



**U.S. Department of the Interior
Bureau of Land Management &
Office of Surface Mining Reclamation and Enforcement**

**Falkirk Mining Company Proposed Federal coal Lease-by-Application
Serial Number: NDM 111489
McLean County, North Dakota
Environmental Assessment DOI-BLM-MT-0000-2025-0005-EA**

U.S. Department of the Interior

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Contents

1.	Introduction.....	1
1.1	Proposed Action and Background.....	1
1.2	Purpose and Need for the Proposed Action	4
1.3	Decision to be Made	5
1.4	Conformance with Bureau of Land Management Land Use Plan	5
1.5	Relationship to Statutes, Regulations, or Other Plans.....	6
1.6	Roles and Responsibilities	9
1.7	Resource Issues Identified for Detailed Analysis	10
1.8	Resources Considered but Eliminated from Further Analysis	11
2.	Alternatives	18
2.1	Introduction.....	18
2.2	Alternatives Considered But Not Analyzed in Detail	21
2.3	Mining Plan and Existing Permits	21
	Mining Methods and Facilities	21
	Reclamation	22
	Water Requirements.....	23
	Waste Management.....	23
	Estimated Employment Requirements.....	23
	Design Features.....	23
3.	Affected Environment and Environmental Consequences.....	24
	Past and Present Actions Summary	25
	Reasonably Foreseeable Future Actions	25
3.1	Air Quality	26
	Affected Environment.....	26
	Environmental Impacts – Alternative A (No Action)	47
	Environmental Impacts – Alternative B (Proposed Action)	51
	Environmental Impacts – Alternative C.....	58
3.2	Greenhouse GasEmissions	59
	Affected Environment.....	59
	Environmental Impacts – Alternative A (No Action)	62
	Environmental Impacts – Alternative B (Proposed Action)	64
	Environmental Impacts – Alternative C.....	70
	Trends in Global, United States, and North Dakota Greenhouse Gas Emissions.....	73

Irretrievable and Irreversible Effects	74
Analysis and Conclusion.....	74
3.3 Cultural Resources and Native American Religious Concerns.....	75
Affected Environment.....	75
Environmental Impacts – Alternative A (No Action)	77
Environmental Impacts – Alternative B (Proposed Action)	78
Environmental Impacts – Alternative C.....	78
3.4 Socioeconomics	78
Affected Environment.....	78
Environmental Impacts – Alternative A (No Action)	80
Environmental Impacts – Alternative B (Proposed Action)	80
Environmental Impacts - Alternative C	81
3.5 Threatened and Endangered Species.....	82
Affected Environment.....	82
Environmental Impacts – Alternative A (No Action)	93
Environmental Impacts – Alternative B (Proposed Action)	97
Environmental Impacts – Alternative C.....	98
3.6 Water Resources	100
Geology and Affected Environment	100
Environmental Impacts Common to All Alternatives.....	108
Environmental Impacts – Alternative A (No Action)	110
Environmental Impacts – Alternative B (Proposed Action)	111
Environmental Impacts - Alternative C	111
3.7 Big Game	112
Affected Environment.....	112
Environmental Impacts – Alternative A (No Action)	119
Environmental Impacts – Alternative B (Proposed Action)	120
Environmental Impacts – Alternative C.....	121
4. Consultation and Coordination and List of Preparers	122
4.1 Persons, Groups, and Agencies Consulted.....	122
4.2 Public Involvement, Consultations, and Coordination	123
Public Involvement	123
Tribal and National Historic Preservation Act Section 106 Consultation	124
U.S. Fish and Wildlife Service Consultation	124

5. Literature Cited	126
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Table of Tables

Table 1. LBA proposed lease tracts from 2021 LBA Amendment	2
Table 2. LBA Tract Federal and Private Mineral Ownership	3
Table 3. Resource Issues Not Carried Forward for Analysis	13
Table 4. LBA tracts proposed by alternative	20
Table 5. National Ambient Air Quality Standards and North Dakota Administrative Code Ambient Air Quality Standards	27
Table 6. 2023 Air Quality Monitoring Data from Beulah North and Hannover Monitoring Stations	30
Table 7. McLean, Mercer, and Oliver Counties - 2020 National Emissions Inventory Data	42
Table 8. Falkirk Mining Company Minor Source Permit to Operate Emission Units	44
Table 9. Dust Control Measures in Falkirk Mine's Fugitive Dust Control Plan	45
Table 10. Coal Creek Station 2019, 2020, 2021, and 2022 Emissions (tpy)	47
Table 11. Falkirk Mine Emissions from Coal Mining - Annual Emission Rate Based on Maximum Allowable Production (in tons per year).	48
Table 12. Falkirk Mine Emissions from Coal Mining - Annual Emission Rate Based on Typical Annual Production (in tons per year)	48
Table 13. Falkirk Mine No Action Alternative Emissions - Total Emissions from Extraction of 11.3 Million Tons of Non-Federal Coal	49
Table 14. Falkirk Mine Proposed Action Emissions - total Emissions from Extraction of Federal Coal ..	52
Table 15. Estimated Emissions Associated with Combustion of the Federal Coal from the Lease by application Tracts at the Coal Creek Station (tons)	53
Table 16. Falkirk Mine Alternative C Emissions – Total Emissions from Extraction of Federal Coal	58
Table 17. Estimated Emissions Associated with Combustion of the Alternative C Coal from the Lease by of Tracts 2 and 3 at the Coal Creek Station (tons)	59
Table 18. 2023 Greenhouse Gas Large Emitters by Sector	61
Table 19. Summary of Total Greenhouse Gas Emissions from the No Action Alternative over the Life of Mine	63
Table 20. Summary of Total Greenhouse Gas Emissions from 11.3 Million Tons of Non-Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use combustion under the No Action Alternative	64
Table 21. Global Warming Potential of Project Greenhouse Gases (Proposed Action)	65
Table 22. Estimated Total Methane Emissions from mining and Postmining Operations (Proposed Action)	65
Table 23. Estimated Greenhouse Gas Emissions from Mine-Related Mobile Source Equipment over the Life of the Project (Proposed Action)	66
Table 24. Estimated Total Greenhouse Gas Emissions Associated with the Combustion of the Federal Coal from the Lease-by-Application Tracts over the Life of the Project (Proposed Action)	67
Table 25. Summary of Total Greenhouse Gas Emissions from Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use Combustion under the Proposed Action	67
Table 26. Total U.S. and Regional Federal Coal Production Trends (tons)	68
Table 27. Estimated Emissions from Federal Mineral Combustion, Extraction, Transportation, and Processing (MMmt of CO ₂ e)	69
Table 28. Projected 2022 to 2050 Greenhouse Gas Emissions from Fossil Fuel Combustion, Extraction, Transportation, and Processing (MMmt of CO ₂ e) (Proposed Action)	69

Table 29. Proposed Action Portion of Projected 2022 to 2050 Greenhouse Gas Emissions from Fossil Fuel Combustion, Extraction, Transportation, and Processing (MMmt of CO ₂ e).....	70
Table 30. Estimated Total Methane Emissions from Mining and Postmining Operations (Alternative C).....	70
Table 31. Estimated Greenhouse Gas Emissions from Mine-Related Mobile Source Equipment over the Life of the Project (Alternative C)	71
Table 32. Estimated Total Greenhouse Gas Emissions Associated with the Combustion of the Federal Coal from the Lease-by-Application Tracts over the Life of the Project (Alternative C)....	72
Table 33. Summary of Total Greenhouse Gas Emissions from Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use Combustion under Alternative C....	72
Table 34. Cultural Resources within Alternatives B and C	76
Table 35. North Dakota Coal Production.....	78
Table 36. Taxable Coal Severed from Non-Federal Land During a 15-year Period	80
Table 37. Taxable Coal Severed Under the Proposed Action.....	81
Table 38. Taxable Coal Severed Under Alternative C.....	82
Table 39. Gap Analysis Project Landcover Classes in the Analysis Area for Whooping Crane, Pallid Sturgeon, Piping Plover, and Rufa Red Knot	85
Table 40. Acres of Habitat Disturbed by the No Action Alternative	93
Table 41. Acres of Habitat Disturbed by the Action Alternative.....	97
Table 42. Acres of habitat disturbed by Alternative C.....	99
Table 43. Road Density Degree of Impact.....	116
Table 44. Landcover and Percentage of Analysis Area	117
Table 45. No Action Alternative Impacts to Habitat Effectiveness	120
Table 46. Proposed Action Alternative Impacts to Habitat Effectiveness	121
Table 47. Alternative C Impacts to Habitat Effectiveness.....	122
Table 48. Bureau of Land Management and Office of Surface Mining Reclamation and Enforcement Staff Participating in the Preparation of this Environmental Assessment.	122
Table 49. Environmental Consultants Staff Participating in the Preparation of this Environmental Assessment.....	123
Table 50. Federal and State Agencies Consulted in the Preparation of this Environmental Assessment.	123

Table of Figures

Figure 1. Existing mine permit boundaries and proposed tracts in LBA.....	3
Figure 2. Air Quality Analysis Area	29
Figure 3. Interagency Monitoring of Protected Visual Environments (IMPROVE) stations.	32
Figure 4. Visibility on haziest and clearest days - Theodore Roosevelt National Park and Lostwood National Wildlife Refuge	35
Figure 5. Dry deposition of nitrogen – Theodore Roosevelt National Park	36
Figure 6. Dry deposition of sulfur - Theodore Roosevelt National Park	37
Figure 7. Wet deposition of nitrate - Theodore Roosevelt National Park 1982-2000	37
Figure 8. Wed deposition of nitrate - Theodore Roosevelt National Part 2001-2003	38
Figure 9. Wet deposition of sulfate - Theodore Roosevelt National park 1982-2000	38
Figure 10. Wet deposition of sulfate – Theodore Roosevelt National Park.....	39
Figure 11, REMSAD simulated total (wet and dry annual mercury deposition [k/km ²]) for North Dakota - highest modeled value shown in blue triangle with data represented in Figure 12	40

