implying that population dispersal and response of a population to habitat fragmentation depends on yearling cohorts. Holloran et al. (2010) noted that nesting yearling females avoided nesting within 950 meters (about 1 km / 0.6 mile) of natural gas infrastructure, and that a female will nest within a 272-ha area (672 acres) over its lifetime. Yearling females appeared to select nesting sites at the spatial scale of their lifetime nesting areas and avoided areas within the infrastructure of natural-gas fields.
- After controlling for habitat, Walker et al. (2007) found support for negative effects of coal bed natural gas (CBNG) development within 0.8-km (0.5 mi) and 3.2-km (1 mi) of the lek and for a time lag between CBNG development and lek disappearance.
- Dinkins et al. (2014) observed that sage-grouse selected habitat with lower densities of oil and gas structures at all reproductive stages.
- Johnson et al. (2011) found that, across the range of the species, trends on leks within 5.0-km (3.1 mi) of a producing oil or natural gas well were depressed.
- Holloran et al. (2015) found that sage-grouse avoided areas with high well pad densities in southwestern Wyoming during the winter regardless of differences in activity levels associated with well pads.
- Doherty et al. (2008) found that sage-grouse were 1.3 times more likely to occupy sagebrush habitats that lacked CBNG wells within a 4-km^2 (1.54 mi^2) area, compared to those that had the

maximum density of 12.3-wells/4.0-km^2 allowed on federal lands, and that sage-grouse avoid CBNG development in otherwise suitable winter habitat.

Offering parcels for lease would not result in immediate ground disturbance. However, once a lease is sold the lessee maintains valid existing rights to the federal mineral resource. Effects to sage-grouse could occur later in time when a lease is developed. At the leasing stage the specific location and extent of development is unknown. The BLM would complete project specific NEPA analysis when an Application for Permit to Drill (APD) is submitted. It is at this time that project specific avoidance, minimization, and mitigation measures would be identified. This analysis looks at the parcels in sage-grouse habitat in aggregate and discusses potential effects from future development on or surrounding the lease parcels should it occur. The one exception to this is on parcel MT-2021-03-0253 where BLM was reviewing an APD before the lease was vacated by the Montana District Court. In this case, the proposed well pad and access roads are considered reasonably foreseeable, and the effects of a specific proposal can be analyzed.

The BLM utilizes a sale specific Reasonably Foreseeable Development (RFD) scenario to consider potential effects from leasing using development potentials identified in the applicable ARMPs. As summarized in **Chapter 2/Table 2** and detailed in **Appendix D**, one to two oil wells and one to two gas wells could be drilled on the Miles City Field Office parcels. The Power River parcels have high development potential, and the Fallon County Parcel has medium development potential. Parcels -0250 and -0253 in Powder River County are the most likely to be developed. Refer to **Appendix D**.

The BLM did not apply sage-grouse stipulations to these parcels as they are in GHMA and BLM's only stipulations are an NSO if a lek is within 0.6 mile, or a CSU if the lek is within 2 miles; no parcel in this analysis warrants application of an NSO or CSU. However, the BLM did apply the following Lease Notice 14-11 and 14-37 to all of the sage-grouse parcels. These lease notices inform a prospective lessee that the parcels are located in sage-grouse habitat and mitigation may be required.

Fallon County: There is one parcel in Fallon County located in sage-grouse habitat. Parcel 241 (162 acres) is in the GHMA and is rated as Category 5, which means there is no existing disturbance on the parcel, and it is further than 3.1 miles from a lek and has medium or high development potential (the parcel is more than 4 miles from a lek). Because the parcel is more than 4 miles from an active lek, oil and gas development is unlikely to affect nesting sage-grouse and any residual effects to sage-grouse habitat would be mitigated in accordance with Montana Sage-Grouse Program requirements.

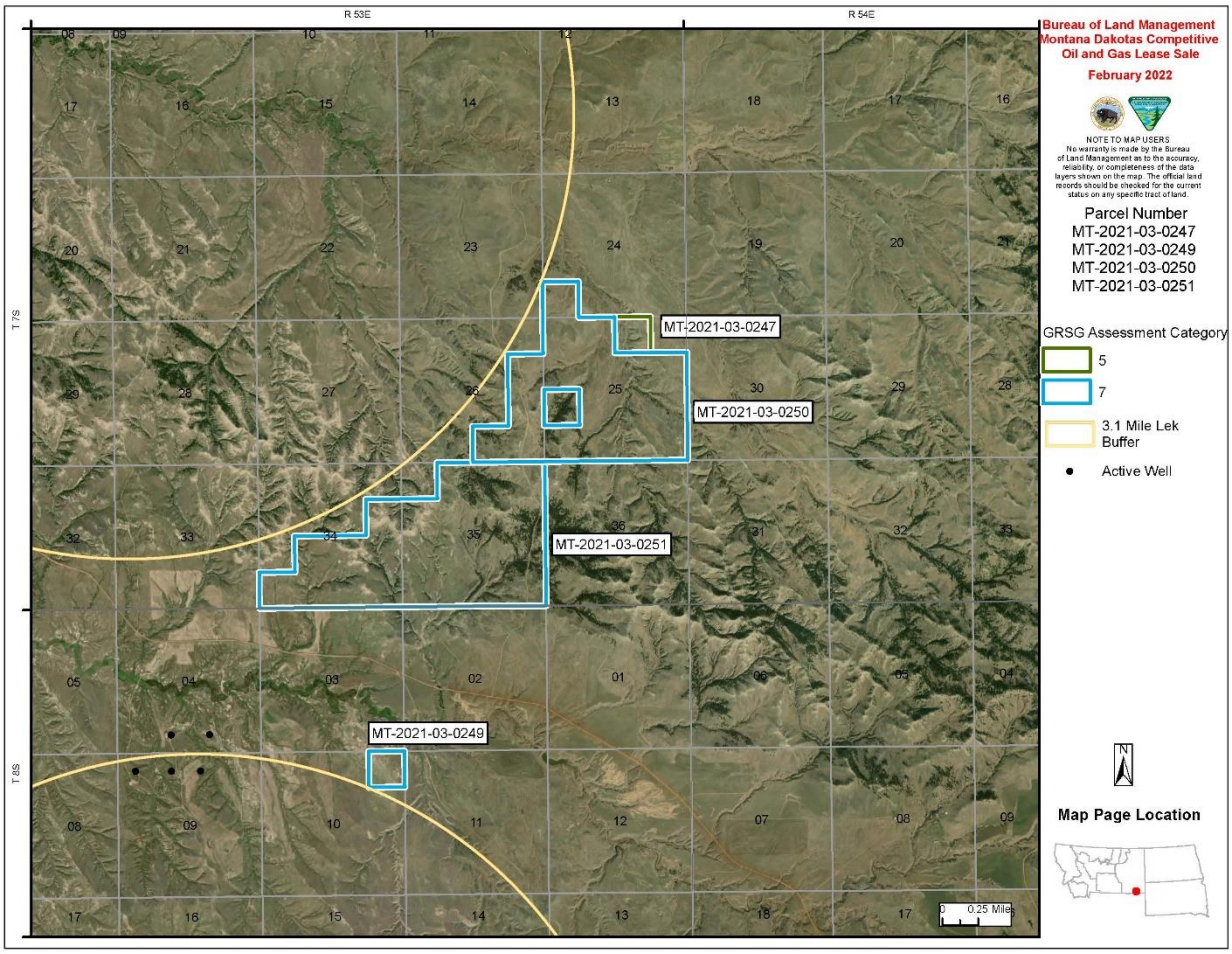
Powder River County: There are eleven nominated parcels in sage-grouse habitat in Power River County. Three adjacent parcels rate as Category 3: 242, 244, and 245. Category 3 parcels provide least valuable sage-grouse habitat. Parcels are more than 3.1 miles from a lek and in an area that is already disturbed. Parcels 242 and 244 are colonized by conifers and portions of parcels 0244 and 245 are farmed. These parcels are also located more than 4 miles from any known lek. All three parcels are considered High RFD. Oil and gas development would not directly affect habitat within a lek buffer. Because these parcels are more than 4 miles from an active lek, oil and gas development is unlikely to affect nesting sage-grouse and any residual effects to sage-grouse habitat would be mitigated in accordance with Montana Sage-Grouse Program requirements. Because these parcels are already disturbed, a project proponent may possibly further minimize effects of project development by co-locating new disturbance with existing development, which may reduce costs associated with compensatory mitigation.

Eight parcels rate as Category 5: 243, 246, 247, 249, 250, 251, 252, and 253. As previously noted, Category 5 habitat has no existing disturbance but is further than 3.1 miles from a lek. By locating development outside the lek buffers, oil and gas development would not directly affect habitat within a 3.1- mile lek buffer. Parcel 246 (626 acres) is located more than 4 miles from the nearest of a lek, therefore development on this parcel would be unlikely to affect nesting sage-grouse. The remaining

parcels are located between 3.1 and 4 miles of two active leks – Lek PO-035 and PO-072.

Parcels 247, 250, 251, and 253 are located between 3.1 and 4 miles from lek PO-035 where signs of lekking were last observed in 2011. Refer to **Table 1 and Figure 2**. This lek is still considered *active* and the last survey year was 2019; additional monitoring data is necessary to identify lek attendance and to determine whether the lek remains active or has become inactive. Development on any of one of these four parcels could individually or cumulatively affect habitat that may be used by a small percentage of nesting sage grouse. Sage-grouse research by Foster et al. (2013) in southwestern Montana indicates that 93 percent of sage-grouse hens' nest within 4.8 km (3 mi) of a lek, and 97 percent within 6.4 km (4 mi). The degree of effects to sage-grouse habitat would depend upon the locations of a proposed well pad and access road and any residual effects would be mitigated through the MT Sage-Grouse Program.

Figure 4: Alternative B Parcels 247, 250 and 251 in Relation to 3.1-mile Lek Buffer for Lek PO-035



Parcels 249 (40 acres), 252 (907 acres) and 253 (817 acres) are all located 3.1- 4 miles of Confirmed Active lek PO-072 (Figure 3). As stated above (**Table 26**), the two most recent surveys at this lek found 29 individuals (11 male, and 18 female) in 2021 and 25 individuals in 2018 (13 males and 12 females). There are currently five active wells located approximately 3 miles to the north of this lek.

With respect to reasonably foreseeable development on Parcel 253, the State of Montana Sage-Grouse Program ran a proposed 2.68-mile access road and 1.5 acre well pad through their HQT and identified

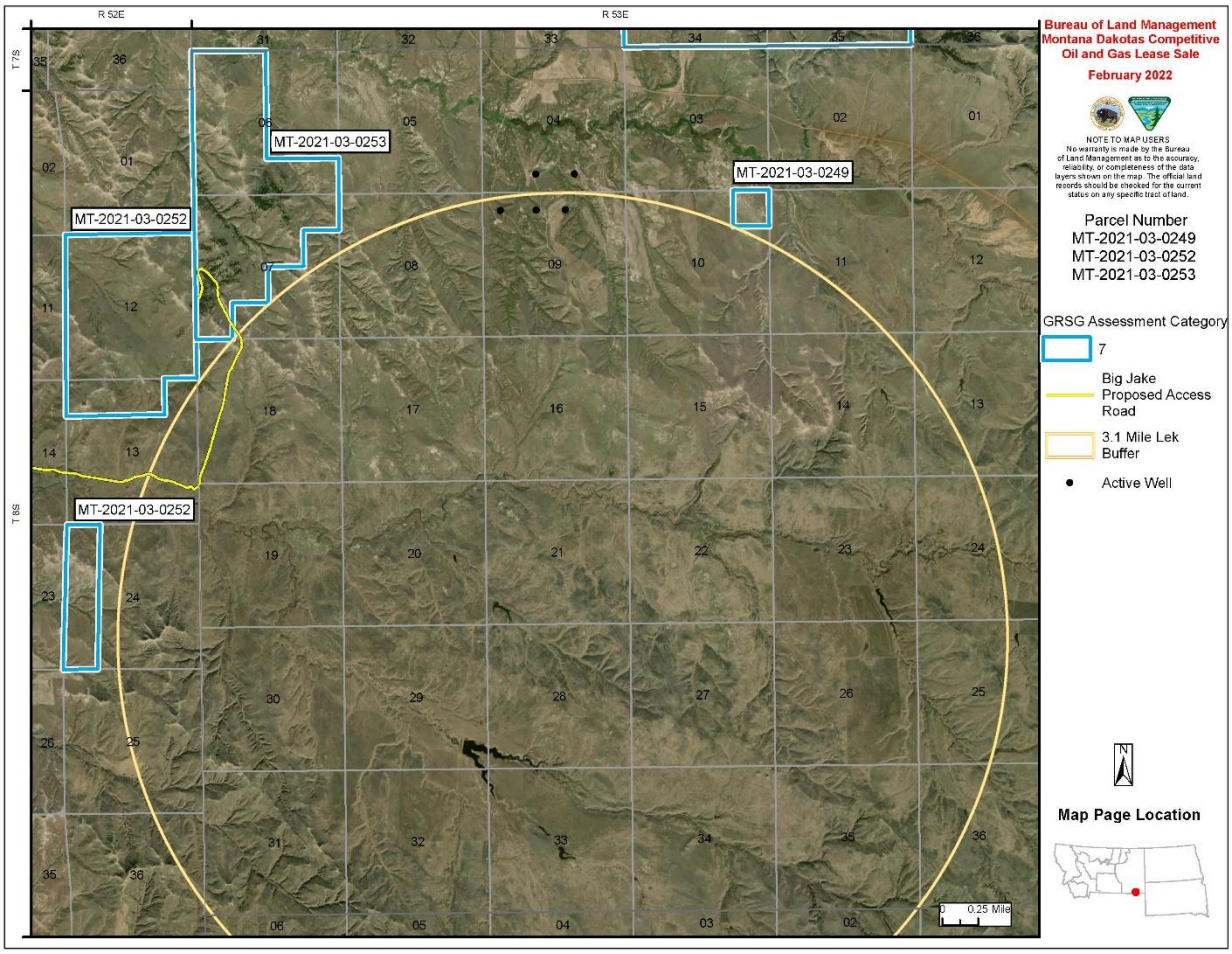
associated mitigation costs for project development. The proposed well pad site is in a stand of trees outside the 3.1-mile lek buffer, but the access road lies within the buffer zone (
Figure 4). To access the new proposed well site and conduct drilling activities, the new access roads would be minimally constructed for access. It is estimated that drilling activities would take approximately seven to ten days. If the well goes into production, the newly constructed roads would be improved to all-weather access roads with a temporary construction disturbance of 24 feet, reclaimed to an 8-foot travel corridor within one year. In addition to these road improvements, the well pad would be cleared of vegetation and leveled. Additional infrastructure would be brought into the well pad to support production activities. If the well is determined not to be productive, the lessee would fully-reclaim the well site. The reclamation of the newly constructed sections of access road would be conducted at the landowner's discretion. The project would result in a loss of 5,385.39 functional acres of sage-grouse habitat, and the lessee intended to fulfill its mitigation obligation by contributing to the Stewardship Fund Account. The Stewardship Fund Account is used to support habitat conservation efforts within the same geographic service area, which benefits the same population of sage-grouse but not necessarily the same lek that was impacted by a development. There ae four geographic service areas across the state including central MT, north central MT, southeastern MT, and southwestern MT.

Figure 5 (below) shows the proposed Big Jake access road in relation to the 3.1 mile like buffer and demonstrates that a lessee may need to traverse lands within the buffer to reach a well pad. Additionally, as previously noted, oil and gas development outside the 3.1-mile lek buffer but within 4 miles of a lek could have a minor effect to habitat that is valuable to a small percentage of nesting sage-grouse (Foster et al. 2013). When and if an APD is submitted, the BLM would need to negotiate well pad and access road location to further minimize impacts to sage-grouse. The State of Montana's HQT score would incentivize minimization efforts as the degree of impact is monetized in a mitigation obligation. Projects with a lesser impact cost less to mitigate.

A project development on any one of these parcels could individually or cumulatively reduce habitat quality by introducing disturbance to the landscape. The degree of impact would depend on the actual location of a proposed development. If BLM were to receive an APD for development on these parcels, the location of a well pad and access road may need to be negotiated. The BLM may modify the siting of the proposed location by no more than 200 meters consistent with 43 CFR § 3101.1-2. The BLM may approve the application as submitted or with appropriate modifications or conditions or return the application and advise the applicant of the reasons for disapproval if project impacts cannot be adequately mitigated (43 CFR § 3162.3-1 (h)). The State of Montana would run a project through their Habitat Quantification Tool (HQT), which could drive a project proponent to further minimize project impacts and associated mitigation costs.

.

Figure 5. Alternative B Parcels 249, 252 and 253 in Relation to 3.1-mile Lek Buffer for Lek PO-072.



3.5.4 Environmental Effects - Alternative C Proposed Action

Under Alternative C, six Powder River County would not be offered for lease including: MT-2021-03-0247, 0249, 0250, 0251, 0252, and 0253 (refer to big game/pronghorn analysis). These parcels are all located between 3.1-4 miles of Leks P-035 and/or PO-072 as noted above. As previously noted, lek PO-035 last had signed of lekking in 2011 but has not been surveyed recently, and lek PO-072 had 29 individual birds in a 2021 survey (11 male, and 18 female).