Figure 12. Model-based analysis and tracking of airborne mercury emissions to assist in watershed planning - mercury deposition contribution analysis study results.	41
Figure 13. Mercury Deposition Network annual mercury deposition monitoring data.	42
Figure 14. Air quality effects analysis area.....	55
Figure 15. Beulah North Wind Rose.....	57
Figure 16. State of North Dakota annual carbon dioxide equivalent in million metric tons.....	62
Figure 20. Threatened and endangered species analysis areas	84
Figure 21. Mercury deposition analysis area	89
Figure 22. Surface Water Features for Falkirk Lease Tracts 1, 2, 3.	103
Figure 23. Surface Water Features for Falkirk Lease Tract 4.....	104
Figure 24. Surface Water Features for Falkirk Lease Tract 5.....	105
Figure 25. Aquifers withing 5-miles of the existing permit boundary.....	107
Figure 26. Falkirk Lease Tracts and Mule Deer Fawning and Foraging Areas	113

Appendices

Appendix A Interdisciplinary Team Checklist

Appendix B Scoping Summary

Appendix C Past, Present, and Reasonably foreseeable Future Actions

Appendix D Abbreviations

Appendix E Final Biological Assessment and Technical Memorandum

1. Introduction

1.1 Proposed Action and Background

This environmental assessment (EA) was prepared to examine the potential environmental impacts of the proposed action and alternative actions to support informed decision-making. This analysis is consistent with the purpose and goals of the National Environmental Policy Act (NEPA) as amended; longstanding federal judicial and regulatory interpretations; the Department of the Interior's (DOI) NEPA regulations (43 CFR part 46); and Administration priorities and policies.

This EA has been prepared jointly by the Bureau of Land Management (BLM) and the Office of Surface Mining Reclamation and Enforcement (OSMRE) to disclose and analyze the potential effects on the environment of issuing a Federal coal lease for the proposed Lease-By-Application (LBA) NDM 111489 and recommendation for approval of the Federal mining plan by OSMRE to the Assistant Secretary of Lands and Minerals (ASLM) enabling the Federal coal to be mined.

On October 30, 2019, Falkirk Mining Company (Falkirk) submitted an emergency Federal coal LBA for the Falkirk Mine to the BLM Montana/Dakotas State Office to lease multiple Federal tracts containing approximately 11.3 million tons of minable coal (See **Table 2**) over 800 acres for a 15-year period (Falkirk, 2019).

On June 6, 2020, Falkirk submitted a revision of the emergency Federal coal LBA for the Falkirk Mine to the BLM Montana/Dakotas State Office removing 34.26 acres (approx. 600,000 tons of minable coal) from the original application, leaving in place a request to lease tracts containing approximately 10.7 million tons of minable coal (See **Table 2**) over 765.74 acres over a 15-year period (Falkirk, 2020).

On January 27, 2021 Falkirk submitted a second revision of the emergency Federal coal LBA for the Falkirk Mine to the BLM Montana/Dakotas State Office to revert to the original application and lease multiple Federal tracts containing approximately 11.3 million tons of minable coal (See **Table 2**) over 800 acres for a 15-year period (Falkirk, 2021).

At the Falkirk Mine, coal is transported to the associated Coal Creek Station via a conveyor system or truck loading operations. Falkirk Mine has a contract with the Coal Creek Station to supply coal at a maximum permitted production rate of 34 million tons per year that extends through 2045. Coal Creek Station is permitted to operate through 2040, and Falkirk Mine is anticipated to operate through the lifetime of the Coal Creek Station. Falkirk has non-Federal coal leases sufficient to supply Coal Creek Station through 2045. Although Falkirk Mine could supply Coal Creek Station with non-Federal coal sources, Falkirk Mine has applied to mine coal within Federal leases through 2045 because this would make for a more efficient mine plan. The Falkirk Mine is expected to have a mining rate of approximately 7.4 million tons per year and the life of the mine is planned through 2045, regardless of whether the Proposed Action is approved or not. Additional equipment would be needed under the No Action Alternative to mine at the same rate but around the Federal coal tracts.

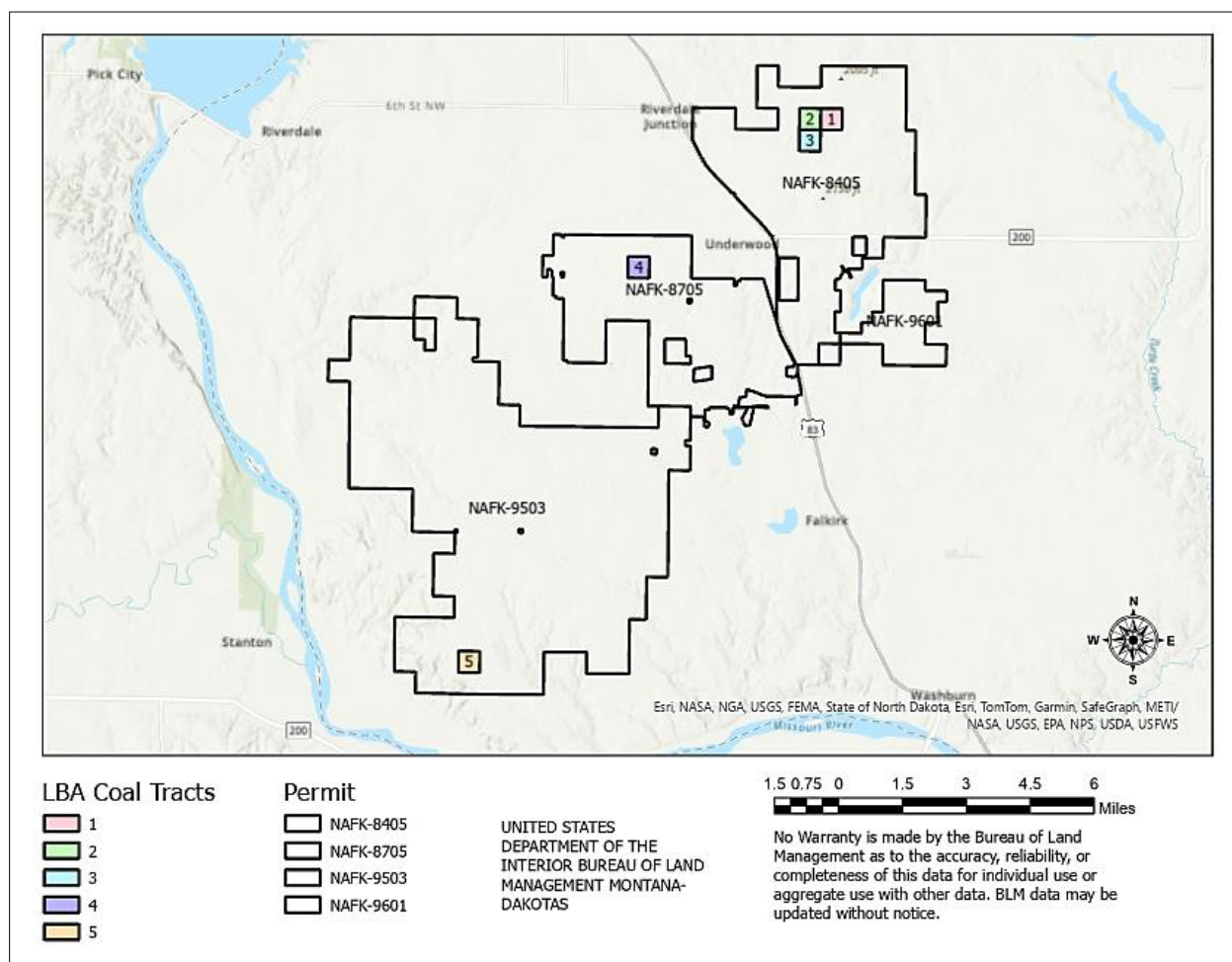
The delineated areas of the Federal lease tracts associated with the Proposed Action and alternatives will be referenced by tract number as indicated in **Table 1**. Legal land descriptions for each tract are as follows:

Table 1. LBA proposed lease tracts from 2021 LBA Amendment

Tract EA Reference number	Legal Land Description	Acres	Minable Coal Resources (short tons)
1	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 2 lots 3 and 4, and S1/2NW1/4	160	2,981,444
2	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 lots 1 and 2, S1/2NE1/4	160	2,515,626
3	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 SE1/4	160	1,176,277
4	T. 146 N., R. 83 W., 5 th P.M., North Dakota Sec. 24 SE1/4	160	2,908,273
5	T. 146 N., R. 84 W., 5 th P.M., North Dakota Sec. 12 NW1/4	160	1,738,325
Total:		800	11,319,945

Falkirk has been mining coal via conventional surface mining methods at the Falkirk Mine (Permits NAFK-8405, NAFK-8705, and NAFK-9503 [i.e. existing permits]) (see **Figure 1**) in McLean County, North Dakota since 1983. The permits have been approved by the North Dakota Public Service Commission (NDPSC), the regulatory authority authorized by the Surface Mining Control and Reclamation Act of 1977 (SMCRA) and the Department of the Interior to regulate surface coal mining operations and the surface effects of underground coal mining on private and state lands within the State of North Dakota.

Figure 1. Existing mine permit boundaries and proposed tracts in LBA



The five (5) proposed Federal lease tracts are within the existing permit boundaries for the existing Falkirk Mine (NAFK-8405, NAFK-8705, NAFK-9503). Each Federal coal tract is comprised of private surface lands. Three of the tracts are fully Federal minerals, and two tracts have split mineral ownership (50% Federal, 50% Privately owned):

Table 2. LBA Tract Federal and Private Mineral Ownership

Tract number	Location	Percentage Private Mineral Ownership	Percentage Federal Mineral Ownership
1	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 2 lots 3 and 4, and S1/2NW1/4	0%	100%
2	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 lots 1 and 2, S1/2NE1/4	50%	50%
3	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 SE1/4	50%	50%
4	T. 146 N., R. 83 W., 5 th P.M., North Dakota Sec. 24 SE1/4	0%	100%
5	T. 146 N., R. 84 W., 5 th P.M., North Dakota Sec. 12 NW1/4	0%	100%

The Federal coal in tracts 2 and 3 were acquired by the United States (after previously being patented to non-Federal ownership) and are therefore available for lease (Mineral Leasing Act for Acquired Lands of 1947). The United States ownership is 50% undivided, meaning that 50% of the revenue stream would be dedicated to non-federal owners and 50% to the United States.

1.2 Purpose and Need for the Proposed Action

The purpose and need for the BLM's Federal action is to respond to Falkirk's emergency LBA to lease Federal coal resources at the Falkirk Mine. The purpose of OSMRE's Federal action is to conduct a thorough analysis of the potential environmental effects of the proposed mining plan to inform its recommendation to the ASLM to approve, disapprove, or approve with conditions the proposed mining plan as required by the Mineral Leasing Act of 1920 (MLA) (30 United States Code [U.S.C.] 207(c); 30 CFR part 746). The ASLM will use OSMRE's recommendation to decide whether the mining plan is approved, disapproved, or approved with conditions.

The criteria for emergency leasing are listed in 43 CFR § 3425.1-4:

- (a) An emergency lease sale may be held in response to an application under this subpart if the applicant shows:*
 - (1) That the coal reserves applied for shall be mined as part of a mining operation that is producing coal on the date of the application, and either:*
 - (i) The Federal coal is needed within 3 years*
 - (A) to maintain an existing mining operation at its current average annual level of production on the date of application or*
 - (B) to supply coal for contracts signed prior to July 19, 1979, as substantiated by a complete copy of the supply or delivery contract, or both; or*
 - (ii) If the coal deposits are not leased, they would be bypassed in the reasonably foreseeable future, and if leased, some portion of the tract applied for would be used within 3 years; and*
 - (2) That the need for the coal deposits shall have resulted from circumstances that were either beyond the control of the applicant or could not have been reasonably foreseen and planned for in time to allow for consideration of leasing the tract under the provisions of [§ 3420.3 of this title](#).*
- (b) The extent of any lease issued under this section shall not exceed 8 years of recoverable reserves at the rate of production under which the applicant qualified in [paragraph \(a\)\(1\)](#) of this section. If the applicant qualifies under both [paragraphs \(a\)\(1\) \(A\)](#) and [\(B\)](#) of this section, the higher rate applies.*

Mine plans are broken into long range and short range mine plans. In coal strip mining, pits are created in a stepwise fashion to minimize equipment movement balancing this with mining coal that adheres to customer specifications, and reclamation. Typically, long range plans are created to address coal that may be mined out to 20 or 30 years depending on reserves. According to the mine plan presented in the lease application, the earliest federal tract in T. 146 N., R. 82 W. section 3 was not expected to be mined until 2025 and therefore Item (a)(1)(i)(A) was not satisfied. Falkirk has expressed their intent to bypass the federal coal should the lease not be granted and the total coal expected to be mined from the lease is less than eight years of the total annual production of the mine, therefore, both items (a)(1)(ii) and (b) are satisfied. Over the last five years the federal leasing application process faced numerous

delays. Due to these delays, the lease application is now within 3 years of the expected start date satisfying Item (a)(1)(i)(A) of the Emergency Lease provisions. In fact, based on their current mine plan and mining progress, Falkirk will immediately begin mining the federal lease upon securing the lease and plan and permit approvals.

1.3 Decision to be Made

The BLM decision to be made is whether to lease all or a portion of the Federal coal resources contained within the lease tracts, and if so, under what terms, conditions, and stipulations. The OSMRE decision to be made is to provide a recommendation to the ASLM regarding the Federal mining plan associated with development of the Federal lease tracts. The ASLM will use OSMRE's recommendation to decide whether the new mining plan is approved, disapproved, or approved with conditions. OSMRE's recommendation to the ASLM is based, at a minimum, on the documentation specified at 30 CFR § 746.13.

1.4 Conformance with Bureau of Land Management Land Use Plan

This EA is in conformance with the Approved North Dakota Resource Management Plan (January 2025) and incorporates by reference the analysis within the North Dakota Final Environmental Impact Statement (2025 ND FEIS) (plan revision). The 2024 ND Draft RMP and EIS were released January 20, 2023, for public comment. The ARMP and ROD were approved and signed on January 8, 2025. (See <https://eplanning.blm.gov/eplanning-ui/project/1505069/510> and search either NEPA Number "DOI-BLM-MT-C030-2020-0085-RMP-EIS" or "North Dakota Resource Management Plan Revision and EIS" for information on the North Dakota RMP revision project).

Further, this EA incorporates the analysis and information provided in the Air Quality Technical Support Document (AQTSD) and the BLM Hazardous Air Pollutants Modeling Final Report (HAPs) developed for the BLM North Dakota Resource Management Plan/EIS (Ramboll Environ 2022). The HAPs report presents the modeling methodology and results of a regional multi-state assessment of the health impacts of hazardous air pollutants (HAPs) originating from oil and gas production in Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming. The AQTSD regional air quality assessment compares the concentrations of air pollutants in the ambient atmosphere to regulatory standards and other nonregulatory thresholds that are protective of human health and the environment. The photochemical modeling is performed using a specific set of emission sources within and outside the Planning area (North Dakota) and is conducted for the future year circa 2028. The 2025 RMP, the HAPs Report, and AQTSD can be found here: <https://eplanning.blm.gov/eplanning-ui/project/1505069/510>.

This EA incorporates the coal screening criteria associated with the BLM's North Dakota Resource Management Plan and Final Environmental Impact Statement (1988 ND RMP). Coal screening criteria complies with 43 CFR 3461 and is discussed further in Section 1.5. Approved in April 1988, the RMP states that "areas of Federal coal will be screened for coal development potential, unacceptable environmental conflicts, and significant surface owner opposition to mining" (BLM 1988:2). The 1988 ND RMP also states that "specific coal lease areas will be analyzed in detail during activity level planning or in response to applications for lease. Documentation of the consequences of leasing and mining for National Environmental Policy Act (NEPA) compliance will be completed prior to lease offering" (BLM

1988:9). Appendix B of the ND RMP EIS (BLM 1988) provides a summary of results obtained by application of each unsuitability criteria along with corresponding exceptions and exemptions.

The 1988 Record of Decision for the North Dakota Approved Resource Management Plan (Page 3) found 599,496 acres of Federal coal acceptable for further consideration for leasing. The 2025 Record of Decision for the North Dakota Approved Resource Management Plan (Pages 2-50) encourages orderly development of the Federal coal resource while avoiding unnecessary impacts on other resources and land uses. Over fifty thousand acres (58,600 acres) in the North Dakota decision area were identified as acceptable for further consideration for coal leasing. In both cases (1988 and 2025 NDRMP) all tracts considered within the range of alternatives discussed in this EA are identified as “acceptable for further consideration” (SLM-CL-AU-01 (2025 ND RMP)). All tracts were identified as “unsuitable with exception” (Screen 2; Appendix F, Coal Screening Process, Map F-26 (2025) and Appendix B (1988)). Criterion 15, Habitat for Species of High Interest to the State, specifically big game species, were identified on all potential lease tracts. The BLM screened the Federal lease tracts for multiple use conflicts as described in Appendix F of the 2025 ND RMP (Multiple Use Screen 3) and Appendix B of the 1988 ND RMP. There were no conflicts identified for any of the following criteria: Air and Climate, Soil Resources, Fluid Minerals, Recreation and Special Designations, National Park Service Viewshed.

1.5 Relationship to Statutes, Regulations, or Other Plans¹

The BLM must comply with 43 CFR 3461: Unsuitability for Mining whereas the regulations found therein implement:

- 1) the general unsuitability criteria in section 522 (a) of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272(a));
- 2) The Federal lands review in section 522(b) of the Surface Mining Control and Reclamation Act of 1977 ([30 U.S.C. 1272\(b\)](#)); and
- 3) The prohibitions against mining certain lands in section 522(e) of the Surface Mining Control and Reclamation Act of 1977 ([30 U.S.C. 1272\(e\)](#)). (43 CFR 3461.0-3 (b)).

The unsuitability procedures and land use planning (43 CFR 3461.2-1) discuss how the unsuitability criteria shall be applied to coal lands with development potential identified in the land use plan or land use analysis. For areas where one or more unsuitability conditions are found and for which the authorized officer of the surface management agency could otherwise regard coal mining as a likely use, the exceptions and exemptions for each criterion may be applied. Furthermore, SMCRA Section 522 (a) discusses how a surface area may be designated unsuitable for certain types of surface coal mining operations and establishes compliance requirements for State processes. SMCRA 522 (b) allows for

¹ Executive Order 14154, Unleashing American Energy (Jan. 20, 2025), and a Presidential Memorandum, Ending Illegal Discrimination and Restoring Merit-Based Opportunity (Jan. 21, 2025), require the Department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The BLM and OSMRE have verified that they have complied with the requirements of NEPA, including the Department’s regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President’s January 2025 Order and Memorandum. The BLM and OSMRE have also voluntarily considered the Council on Environmental Quality’s rescinded regulations implementing NEPA, previously found at 40 C.F.R. Parts 1500–1508, as guidance to the extent appropriate and consistent with the requirements of NEPA and Executive Order 14154.

permitting surface coal mining on Federal lands or the withdrawal of such area or condition any mineral leasing or mineral entries in a manner so as to limit surface coal mining operations on such area.