Based on well development potential described in Appendix D, the BLM predicts that four wells may be constructed on these six parcels. By not offering the parcels for lease in a February 2022 lease sale, development rights would not be conveyed to a third party, and all potential impacts described under Alternative B would be avoided, allowing time for additional data to be collected to determine if Lek PO-035 remains active. As described in the big game/pronghorn analysis, this area appears to provide undisturbed habitat that is valuable for both pronghorn and sage-grouse and Alternative C maintains these resource values for the foreseeable future.

3.5.5 Reasonably Foreseeable (Cumulative) Effects

The direct, indirect, and cumulative effects of leasing parcels proposed in previous quarterly lease sales were analyzed in their respective EA, which are incorporated by reference into this EA. As previously noted, once a lease is sold the lessee maintains valid existing rights to the federal mineral resource. Effects to sage-grouse could occur later in time if and when a lease is developed.

Figure 6 and Figure 7 identify February 2022 nominations in relation to active wells and parcels leased since the 2015 Plans were approved. The MT District Court vacated all parcels from the December 2017 and March 2018 lease sales.

Figure 6. Lease Parcels 2015 to 2021 near February 2022 Powder River County Nominated Parcels

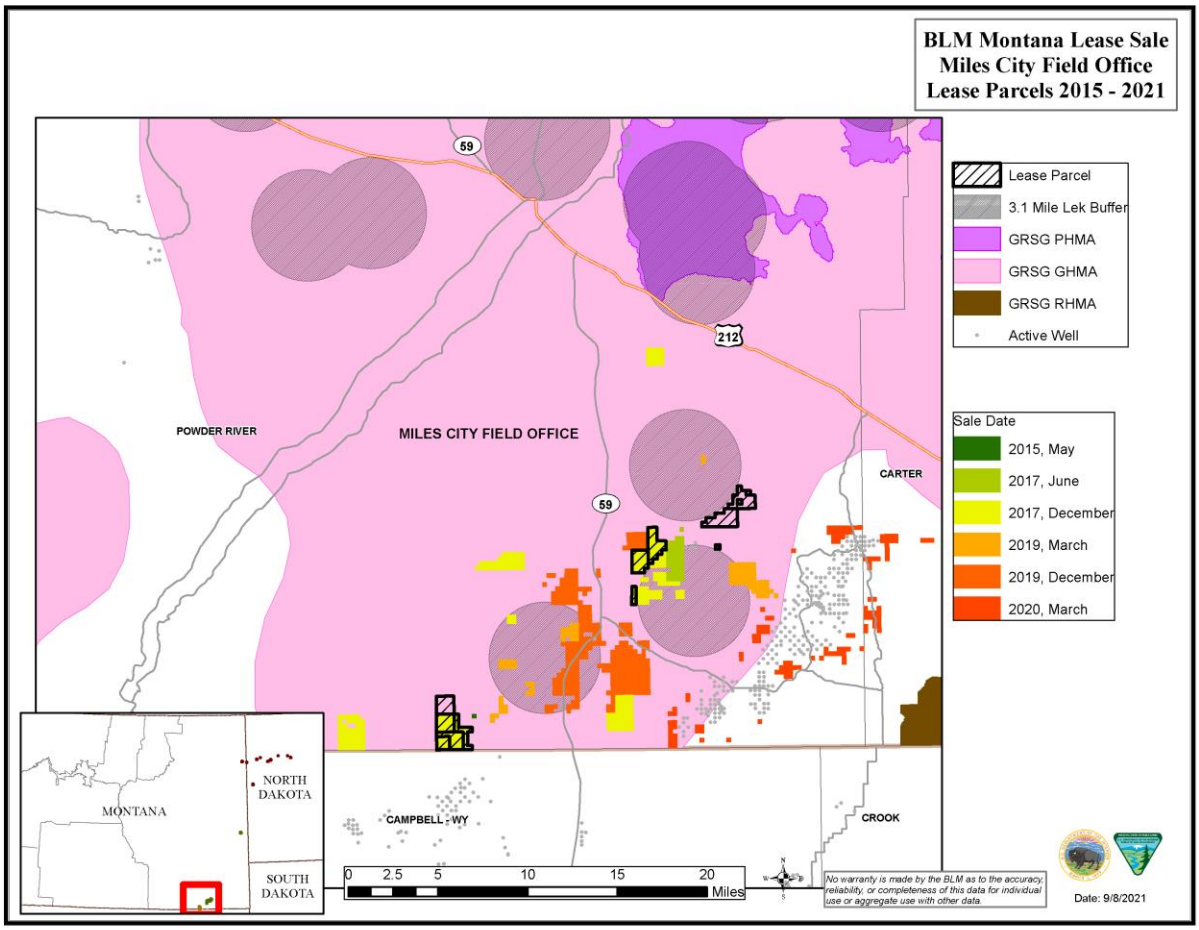


Figure 7. Lease Parcels 2015 to 2021 near February 2022 Fallon County Nominated Parcels

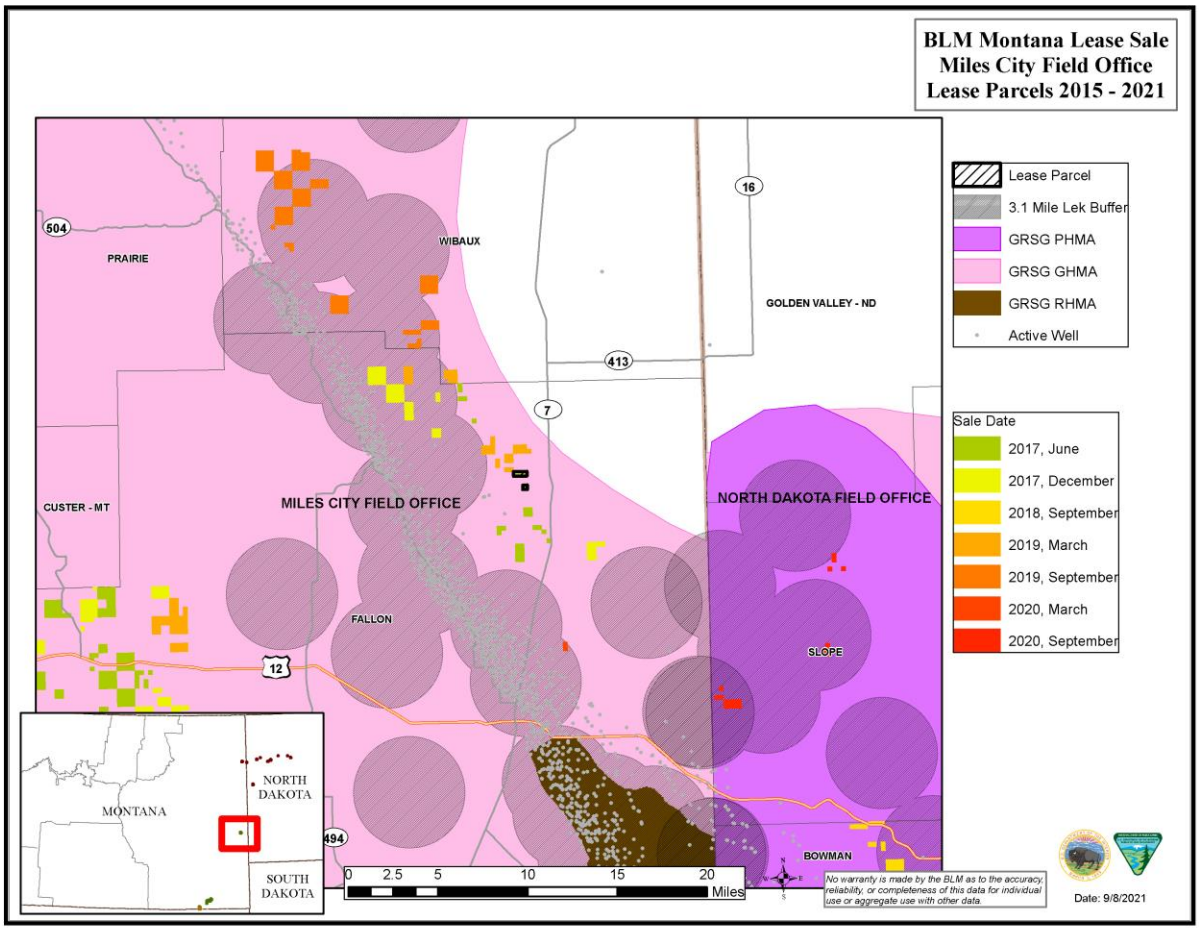


Figure 6 and Figure 7 show that some of the Fallon and Powder River parcels from the December 2017 sale were vacated and re-nominated in the February 2022 sale. While there is not near absolute certainly that all the lease parcels will be developed, the fact that the parcels were re-nominated indicates a strong desire to maintain valid leasing rights to the federal mineral resource. In another court case in in the US District Court for the District of Columbia, parcels from the June 2017 lease sale were voluntarily remanded without vacatur while the BLM completes supplemental NEPA analysis for issues related to air quality and climate change (Order in Case 1:20-cv-00056-RC filed 10/23/20). While the leases were not vacated, BLM cannot approve an APD on any of the June 2017 parcels until additional NEPA analysis is completed. Development on any one of the remaining lease parcels has the potential to affect sage-grouse habitat individually or cumulatively. As discussed above, this is especially apparent for lek PO-072 which 2021 field observations detected 29 individual birds (11 male and 18 female) on the lek and multiple parcels are under consideration for development within 4 miles of the lek.

The pattern of existing active wells in Fallon County is clustered in a relatively narrow band along the Cedar Creek Anticline. All of the parcel nominations extend eastward from that band into what is currently undisturbed habitat. In Powder River County, the nominated parcels parallel the Bell Creek oil field to the northwest. The water resources analysis suggests that the parcels are likely to be developed with vertical oil and gas wells as it is unlikely that there is sufficient organic rich mudstone with the required pressures and thermal maturity to support horizontal wells.

Nominated Parcels

During 2020 the Montana Sage-Grouse Program received 275 new program requests and 25 requests to continue reviewing projects from 2018 and 2019. They completed reviews for 22 proposed Energy – Oil/Gas Projects statewide. Approximately 45 percent of the proposed Oil/Gas Projects were located in a state designated Core Area (10 projects) and 55 percent were located in state designated General Habitat (12 projects). Oil/Gas Projects encompassed a variety of proposed infrastructure and activities, including Gas/Oil Wells, Well Pads, Temporary Abandonment, Plug and Abandon, Roads, Storage Yards, Fences, Ponds, Pipelines, Power Lines, Maintenance Activities, Buildings, Compressors, or Collection Facilities (MT Sage-Grouse Conservation Program, 2020). All of these projects would be considered reasonably foreseeable, and may include state, federal or private minerals across all land ownerships across the state. The 2020 Annual Report concludes that Montana did not meet its mitigation specific habitat-based objectives in 2020 statewide. Three service areas did meet objectives, the Central, Southwestern, and Southeastern service areas, and the total number of credits created exceeds the total number of debits. The North Central Service Area did not meet objectives, and more debits exceeded the number of credits. Across all Service Areas and credit-producing entities, a total of 305,129.79 credits were created as of December 31, 2020, with approximately 90 percent attributed to projects located in a Core Area. The majority of credits were created through perpetual conservation easements (73 percent, 222,903.94) through three 2016 Stewardship Account grants that had closed as well as permittee-responsible easements. The remaining 27 percent of total credits were created through restoration or enhancement efforts.

3.6 Issue 5 – Socioeconomic Conditions, Environmental Justice, and Human Health

3.6.1 Affected Environment

The social and economic environment of the counties containing the parcels proposed are described in detail in their associated RMP and FEIS. This section provides updated estimates of population and other socioeconomic variables within the study area, which includes all the counties containing the Federal parcels covered in this EA.

Table 27. Population Estimates

			American Indian and Alaska Native		Hispanic or Latino Heritage (of any race)	
	Total Pop.[1]	Pop. Change 2010-2019[2]	Pop.	Pct.	Pop.	Pct.
All Montana	1,050,649	8%	66,839	6.4%	40,314	3.8%
… EJ Criteria Percentage				11.4%		8.8%
Fallon County, MT	2,921	-1%	30	1.0%	58	2.0%
Powder River County, MT	1,607	-3%	27	1.7%	51	3.2%
Richland County, MT	11,199	11%	222	2.0%	608	5.4%
Roosevelt County, MT	11,175	5%	6,455	**57.8%**	442	4.0%
All North Dakota	756,717	13%	40,006	5.3%	28,317	3.7%
… EJ Criteria Percentage				10.3%		8.7%
McKenzie County, ND	13,334	134%	1,472	**11.0%**	1,114	8.4%
Mountrail County, ND	10,321	37%	2,956	**28.6%**	838	8.1%
Williams County, ND	35,208	66%	1,081	3.1%	2,709	7.7%
Combined Counties in Proposed Action	85,765		12,243		5,820	

1. Population from 2019 ACS 5-Year County Estimates
2. Population from 2019 ACS 1-Year County Estimates

As shown on **Table 27**, the counties with proposed parcels have an estimated population of 85,765 (U.S. Census Bureau, 2020). Approximately 30% of this total population lives in the Montana counties and 70% lives in North Dakota counties. County-level population ranged from Williams County ND (population 35,208) to Powder River County MT (population 1,607).

Between 2010 and 2019 the population of the ND counties where proposed parcels are listed have grown considerably faster than did North Dakota's overall population, ranging from Mountrail County's 37% increase to the 134% population increase experienced in McKenzie County. In Montana, only Richland County's growth of 11% exceeded the statewide growth of 8%, while Fallon and Powder River Counties experienced population declines of 1% and 3%, respectively.

Several of the counties containing proposed parcels are the homes for American Indian and Alaska Native populations that meet the criteria for Environmental Justice populations (five percentage points greater than the statewide percentage for that population cohort). Most of Roosevelt Co. MT's population (58%) are American Indian or Alaska Native, while this cohort represents 6% of Montana's overall population. Twenty-nine percent (29%) of the population of Mountrail Co. ND and 11% of the population of McKenzie Co. ND are American Indian or Alaska Native, while ND's overall population of American Indian and Alaska Native represents 5% of the total statewide population.

For the rest of the counties covered in the proposed action, the percentage of the county population belonging to one or more Environmental Justice cohort were not five or more percentage points larger than that percentage for the State's overall population.

Economic Conditions

The social and economic environment of the counties containing the parcels proposed are described in detail in their associated RMP and FEIS. This section focuses upon economic aspects related to the potential Federal oil and gas lease sales.

Mineral rights can be owned by private individuals, corporations, Indian tribes, or by local, State, or Federal Governments. Typically, companies specializing in the development and extraction of oil and gas lease the mineral rights for a particular parcel from the owner of the mineral rights. Federal oil and gas leases are generally issued for 10 years unless drilling activities result in one or more producing wells. Once production has begun on a federal lease, the lease is considered to be held by production and the lessee is required to make royalty payments to the Federal Government.

Table 28: Total and Average Annual Bonus Bid and Rental Payments for Existing Oil and Gas Leases on Non-Indian Federal Mineral Estates (2016-2020)

State	Geography	Total Rents 2016-2020	Total Bonus Bid Payments 2016-2020
MT	Fallon	$ 50,702	$ 30,880
MT	Powder River	$ 903,102	$ 112,614
MT	Richland	$ 273,150	$ 445,728
MT	Roosevelt	$ 15,922	$ 112,378
MT	Total	$ 1,242,876	$ 701,600
ND	McKenzie	$ 215,698	$ (115,543)
ND	Mountrail	$ 102,773	$ (3,539,906)
ND	Williams	$ 19,922	$ (1,034,743)
ND	Total	$ 338,392	$ (4,690,192)
	Grand Total	$ 1,581,268	$ (3,988,592)
Source: ONRR data, https://revenuedata.doi.gov/downloads/federal-revenue-by-location/ accessed 10/17/2021.			

Table 28 provides information on rental and bonus bid revenue from existing oil and gas leases for the counties that have parcels nominated for the proposed leasing action. Existing Federal oil and gas leases on Federal non-Indian properties located in these counties produced nearly $1.6 million dollars in rental income between 2016 and 2020. The leasing of these minerals supports local employment and income and generates public revenue for surrounding communities. The economic contributions of Federal fluid mineral leasing actions are largely influenced by the number of acres leased, and can be measured in terms of the jobs, income, and public revenue generated. Additional details on the economic contribution of Federal fluid minerals are discussed in the RMP and FEIS covering the location of the parcel. Bonus Bid payments to the Montana counties from previous lease sales generated $700 thousand dollars between

2016 and 2020.

Leasing mineral rights for the development of Federal minerals generates public revenue through the bonus bids paid at competitive lease auctions and annual rents collected on leased parcels not held by production. Nominated parcels approved for oil and gas leasing are offered by the BLM at a minimum bid rate of $2.00 per acre at the competitive lease sale. In addition to bonus bids, lessees are required to pay rent annually until production begins on the leased parcel, or until the lease expires. These 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. Additionally, Federal oil and gas production in Montana is subject to production taxes or royalties. The Federal oil and gas royalties on production from public domain minerals equal 12.5 percent of the value of production (43 CFR 3103.3.1).

A portion of these Federal revenues are distributed to the State and counties where the parcels are located. The amount that is distributed is determined by the Federal authority under which the Federal minerals are being managed. Forty-nine percent of Federal revenue associated with oil and gas from public domain lands are distributed to the State. In Montana, 25% of the rental and bonus bid revenues that the State receives are redistributed to the counties of production (Title 17-3-240, MCA). Twenty-five percent of bonus bid, and rental revenues associated with oil and gas development from Bankhead-Jones lands are distributed to counties where the parcels are located. Distribution of Federal royalties and leasing revenues to the State for oil and gas development on other Federal acquired lands differs based upon the authority associated with those lands. Generally, the revenue associated with oil and gas leasing and development that is received by the State and counties help fund traditional county functions such as enforcing laws, administering justice, collecting, and disbursing tax funds, providing for orderly elections, maintaining roads and highways, providing fire protection, and/or keeping records. Other county functions that may be funded include administering primary and secondary education and operating clinics/hospitals, county libraries, county airports, local landfills, and county health systems.