In applying each criterion to lands, the phrase “shall be considered unsuitable for all or certain stipulated methods of coal mining involving surface coal mining operations” is shortened to “shall be considered unsuitable.” Some criteria have exceptions or exemptions; If the exemption or exception for a specific criterion can be applied (i.e. unsuitable with exception), the coal lands being evaluated would not be considered unsuitable and could be considered for leasing. If the unsuitability criteria are those “without exception”, the acreage would not be made available for leasing under any circumstance. All suitability criteria will be reviewed at the time of application and acreages may be made available without requiring a land use plan amendment if resource data change.

Federal agencies must consider the effects of their actions on cultural resources under NEPA and under Section 106 (54 U.S.C. 306108) of the NHPA (54 U.S.C. 300101 et seq.). Specifically, Section 106 directs Federal agencies to consider the effects of their actions on historic properties and provide the Advisory Council on Historic Preservation a reasonable opportunity to comment. The Section 106 process is separate from, but often conducted in parallel with, the preparation of an EA. Other Federal legislation applicable to cultural resources in the analysis area includes the following:

- American Antiquities Act of 1906 (54 U.S.C. 320301 et seq.)
- Archaeological Resources Protection Act of 1979 (54 U.S.C. 302101)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001–3002)
- EO 13007, Sacred Sites Act
- EO 13287, Preserve America
- EO 13175, Consultation and Coordination with Indian Tribal Governments

The State Historical Society of North Dakota, in conjunction with the North Dakota State Historic Preservation Office (SHPO), a subdivision within the State Historical Society of North Dakota, is responsible for ensuring that effects on historic properties resulting from Federal undertakings on any lands within the state, as well as on lands under the jurisdiction of the state, are considered under applicable state laws and that state cultural resources and historic properties laws are followed. State of North Dakota statutes and guidelines applicable to cultural resources in the analysis area include the following:

- NDCC 55-10-01 indicates it is policy for the state to provide for the preservation of historic sites, buildings, structures, and antiquities of state and national significance.
- NDCC 55-03-01 requires a permit be obtained from the state to investigate, evaluate, or mitigate adverse effects on cultural resources, historic buildings, structures, or objects on any lands in North Dakota under Section 106 of the NHPA.
- NDCC 55-03-01.1 requires a permit be obtained from the state to investigate, evaluate, or otherwise record cultural resources on land owned by an instrumentality of the state or to excavate cultural resources on private land for any purpose other than those identified in NDCC 55-03-01.
- NDCC 55-02-07 provides for the protection of significant historical or archaeological artifacts or sites on any land owned by the state or its political subdivisions or in the state’s custody or possession.

- NDCC 23-06-027 “Protection of Human Burial Sites, Human Remains, and Burial Goods — Unlawful Acts — Penalties — Exceptions” and NDAC 40-02-03 “Protection of Prehistoric and Historic Human Burial Sites, Human Remains, and Burial Goods” require a process be followed when human remains on state or private lands are discovered.

Federal undertakings may take place on lands under the jurisdiction of the state. In accordance with Section 101(b)(3) of the NHPA, the North Dakota SHPO is also responsible for advising and assisting Federal agencies in carrying out their Section 106 responsibilities and for cooperating with agencies, local governments, organizations, and individuals to ensure that historic properties are taken into consideration at all levels of planning and development (36 CFR § 800.2(c)(1)(i) and 36 CFR §800.2(c)(2)(ii)). BLM and OSMRE are currently working with the North Dakota SHPO and interested parties as described in 36 CFR § 800.2 and Chapter 4 to fulfill Section 106 responsibilities

The LBA for the Federal tracts was submitted and will be processed and evaluated under BLM and OSMRE statutory mandates, DOI authority governing Federal coal leasing and mining, and other Federal laws, regulations, and guidance documents listed below:

- Migratory Bird Treaty Act of 1918
- Mineral Leasing Act for Acquired Lands of 1947
- Mineral Leasing Act of 1920 (MLA), as amended by the Federal Coal Leasing Amendments Act of 1976
- Bald and Golden Eagle Protection Act of 1940
- National Historic Preservation Act (NHPA) of 1966
- NEPA of 1969, as amended
- Clean Air Act (CAA) of 1970
- Clean Water Act (CWA) of 1972
- Endangered Species Act (ESA) of 1973
- Archaeological and Historical Act of 1974
- FLPMA of 1976
- SMCRA
- Archaeological Resources Protection Act of 1979
- Energy Policy Act of 2005
- 2020 ESA Section 7 Consultation Final Programmatic Biological Opinion and Conference Opinion on the OSMRE Title V Regulatory Program (U.S. Fish and Wildlife Service [USFWS] 2020a)
- EO 14154 Unleashing American Energy
- 43 CFR Group 3400 Coal Management, and all parts therein

The BLM regulates coal leasing primarily to ensure that the maximum economic recovery of the coal resource is achieved (30 U.S.C. 201(a) and 43 CFR Part 3480), while maintaining compliance with other applicable laws and regulations.

On January 20, 2025, President Trump issued E.O. 14154, *Unleashing American Energy*. The Executive Order revoked E.O. 11991, which had directed CEQ to issue regulations implementing NEPA and required Federal Agencies to comply with those regulations. Because of the issuance of E.O. 14154 BLM and OSMRE are using the CEQ Regulations and 40 CFR Parts 1500-1508 as issued in 2020.

<https://trumpwhitehouse.archives.gov/wp-content/uploads/2020/01/nepa-implementing-regulations-desk-reference-2020-1.pdf> This EA is in compliance with the 2020 CEQ regulations being used as guidance until such time that an updated regulatory authority is implemented.

In North Dakota, NDPSC has primacy over surface coal mining operations on non-Federal, non-Indian lands within its borders, and North Dakota and DOI have entered into a State-Federal Cooperative Agreement (30 C.F.R. 934.30) to allow NDPSC primacy for permitting surface coal mining operations on Federal lands within North Dakota. Under SMCRA, OSMRE has an oversight and enforcement role that includes evaluating and assisting the state in the administration, implementation, enforcement, and maintenance of its approved state surface mining program. If the Federal coal is leased, OSMRE reviews the Federal mining plan modification as required by 30 U.S.C. 207(c) and will prepare a recommendation to the ASLM whether to approve, disapprove, or approve with conditions the Federal mining plan modification.

1.6 Roles and Responsibilities

Bureau of Land Management (BLM)

The BLM is responsible for the issuance, readjustment, modification, termination, cancellation, and/or approval of transfers of Federal coal leases pursuant to MLA, as amended. The BLM has the general responsibility to administer MLA with respect to coal mining, production, and resource recovery and protection operations on Federal coal leases and licenses, and to supervise exploration operations for Federal coal. The BLM must decide whether to grant a lease for Federal coal reserves.

Office of Surface Mining, Reclamation, and Enforcement (OSMRE)

SMCRA is a comprehensive statute designed to establish a nationwide program to protect society and the environment from the adverse effects of surface coal mining operations. SMCRA establishes a program of cooperative federalism, allowing States to enact and administer their own regulatory programs on non-Federal and non-Indian lands, within limits established by minimum Federal standards, and subject to oversight and enforcement by OSMRE. For Federal mining plan modifications, a operator or permittee may not commence mining unless the mining plan modification is approved by the ASLM. OSMRE is responsible for preparing and submitting a decision document to the ASLM recommending approval, disapproval, or approval with conditions of a proposed mining plan modification. Pursuant to 30 CFR § 746.13, OSMRE's recommendation is based, at a minimum, upon:

- The Permit Application Package (PAP)
- Information prepared in compliance with NEPA, including this EA
- Documentation assuring compliance with the applicable requirements of Federal laws, regulations, and executive orders other than NEPA
- Comments and recommendations or concurrence of other Federal agencies and the public;

- Findings and recommendations of the BLM with respect to the Resource Recovery and Protection Plan (R2P2), Federal lease requirements, and the MLA
- Findings and recommendations of the PSC with respect to the mine permit NACT0201 and the North Dakota State program and,
- The findings and recommendations of OSMRE with respect to the additional requirements of 30 CFR Chapter VII, Subchapter D

North Dakota Public Service Commission (PSC)

In North Dakota, the North Dakota Public Service Commission (NDPSC) applied for and received primary jurisdiction (“primacy”) over regulation and permitting of surface coal mining operations on non-Federal and non-Indian lands within its borders. In August 1983, North Dakota and OSMRE entered into a cooperative agreement, which allows North Dakota to issue state permits on Federal, but not Indian lands, as defined in SMCRA. OSMRE has ongoing authority to oversee the administration, implementation, enforcement, and maintenance of its approved state surface mining program. If the Federal coal is leased, OSMRE reviews the mining plan as required by 30 U.S.C. 207(c) and will prepare a recommendation to the ASLM whether to approve, disapprove, or approve with conditions the Federal mining plan.

The PSC Reclamation Division is responsible for administering the state’s program regulating the surface mining of coal. The program is primarily an environmental protection program that strives to administer the surface coal mining and reclamation program mandated by state and Federal laws to achieve optimum results in a cost-effective and fair manner, and to ensure that mining operations subject to this program are conducted in such a way that they are environmentally sound and minimize adverse effects, protect public interest and the rights of property owners, return mined lands to beneficial uses, and restore the productivity of mined agricultural lands to pre-mining levels (NDPSC 2015a).