***NEW ***

Environmental Justice and Human Health

Environmental Justice is an initiative that culminated with President Clinton's February 11, 1994, Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" and an accompanying Presidential memorandum. Executive Order 12898 requires the analysis of disproportionately high and adverse human health effects and environmental effects on environmental justice populations. Environmental effects may include "ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment" (CEQ 1997 page 26) and that each Federal agency consider environmental justice to be part of its mission. Its intent is to promote fair treatment of people of all races and income levels, so no person or group of people bears a disproportionate share of the negative effects from the country's domestic and foreign programs. Specific to the EIS process, the EO requires that proposed projects are evaluated for "disproportionately high adverse human health and environmental effects on minority populations and low-income populations.

The Environmental Protection Agency (EPA 2016) guidelines for evaluating the potential environmental effects of projects require specific identification of minority populations when either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). Additionally, the EPA states that "A minority population 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). When analysts are evaluating potential EJ concerns under NEPA, they "may consider as a community

either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect" (CEQ 1997).

Using U.S. Census Bureau data, Roosevelt County, MT and McKenzie County, ND met the criteria for minority environmental justice populations due to the percent of residents identifying themselves as American Indian or Alaska Native. In addition, Williams County, ND was just below the threshold for the aggregate non-white and/or Hispanic population demographics. Adverse effects to historical and current cultural and traditional uses and values in this area are correlated to the amount of surface-disturbing or other disruptive activities allowed under the proposed action. Additionally, because EJ populations are known to exist within the counties included in the EA, future site development and production on leased parcels would require an additional Environmental Justice assessment to evaluate potential disproportionate adverse impacts on any EJ population(s) present in the project area.

3.6.2 Economic Effects—No Action Alternative

Under the No Action Alternative, none of the nominated parcels would be offered for sale and no Federal bonus bid or rental incomes would be received for the parcels awarded leases. Existing Federal leases for oil and gas properties would continue to generate rental income.

3.6.3 Environmental Justice and Human Health Effects – No Action Alternative

Under the No Action Alternative, none of the nominated parcels would be offered for sale and no additional disturbance or effects would result from the lack of sale. Under the No Action alternative, it is not anticipated that there would be any specific disproportionate adverse impacts to EJ populations living withing the analysis area.

3.6.4 Economic Effects— Proposed Action Alternative

Under Alternative B, the complete set of proposed parcels would be offered for sale. Those parcels that are successfully leased will generate Federal bonus bid revenue and annual rents, which will be collected on leased parcels not held by production. As described in **Economic Conditions**, these revenues are collected by the Federal government, which then distributes a portion of the revenues collected to the State and counties. The amount that is distributed is determined by the Federal authority under which the Federal minerals are being managed.

Table **29**: Alt B - Estimated Federal Revenue Associated with the June 2022 Lease Sale

Field Office	County	Total Acres	Years 1-5 ($1.50/acre)[1,2]	Years 6-10 ($2.00/acre)[1,2]	Bonus Bid (Min. $2.00/acre)[1,2]	Total Rental Income and Bonus Bids Collected over 10-Year Lease[1,2]			
						Federal	State	County/Local	Total
MCFO	Fallon	161.9	242.85	323.8	323.8	1,610	1,168	378.846	3,157
	Powder River	6097.4	9146.1	12194.8	12194.8	60,639	43,993	14267.92	118,899
	Richland	12.4	18.6	24.8	24.8	123	89	29.016	242
	Roosevelt	5.4	8.025	10.7	10.7	53	39	12.519	104
	Total	6277.1	9,416	12,554	12,554	62,425	45,289	14,688	122,402
NDFO	McKenzie	234.0	351	468	468	2,327	1,688	547.56	4,563
	Mountrail	87.1	130.65	174.2	174.2	866	628	203.814	1,698
	Williams	251.1	376.65	502.2	502.2	2,497	1,812	587.574	4,896
	Total	572.2	10,274	13,699	13,699	68,116	49,417	16,027	133,560
TOTAL	-	6,849	19,689	26,253	26,253	130,541	94,706	30,716	255,963

1 Dollar value of parcel rental and bonus bid payments over time. Not discounted.

2 Assumes all parcels are successfully leased at minimum regulatory rental rate and bonus bid.

In this analysis, Federal leasing revenue estimates (lease rent and bonus bids) are based upon the number of acres being offered. There are no guarantees that any of the parcels offered for lease will receive bids, and until the lease sale is conducted it is unknown which and how many of the offered parcels will be leased.

Due to energy market volatility and the dynamics of the oil and gas industry, the BLM cannot predict the exact economic effects of this leasing action. These effects are specific to which successfully leased parcels will be developed and which developed parcels will produce paying quantities of Federal fluid minerals.

Given this uncertainty, in this analysis revenue estimates are limited to the direct effects of leasing and are calculated under the following assumptions:

1. All of the proposed parcels will be sold.
2. Federal rental income will be collected during the full term of the leases (10 years).
3. All parcels are leased at the regulatory minimum bonus bid and rental rates.

The estimates based upon these assumptions are provided in **Table 29**. Alternative B would generate bonus bids totaling $26,253, annual rental income of $19,689 for lease years 1 through 5, and annual rental income of $26,253 for years 6 through 10. The total value of all rentals and bonus bids received over a 10-year lease would be $255,963.

In this scenario, the lease parcels in Powder River County, Montana, would generate nearly $119 thousand dollars in lease rent and bonus bid revenues, representing over 90% of the total revenue generated from this lease sale. The Carbon, McKenzie, and Fallon County parcels would generate $4,700 - $6,500 in bonus bids and rental income, while those counties with fewer acres offered would see 10-year bonus bids and rental incomes of less than one thousand dollars.

As noted above, Federal rental income and bonus bids from the lease sale described in Alternative B would be shared with the State and county where the parcel is located. During the term of these leases the Federal government would collect nearly $131,000, the States of MT and ND would collect and retain $45 thousand and $49 thousand, respectively, and local governments in the counties containing the parcels would share $31 thousand in rental and bonus bids.

3.6.5 Environmental Justice and Human Health Effects – Proposed Action Alternative

The Reasonable Foreseeable Development potential for all leases offered on the sale are 3-5 wells (see **Table 2**). Delineated by state, Montana counties (Fallon, Powder River, Richland, and Roosevelt) could potentially have 1 oil well and 1-2 gas wells. The Reasonable Foreseeable Development for the three counties in North Dakota (McKenzie, Williams, Mountrail) is one well (See Appendix D). These calculations equate to less than one well for each county identified as having EJ populations.

There are nine unique residences within 1km of the proposed lease parcels, and eight of the parcels have at least one residence within 1km. It is undetermined if these residences are occupied as of the date of this analysis. Parcels MT-2022-06-0343, 0245, and 0246 are all associated with the same residence. The Reasonable Foreseeable Development potential for these parcels is, cumulatively, one well.

Parcels MT-2022-06-0234 and 0235 are both associated with the same residence, and this parcel has an NSO stipulation that would prohibit surface occupancy within the parcel. Development on parcels -0234 and -0235 would likely occur on existing well pads that could potentially accommodate additional wells. The nearest existing well pad is approximately 1 mile (1.61km) from the residence, reducing the probability of impacts.

Parcels ND-2022-06-0074 and 0075 are associated with six unique residences. The nearest active wells to the identified residences are 0.66 miles and 0.74 miles (1.062 km and 1.19km), respectively. Parcels MT-2022-06-0251 and ND-2022-06-0230 are each associated with their own unique residence. The nearest active well to these parcels is 0.905 miles and 0.934 miles (1.46km and 1.5 km), respectively.

The results of EPA's 2014 National Air Toxics Assessment (NATA) indicated that cancer, neurological risks, and respiratory risks in the analysis area are generally lower than national levels. Cancer risks are 15-25 per one million people as a result of airborne pollutants (EPA 2014 NATA Summary of Results). No formal human health risk assessments have been conducted specific to past and present development in the Miles City and North Dakota Field Office areas; Human health risk assessments cannot be performed until project-specific details are known so that frequency, timing, and levels of contact with potential stressors may be identified. However, each of the reasonably foreseeable environmental trends and planned actions have been, or will be, subject to relevant rules and regulations regarding public health and safety. For this reason, the EJ populations identified will not have increased vulnerability to environmental stressors that could impact cultural resources, spiritual or sacred sites, unique community practices, genetic predispositions, access to health care, education, geography because of the proposed action. The demographic characteristics and responses to any potential environmental stresses are not anticipated to result in adverse health outcomes. The physical, emotional, social, spiritual, and intellectual health of the populations is not anticipated to be affected.

For all parcels, the effects of development to these residences can be mitigated with 43 CFR 3101.1-2 and Lease Notice 14-23. LN 14-23 is a requirement for a setback from human occupied residences. The setback requirement of 500 feet (152.4m) has been established based upon the best information available. This lease notice is also applicable to facilities. 43 CFR 3101.1-2, Surface Use Rights, give the allow the authorized office to move proposed operations as far as 200 meters from the proposed location. Furthermore, development associated with these parcels could occur on the existing nearby well pads that could potentially accommodate additional wells, thus reducing the probability of impacts.

The identified populations have had an appropriate opportunity to participate in the public scoping period from August 31 to October 01, 2021, and again during the public comment period from October 29 to December 09, 2021. Scoping letters and request for comment were sent to all persons included in **Table 31** of this EA, including Tribal governments, THPOs, BIA representatives, Tribal archeologists, and project coordinators. The concerns of all participants involved will be considered in the decision-making process.

No disproportional adverse impacts to EJ populations are anticipated as a direct effect of either of the action alternatives. The EJ EO 12898 requires the BLM to minimize and/or mitigate any disproportionate adverse impacts to EJ populations; Should such adverse impacts be anticipated due to future exploration and development activities in connection with any parcels lease under the chosen action alternative, these potential effects and any need for minimization or mitigation would be evaluated at the time of those activities.

3.6.6 Economic Effects—Alternative C

The economic impacts of Alternative C were analyzed using the same approach as in Alternative B.

Table 30. Alt C - Estimated Federal Revenue Associated with the June 2022 Lease Sale

Field Office	County	Total Acres	Years 1-5 ($1.50/acre)12	Years 6-10 ($2.00/acre)12	Bonus Bid (Min. $2.00/acre)12	Total Rental Income and Bonus Bids Collected over 10-Year Lease12			
						Federal	State	County/Local	Total
MCFO	Fallon	161.9	242.85	323.8	323.8	1,610	1,168	378.846	3,157
	Powder River	2654.0	3981	5308	5308	26,394	19,149	6210.36	51,753
	Richland	12.4	18.6	24.8	24.8	123	89	29.016	242
	Roosevelt	5.4	8.025	10.7	10.7	53	39	12.519	104
	Total	2833.7	4,250	5,667	5,667	28,181	20,445	6,631	55,256
NDFO	McKenzie	234.0	351	468	468	2,327	1,688	547.56	4,563
	Mountrail	87.1	130.65	174.2	174.2	866	628	203.814	1,698
	Williams	251.1	376.65	502.2	502.2	2,497	1,812	587.574	4,896
	Total	572.2	5,109	6,812	6,812	33,871	24,573	7,970	66,414
TOTAL		3,406	9,359	12,479	12,479	62,052	45,018	14,600	121,670
1 Dollar value of parcel rental and bonus bid payments over time. Not discounted.									
2 Assumes all parcels are successfully leased at minimum regulatory rental rate and bonus bid.									

The estimates are for Alternative C are shown in **Table 30**. Total rental and bonus bids are significantly lower under Alternative C compared to Alternative B. The differences in the economic impacts of this alternative are due to 3,443 fewer acres offered for lease under this alternative. The county-level results for Power River County decline in proportion to the reduction in acreage offered compared to Alternative B. Using these assumptions Alternative C would generate bonus bids totaling $12,479, annual rental income of $9,359 for lease years 1 through 5, and annual rental income of $12,479 for years 6 through 10. The total value of all rentals and bonus bids received would be $121,670.

In Alternative C bonus bids and rental incomes produced for the Federal government would total $62,052; the states would receive over $42,000 while the counties and local governments would share $14,600 in incomes.

3.6.7 Environmental Justice and Human Health Effects – Alternative C

No disproportional adverse impacts to EJ populations are anticipated as a direct effect of either of the action alternatives. The impacts for Alternative C will be identical, or less than those of Alternative B; within the analysis for alternative C, parcel MT-2022-06-0251 will not be offered for sale. The EJ EO 12898 requires the BLM to minimize and/or mitigate any disproportionate adverse impacts to EJ populations; Should such adverse impacts be anticipated due to future exploration and development activities in connection with any parcels lease under the chosen action alternative, these potential effects and any need for minimization or mitigation would be evaluated at the time of those activities.

3.6.8 Cumulative Impacts

The direct, indirect, and cumulative economic impacts from potential subsequent oil and gas development are discussed in the RMP and FEIS covering the county where the development would take place. Oil and gas development affect employment and labor income generated by 1) payments to counties associated with the leasing and rent of Federal minerals, 2) royalty payments associated with production of Federal oil and gas, and 3) economic activity generated from drilling and associated activities. The magnitude of these types of economic affects is based upon the level and pace of development that is unknown at this time.

The scoping process identified socioeconomic conditions as an area of potential concern. The pace and scale of oil and gas development can often concern local communities. Rapid development can drive important social changes due to the influx of people to these areas who find employment in the oil and gas industry and ancillary service industries. Rapid population growth for unprepared communities can cause stress on community resources such as educational infrastructure, roads and utilities, emergency services, and community cohesion. Should oil and gas leasing and subsequent development occur, impacts to people living near or using the area in the vicinity of the lease would potentially occur. Oil and gas exploration, drilling, or production, would potentially inconvenience these people through increased traffic and traffic delays, noise, and visual impacts. These impacts would be particularly noticeable in rural areas in which oil and gas development has not occurred previously. The level of inconvenience would depend on the activity affected, traffic patterns within the area, noise levels, the length of time and season in which these activities occurred, and other factors. Creation of new access roads would potentially allow increased public access and exposure of private property to vandalism. For leases in which the surface is privately owned and the mineral estate is federally owned, surface owner agreements, standard lease stipulations, and BMPs would potentially address many of the concerns of private surface owners.

Executive Order 12898 requires the analysis of disproportionately high and adverse human health effects and environmental effects on environmental justice populations. Environmental effects may include “ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment” (page 26); CEQ, 1997. As discussed earlier, using U.S. Census Bureau data Roosevelt County MT and McKenzie County ND met the criteria for minority environmental justice populations due to the percent of residents identifying themselves as belonging to American Indians or Alaska Native. In addition, Williams County ND was just below the

threshold for the aggregate Non-White and/or Hispanic Population demographics. Adverse effects to historical and current cultural and traditional uses and values in this area are correlated to the amount of surface-disturbing or other disruptive activities allowed under the proposed action.

The BLM considers all input from persons or groups regardless of age, income status, race, or other social or economic characteristics. The outreach and public involvement activities taken for this effort, including the consultation of tribes, are described in Chapter 1 and **Table 31**.

3.7 Issue 6 – Water Resources

What are the direct, indirect, and cumulative effects of potential oil and gas development, including hydraulic fracturing, on parcels that may be offered for lease on surface and groundwater quality and quantity?

BLM Montana/Dakotas developed a hydraulic fracturing (fracking) white paper that describes industry practices commonly associated with fracking, as well as regulations designed to protect water resources. This white paper is included as **Appendix F** to this EA, and the information is incorporated by reference into this water resources analysis.

BLM surface and split estate parcels would be subject to management decisions contained in their applicable Resource Management Plan including the 2015 Miles City RMP and 1988 North Dakota RMP. These RMPs designate areas open or closed to fluid mineral leasing and assign standard terms and conditions as well as stipulations to conserve water resource values. Those stipulations include:

- NSO 11-70 (Miles City): Surface occupancy and use is prohibited within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.
- NSO 11-71 (Miles City): Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.
- CSU 12-5 (North Dakota): Surface occupancy or use will be subject to the following special operating constraint: No disturbance of riparian areas of wetlands, intermittent, ephemeral, or perennial streams and rivers would be allowed except for essential road and utility crossings.
- CSU 12-25 (Miles City): Surface occupancy and use is subject to the following operating constraints: prior to surface occupancy and use within 300 feet of riparian and/or wetland areas, a plan must be approved by the AO with design features that demonstrate how all actions would maintain and/or improve the functionality of riparian/wetland areas.

Exceptions are not allowed in streams, natural lakes, or wetlands. However, the BLM may authorize modifications or waivers for riparian areas and floodplains if the operator can demonstrate that: (1) there is no practicable alternatives to locating facilities in these areas, (2) the proposed actions would be designed to maintain or enhance resource functions, and (3) all reclamation goals and objectives would be met. The BLM may also grant modifications or waivers to these stipulations if an operator can demonstrate that the proposed action would not adversely impact wetland or riparian function or associated water quality, or portions of the lease area does not contain wetlands or riparian areas.

Montana Department of Natural Resources and Conservation and North Dakota Office of the State Engineer & State Water Commission regulate the right to use surface and groundwater in their respective states. State laws require that water rights be established for all beneficial uses of water, including that used for oil well development (drilling and hydraulic fracturing). Depending on location, new water rights or changes to existing water rights may apply (http://dnrc.mt.gov/divisions/water/water-rights/docs/oil-gas/water_options_oil_development.pdf).

In addition, the States administer numerous water quality regulations including the Clean Water Act of 1977, the Water Resources Planning Act of 1962, the Pollution Prevention Act of 1990, and the Safe Drinking Water Act of 1977. The Antidegredation Policy in the Clean Water Act mandates the maintenance of the level of water quality that has been identified as being necessary to support the existing uses of a waterbody (40 CFR Section 131.12(a)). Wastewater will be disposed of in accordance with state, local and federal regulations, including HB1409-38-11.2-07 (North Dakota) and ARM Rules 36.22.1005 & 36.22.1226 (Montana).

3.7.1 Affected Environment

Lease parcels associated with the June 2022 Lease Sale are distributed throughout the hydrographic subregions (HUC-6) identified in **Figure 8** below. Of these subregions, 89 percent of the leasable area is located in the Powder subregion, 5 percent is in the Lower Yellowstone subregion, 5 percent is in the Lake Sakakawea region, > 1% is in the Missouri-Poplar region.

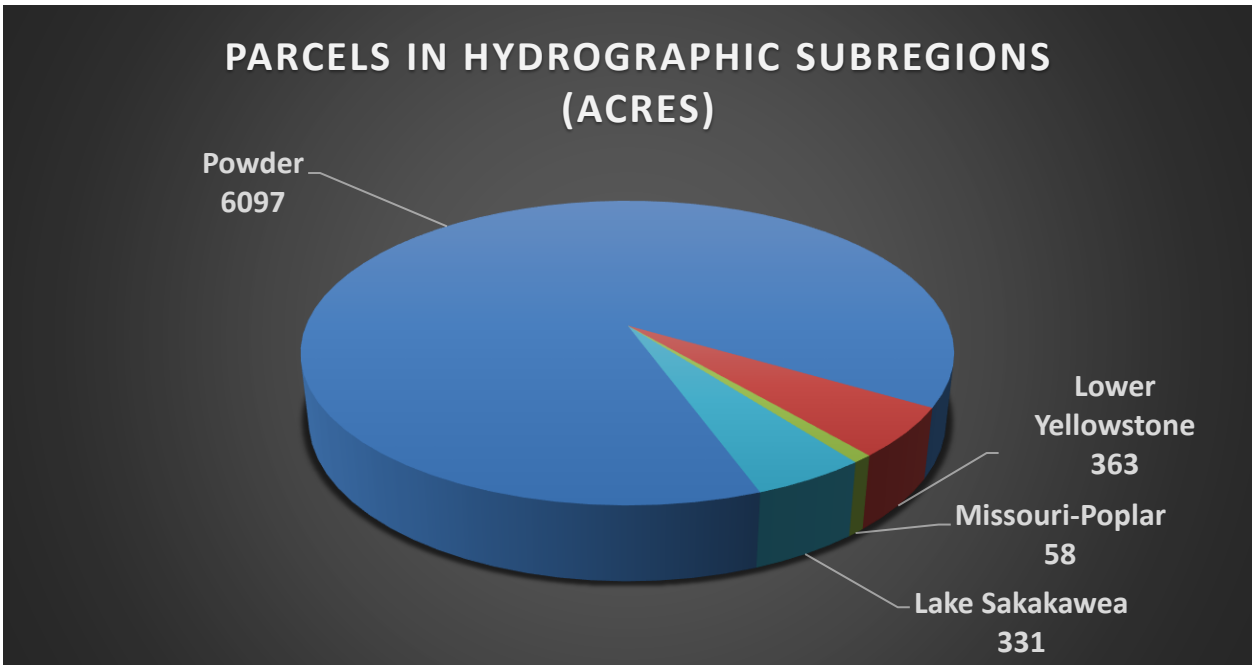
Pursuant to CWA section 303(d)(1), 33 U.S.C. § 1313(d)(1), each state is further required to identify those waters that do not meet water quality standards—called the "303(d)(1) list." The 303(d) list is short for a state's list of impaired and threatened waters. States are required to submit their list for EPA approval every two years. For each water on the list, the state identifies the pollutant causing the impairment, when known. The BLM has identified through the EPA WATERS Geoviewer website that all parcels nominated for this lease sale have proximity to impaired water bodies. These waterbodies range from zero miles to over nine miles from parcel locations and causes for impairment are salinity, excess algal growth, selenium, methylmercury, flow regime alterations, temperature, and sedimentation. See Appendix H for the list of impaired waters and associated maps.

As identified in Appendix H, waterbody ND-10110101-021-L_00 (Lake Sakakawea) is impaired because of methylmercury and fish consumption from Lake Sakakawea is not recommended. The probable source group for methylmercury is listed as 'atmospheric deposition; According to Sackett, et. al. (2010) much of the mercury contamination in aquatic biota originates from coal-fired power plants, point sources that release mercury into the atmosphere. A study published in 2008(EPA 2008) included a Mercury Deposition Contribution Analysis to model potential stationary source contributions to Mercury Deposition within the state of North Dakota (among other states). Results of the modeling analysis include an estimated range of annual mercury deposition impacts in North Dakota between 6.4 micrograms per cubic meter (µg/m3) and 19.5 µg/m3. There are seven coal-fired power plants within 70 miles of Lake Sakakawea, and it is possible that these plants contribute to the deposition of methylmercury in Lake Sakakawea.

MT40S003_010 (the Missouri River, from the Poplar River to the North Dakota border) is impaired because of hydromodification, not point-source pollution. A dam or impoundment has altered the flow regime and temperature of the river. The same situation occurs with MT42M002_150 (Cabin Creek, headwaters to the mouth of the Yellowstone River): hydromodification, rangeland grazing, and natural sources (wildlife) have caused sedimentation, siltation, and oxygen depletion in this identified water body. MT42I001_010 (Little Powder River from the Wyoming border to the mouth of the Powder River) is impaired because of salinity from natural sources (wildlife). It is possible that because these lands are primarily used for agriculture, that dissolved salts, including nitrates, from past and current agricultural practices have affected the salinity of the water body. Widespread altered land use may take the form of 'irrigation-induced' salinity. Last, MT42M002-060 (O'Brien Creek from the North Dakota border to the mouth of the Yellowstone River) is impaired because of excess algal growth, excessive nitrate/nitrite, and selenium. The probable sources for these causes of impairment are animal feeding operations and irrigated crop production. (*EPA 2021 303d Impaired Waters Data). (ND Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads)*

(MTDEQ Final 2021 Water Quality Integrated Report)

Figure 8. Distribution of Lease Parcels throughout the Hydrographic Subregions associated with the June 2022 lease sale (Note: Subregions represent the 4-digit hydrologic unit codes associated with the USGS' Watershed Boundary Dataset, 2017)



Surface Water

Most of the consumptive water use in the region comes from surface water, which is especially critical for agricultural operations. According to the National Hydrography Dataset (NHD High_92V.210), the parcels contain approximately:

- .23 miles of perennial streams
- 30.6 miles of intermittent/ephemeral streams
- 1.3 miles of canals and ditches
- 12.5 acres of intermittent lakes/ponds
- 329 acres of perennial lakes/ponds
- 0 springs and seeps
- 1.03 acres of swamp/marsh

All parcels are within areas defined as "Areas of Minimal Flood Hazard" or in areas that have not been mapped for flood hazards by FEMA. Fifteen of the parcels that border Roosevelt, Williams and Mountrail counties exist within the high-water marks of the Missouri River. Access to these parcels will have to be horizontal similar to the numerous wells that have already been drilled under the Missouri River in the surrounding parcels. Mapping by FEMA is incomplete across a few of these leases, especially in remote areas where impacts to life and property are limited (relative to areas with more substantial human development). Site specific assessments of flood hazard would be completed for any subsequent Surface Use Plan of Operations.

Streamflow in the area varies seasonally, with the largest flows commonly occurring in the spring or early summer. Water quality is often indirectly tied to streamflow, as it is largely dependent on the relative

contributions of runoff and groundwater. Water quality affects the degree to which water can be used for a beneficial use and monitoring indicates that water quality in the region has been affected by a suite of factors; While the sources of water quality impairment vary considerably among waterbodies, nonpoint source pollution, nutrients, stream alteration, total suspended solids and metals are often listed as the primary causal factors (*Montana 303(d)/305(b) Integrated Report, 2021; North Dakota Integrated Section 305(b) Water Quality Assessment Report, 2016*). The BLM is required to comply with state water quality standards and utilizes BMPs to avoid, minimize, or mitigate potential impacts that could contribute to water quality impairment.

Consumptive Uses

Type, source, and volume of water use varies within and between hydrographic subregions. Most water used in hydraulic fracturing comes from surface water sources such as lakes, rivers, and municipal supplies. However, groundwater can be used to augment surface water supplies where it is available in sufficient quantities. The amount of water used in hydraulic fracturing, particularly in shale gas formations, may appear substantial, but is often small when compared to other water uses such as agriculture and municipal supply.

Groundwater

Groundwater plays an important role in meeting regional demands for water. For example, while less than three percent of water diverted in Montana for beneficial uses in calendar year 2000 was from groundwater, 95 percent of the rural, self-supplied domestic systems operate on groundwater sources (Montana Department of Natural Resources, *Water Fact Sheet #4*). Local groundwater conditions within the vicinity of the lease parcels are highly variable and the quality and availability of groundwater varies greatly across the region. Residents commonly get their groundwater from aquifers consisting of unconsolidated, alluvial valley-fill materials, glacial outwash, or consolidated sedimentary rock formations and some coal beds.

Aquifers in Western Montana are typically in unconsolidated, alluvial valley-fill materials within intermontane valleys. These intermontane valley aquifers often yield relatively large quantities of high-quality water to relatively shallow water wells. Conversely, within the Northern Great Plains (eastern Montana & Western North/South Dakota), bedrock aquifers are often an important source of groundwater (especially in the non-glaciated zone). These aquifers generally support low-producing domestic and stock wells that have relatively poor water quality from deep beneath the earth's surface (100's of feet). However, aquifers associated with preglacial alluvial channels are also an important source of water, especially in the non-glaciated areas of the Northern Great Plains. Similarly, alluvial terrace deposits associated with modern streams often provide groundwater for nearby domestic, stock, and municipal uses, especially along the Yellowstone and other larger rivers in the region. In fact, across the lease area, groundwater stored in modern alluvial stream deposits often represents the most reliably productive aquifers. This is noteworthy, as unconfined aquifers are also among the most susceptible to contamination because they tend to lack confining layers that would otherwise slow/halt the transmission of contaminates from the surface and shallow subsurface directly into the aquifer.

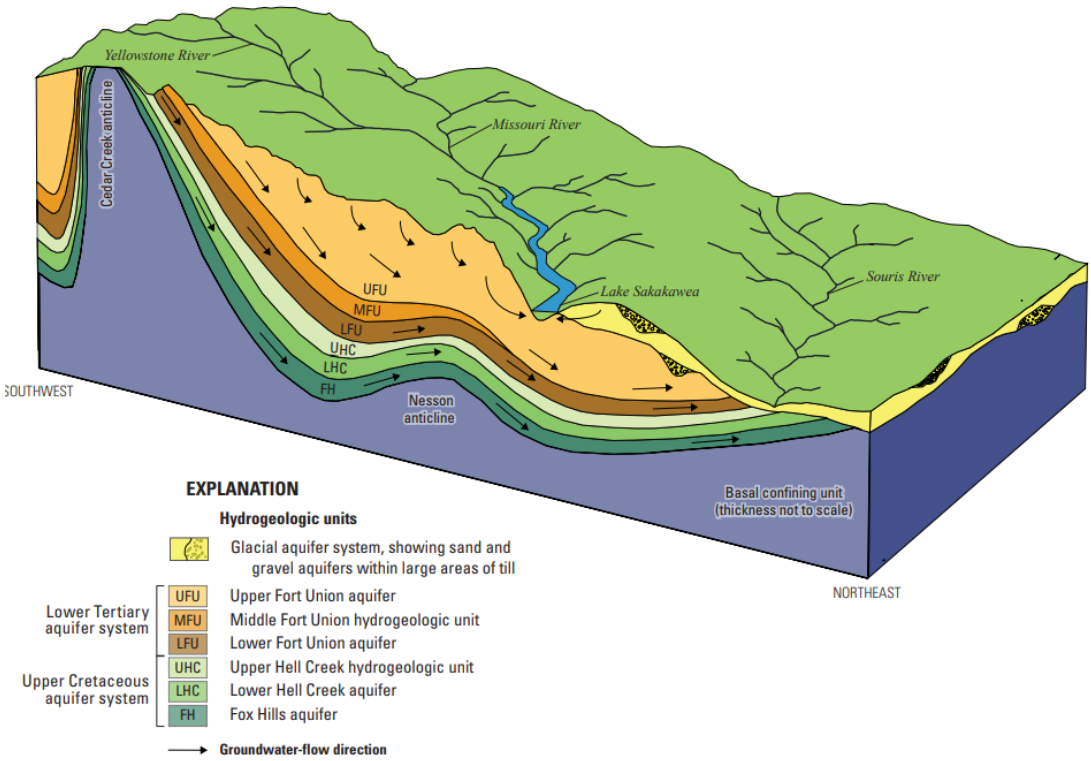
The aquifers associated with the Williston Basin are often divided into three units; the uppermost glacial till, lower Tertiary, and the Upper Cretaceous. These three aquifer systems, specifically the Fox Hills, Fort Union, and shallow unconsolidated aquifers cover 91,000 square miles throughout the Williston Basin with a maximum thickness of 2,900ft deep in the center and thinning towards the edge of the basin. It is underlaid by 800 – 3,000 feet of relatively impermeable marine shales that serve as the basal confining unit. The main components of recharge to groundwater are precipitation and infiltration from streams and reservoirs.

NEW

As of 2018 industrial water use which includes hydraulic stimulation made up 10.1% of all consumptive water use within North Dakota. North Dakota's Office of the State Engineer is responsible for managing the State's water resources as directed under Chapter 61-04 of North Dakota's Century Code, and Article 89-03 of the State Administrative Code. Water intended for hydraulic stimulation requires a temporary water permit which necessitates a point of diversion review by a state hydrologist which is either granted or denied based on Chapter 61-04-06. Temporary water permits and reviews are publicly available under the ND.GOV website (https://www.swc.nd.gov/info_edu/map_data_resources/tempwaterpermits).

In 2013 the North Dakota office of the State Engineer formalized a policy that restricted industrial uses from utilizing groundwater from the Fox Hills Aquifer. This policy had already been enforced on a case-by-case basis since the early 1980's. (Wanek 2009; pg.90) This aquifer has sufficient hydraulic head to naturally flow to the surface without the use of pumps. Ranchers have drilled approximately 500 wells into this aquifer to water livestock in the western part of North Dakota allowing the watering of livestock in areas with no electrical infrastructure. The rate of decline of hydraulic head has decreased at 1.5-3ft per year since 1995 centered in McKenzie County North Dakota. (Wanek 2009) In the next 100 years it is expected that the majority of these naturally flowing wells will cease to flow.

Figure 9. Groundwater aquifers and flow in the Williston Basin region (From Long et al., 2018)



BLM frequently receives comments asking for an alternative that would protect usable groundwater, defined under the Safe Drinking Water Act as an aquifer with water that contains less than 10,000 mg/L (10,000 ppm) of total dissolved solids. However, a separate alternative to protect usable groundwater is not warranted because protection of groundwater would be required for any APD that is approved on a

lease parcel. Authorization of proposed projects would require full compliance with local, state, and federal directives and stipulations that relate to surface and groundwater protection, and the BLM would deny any APD that proposes drilling and/or completion processes that are insufficient to protect of usable water, as required by 43 CFR 3162.5-2(d). Any proposed drilling/completion activities would have to comply with Onshore Order No. 2, 43 CFR 3160 regulations, and not result in a violation of a Federal and/or State laws that prohibit degradation of surface or groundwater quality.

Lease parcels for the June 2022 lease auction exists within the Williston Basin in both North Dakota and Montana, Along the Cedar Creek Anticline in Montana, and on the east flank of the Powder River Basin also in Montana.