1.7 Resource Issues Identified for Detailed Analysis

Resource analysis issues include resource issues that could be affected by Federal coal leasing. The BLM and OSMRE focuses their analysis on relevant environmental information to ensure informed decision making by Federal agencies (40 CFR § 1500.1(b) (2020)).

Site-specific resource concerns were identified by the BLM, OSMRE, and the public through the preliminary review process conducted during the 30-day public scoping period. The BLM and OSMRE focus their analysis on issues that: are determined to be potentially significant as related to the action alternatives, have a cause-effect relationship with the action alternatives, are within the scope of analysis, and are amenable to scientific analysis. The following resources/issues will be analyzed in detail in this EA:

Air Quality

- Would leasing, mining, reclamation, and combustion activities (associated with end-user facility operations) increase air pollutant concentrations above the National Ambient Air Quality Standards (NAAQS) and impact human health?
- How would leasing, mining, reclamation, and combustion activities (associated with end-user facility operations) cause or contribute to Hazardous Air Pollutants (HAPs) concentrations that are detrimental to human health or the environment?

- How would leasing, mining, reclamation, and coal combustion activities (associated with end-user facility operations) cause or contribute to visibility impacts at Class I Areas?
- How would impacts from the action alternatives in combination with emission-generating activities within the analysis area impact air quality, visibility, mercury deposition, and HAP concentrations?

Greenhouse Gases

- How would the leasing, mining, reclamation, and coal combustion (associated with the end-user facility operations) contribute to greenhouse gas (GHG) emissions?
- How would the GHG emissions from mining, reclamation, and coal combustion contribute to climate impacts?

Cultural Resources and Native American Religious Concerns

- What are the potential impacts to cultural resources and Native American Religious Concerns on the Federal tracts related to leasing, mining, and reclamation activities?

Socioeconomics

- How would leasing, mining, and reclamation activities of the action alternatives affect community services such as public institutions and services that receive Federal coal royalty payments?

Threatened and Endangered Species

- How would the alternatives potentially impact the following threatened and endangered species: Dakota skipper, piping plover, whooping crane, red knot, northern long-eared bat, and pallid sturgeon?
- How would the alternatives potentially impact the following proposed endangered and proposed threatened species: Suckely's cuckoo bumble bee, monarch butterfly, and Western regal fritillary?

Water Resources

- How would the alternatives affect the quantity and quality of groundwater?
- How would the alternatives affect wetlands function and/or contribute to erosion, surface water runoff, and sedimentation?
- How would the alternatives affect the acreage of available seasonal and temporary wetlands?

Big Game

- How would the alternatives potentially impact designated big game habitat for mule deer and pronghorn?

1.8 Resources Considered but Eliminated from Further Analysis

The interdisciplinary team identified potential issues for resources that may be impacted with the leasing of the Federal coal resources contained in the tracts and identified recommendations for the proposed mining plan associated with development of the tracts. Scoping for the action alternatives included: BLM specialists' professional expertise and site knowledge, and agency specialists' review of data available

from regional and site-specific datasets; existing permit documents and reports for the Falkirk Mine, other regional survey work, and peer-reviewed literature; and discussion with other Federal and state agencies (e.g., USFWS, State Historic Preservation Office [SHPO]). Based on scoping, the resources described in **Table 3** were determined to be present within the Federal lease tracts but not affected to a degree that additional analysis is required. If a resource issue was identified for a resource, then it is analyzed in detail in Chapter 3. If no resource issues were identified, then the analysis pertaining to that resource was eliminated.

The elimination of resources and issues are consistent with 40 CFR § 1500.4. Rationale for each resource eliminated from detailed analysis is provided in **Table 3**. Furthermore, during the scoping process, resources determined not to be present within or adjacent to the Federal lease tracts (including fisheries; alluvial valley floors; various designated areas; fuels/fire management; threatened, endangered, protected and/or candidate vegetation species; recreation; and woodlands/forestry) would not be impacted by the proposed LBA and are provided in Appendix B, Interdisciplinary Team Checklist.

Table 3. Resource Issues Not Carried Forward for Analysis

Resource	Rationale for Determination to Eliminate from Detailed Analysis
Geology and minerals (other than coal)	Falkirk Mining Company is the owner and operator of the Falkirk Mine and has been mining coal since 1978. Annual coal production varies from 7 to 8 million tons. The Federal tracts contain an estimated 11.3 million tons of lignite coal (Falkirk 2021). If the 11.3 million tons were to be mined in a continuous manner, it would represent approximately 1.5 years of coal production at the Falkirk Mine at a mining rate of approximately 8 million tons per year (tpy). It is anticipated that mining operations would occur 7 days per week, 52 weeks per year (subject to change based on power plant demand). The projected mine life and operating plans of the Falkirk Mine are anticipated to extend through the year 2045. The minable coal beds in the tracts consist of the Hagel A and the underlying Hagel B beds. The average thickness of the Hagel A bed is 6.3 feet and 3.4 feet for the Hagel B bed. The average interburden thickness between the Hagel A and Hagel B coal beds is 8.4 feet. The average overburden thickness for the tracts is 88 feet, and the average stripping ratio is 6.32 cubic yards/coal ton. The sedimentary units that occur from the base of the Hagel B coal bed up to the land surface would be subject to permanent change after the overburden and interburden are removed and placed in the backfill, and the coal is mined. As a result, the physical characteristics of the material in the backfill would be different from the physical characteristics of the pre-mined sediments. Due to the reclamation requirements approved by the NDPSC to reclaim the land surface to the approximate pre-mined contour, the direct and indirect effects on geologic and mineral resources are not expected to be substantial but would be permanent for the Federal lease tracts. No conflicts with other solid or fluid mineral development are anticipated.
Land use and access	Land use estimates on the Federal lease tracts are as follows: • Cropland: 702.70 acres • Seasonal wetlands:² 42.85 acres (Discussed in Section 3.7) • Hay land: 12.87 acres • Native grassland: 9.82 acres • Temporary wetlands:³ 4.91 acres (Discussed in Section 3.7) • Farmstead: 4.14 acres • Shelterbelts: 3.30 acres • Rights-of-way: 24.55 acres A review of McLean County planning and zoning codes indicate the Proposed Action is compatible with the existing land use (Agriculture) and authorized rights-of-way. Mining would not occur within 500 feet of any adjacent buildings on neighboring lands and Falkirk has secured a surface lease for the existing farmstead on the Federal coal tract in sec. 2. Livestock grazing occurs in portions of the Federal lease tracts during the summer months; however, Falkirk already has appropriate surface leases in place with the private landowners that allows the mine to conduct surface-disturbance preparatory work on the private lands overlying the Federal lease tracts. The BLM does not have authority to manage surface operations on the Federal lease tracts. Additionally, mining operations would not interfere with access to adjacent private lands. The Proposed Action is not expected to result in substantial impacts to land use, grazing or access. Further analysis of the impacts to land use and access is not required.

² Seasonal ponds and lakes are characterized by shallow marsh vegetation, which generally occurs in the deepest zone (usually dry by midsummer). These wetlands are typically dominated by emergent wetland grasses, sedges, and rushes (Stewart and Kantrud 1971).

³ Temporary wetlands are periodically covered by standing or slow-moving water. They typically have open water for only a few weeks after snowmelt or several days after heavy storm events. Water seepage is fairly rapid, but surface water usually lingers for a few weeks after spring snowmelt and for several days after heavy rainstorms at other times of the

Resource	Rationale for Determination to Eliminate from Detailed Analysis
Paleontology	The BLM uses the Potential Fossil Yield Classification (PFYC) System to classify geologic units based on the relative abundance of significant paleontological resources and their sensitivity to adverse impacts. Class 1 (Low) geologic units are not likely to contain recognizable paleontological resources. Class 2 (Low) geologic units are not likely to contain paleontological resources. Class 3 (Moderate) are sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Class 4 (High) geologic units are known to contain a high occurrence of paleontological resources. State geologic maps indicate the presence of Oahe, Coleharbor, and Sentinel Butte Formations in the Falkirk Mine area. The PYFC for the identified units ranges from 2 to 4, indicating some areas have a high potential to contain scientifically important fossils. Fossils with scientific importance could be present in the Federal lease tracts but not exposed at the surface as these areas have low relief and are covered by vegetation with limited to no geologic units naturally visible. It is current practice for the BLM to incorporate an Unanticipated Discoveries Plan as a stipulation of the lease. The Unanticipated Discoveries Plan will provide guidance should previously unknown, potentially significant paleontological sites be discovered. The Unanticipated Discoveries Plan would require mining operations in that area to temporarily cease, and measures would be taken to assess and protect the site. The effects on paleontological resources resulting from the Proposed Action are not expected to be substantial but would be permanent. Further analysis of impacts to paleontological resources is not required (BLM 2015; Bluemle 1971; Carlson 1973; Clayton et al. 1980).
Soils: prime farmland	Two areas of prime farmlands have been identified within the Federal lease tracts; 6.3 acres in the SE¼ of sec. 3 of Permit NAFK-8405 and 8.3 acres in the NW¼ of sec. 12 of Permit NAFK-9503. Volumes of topsoil and subsoil in prime soils areas will be removed and either be directly placed or stockpiled to ensure that 48 inches of material will be placed during reclamation. In accordance with North Dakota Century Code (NDCC) 38-14.1-24(6)(a), topsoil removal will generally consist of a combination of A horizon material and other available suitable plant growth material (upper B horizon) that will provide a reclaimed soil possessing a productive capacity equal to, or greater than, that which existed prior to mining. Reclamation research in North Dakota demonstrating methods for returning full pre-mining yields has been conducted generally using two lifts: 1) topsoil composed of the A horizon and the upper B horizon, and 2) subsoil composed of the lower B and the C horizons. This two-lift method, currently in use for all surface-mined lands in North Dakota, has been shown to be effective in reclaiming croplands to their full pre-mining yield potential. In this respect, and pursuant to NDCC 38-14.1-24(6)(b), topsoil and subsoil will create in the regraded final soil a root zone of comparable depth and quality to that which existed in the pre-disturbed natural soil. Falkirk will segregate prime and non-prime topsoil salvaged from land to be mined; Falkirk does not propose to segregate prime and non-prime topsoil salvaged from land indirectly disturbed by mining. A similar proposal made by the North American Coal Company's Freedom Mine was approved by the Soil Conservation Service (July 16, 1980, letter to acting State Soil Conservationist). The methods described herein align entirely with the prime farmland reclamation practices established in Permit NAFK-8405, which has been approved by the NDPSC, the regulatory authority authorized by OSMRE to issue surface coal mining permits under SMCRA. Impacts to soil resources from mining Federal coal would not be substantial due to the reclamation requirements approved by the NDPSC and, specifically, the soil-handling requirements described in Section 2.8, Soils Handling Narrative, of the NDPSC-issued SMCRA permits. Further analysis of soil resources is not carried forward in this EA under the issue-based analysis because there is no specific action that would likely result in a substantial impact to the resource.

year. Water is retained long enough to establish wetland or aquatic processes. The temporary wetlands are dominated by wet meadow vegetation such as fine-stemmed grasses, sedges, and associated forbs (Stewart and Kantrud 1971).