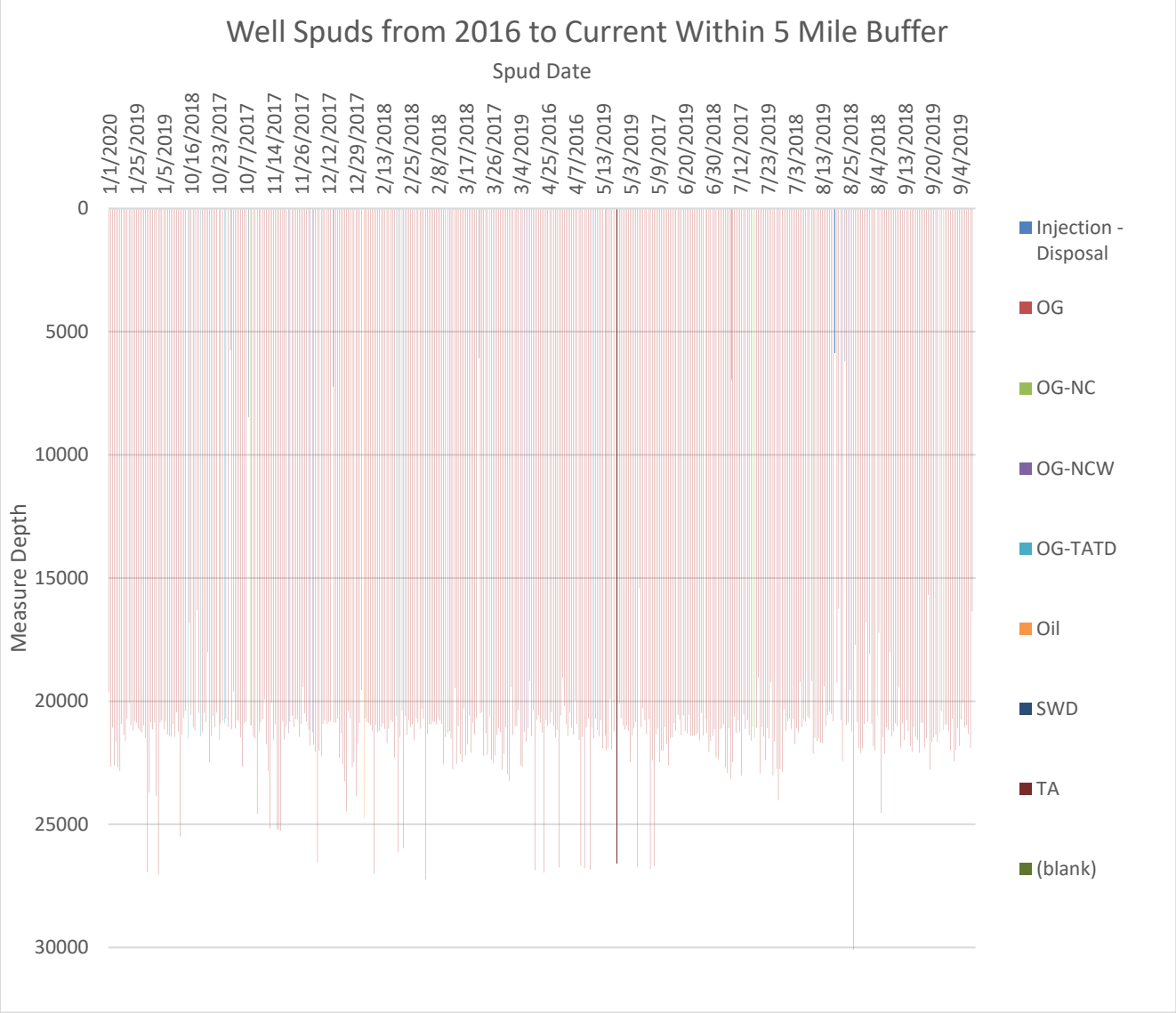
Williston Basin:

Williams, Mountrail, McKenzie counties in North Dakota, and Roosevelt, Richland counties in Montana contain parcels from the June 2022 lease sale. These parcels are within the Williston Basin unconventional Bakken/Three Forks development area. The probable development scenario is continued horizontal well development within the Bakken and Three Forks formations.

Oil and Gas Wells: (NDIC data)

Due to the large number of wells and increasing activity in this area; only well data after 2016 was used to display in the graph. Older data was considered but the amount of development and focus on the Bakken since 2010 has not changed and we don't foresee it to change in the immediate future. **Figure 10** shows a large number of wells at >15,000ft measure depth. These are all horizontal Bakken, Three Forks wells. There have also been wells drilled to ~5000ft that are used as saltwater disposal injection wells into the Cretaceous sand intervals.

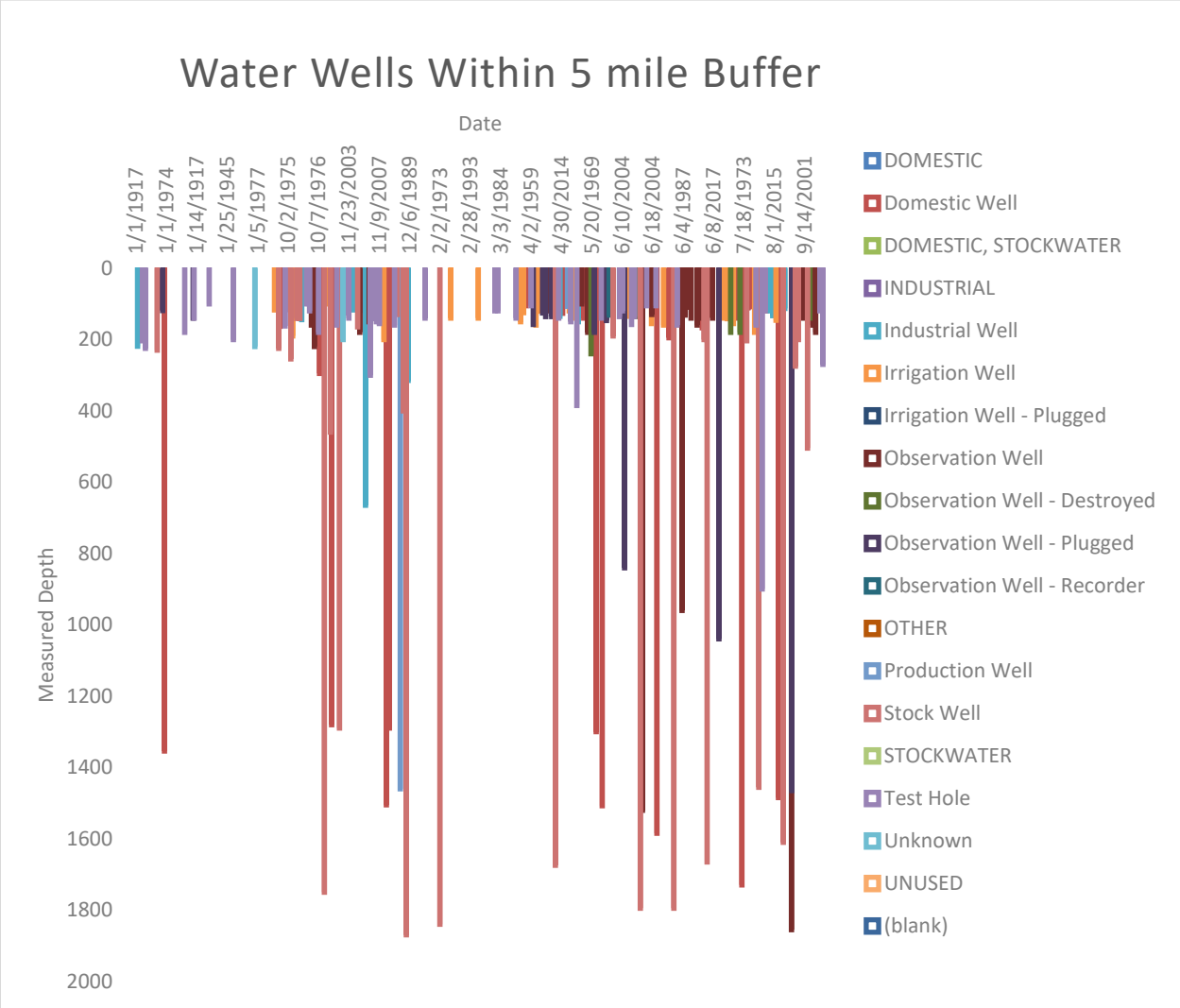
Figure 10. Graph of total depth of Oil and Gas wells within 5 miles of Williston lease parcels colored by use. The shallower wells at 5000'ft are used for saltwater disposal wells.



Water Wells: (ND Water Data, MT GWIC Data)

Water wells within 5 miles of these lease parcels are all <2000ft deep. **Figure 11** shows surrounding consumptive use groundwater wells are 1000's of feet shallower than the horizontal well development in Williston Basin.

Figure 11. Graph of total depth of Water wells within 5 miles of North Dakota lease parcels colored by use



Powder River Basin:

Powder River County contains 11 parcels in the June 2022 lease sale that border the Wright Creek Field, Leary Field, and the Bell Creek Field: all on the eastern edge of the Powder River Basin. Across the border in Wyoming are the Ute, Sandbar East, and Hunger Ranch fields which are south of the proposed lease acreage.

The Bell Creek field is a westerly dipping stratigraphic sand trap that has been producing from the Muddy Formation since the 1960's. The productive interval is ~4500ft deep and has been solely drilled with vertical wells on 40 acre spacing. This field has been and is currently being used to trial enhanced oil recovery methods in conventional oil reservoirs. The latest method is to use it as an integrated EOR and CO2 storage method. There are numerous adjacent Class IIR and Class IID injection wells permitted into the Muddy formation

The Leary Field is a small stratigraphic sand trap that was discovered in 1969. It produces from the

Muddy formation; a 13ft thick sandstone at 5,700ft measured depth. There are 5 productive wells surrounded by dry holes, all conventional vertical wells.

The Wright Creek Field is a structural trap that produces from the Muddy formation sandstone. It was discovered in 1969 and has an average depth of 4600ft. There are 8 producing wells with several dry holes defining the extent of the reservoir.

Ute, Sandbar East, Hunter Ranch. All three of these fields were discovered in the late 1960's and produce from the Muddy formation sand interval. A handful of deviated wells (Figure 12) have been drilled in the Muddy and Minnelusa sand formations in and around this group of fields.

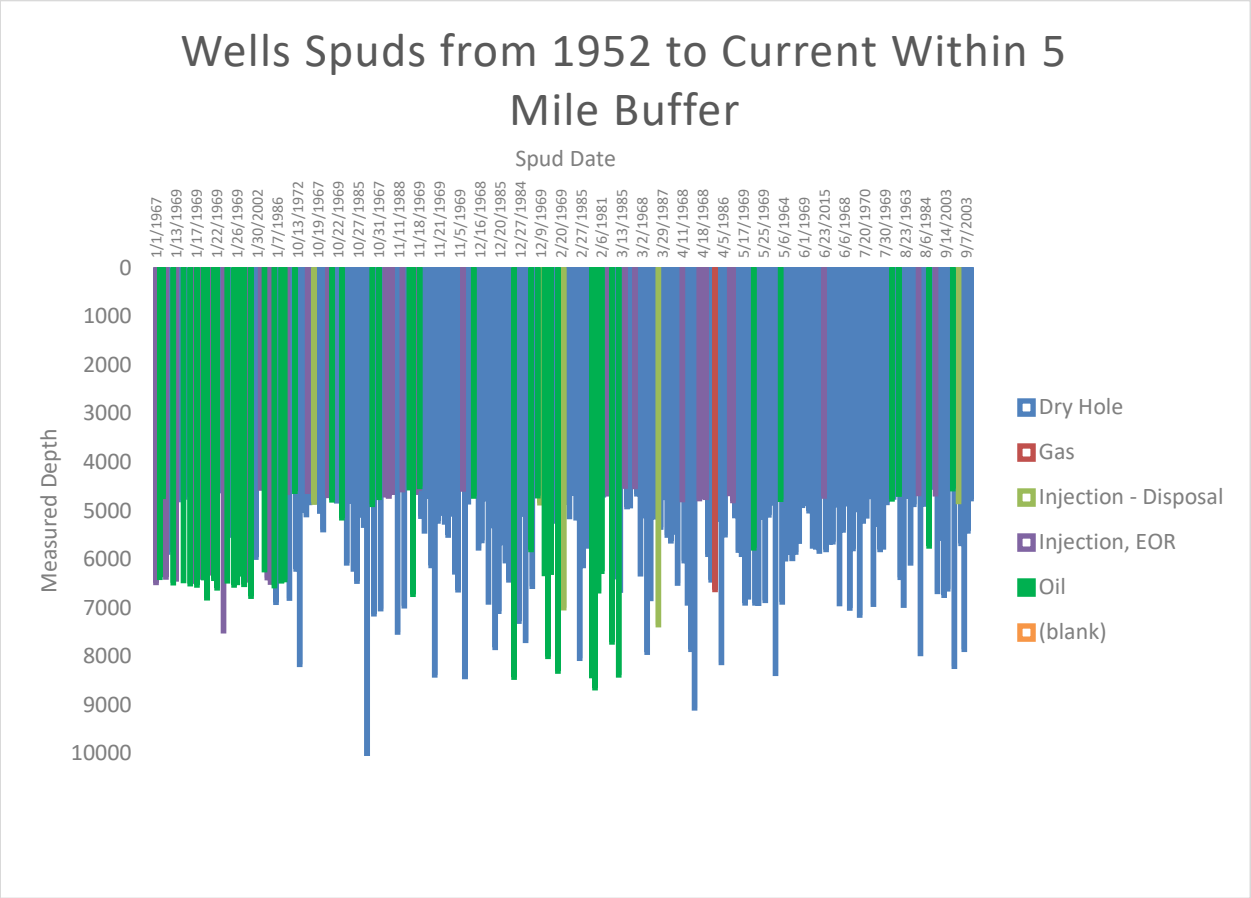
Figure 12. Deviated wells south of proposed lease acreage in Wyoming.

API	Spud Date	Formation	Depth	Status
4900521289	1999	MUDDY SAND	6380	Producing
4900568543	2019	MINNELUSA SAND	8365	Producing
4900533958	1999	MINNELUSA SAND	8400	Producing
4900549921	2002	MINNELUSA SAND	8744	Plugged

Oil and Gas Wells: (MBOGC, WOGCC data)

Wells surrounding the Powder River lease parcels (**Figure 13)** have been historically drilled into the Cretaceous Sand intervals starting in the Muddy Formation around 4500ft. These are all conventional oil fields that produce migrated oil that has been trapped in either a structural or stratigraphic sand intervals. There have been a handful of deviated wells that have been attempted in Wyoming to follow the productive sand interval with a horizontal well with limited success. The likely development scenario for these lease parcels are vertical wells to develop a conventional reservoir in the same sand intervals.

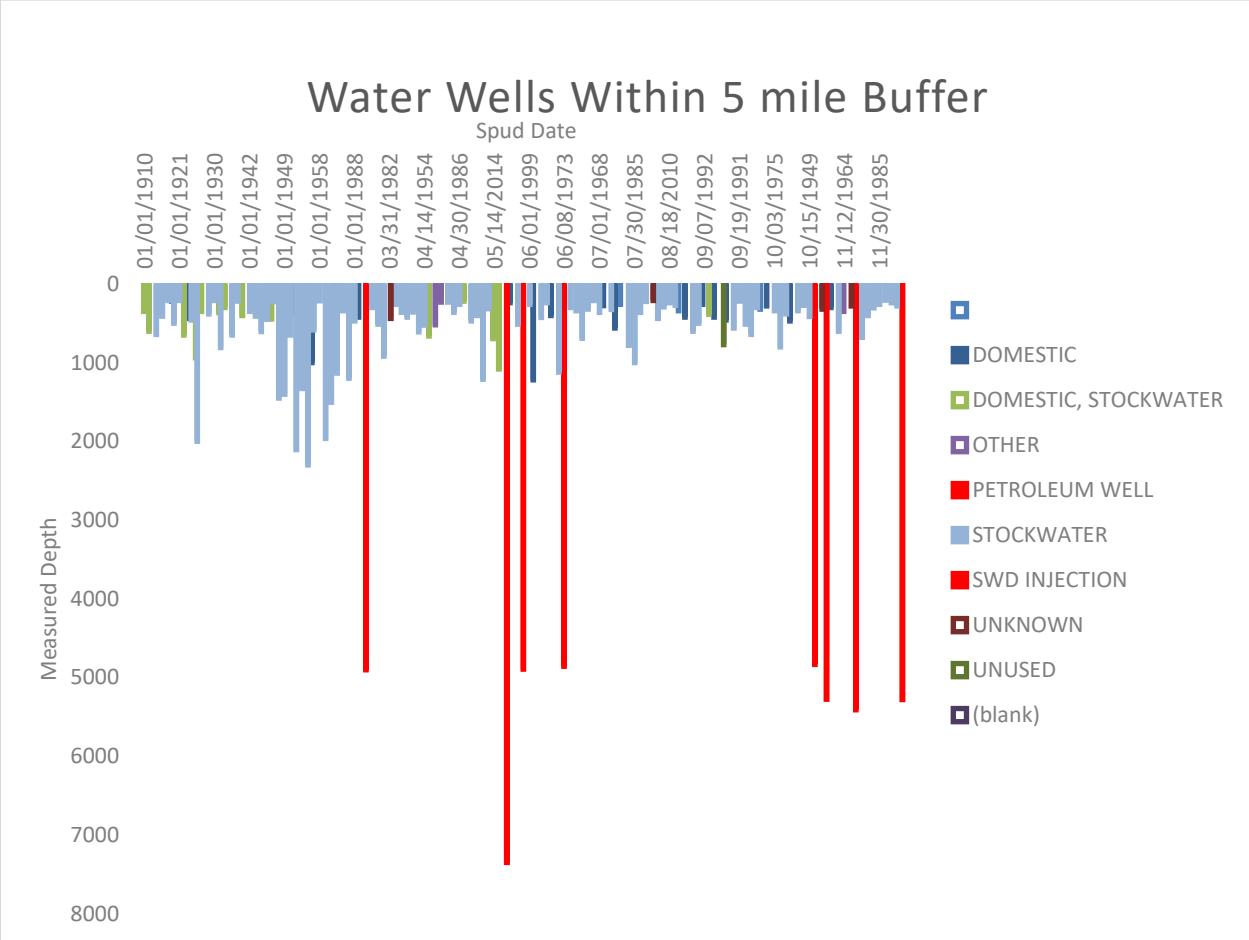
Figure 13. Graph of total depth of Oil and Gas wells within 5 miles of Powder River lease parcels colored by use. The shallower wells at 4500'ft are Muddy formation sandstone wells.



Water Wells: (MT GWIC Data, WY Groundwater Atlas)

Water wells within 5 miles **Figure 14** of these lease parcels for consumptive uses are all <2500ft deep. The petroleum wells and SWD injection wells are used for enhanced oil recovery methods in the same interval as the surrounding producing wells in that field.

Figure 14. Graph of total depth of Water wells within 5 miles of Powder River lease parcels colored by use.



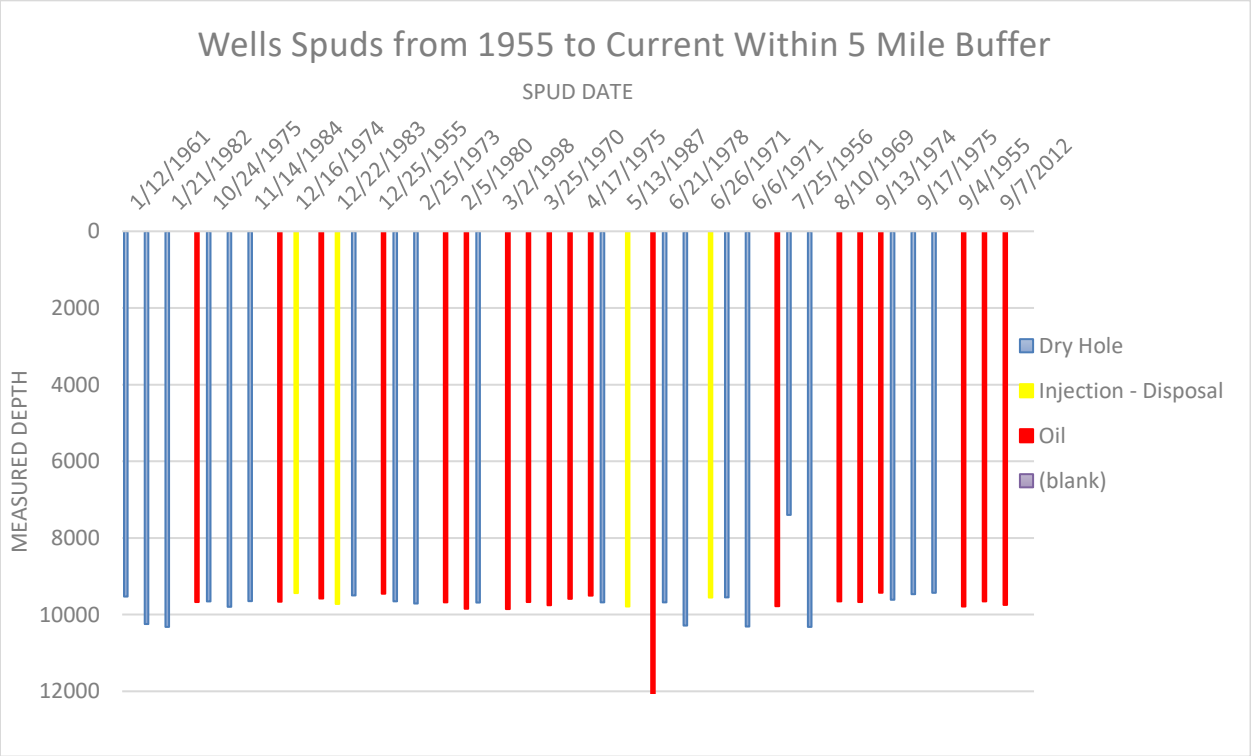
Cedar Creek Anticline

One parcel exists in Fallon County Montana on the flank of the Cedar Creek Anticline just east of Cupton Field. The wells produce from the Red River Dolomite at 9600' true vertical depth. Horizontal wells have not been tried within Cupton field, but they have been used successfully in other parts of the Cedar Creek Anticline. One well the Winona Mertis 41-22H, which is a horizontal well drilled in the year 2000, in an analogous structural position as the lease parcel, was found to produce only water and plugged after 2 months of production.

Oil and Gas Wells: (MBOGC, WOGCC data)

Wells around 10,000 feet (**Figure 15)** were all targeting the Red River Dolomite. One well, NW Improve 22-9, was drilled in 1959. At 7398'ft they broke their drill pipe and were forced to plug and abandon the well. The well >12000' was the horizontal Winona Mertis 41-22H which was plugged due to producing only water.

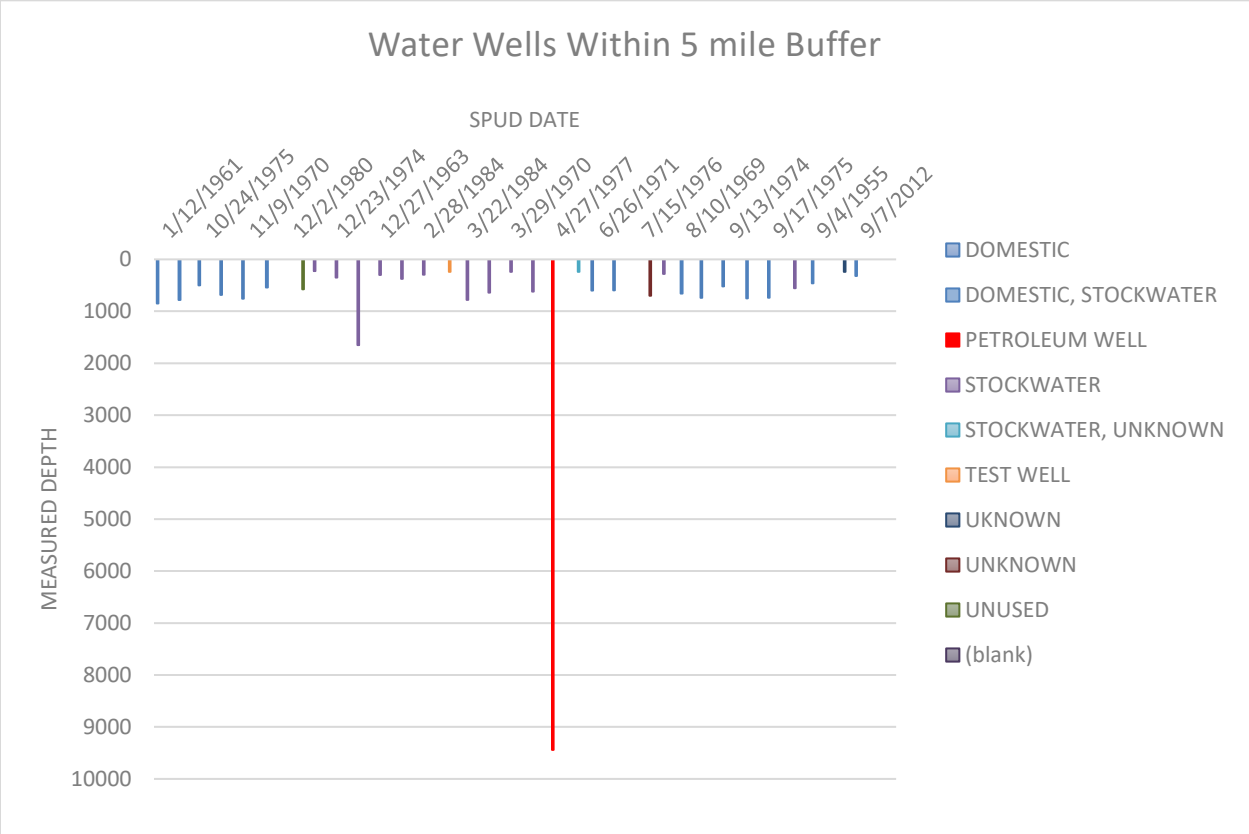
Figure 15. Graph of total depth of Oil and Gas wells within 5 miles of Cedar Creek lease parcels colored by use.



Water Wells: (MT GWIC Data)

Water wells (**Figure 16**) within 5 miles of these lease parcels for consumptive uses are all <1500ft deep.

Figure 16. Graph of total depth of Water wells within 5 miles of the single parcel in Fallon County colored by use.



Summary:

The probable development scenario for the North Dakota parcels are horizontal unconventional wells into the Bakken, and Three Forks formations. This has been the predominate development scenario for the last 10 years and will likely continue if oil prices rise. The Bakken and Three Forks formation are all greater than 8000'ft deep while all the water wells used for consumptive use are shallower than 2000'ft deep. Between the water wells and oil producing horizons are layers Cretaceous sands that are often used for saltwater disposal wells. While there is sufficient vertical separation between existing groundwater wells and horizontal wells to make vertical fracture growth between the two zones highly unlikely, the higher permeability sands between the two zones makes the vertical propagation of hydraulic fluid past this zone even less likely. There is not a conflict between groundwater aquifers and horizontal well development due to hydraulic vertical fractures in this group of lease parcels.

The parcels being leased in Powder River County, MT are surrounded by producing Cretaceous sand conventional oil and gas fields. There have been 100's of wells drilled in the surrounding acreage, and they have all targeted the Muddy formation at ~4500 ft or a deeper horizon. The probable development scenario for these lease parcels are similar vertical oil and gas wells to test for structural or stratigraphic traps within the Cretaceous sands. This will not conflict with the existing shallow groundwater wells through vertical hydraulic fractures.

The single parcel in Fallon County, MT is on the flank of the Cedar Creek Anticline. It is likely this parcel will be used to target the Red River Dolomite similar to surrounding oil and gas fields. This will

not conflict with existing shallow groundwater wells through vertical hydraulic fracture growth.

3.7.2 Environmental Effects—No Action Alternative

There would be no impacts to groundwater or surface water resources from the No Action Alternative because no parcels would be offered for sale.

3.7.3 Environmental Effects— Proposed Action Alternative

Water Quality

Offering the parcels for lease would have no direct impact to surface or groundwater resources. Any potential effects on water from the sale of lease parcels would occur at the time the leases are developed (at the APD stage) and could be both short and long-term. Potential indirect and cumulative impacts from oil and gas leasing on water resources are also discussed in the applicable ARMP and FEIS for each field office and incorporated here by reference.

Although these waters are currently impaired from natural and anthropogenic features, fluid mineral development could additionally affect water resources during exploration, drilling, production, and/or abandonment. The magnitude of these impacts would depend largely on the specific activity, season, proximity to waterbodies, location in the watershed, density of development, hydrogeologic characteristics of the affected area, effectiveness of mitigation, time until reclamation success, and characteristics of any hydrologically connected aquifers. Adherence to applicable regulations (i.e., Onshore Orders No. 1, 2 & 7; wastewater disposal, water right, and water quality laws, etc.), as well as stipulations regarding steep slopes, erosive soils, streams, waterbodies, floodplains, and wetlands would minimize impacts that may be associated with future development (see **Appendix A** and **B**). Alterations in watershed hydrology outside of the no surface occupancy zones could affect the water resources in these systems, but such impacts would likely be small and proportional to the footprint of the disturbance (noted below), relative to the size of the watershed in which the disturbance were to occur.

A Reasonably Foreseeable Development (RFD) scenario for oil and gas leasing at the plan level was analyzed in the applicable FEIS for the RMP for each field office. The BLM used the plan level RFD to develop an RFD for this lease sale, which is summarized in Chapter 2 and further described in **Appendix D**. The associated estimates of surface disturbance relate to the potential scope and magnitude of impacts to surface hydrology and are used to provide context in this EA. The RFD for this lease sale estimates surface disturbance over the 10-year leases associated with the June 2022 lease sale as:

- Miles City: Reasonably Foreseeable Development for the Miles City Field Office lease parcels is 6-7 wells (2-4 oil wells and 3-4 gas wells) from 6-7 new well pads. Short term disturbance is estimated to be 15.8-18.4 acres and long-term surface disturbance is estimated to be 5.85-6.83 acres.

- North Dakota: Reasonably Foreseeable Development for the North Dakota Field Office lease parcels is 1 oil or gas well from 1 new well pad. Short term disturbance is estimated to be 7.1 acres and long-term surface disturbance is estimated to be 3.25 acres.

Produced water from conventional oil and gas development could impact the quality of surface water and groundwater through impoundments, injection, and discharge. Left untreated, produced water discharge and infiltration, or leaking produced water disposal pits could reach stream channels via subsurface flow, which could decrease water quality. Proper wastewater disposal methods, including siting and design of disposal pits in accordance with state and federal regulations, would minimize or avoid these impacts.

Underground injection control regulations would isolate injection zones from potentially useable aquifers, which would limit the potential for adverse impacts to surface or groundwater resources.

Standard stipulation STD 16-3 requires the Agency to furnish data on any special areas, which may include domestic water supplies within 1,000 feet of parcels and stipulates that surface use or occupancy will be controlled to prevent damage to surface or other resources.

The use of any specific water source on a federally administered well requires review and analysis of the proposal through the NEPA process, which will be completed at the APD stage. The Gold Book, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (BLM and USFS 2007) would be followed, and site-specific mitigation measures, BMPs, and reclamation standards would be implemented and monitored in order to minimize effects to water resources. All proposed actions must comply with local, state, and federal regulations, including Montana and North Dakota water laws.

Surface Water

Future oil and gas exploration and development of a lease parcel could affect surface water resources by causing the removal of vegetation, soil compaction, and soil disturbance in uplands within the watershed. The potential effects from this are accelerated erosion, increased overland flow, decreased infiltration, increased water temperature, channelization, and water quality degradation associated with increased sedimentation, turbidity, nutrients, metals, and other pollutants. Erosion potential can be further increased in the long term by soil compaction and low permeability surfacing (e.g., roads and well pads), which increases the energy and amount of overland flow by decreasing infiltration, which in turn changes flow characteristics, reduces groundwater recharge, and increases sedimentation and erosion. As acres of surface disturbance increase within a watershed, however, effects on water resources could correspondingly increase. However, due to the limited footprint of disturbance associated with the RFD, these potential impacts to water resources are expected to be minor. Furthermore, site specific effects would be more fully analyzed upon receipt of an Application for a Permit to Drill and minimized through vegetation reestablishment and the application of BMPs to reduce erosion, and other conditions of approval.

Future oil and gas exploration and development of a lease parcel could result in spills or produced fluids that could potentially affect surface and/or groundwater resources in the short and/or long term. Oil and gas exploration/development could contaminate aquifers with salts, drilling fluids, fluids and gases from other formations, detergents, solvents, hydrocarbons, metals, naturally occurring radioactive materials, and nutrients; change vertical and horizontal aquifer permeability; and increase hydrologic communication with adjacent aquifers (EPA 2004). Spills of oil and brine continue to occur regularly.

From December 2020 through October 2021, ND Department of Environmental Quality reported 195 incidents that were not contained, for example, an overflow of the facility boundaries or a leak from a facility pipeline. The Department reported another 566 incidents that were contained within the boundaries of the production or exploration facility during the same time period. The ND Department of Environmental Quality receives their data was from the Oil and Gas Division whenever Oilfield Environmental Incident Report is filed. Not all spills may reach or impact a drinking water resource. For example, on 10/03/2021, 220 barrels of brine spilled onto a cultivated field 1320 feet from the nearest water well. Actions were taken to recover the fluid, and it was removed for disposal. The incident report notes that the produced water pooled within the field and that the area had been flagged for monitoring. The area was excavated and follow up readings will be taken as necessary to determine if any other actions will be needed (incident 764). All of these incident reports are available online at: https://northdakota.hazconnect.com/ListIncidentPublic.aspx

The size of the spill and site characteristics will influence whether a spill reaches a drinking water resource. Sandier soils and more permeable rock can increase the potential for spills to reach groundwater or migrate into surface water bodies. Spill prevention and response factors would be incorporated as Conditions of Approval at the APD stage and may reduce the frequency and severity of impacts to surface water resources from spills.

Groundwater

Potential effects to deeper aquifers may include cross-aquifer mixing through the wellbore or along fractures that extend between aquifers. All wells would be cased and cemented pursuant to Montana Board of Oil and Gas Conservation (MBOGC) and North Dakota Department of Health (NDDH) rules, and Onshore Orders No. 1 & 2. All wells also would be constructed according to relevant MBOGC, NDDH, and Montana Department of Environmental Quality (MDEQ) regulations to prevent cross-aquifer contamination. There would be minor potential for commingling of waters during well construction if proper well drilling procedures and completion techniques are employed. Refer to **Appendix F**, Fracking White Paper, **Appendix F2** (Bakken), and **Appendix F3** (Powder River) for further discussion.

BLM reviewed existing groundwater and oil/gas well data to identify any multiple use conflicts between groundwater use and petroleum development around the lease acreage that is scheduled to be made available for fluid minerals development in the June 2022 lease auction. The large caveat to this assessment is that prior to lease sale, it cannot be guaranteed which geologic formation will be targeted in any one area. However, BLM can make an educated guess based on prior petroleum activity in the area.

BLM produced a series of maps for the proposed lease parcels showing the true vertical depth of surrounding oil and gas wells. There are points on each of these maps representing the location and depth of surrounding water wells. Refer to **Appendix G.**

Powder River Basin:

The likely development scenario for the Powder River lease parcels are vertical oil and gas wells targeting structural or stratigraphic closures with accumulations of oil and gas. Horizontal wells in organic rich mudstones with multi-stage hydraulic fractures have not been tested in the surrounding area to these lease parcels. Given that this is on the perimeter of the Powder River Basin it is unlikely that there is sufficient organic rich mudstone with the required pressures and thermal maturity to support horizontal wells that would be more typical in the southern half of the Powder River Basin in Wyoming. Looking at the surrounding oil and gas development all fields have been developed at greater than 4,000 ft TVD while all current consumptive use water wells are shallower than 1,200 ft TVD. There is sufficient vertical separation between current water wells and any likely oil and gas deposits that there will be minimal impact on subsurface groundwater due to hydraulic fractures. Vertical conventional oil and gas development typically uses much smaller and lower volume hydraulic fracturing technology.