Resource	Rationale for Determination to Eliminate from Detailed Analysis
Soils: topsoil and subsoil	A soil survey report of the Falkirk Mine was prepared by Prairie Soil Consulting, LLC, and submitted in 2001 (Permit NAFK-8705), 2013 (Permit NAFK-9503), 2018 (Permit NAFK-8405), and 2020 (Permit NAFK-8405 [proposed expansion area]). The soils found in the existing permit areas are on a near level to undulating glacial till plain. The soils were formed in friable, calcareous, alkaline loam or clay loam glacial till, or in glacial meltwater deposits. As indicated by the laboratory analysis data, there are no severe chemical factors that would inhibit growth of vegetation. As a result, most of the permit area is under cultivation. For Permit NAFK-8405, soil volumes calculated for each landowner and land use are presented in Section 2.8.6, and soil descriptions are provided in Section 2.8.1 of the permit. The soil data resulting from classifier surveys regarding Permit NAFK-8705 are presented in Section 2.8.2 (Soil Survey Map), Section 2.8.3 (Soils Volume Computation Sheets, Soils Laboratory Data, and Pedon Descriptions), Section 2.8.4 (Soils Descriptions), and Section 2.8.6 (Soils Volumes) of the permit. For Permit NAFK-9503, refer to Section 2.8.2 and Section 2.8.2a of the permit for soil report classifications. As described in Section 4.2 of the existing permits, Falkirk will submit to the NDPSC a suitable plant growth material (SPGM) removal plan prior to each SPGM removal season. These plans will address the volume of SPGM which is projected to be salvaged during the season and will include a map depicting the SPGM removal operations. The salvaging, stockpiling, and replacement process would result in reclaimed soil with different long-term physical, structural, biological, and chemical properties than those present prior to surface mining. Postmining soil would initially be more uniform in thickness, structure, texture, nutrient availability, and chemistry. Soil resources will be disturbed as a result of mining and topsoil management. Impacts to disturbed soils will be reduced through implementation of best management practices to reduce erosion and maintain soil quality within stockpiles. Through appropriate management measures implemented during and following reclamation, soil properties will be restored to approximate pre-disturbance conditions after an estimated period of 5 to 10 years. Temporary adverse mining impacts would thus be minimized during the mine life, physically restored during reclamation, and followed by long-term soil quality establishment resulting from post-reclamation management practices. Soil resources associated with mining the Federal coal would not be affected because of the reclamation requirements approved by the NDPSC and, specifically, the soil-handling requirements described in Section 2.8, Soils Handling Narrative, of the NDPSC-issued SMCRA permits. Further analysis of soil resources is not carried forward in this EA under the issue-based analysis because there is no action that would likely result in a substantial impact to the resource.
Transportation	The coal extracted from the Falkirk Mine is transported to the Coal Creek Station for processing via a covered conveyor system owned and operated by GRE. The covered conveyor system is 4,260 feet long, and a parallel access road allows light vehicle traffic by GRE employees to perform routine maintenance and inspections. The covered conveyor system is included as part of GREs existing infrastructure and operations and is covered by the necessary permits. Impacts to air quality, climate change, water quality, and wildlife are included in the analysis presented in Chapter 3. No additional impacts to transportation resources are anticipated. Further analysis of the potential impacts to transportation resources is not required.
Vegetation: noxious and invasive weeds	Noxious weeds and invasive plant species would be addressed through reclamation and mitigation actions described in Section 4.2 (Reclamation) of the existing permits (Permit NAFK-8405, Permit NAFK-8705, Permit NAFK-9503) and as required under applicable regulations (<i>NDPSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre-mining and Post-mining Vegetation Assessments</i> [NDPSC 2003]). Eventually native plant abundance would increase after mining is complete and reclamation practices are implemented. When areas meet an "equal-to-or-better-than" production and cover standard, they may be released from bond. Lastly, the great majority of land cover in the Federal lease tracts consists of working agricultural lands. Further analysis of noxious and invasive weeds is not carried forward in this EA under the issue-based analysis because there is no specific action that would likely result in a substantial impact to the resource.

Resource	Rationale for Determination to Eliminate from Detailed Analysis
Vegetation: upland (non-special-status species)	Vegetation characteristics on the Federal lease tracts are very similar to surrounding land uses and vegetation in this part of McLean County, where croplands are mixed with native prairie. The majority of the land within the Federal lease tracts is devoted to agriculture. Croplands are used primarily for spring wheat production, where the land is privately held and generally managed by the surface owner or by a tenant farmer. Native grasslands are present within the Federal lease tracts and include species such as little bluestem (<i>Schizachyrium scoparium</i>) and sideoats grama (<i>Bouteloua curtipendula</i>), though the vast majority of acreage within these areas, and McLean County as a whole, exhibit high concentrations of invasive species with few nectar sources and warm season grasses (Jochim et al. 2019). Direct effects associated with the Proposed Action include removal of upland and wetland vegetation (wetlands discussed separately below). Although upland vegetation would be removed, reclamation and mitigation requirements would limit impacts over the long term as described in Section 4.2 (Reclamation) of the existing permits (Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503) and as required under applicable regulations (<i>NDPSC Standards for Evaluation of Revegetation Success and Recommended Procedures for Pre-mining and Postmining Vegetation Assessments</i> [NDPSC 2003]). Reclamation, including revegetation, would occur concurrently with mining on adjacent lands (i.e., reclamation would begin after an area is mined). In an effort to approximate pre-mining vegetation conditions, Falkirk would plan to reestablish vegetation types during the reclamation operation that are similar to the pre-mine types per Section 4.2 (Reclamation) of the existing permits (Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503), including croplands, native grasslands, and shelterbelts. When reclaimed areas meet an "equal-to-or-better-than" production and cover standard for upland areas, they may be released from bond. Further analysis of upland vegetation is not carried forward in this EA under the issue-based analysis because there is no specific action that would likely result in a substantial impact to the resource.
Wastes: hazardous and solid	Solid waste generated by the mine is sent to a landfill owned by Waste Management, which operates under strict regulations through 40 CFR parts 239–259. No hazardous waste will be generated from the mining operations; therefore, there would be no impacts to the environment from hazardous waste from leasing and mining the Federal coal in the lease tracts. Any universal waste (e.g., used grease, used diesel, used solvent, etc.) would be taken and managed by Safety Kleen. The operator would also adhere to a spill prevention countermeasure control plan that would be reviewed and approved by the agencies. The generation of coal combustion residuals (CCR) from combustion of the Federal coal mined under the Proposed Action and supplied to the Coal Creek Station (operated by GRE) is discussed in Chapter 3 and would be considered an indirect effect of leasing and mining. Effective October 19, 2015, the U.S. Environmental Protection Agency (EPA) issued the Disposal of Coal Combustion Residuals from Electric Utilities rule (Rule), which regulates the disposal of CCRs, including fly ash, bottom ash, boiler slag, and flue gas desulfurization materials from coal-fired power plants. The Rule regulates CCR as a nonhazardous waste under subtitle D of the Resource Conservation and Recovery Act contained in 40 CFR 257(D). The Rule sets design standards for CCR landfills and impoundments, requirements for conducting hazard-potential ratings for surface impoundments, methods and procedures for groundwater monitoring, corrective actions if a leak is detected, closure and post-closure care, and implementation and notification requirements. GRE facilities comply with the rules that regulate coal ash from power plants and have actively pursued beneficial reuse opportunities for the coal combustion products generated. Historically, fly ash was stored in landfills; however, fly ash is now primarily used as a partial replacement for cement, which facilitates concrete strength and durability and reduces landfill space requirements and cement production, which has the co-benefit of reducing carbon dioxide (CO₂) emissions during the cement production process. According to GRE's CCR Rule Compliance Data and Information (GRE 2020), GRE annually sells or donates approximately 400,000 tons of fly ash (GRE 2021). For reference, GRE's Coal Creek Station generates approximately 500,000 tons of fly ash per year total (GRE 2020). CCRs at the Coal Creek Station are placed in composite-lined surface impoundments and one dry waste landfill facility that are regulated, permitted, and inspected by the North Dakota Department of Environmental Quality in accordance with the North Dakota Administrative Code (NDAC) Article 33-20, Solid Waste Management and Land Protection. Ash Pond 91, Ash Pond 92, and SW sec. 16 Landfill are composite-lined surface impoundments used as combined dewatering and storage facilities for CCRs, including fly ash, bottom ash, and flue gas desulfurization material. The Drains Pond System is a composite-lined surface impoundment used as a combined dewatering and storage facility for CCRs, including bottom ash, coal pulverizer rejects, and economizer ash; it is also part of the power plant process water storage inventory, which functions as a clarifier for processed water conveyed with CCRs that are introduced into the impoundment. These sites have groundwater monitoring systems with associated annual reporting requirements. Hazardous and solid wastes are not carried forward in this EA under the issue-based analysis because there is no specific action that would likely result in a substantial impact to the resource.