Williston Basin/Cedar Creek Anticline:

The probable development scenario for the Williston Basin and Cedar Creek Anticline lease parcels are horizontal unconventional wells into the Red River, Bakken, and Three Forks formations. This has been the predominate development scenario for the last 10 years and will likely continue if oil prices rise. The Red River, Bakken and Three Forks formation are all greater than 8,000 ft deep while all the water wells used for consumptive use are shallower than 2,000 ft deep. Between the water wells and oil producing horizons are layers Cretaceous sands that are often used for saltwater disposal wells. While there is sufficient vertical separation between existing groundwater wells and horizontal wells to make vertical fracture growth between the two zones highly unlikely, the higher permeability sands between the two zones makes the vertical propagation of hydraulic fluid past this zone even less likely. Although the

Cedar Creek Anticline areas produces from intercrystalline porosity within the different dolomite formations, there is not a conflict between groundwater aquifers and horizontal well development due to vertical fractures in this group of lease parcels.

Summary:

The Powder River parcels are on the edge of the Powder River Basin where unconventional horizontal wells have been largely untested. Horizontal wells in existing conventional reservoirs were found to not be economically feasible. The conventional vertical developments in this area are all deeper than 4,000 ft while the groundwater resources are much shallower. There is no conflict expected between oil and gas development and existing groundwater resources in the Powder River County parcels. The parcels that are within the Williston Basin and Cedar Creek anticline are likely to be used for deep horizontal unconventional well development that will not conflict with the shallow groundwater aquifers due to vertical separation and limited horizontal fracture growth.

Water Quantity

Oil and gas drilling operations could affect available quantities of surface water and groundwater, but are expected to be small, especially when compared to other consumptive water uses within the region. For example, while hydraulic fracturing uses billions of gallons of water every year at the national and state scales, when expressed relative to total water use or consumption, hydraulic fracturing generally accounts for only a small percentage, usually less than 1%. (USEPA, 2016, page 4-46).

The BLM estimated future water consumption associated with the June 2022 lease sale based on the sale specific RFD. The estimates were made with the following assumptions: (1) all wells ultimately put into production as a result of this lease sale utilize hydraulic fracturing, (2) the underlying factors used to estimate future development under the sale specific RFD scenario persist, and (3) actual water use per well is similar to the state median water use estimates as noted in **Appendix F**, Fracking White Paper. All estimates are approximate and could vary substantially based on site characteristics and other factors like the length of horizontal laterals and hydrocarbon extraction intensity.

- Miles City: 162 lease acres with assumed 0.0003591 wells/acre and 10,831 lease acres with assumed 0.0006156 wells/acre = 7 wells. 7 wells * 5 million gallons/well = 35 million gallons

- North Dakota: 572.13 lease acres with assumed 0.001073 wells/acre = 1 well. 1 well(s) * 5 million gallons/well = 5 million gallons

If drilling technology improves and economic considerations increase the average lateral length of horizontal wells and hydrocarbon extraction intensity, future water use and wastewater production would likely correspondingly increase, as would the potential for adverse impacts to water resources.

While many areas within the lease sale are experiencing low or medium to high water stress and estimated water consumption associated with the RFD scenario is minor (relative to existing uses & available supply; see estimates below), some areas are experiencing high Baseline Water Stress (most parcels in Southern Montana, including the parcels in the Miles City Field Office area). Areas with higher Baseline Water Stress would be more likely to experience depletion of surface and groundwater resources and/or competition among users from additional future development than areas with lower baseline water stress.

The potential for impacts associated with future development depends on the combination of water withdrawals and water availability at a given withdrawal location, as well as factors such as wastewater disposal methods and amounts. For example, where water withdrawals are relatively low compared to

water availability, adverse impacts are unlikely to occur. Where water withdrawals are relatively high compared to water availability, impacts are more likely. Areas reliant on declining groundwater are particularly vulnerable to more frequent and severe impacts from cumulative water withdrawals, including withdrawals for hydraulic fracturing. Among surface water sources, smaller streams are more vulnerable to frequent and severe impacts from withdrawals. Seasonal or long-term drought can also make impacts more frequent and severe for surface water and groundwater sources.

Water withdrawals could lead to reduced aquifer water levels, reduced streamflow (through direct withdrawals or drawdown of aquifers that are hydraulically connected to nearby streams or springs), altered hydroperiods, and impacts to water quality parameters associated with stream flow. Typically, produced water from conventional oil and gas wells would originate from a depth below useable aquifers or coal seams and would be unlikely to adversely affect freshwater resources.

Potential site-specific effects would be analyzed at the time of a receipt of an Application for a Permit to Drill. In the event of exploration or development, site-specific mitigation measures would be identified to avoid or minimize potential impacts to water resources prior to land disturbance. Compliance with state regulations and implementation of BMPs and COAs at the APD stage would help minimize the impacts of water withdrawals on surface and groundwater by ensuring that water rights are established for all beneficial uses of water, ensuring that water resources are not over-appropriated, and considering the impacts of water withdrawals to groundwater wells and hydraulically connected surface waters. A lessee/operator would be required to obtain valid water rights from the states prior to operation, which would help to minimize the potential for impacts to the hydrologic system, other water users, and related ecological processes. Additional information on water rights and the availability of water resources in the project area can be obtained at the local Montana Department of Natural Resources and Conservation (MDNRC) Water Resources Office, and the North Dakota State Water Commission (NDSWC).

Cumulative Impacts

Given the limited disturbance estimated in the reasonably foreseeable development scenario (see Chapter 2, **Table 3**), the potential for future development associated with the June 2022 lease sale to contribute to the cumulative impacts of water resources is correspondingly limited and likely negligible (relative to other water uses and potential sources of contamination).

However, with more oil and gas wells being developed in proximity to fresh water, there is a potential for groundwater and surface water decline, as well as an increased possibility for nonpoint source pollution associated with ground disturbance to adversely affect water quality in receiving waterbodies. The vulnerability of the decline and related impacts to existing water users and environmental processes is directly associated with the water need, the quantity and quality of the groundwater, and the cumulative withdrawals and is likely correlated to existing and predicted Baseline Water Stress within the potentially affected basins. Water used to develop any of the proposed parcels could have a cumulative depletion effect, especially if other oil and gas development and regional water uses exceed recharge rates in the basins, potentially affecting surface flows and groundwater elevations. Such effects could be exacerbated during periods of drought. BMPs to reduce runoff, erosion, and potentially associated nonpoint source pollution to downstream waterbodies would minimize cumulative effects to water quality.

Groundwater recharge rates can be extremely low, and groundwater pumping can exceed recharge rates in many areas of the country (Konikow, 2013). Cumulative drawdowns can affect surface waterbodies since groundwater can be the source of base flow in streams and alter groundwater quality by mobilizing chemicals from geologic sources, among other means (DeSimone et al., 2014).

Aquifers can be affected directly and indirectly by increasing the number of wells in an area. Direct impacts are a result of direct use of the groundwater. Indirect ramifications could result from declines in

surface water resources (or vice versa) which could lead to increased groundwater withdrawals and net cumulative depletions of groundwater (Castle et al., 2014; Georgakakos et al., 2014; Konikow, 2013; Famiglietti et al., 2011).

It should be noted that cumulative impacts on water quality findings associated with hydraulic fracturing appear inconclusive at this time, but localized impacts to surface water quality associated with dense surface disturbance have been observed elsewhere. However, it has been observed that pumping can promote changes in reduction-oxidation (redox) conditions and thereby mobilize chemicals from geologic sources (DeSimone et al., 2014). Similar patterns of groundwater quality degradation associated with prolonged aquifer depletion (i.e., salinization and contamination) have also been observed. (U.S. Environmental Protection Agency; 2016a).

As studies are conducted and ramifications are analyzed they will be instrumental in developing better science to determine cumulative impacts to the environment. When the science of these studies is complete, they will be incorporated to the analysis of oil and gas lease sales to determine the best course of action according to the science.

3.7.4 Environmental Effects – Alternative C

The effects from Alternative C are expected to be the same as, or less than Alternative B. The removal of 6 parcels in Powder River County would eliminate any development associated with the area and eliminated any chance of additional water use or degradation of waterbodies already on the 303(d) list (waterbody MT42I001_010). The baseline stress of aquifers associated with domestic and agricultural water uses in the area would not be affected by oil and gas development.

As for Alternative B, the BLM estimated future water consumption associated with the June 2022 lease sale Alternative C based on the sale specific RFD. For Alternative C, the estimates were made with the following assumptions: (1) all wells ultimately put into production as a result of this lease sale utilize hydraulic fracturing, (2) the underlying factors used to estimate future development under the sale specific RFD scenario persist, and (3) actual water use per well is similar to the state median water use estimates as noted in **Appendix F**, Fracking White Paper. All estimates are approximate and could vary substantially based on site characteristics and other factors like the length of horizontal laterals and hydrocarbon extraction intensity.

- Miles City: 162 lease acres with assumed 0.0003591 wells/acre and 2677 lease acres with assumed 0.0006156 wells/acre = 2 wells. 2 wells * 5 million gallons/well = 10 million gallons

- North Dakota: 572.13 lease acres with assumed 0.001073 wells/acre = 1 well. 1 well(s) * 5 million gallons/well = 5 million gallons

4 Consultation and Coordination

4.0 Summary of Consultation and Coordination

The BLM coordinates with Montana Fish, Wildlife, and Parks (MTFWP), North Dakota Game and Fish (NDGF) and the U.S. Fish and Wildlife Service (USFWS) to identify wildlife concerns, protective measures, and apply stipulations and lease notices associated with oil and gas lease sales. While the BLM manages habitat on BLM lands, the state agencies are responsible for managing all wildlife species populations. The USFWS also manages some wildlife populations but only those federal trust species managed under mandates such as the Endangered Species Act, Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. The BLM mailed letters to MTFWP, NDGF, and USFWS

informing them of scoping and EA comment periods. The BLM communicated informally with MTFWP and NDGF. No scoping comments were received from USFWS.

The BLM consults with Native Americans under various statutes, regulations, and executive orders, including the American Indian Religious Freedom Act, the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, the National Environmental Policy Act, and Executive Order 13175-Consultation and Coordination with Indian Tribal Governments. The BLM notified consulting tribes of the oil and gas lease sale and invited them to identify any issues or concerns that the BLM should consider in this EA.

The BLM coordinates with the USFS DPG McKenzie Ranger District to identify resource concerns and apply stipulations and lease notices to lease parcels proposed within the administrative boundary of the DPG McKenzie Ranger District. Refer to Table 30 for the list of Tribes and Agencies contacted.

Table 31. Tribes and Agencies Contacted

Tribe or Agency	**Title**	**Name**
Assiniboine Tribe	Buffalo Chaser's Society	John Allen Jr.
Blackfeet Nation	BIA Superintendent	Thedis Crowe
Blackfeet Nation	THPO	John Murray
Blackfeet Tribe	Chairman	Tim Davis
Cheyenne River Sioux Tribe	THPO	Steve Vance
Cheyenne River Sioux Tribe	Tribal Chairman	Harold Frazier
Chippewa Cree Tribe	BIA Field Representative	Mamie Stump
Chippewa Cree Tribe	THPO	Jonathan Windy Boy
Chippewa Cree Tribe	Tribal Chairman	Harlan Baker
Comanche Nation	Chairman	William Nelson Sr.
Comanche Nation	THPO	Martina Callahan
Confederated Salish & Kootenai Tribes	Chairman	Shelly Fyant
Confederated Salish & Kootenai Tribes	THPO	
Confederated Salish & Kootenai Tribes	Tribal Preservation Specialist	Mike Durglo
Confederated Tribe of the Umatilla Indian Reservation	Chairman	Lindsey X Walkman
Confederated Tribe of the Umatilla Indian Reservation	THPO	Carey Miller
Confederated Tribes of the Colville Indian Reservation	Chairman	Marvin Kheel
Confederated Tribes of the Colville Indian Reservation	THPO	Guy Moura
Crow Creek Sioux Tribe	Chairperson	Peter Lengkeek
Crow Creek Sioux Tribe	THPO	Merle Marks
Crow Tribe	BIA Superintendent	Vianna Stewart
Crow Tribe	Chairman	Frank White Clay
Crow Tribe	THPO	Aaron Brien

Eastern Shoshone Tribe	BIA Superintendent	Norma Gourneau
Eastern Shoshone Tribe	Chairman	John St. Claire
Eastern Shoshone Tribe	THPO	Josh Mann
Flandreau Santee Sioux Tribe	President	Anthony Reider
Flandreau Santee Sioux Tribe	THPO	Garrie Kills A Hundred
Fort Belknap Tribe	Acting THPO	Michael J. Black Wolf
Fort Belknap Tribe	BIA Superintendent	Mark Azure
Fort Belknap Tribe	Environmental Protection Manager	Ina Nez Perce
Fort Belknap Tribe	White Clay Society	Morris Belgard
Fort Peck Tribe	BIA Superintendent	Howard Bemer
Fort Peck Tribe	Chairman	Floyd Azure
Fort Peck Tribe	THPO	Dyan Youpee
Ft. Belknap Tribe	CAO	Delina Cuts The Rope
Ft. Belknap Tribe	President	Andrew Werk Jr.
Kiowa Nation	Chairman	Matthew Komalty
Kiowa Nation	THPO(Acting)	Dewey Tsonetonkoy Sr.
Little Shell Chippewa Tribe	Chairman	Gerald Gray
Little Shell Chippewa Tribe	THPO	Dwayne Reid
Lower Brule Sioux Tribe	Chairman	Clyde Estes
Lower Brule Sioux Tribe	Cultural Resources	Claire Green
Lower Sioux Indian Community	President	Robert Larson
Lower Sioux Indian Community	THPO	Cheyanne St. John
Nez Perce Tribe	Chairman	Samuel N. Penney
Nez Perce Tribe	THPO	Keith "Pat" Baird
Nez Perce Tribe	Tribal Archaeologist	Josiah Pinkham
Northern Arapaho Nation	Chairman	Jordan Dresser
Northern Arapaho Nation	THPO	Devin Oldman
Northern Cheyenne Tribe	BIA Superintendent	Michael Addy
Northern Cheyenne Tribe	President	Donna Marie Fisher
Northern Cheyenne Tribe	THPO	Teanna Limpy
Oglala Sioux Tribe	President	Kevin Killer
Oglala Sioux Tribe	Project Coordination	Thomas Brings
Rosebud Sioux Tribe	President	Rodney M. Bordeaux
Rosebud Sioux Tribe	THPO	Ione Quigley
Santee Sioux Tribe of Nebraska	Chairman	Roger Trudell
Santee Sioux Tribe of Nebraska	THPO	Joseph Moose
Shoshone-Bannock Tribes Fort Hall Reservation	Chairman	Devin Boyer
Shoshone-Bannock Tribes Fort Hall Reservation	Cultural Resources Director	Louise E. Dixey

Shoshone-Bannock Tribes Fort Hall Reservation	Environmental Program Manager	Christina Cuttler
Sisseton-Wahpeton Oyate Tribe	Chairman	Delbert Hopkins
Sisseton-Wahpeton Oyate Tribe	THPO	Dianne Desrosiers
Spirit Lake Sioux Tribe	Chairman	Douglas Yankton Sr.
Spirit Lake Sioux Tribe	THPO	Dr. Erich Longie
Standing Rock Sioux Tribe	Chairman	Mike Faith
Standing Rock Sioux Tribe	THPO	Jon Eagle
Three Affiliated Tribes	Chairman	Mark Fox
Three Affiliated Tribes	THPO	Allen Demaray
Turtle Mountain Band of Chippewa	Chairman	Jamie Azure
Turtle Mountain Band of Chippewa	THPO	Jeff Desjarlais Jr.
Yankton-Sioux Tribe	Chairperson	Robert Flying Hawk
Yankton-Sioux Tribe	THPO	Kip Spotted Eagle
Northern Plains Resource Council		Adam Haight
EPA Region 8 NEPA Program		Amelia Platt
Board of County Commissioners	Big Horn County	
Board of County Commissioners	Bowman County	
The Wilderness Society		Bruce Pendery
Trout Unlimited		Cathy Purves
MT Preservation Alliance		Chere Justio
State Historical Society of ND		Claudia Berg
Board of County Commissioners	Custer county	
Ft. Peck Army Corps of Engineers		Darin McMuriy
Board of County Commissioners	Dawson County	
MT Fish, Wildlife, and Parks		Deb O'Neill
Lewis & Clark National Historic Trail		Denise Nelson
Environment Montana		Director Skye Borden
Jodi Bush	Div of Ecological Services	
Board of County Commissioners	Divide County	
Chris Pileski	DNRC-Eastern Land Office	
Montana Historical Society		Dr. Mark Baumler
Board of County Commissioners	Fall River County	
Board of County Commissioners	Fallon County	

South Dakota Dept. of	Game, Fish and Parks	
Board of County Commissioners	Garfield County	
Board of County Commissioners	Golden Valley County	
Board of County Commissioners	Harding County	
Theodore Roosevelt National Park		Heidi Riddle
US Environ. Protection Agency Reg 8	Helena office	
Public Lands Solutions		Jason Keith
Little Missouri National Grassland		Justin Hartel
Mariah Energy		Lenny Behm
LCTHF Executive Director		Lindy Hatcher
Board of County Commissioners	McCone couny	
Board of County Commissioners	McKenzie County	
	MT. Env. Info. Center	
Board of County Commissioners	Musselshell County	
Patrick T. Isakson	ND Game and Fish	
Cheryl Schuldt	North Blaine Cooperative State Gazing Distrcit	
Montana DNRC	Northern District Field Office	
National Wildlife Federation	Northern Rockies Proj. Office	
Army Corps of Engineers	Omaha District	
Board of County Commissioners	Petroleum County	
Board of County Commissioners	Powder River County	
Representative		Ray Shaw
Dept. of Env. Quality		Richard Opper
Board of County Commissioners	Richland County	
Earthjustice	Rocky Mountain	
Board of County Commissioners	Rosebud County	
Board of County Commissioners	Sweet Grass County	
Theodore Roosevelt Conservation Partnership		
DNRC MT board of O&G	Tom Richmond	
Board of County Commissioners	Treasure county	

Western Energy Alliance	Tripp Parks	
Montana DNRC	Trust Land Management HQ	
Sandi McFarland	USFS NPNHT Admin.	
Julie Molzahn	USFS NPNHT CMP	
Roger M. Peterson	USFS NPNHT PAO	
Board of County Commissioners	Valley County	
Board of County Commissioners	Wheatland County	
Board of County Commissioners	Wibaux county	
Board of County Commissioners	Yellowstone County	
Montana Trout Unlimited		
Montana Wilderness Association		
North Dakota Dept of Trust Lands		
Western Env. Law Center		

4.1 Summary of Public Participation

Public scoping for this project was conducted through a 30-day scoping period from August 31 to September 30, 2021, as described in a Press Release issued by the Montana/Dakotas State Office, advertised on the BLM Montana/Dakotas State Office website, and posted online in the BLM NEPA e-Planning website. The BLM also mailed letters to local, state, and federal agencies, Tribal entities, and private surface owners informing them of the lease sale and seeking comments. The mailing list is included in the project record.