Resource	Rationale for Determination to Eliminate from Detailed Analysis
Wildlife: migratory birds (including raptors)	The context of migratory birds, as referenced herein, includes species protected under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Birds of Conservation Concern. Avian surveys indicate this area is not used for nesting by eagles, and used only minimally by other raptors, though migratory birds (including raptors) are known to occur within the Federal lease tracts. Mining operations could cause abandonment or direct removal of nests if land-clearing operations occur during the breeding season. There are approximately 742 acres within the Federal lease tracts that are suitable habitat for migratory birds that would be used by species such as canvasback (<i>Aythya valisineria</i>), bobolink (<i>Dolichonyx oryzivorus</i>), western meadowlark (<i>Sturnella neglecta</i>), grasshopper sparrow (<i>Ammodramus savannarum</i>), least flycatcher (<i>Empidonax minimus</i>), American robin (<i>Turdus migratorius</i>), and clay-colored sparrow (<i>Spizella pallida</i>) (Falkirk 2021). No special-status migratory birds were observed in the Federal lease tracts (Falkirk 2021). Mining operations could cause abandonment or direct removal of nests if land-clearing operations occur during the breeding season. Birds using habitats on the Federal lease tracts or adjacent lands could be displaced resulting from human activity and noise from mining and vehicle travel. However, similar habitat types in the immediate project vicinity could be used by avian species displaced as a result of mining and reclamation operations. Resident avian species tend to be relatively mobile, and most tolerate human presence and activity in the area and are not expected to experience significant impacts from the action alternatives. Mining the Federal lease tracts would impact a variety of habitats used by migratory birds as vegetation removal would reduce available habitat for breeding, roosting, and foraging activities; however, the Proposed Action would affect approximately less than 0.01% of available habitats within the associated watershed (Dyke et al. 2015). Falkirk would be required to conduct preconstruction nest surveys using a qualified biologist to identify any migratory birds, active nests, eggs, or young that would be present if mining operations occur during the breeding season. Any active nests that are detected would be flagged, buffered, and avoided until the nest is no longer active. Reclamation following coal removal would occur concurrently with mining in adjacent areas and would provide habitat for avian species that use the habitats that are in the Federal lease tracts. With respect to wetlands, data on wildlife use within Falkirk Mine boundaries has been collected since 1979. A wetland-wildlife study plan has been developed after extensive consultation with research biologists at the Northern Prairie Wildlife Research Station, the USFWS, and the waterfowl biologist with North Dakota Game and Fish Department (NDGFD). The objective of this plan is to characterize wildlife use of the reclaimed wetlands relative to use of naturally occurring wetlands in a similar complex of the same class. Weekly observations will continue to be made during seasons of waterfowl use to record data and characterize seasonal use by migrants, breeding resident waterfowl, and shorebirds. Additionally, waterfowl pair counts will be made to characterize breeding use of the wetlands by various species. These data will be collected annually to document the successional development of Falkirk's reclaimed wetlands and the year-to-year variations in wildlife use attributable to various local or regional influences. Falkirk also assumes management and financial responsibility for ensuring that the wetland is established and functions for a period of 10 years once the wetland has been reclaimed, due to bond lease requirements. It is anticipated that the implementation of these techniques as outlined in the Falkirk mining permit would make any long-term impacts to migratory bird habitat negligible, as any habitat loss would be successfully revegetated to similar habitat types and data will be collected to inform if changes in management are needed. Temporal losses to jurisdictional wetlands will be mitigated through sedimentation ponds, which, due to the seasonality of surface water runoff and design, exhibit wetland characteristics and functionality (Falkirk 2016). Effects on migratory birds are expected to be temporary and not substantial. Further analysis of impacts to migratory birds is not required.
Human Health	Literature has indicated that there are many effects to human health associated with coal development, particularly (but not exclusively) in areas that are proximal to coal mining. Some of these effects include reproductive harms, air pollution (particulate inhalation), changes to DNA, respiratory health effects, possible disruption of the immune system, chronic exposure in utero and/or early childhood to the solid burning fuels causes immune modulation and predisposes infants to acute lower respiratory tract infections (Lee et al., 2015), and cancer (lung cancer and other types of cancer). This analysis has not identified any impacts resulting in business or residential relocations. All affected landowners have been notified and either have consented to their surface land being disturbed or have been contacted by the proponent for concurrence to disturb privately owned surface lands. Contaminated and hazardous waste encounters are not expected with this project and there are no permanent impacts to any public parks or recreational facilities, or any other valuable resources.

2. Alternatives

2.1 Introduction

Agencies must evaluate the environmental impacts of a reasonable range of alternatives when analyzing a proposed Federal action. The DOI's NEPA-implementing regulations define reasonable alternatives as those that are "technically and economically practicable or feasible and meet the purpose and need of the proposed action" (43 CFR § 46.420). This section describes Alternative A (No Action Alternative), Alternative B (Proposed Action), and Alternative C, which are considered and analyzed in detail in this EA and provide information on the existing operations at the Falkirk Mine and how those operations may change under the action alternatives. See **Table 4**.

Action alternatives were developed based on national and state BLM and OSMRE direction and policy, existing conditions, including surface access agreements and resource issues. Resource issues were presented in Chapter 1.

Alternative A (No Action)

Under the No Action Alternative, the BLM would not approve the LBA for NDM 111489. OSMRE would not recommend the approval of a Federal mining plan and the ASLM would not approve the mining plan. The Federal coal resources contained within the Federal lease tracts would not be mined. All private coal surrounding the Federal lease tracts located within existing permit boundaries would be mined, leaving the Federal lease tracts undeveloped within a mined and reclaimed landscape.

The No Action Alternative assumes that mine-related surface disturbance would only occur within existing permit boundaries and in areas where surface access agreements are in place. If surface access agreements have been obtained on areas adjacent to the Federal coal tracts, the No Action Alternative assumes surface disturbance to the Federal coal tracts and mining of the non-Federal coal resources located adjacent to the lease tracts is reasonably foreseeable.

The resultant bypass of the Federal coal resources by the applicant would result in increased surface disturbance area and be attributed to the abandonment and relocation of mine pits, support features (impoundments, topsoil/subsoil piles, utilities, etc.), and the relocation of haul roads and other ancillary roads that would be required to avoid the federal tracts. The total acreage of additional disturbance, for the purpose of this analysis, will be estimated up to approximately 1,600 acres (an increase of 800 acres from Alternative B, in which all proposed tracts may be developed) adjacent to the proposed lease tracts. The additional disturbance would result in an increase in emissions. Because of the availability of leased private coal resources located within the permit boundary and adjacent areas, the projected life of the Falkirk Mine would not change and is anticipated to continue through 2045 under this No Action alternative.

Alternative B (Proposed Action)

Under the Proposed Action, Falkirk would lease and mine approximately 800 acres comprising all proposed federal lease tracts (see **Table 4**) as submitted in the amended Lease-By-Application. The BLM would approve the LBA and issue a Federal coal lease for all or a portion of the proposed tracts subject to standard and special lease stipulations developed. OSMRE would review the mining plan and recommend a decision to either approve, disapprove, or approve with conditions to the ASLM, as required by 30 CFR part 746. The NDPSC would not be required to review an application for revision to the existing SMCRA permits (NAFK-8405, NAFK-8705, NAFK-9503) because the current permit boundaries include the Federal coal.

The Proposed Action was developed by Falkirk in its Lease-By-Application based on Falkirk Mine's proximity to existing lease holdings, and the mining sequence enabling for the continued development of an existing mining bloc. It would not represent an independent economic venture based on a stand-alone development but is based on access to the Federal coal resources at the Falkirk Mine, and surface access agreements. Falkirk would continue to use permitted mining and reclamation methods to mine the new lease tracts.

A resource evaluation conducted by Falkirk estimated that there are approximately 11.3 million tons of minable Federal coal contained in the Proposed Action Federal lease tracts (Falkirk 2021). Falkirk intends to produce the Federal coal over a 15-year period. The potential impacts of leasing, mining, and combustion of the Federal coal from the Proposed Action are analyzed in this EA. This alternative would not extend the life of the mine.

Alternative C

Alternative C was developed to evaluate the impacts that might occur if the mining plan approval were conditioned to only allow development of the tracts with split mineral ownership. Tracts 2 and 3 represent the tracts that have split mineral ownership (50% federal, 50% private). To lease these two tracts, as proposed in Alternative C, would allow for development of the split-mineral ownership coal, so as not to preclude the development of the fractionally, privately owned coal within the federal nexus. This alternative assumes that Falkirk has obtained the rights and landowner consent it needs from the various private parties involved to conduct mining operations on these tracts prior to the posting of the lease sale per 43 CFR § 3427.2.