A 40-day public comment period has been completed from October 29 to December 09, 2021, as described in a Press Release issued by the Montana/Dakotas State Office, advertised on the BLM Montana/Dakotas State Office website, and posted online in the BLM NEPA e-Planning website. The BLM also mailed letters to local, state, and federal agencies, Tribal entities, and private surface owners informing them of the lease sale and seeking comments. The mailing list is included in the project record and can be viewed in above.

Section 208 Report

In November 2021, the Department of the Interior released a Report on the Federal Oil and Gas Leasing Program (Report). The Report made specific recommendations to address documented deficiencies in the program to meet three programmatic goals:

- Providing a fair return to the American public and States from Federal management of public lands and waters, including for development of energy resources;
- Designing more responsible leasing and development processes that prioritize areas that are most suitable for development and ensure lessees and operators have the financial and technical capacity to comply with all applicable laws and regulations; and

- Creating a more transparent, inclusive, and just approach to leasing and permitting that provides meaningful opportunity for public engagement and Tribal consultation.

The Report also recommends: As an overarching policy, BLM should ensure that oil and gas is not prioritized over other land uses, consistent with BLM's mandate of multiple-use and sustained yield. The BLM should carefully consider what lands make the most sense to lease in terms of expected yields of oil and gas, prospects of earning a fair return for U.S. taxpayers, and conflicts with other uses, such as outdoor recreation and wildlife habitat. The BLM should always ensure it is considering the views of local communities, Tribes, businesses, State and local governments, and other stakeholders. While the leasing decisions for this lease sale result from the BLM's exercise of its discretion based on its analysis and review of the record, they are also consistent with the recommendations in the Report, as well as numerous reports issued by the Governmental Accountability Office and Congressional Budget Office, including: ensuring public participation and Tribal consultation, addressing conflicts with other resources, avoiding lands with low potential for oil and gas development, focusing leasing near existing development and ensuring a fair return to taxpayers. This lease sale and NEPA process have included a 30-day scoping period, 30-day comment period on the environmental assessment (which was then extended by an additional 10 days) and 30-day protest period. The BLM has also ensured applicable Tribal consultation is current. The BLM's leasing decisions take into account received during this process and will further evaluate points raised in any protests received. As a result of public comments received on the sale and consistent with recommendations in the November 2021 report, BLM undertook additional review and has not identified any additional parcels which warrant deferral. Details of this review is included in Appendix K.

Recent Court Decisions

On February 11, 2022, the United States District Court for the Western District of Louisiana issued an order that, in general, enjoined the Department, among other agencies, from taking action in connection with Section 5 of Executive Order 13990 and the Interagency Working Group ("IWG") established by that Order relating to the measurement of the Social Cost of Greenhouse Gases.

Because this proposed sale relies upon the IWG and Section 5 of the Executive Order, the District Court's injunction precluded the Department from advancing this and similar proposed sales. On March 16, 2022, the Court of Appeals for the Fifth Circuit stayed the injunction pending appeal. *Louisiana by & through Landry v. Biden*, No. 22-30087, 2022 WL 866282 (5th Cir. Mar. 16, 2022).

Previously, on January 27, 2022, the United States District Court for the District of Columbia issued a decision in *Friends of the Earth v. Haaland*, vacating offshore oil and gas lease sale 257 because the Department did not quantify the effects of that sale on emissions from the foreign consumption of oil and gas, despite (in the Court's view) possessing the tools and methodology to do so. 2022 WL 254526 (D.D.C. Jan. 27, 2021). Given the analysis presently available to BLM, *Friends of the Earth* does not affect BLM's analysis of this proposed lease sale.

Unlike the Bureau of Ocean Energy Management ("BOEM")—the agency responsible for sale 257—the Bureau of Land Management has not traditionally used simulation tools like MarketSim (the tool at issue in *Friends of the Earth* and used by BOEM in preparation for sale 257) when evaluating effects on foreign consumption from proposed BLM State Office lease sales. Indeed, the *Friends of the Earth* Court recognized that it had previously upheld BLM's decision not to consider foreign effects where BLM had "refused to quantify emissions resulting from particular lease parcels, and thus could not conceptualize the extent to which the lease sales would contribute to the local, regional, and global climate change." 2022 WL 254526, at *13 n.13 (quotation omitted). Likewise, the Court ruled against BOEM for forgoing the foreign consumption analysis for sale 257 in part because BOEM shortly thereafter applied that

analysis to a draft NEPA analysis for proposed offshore sale 258. The court's reasoning does not apply to BLM, which, as noted above, lacks access to any historic or imminent foreign effects analysis at the level of individual BLM State Office lease sales. If and when BLM undertakes this or similar analysis in the future, it may be appropriate to include and consider that analysis when proposing onshore lease sales.

Oil and Gas Administration

As the steward of onshore Federal energy resources, including deposits of oil and gas, the BLM is responsible for balancing conservation, energy production, and generating a fair return to the public for the extraction of public resources. Revenue from Federal oil and gas development is distributed to several Federal programs, as well as being shared with the States in which the oil and gas development occurs. At the same time, energy development can pose significant risks to the environment. The BLM is charged with balancing these competing considerations in a manner that best serves the public interest. For all competitively issued leases, the Mineral Leasing Act (MLA) requires a royalty "at a rate of not less than 12.5 percent in amount or value of the production removed or sold from the lease." 30 U.S.C. 226(b)(1)(A); see also 30 U.S.C. 352 (applying that requirement to leases on acquired land). Although the BLM is authorized by the MLA and its implementing regulations (43 C.F.R. 3103.3-1(a)(2)(ii)) to specify a royalty rate higher than 12.5 percent for competitive leases, the MLA sets a flat 12.5 percent royalty rate for noncompetitive leases. 30 U.S.C. 226(c); 30 U.S.C. 352 (acquired lands). Historically, BLM has conducted competitive lease sales by offering leases at the statutory minimum royalty rate of 12.5 percent. However, recent analyses suggest that offering leases at this royalty rate does not provide a fair return to the public for the extraction of Federal oil and gas resources. These analyses include the Department of the Interior's recent Report on the Federal Oil and Gas Leasing Program (Nov. 2021); Government Accountability Office (GAO) publications; a report from the Congressional Budget Office (CBO); and an analysis produced by the consulting firm IHS Markit for the Department of the Interior in 2019. Key takeaways from these reports include:

- The 12.5 percent royalty rate typically applied to Federal leases is substantially lower than the prevailing royalty rates for leases on State and private lands;
- Increasing royalty rates on Federal leases, to more closely align with rates on private and State lands, is not expected to drive development away from Federal lands to neighboring State and private lands; and
- Increasing the royalty rates on Federal leases could decrease production on Federal lands by a small amount (or not at all), but will also increase net Federal revenues, and the commensurate share of those revenues disbursed to the States.

While current minimum royalty rates for leases sold at competitive sale are 12.5%, the BLM has the discretion to set royalty rates for individual lease sales. Section 2 of the standard lease form terms (3100-11) states for royalties that:

Royalty rates are:

(a) Noncompetitive lease, 12 ½ %;

(b) Competitive lease, 12 ½ %;

(c) Other, see attachment; or

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

For this sale, the BLM is updating the sale notice and including an attachment to the standard lease form applying an 18.75% royalty rate.

5 List of Preparers

Name	Title	Resource Area
Bobby Baker	Natural Resource Specialist	Project Coordination
Cale Bickerdyke	Mineral and Lands Supervisor, USFS	USFS DPG Coordination
Josh Buckmaster	Soil Scientist	Soil Resources
Nicole Hupp	Supervisory NRS	Greater Sage-grouse
Christine Cimiluca	Natural Resource Specialist	Project Lead
Tyler Croft	Petroleum Engineer	Water Resources
Andy Daniels	Wildlife Biologist	Wildlife
Peter Davis	Petroleum Engineer	Reasonably Foreseeable Development Scenario
Greg Liggett	Geologist (Paleontology)	Paleontology
Ruth Miller	Planning and Environmental Specialist	NEPA Coordination
Paul Helland	Petroleum Engineer	Reasonably Foreseeable Development Scenario
Fiona Petersen	Wildlife Biologist	Wildlife, Listed Species
Reyer Rens	Supervisory Rangeland Management Specialist	Range, Livestock Grazing
Benjamin Rice	GIS Specialist	GIS
Scott Rickard	Economist	Socioeconomics, Environmental Justice
Jason Sprung	Geospatial Ecologist	Project Coordinator
Christina Stuart	Fish Biologist	Fisheries
CJ Truesdale	Lead Archaeologist	Cultural Resources
Kent Undlin	Wildlife Biologist	Wildlife, Listed Species
Erik Vernon	Air Resource Specialist	Air Resources
Tessa Wallace	Physical Scientist	Project Coordination, Editor
Amy Waring	Natural Resource Specialist	Big Game, Greater Sage-grouse
Katie West	Archaeologist	Cultural Resources
Annette Yeager	GIS Specialist	GIS, Maps

6 Table of Issues and Resources Considered

Determination*	Issue	Rationale for Determination
NI	Access	No issues from act of leasing.
PI	Air Quality	Potential impacts; will be analyzed.
NP	Areas of Critical Environmental Concern	Not present per review of GIS data.
NP	Backcountry Conservation Areas	Not present per review of GIS data.
PI	Climate	Potential impacts; will be analyzed.
NI	Cultural Resources	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
PI	Environmental Justice	Potential impacts; will be analyzed.
NP	Farmlands (Prime or Unique)	Not present per review of GIS data.
NI	Fire Management	No issues from act of leasing.
NI	Fish Habitat	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Floodplains	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Forests and Rangelands	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Forestry Resources and Woodland Products	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
PI	Greenhouse Gases and Climate	Potential impacts; will be analyzed.
NI	Human health and safety concerns	No issues from act of leasing. Stipulation application and regulatory requirements will adequately mitigate potential impacts at APD stage.
NI	Invasive, Non-native Species	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Lands and Realty	The act of leasing is in accordance with current management plans and is consistent with current land use.
NP	Lands with Wilderness Characteristics	Not present per review of GIS data.
NI	Livestock Grazing Management	No issues from act of leasing.
NI	Migratory Birds	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Native American Religious Concerns	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Noise Resources	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Paleontological Resources	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.

Determination*	Issue	Rationale for Determination
NI	Recreation Resources	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
PI	Sage Grouse Habitat	Potential impacts; will be analyzed.
PI	Socioeconomics	Potential impacts; will be analyzed.
NI	Soils	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Threatened, Endangered or Candidate Plant or Animal Species	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Vegetation	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Visual Resources	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NI	Wastes, Hazardous or Solid	No issues from act of leasing. Stipulation application and regulatory requirements will adequately mitigate potential impacts at APD stage.
PI	Water	Potential impacts; will be analyzed.
NI	Wetlands/Riparian Zones	No issues from act of leasing. Stipulation application will adequately mitigate potential impacts at APD stage.
NP	Wild Horses and Burros	Not present per review of GIS data.
NI	Wild and Scenic Rivers	Not present per review of GIS data.
NP	Wilderness and Wilderness Study Areas	Not present per review of GIS data.
PI	Wildlife	Potential impacts to big game (pronghorn).

*NP = not present in the area impacted by the proposed or alternative actions.
NI = present, but not affected to a degree that detailed analysis is required.
PI = present and may be impacted. Will be analyzed in affected environment and environmental effects. For consistency, the term 'effects' is used throughout the EA, but we use the term 'impacts' just in this table. (NOTE: PI does not necessarily mean effects are likely to be significant, only that there are effects to this issue, resource, or use. Significance will be determined through analysis and documented in a Finding of No Significant Impact or Environmental Impact Statement.)

7 Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
AERMOD	American Meteorological Society / EPA Regulatory Model
APA	Administrative Procedures Act
APD	Application for Permit to Drill
AQRV	Air Quality Related Value
ARMP	Approved Resource Management Plan
ARPA	Archeological Resources Protection Act
ARTSD	Air Resource Technical Support Document
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
BBCS	Bird and Bat Conservation Strategy
BCC	Birds of Conservation Concern
BIA	Bureau of Indian Affairs
BiFO	Billings Field Office
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
BTV	Blue-tongue Virus
CAA	Clean Air Act
CALPUFF	California Puff Model
CAP	Criteria Air Pollutant
CBNG	Coal Bed Natural Gas
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2eq	Carbon Dioxide Equivalent
COA	Condition of Approval
CSU	Controlled Surface Use
DEQ	Department of Environmental Quality
DM	Departmental Manual
DoAQ	Division of Air Quality
DPG	Dakota Prairie Grasslands
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EOI	Expression of Interest
EOR	Enhanced Oil Recovery
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESD	Ecological Site Description
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FLIGHT	Facility Level Information on Greenhouse Gas Tool
FLIR	Forward Looking Infrared
FLPMA	Federal Land Policy Management Act of 1976, as amended
FONSI	Finding of No Significant Impact
FOOGLRA	Federal Onshore Oil and Gas Leasing Reform Act of 1987
GHG	Greenhouse Gas
GHMA	General Habitat Management Area

GIS	Geographic Information Systems
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HD	Hunting District
HMA	Herd Management Area
HQT	Habitat Quantification Tool Technical Manual
IB	Information Bulletin
IBLA	Interior Board of Land Appeals
IDT	Interdisciplinary Team
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
KOP	Key Observation Point
LN	Lease Notice
LTA	Long-Term Averages
MAAT	Mean Annual Air Temperature
MACT	Maximum Achievable Control Technologies
MAF	Master Address File
MAP	Mean Annual Precipitation
MBOGC	Montana Board of Oil and Gas Conservation
MBTA	Migratory Bird Treaty Act of 1918
MCFO	Miles City Field Office
MDEQ	Montana Department of Environmental Quality
MDNRC	Montana Department of Natural Resources and Conservation
MFP	Management Framework Plan
MLA	Mineral Leasing Act
MMT	Million Metric Tons
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSGOT	Montana Sage Grouse Oversight Team
MTDB	MAF/TIGER Database
MTFWP	MT Fish, Wildlife and Parks
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NDDH	North Dakota Department of Health
NDFO	North Dakota Field Office
NDGF	North Dakota Game and Fish
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NHT	National Historic Trails
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
NSPS	New Source Performance Standards
OHV	Off-Highway Vehicle
PEIS	Programmatic Environmental Impact Statement
PFC	Proper Functioning Condition
PGM	Photochemical Grid Modeling

PHMA	Priority Habitat Management Area
P.L.	Public Law
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
RAC	Resource Advisory Council
RFD	Reasonably Foreseeable Development
RFFA	Reasonably Foreseeable Future Action
RHMA	Restoration Habitat Management Area
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
ROW	Right-of-way
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SRP	Special Recreation Permit
T&E	Threatened and Endangered
TIGER	Topologically Integrated Geographic Encoding and Referencing
TL	Timing Limitation
TRNP	Theodore Roosevelt National Park
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USDOI	U.S. Department of the Interior
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
VOC	Volatile Organic Compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WEM	Waivers, Exceptions, or Modifications
WHB	Wild Horse and Burro
WO	Washington Office
WSA	Wilderness Study Area

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Groundwater Assessment Data Sources:

http://mbmggwic.mtech.edu/ - Source of Montana ground water well data

https://mslservices.mt.gov/Geographic_Information/Data/DataList/ - Source of Shapefiles.

http://www.swc.nd.gov/info_edu/map_data_resources/groundsurfacewater/ - North Dakota Ground water data

https://www.dmr.nd.gov/default.asp - North Dakota horizontal well data

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