Table 4. LBA tracts proposed by alternative

Tract EA Reference number	Legal Land Description	Acres	Minable Coal Resources (Short Tons)	Alternative	Total acreage/coal resources by Alternative
1	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 2 lots 3 and 4, and S1/2NW1/4	160	0	No Action	
2	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 lots 1 and 2, S1/2NE1/4	160	0	No Action	
3	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 SE1/4	160	0	No Action	
4	T. 146 N., R. 83 W., 5 th P.M., North Dakota Sec. 24: SE1/4	160	0	No Action	
5	T. 146 N., R. 84 W., 5 th P.M., North Dakota Sec. 12: NW1/4	160	0	No Action	
	Additional Acreage for support features, roads, etc.	800	0	No Action	
Total Acreage for No Action:					1,600 Acres
Total Tons Federal Coal Mined for No Action:					0 Tons
1	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 2 lots 3 and 4, and S1/2NW1/4	160	2,981,444	Proposed Action	
2	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 lots 1 and 2, S1/2NE1/4	160	2,515,626	Proposed Action	
3	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 SE1/4	160	1,176,277	Proposed Action	
4	T. 146 N., R. 83 W., 5 th P.M., North Dakota Sec. 24: SE1/4	160	2,908,273	Proposed Action	
5	T. 146 N., R. 84 W., 5 th P.M., North Dakota Sec. 12: NW1/4	160	1,738,325	Proposed Action	
Total acreage for Proposed Action:					800 Acres
Total Tons Federal Coal Mined for Proposed Action:					11,319,945
2	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 lots 1 and 2, S1/2NE1/4	160	2,515,626	Alternative C	
3	T. 146 N., R. 82 W., 5 th P.M., North Dakota Sec. 3 SE1/4	160	1,176,277	Alternative C	
Total Acreage for Alternative C:					320 Acres
Total Tons Federal Coal Mined for Alternative C:					3,691,903

This EA discloses minable coal by alternative in **Table 4**, above; however, there is a difference between minable coal and recoverable coal:

- **Minable reserve base** means that portion of the coal reserve base which is commercially minable and includes all coal that will be left, such as in pillars, fenders, or property barriers. Other areas where mining is not permissible (including, but not limited to, areas classified as unsuitable for coal mining operations) shall be excluded from the minable reserve base. (43 CFR 3480.05(a)(23). *Minable reserve base* will be referred to as *Minable Coal* throughout this EA.
- **Recoverable coal reserves** means the minable reserve base excluding all coal that will be left, such as in pillars, fenders, and property barriers. (43 CFR 3480.05(a)(32). *Recoverable coal reserves* will be referred to as *Recoverable Coal* throughout this EA.

2.2 Alternatives Considered But Not Analyzed in Detail

NEPA requires the agency to consider a reasonable range of alternatives to the proposed action. In this EA, the BLM and OSMRE consider two action alternatives in addition to the No Action alternative. The two action alternatives would lease, or not lease, tracts based upon specific resource concerns identified during the NEPA analysis.

The following alternative is within the range of alternatives analyzed in this EA:

Alternative Option 1

- An alternative that would exclude approximately 34 acres around an occupied farmstead in sec. 2. As documented in the amended LBA submitted to the BLM on January 27, 2021, Falkirk has obtained a surface lease agreement with the landowner resulting in the possible surface disturbance of the lands, regardless of what alternative is chosen. Therefore, the lands submitted as in the first amendment to the LBA (June 8, 2020) to lease approximately 766 acres and excluded the farmstead, was not carried forward for analysis. For this reason, this alternative is not carried forward for detailed analysis as it provides no additional benefit compared to the alternatives analyzed within this document.

Pursuant to 43 CFR § 3461.5, a lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on species being protected. All affected species have been analyzed in the EA, and it has been determined that there are not any significant long-term impacts. Further, regardless of the decision to issue a lease, or not, Falkirk holds landowner consent to disturb the surface of the tracts listed here as the surface is privately owned. Any decision would allow for surface disturbance of the surface whether it be overburden placed on the tract while mining adjacent private coal, or surface disturbance associated with a lease action. Therefore, this alternative is not carried forward for detailed analysis in Chapter 3.

2.3 Mining Plan and Existing Permits

If a lease is issued and the Federal mining plan is approved, it is expected that Falkirk would use the existing mine facilities and similar mining and reclamation methods, water requirements, and other mining operations/requirements described in the existing state-approved mine plan and reclamation plan for the existing permits (Permit NAFK-8405, Permit NAFK-8705, Permit NAFK-9503). Falkirk has the appropriate surface lease agreements, access agreements, and NDPSC approval within the listed permits that would allow Falkirk to conduct surface activities (including surface disturbance and overburden removal) on all proposed tracts regardless of if the Federal coal is leased and mined. Generalized mining methods used by Falkirk are described below and are based on the existing mining and reclamation permits.

Mining Methods and Facilities

Based on existing mining and reclamation permits, Falkirk would use standard surface mining techniques to extract coal from the permit area. Suitable plant growth material (SPGM) would be removed by tractor-scrapers and/or a front-end loader or excavator and truck fleet. The SPGM would either be stockpiled in areas designated for topsoil or subsoil stockpiles or be directly re-spread onto regraded areas. The SPGM stripping operation is generally scheduled for 2 shifts per day, 5 days a week.

Overburden removal includes removal of any material between the SPGM and the minable coal bed. Indurated sediments are occasionally encountered in the overburden and can be blasted if it is determined necessary to fracture rock prior to removal. One method of overburden removal is accomplished with the use of draglines, hydraulic truck-shovel fleets, tractor-scrapers, or other auxiliary equipment. In most

areas where the overburden material is stable and the overburden thickness is less than 90 feet, a simple dragline side casting method is used in conjunction with material moved by a track dozer. The second method that would be used is known as the two-pass dragline stripping method, where the overburden bench is removed in two passes for each pit. The two-pass method is used to reduce overburden rehandle in cases where the side casting method involves an extensive amount of material rehandling. When it is not feasible or practical to use the dragline because overburden strip ratios are low, Falkirk may use its excavator and truck fleet, scrapers, or dozers to remove the overburden. Initially, overburden would be stockpiled in the first pits, but then used to fill successive pits as mining progresses and additional pits are excavated.

Once all overburden has been removed, the coal surface is cleaned with a rubber-tire dozer. The coal bed is then drilled with a mobile drill rig to prepare it for blasting. Coal is blasted to a size that can be most effectively loaded into the haul trucks. Blast hole patterns can range in number from one to over 500 holes with either a 7⁷/₈-inch or 9⁷/₈-inch diameter. Once the appropriate pattern is drilled, a detonation cap and explosive booster are lowered into the drill hole, the hole is then filled with a predetermined amount of blasting agent,⁴ and back filled (stemmed) with drill cuttings. Once the electronic blasting system (Unitronic Electronic Blasting System) is connected and is in communication with each blasting cap, the blast area is cleared and blocked, warning sirens and radio announcements are made, then the blaster initiates the blast by sending a signal from the electronic blasting system to each blasting cap, resulting in detonation.

Blasted coal is loaded by a front-end loader into haul trucks. Coal loading and hauling operations are typically scheduled two shifts per day, 5 days per week. The coal is hauled from the pit to the truck dump crushing facility and dumped into the coal hopper or placed on an unprocessed coal storage pile adjacent to the truck dump facility. As needed, a rubber-tire dozer is used to feed coal from the unprocessed coal storage pile to the apron feeder which feeds the primary crusher at the coal processing facility. The coal is then crushed to a predetermined size and transported on a conveyor system to either produce electricity from AVS or to produce synthetic natural gas, urea, and other coproducts at the Dakota Gasification Company's Great Plains Synfuels Plant. Coal used to produce electricity by LOS, is transported from the mine approximately 30 miles by rail to the power plant.

Reclamation

Once coal is removed from the pit, overburden removed from the next pit is spoiled into the empty pit, and the mining operation transitions into a reclamation operation. Regrading of spoils would occur so that no more than four spoil peaks are standing at any one time, except in isolated instances in which out-of-pit spoil must remain to complete reclamation. Rough grading would generally be completed within 1 year following coal removal, and final grading would generally be completed the year following. Soil re-spread and seeding would occur in the same year or within the year following final grading. This procedure would a) enable the regraded spoil to settle and conduct repairs to any areas with early settling issues before soil re-spread; and b) provide for larger soil re-spread areas, which can be re-spread and seeded in larger blocks, facilitating more a cost-effective reclamation operation.

SPGM would be placed, generally by tractor-scrapers and front-end loaders or excavators and truck fleets after final grade approval has been provided by NDPSC. Areas to be re-spread would be staked at 100-foot intervals to establish proper topsoil and subsoil thickness; or re-spread without staking by using GPS-equipped track dozers spreading the material. Farm-type equipment would be used to revegetate and maintain reclaimed areas. Postmining topography would be reestablished to the approximate pre-mining topography overlying the mined tracts.

⁴ Falkirk uses emulsion as its blasting agent due to its higher controllability, greater fragmentation, and reliability in wet conditions.

Postmining topography is developed to meet the required conditions of approximating the pre-mining original contours and is approved by the NDPSC prior to mining. It is developed using Carlson SurvCADD application software with AutoCAD. Geologic models of the surface and subsurface materials are constructed from drill hole geologic based information as well as pre-mining topography surveys. From these models, 200-foot × 200-foot grid patterns are created and used in developing the postmining topography. Overlying topsoil and subsoil isopach grids are temporarily removed from the underlying overburden to the top elevation of the coal bed. Overburden thickness grids are swollen and shifted perpendicular to pit advancement at various distances depending on the depth to the coal bed and overburden removal method utilized to reflect mining. Coal isopach grids are removed from the development areas. Once shifted, grid files are then added together and contoured creating a draft postmining topography. Postmining contours are adjusted to account for initial box pit cut areas and coal croplines, to tie into preexisting drainageways, address probable hydrologic consequences (PHC) concerns, and to redistribute overburden stockpiles. Finally, a pre-mining versus postmining material balance is conducted where topography is further adjusted, as necessary, until a favorable balance is obtained. Ultimately, postmining topography, which guides reclamation efforts, is not considered final until approved by the NDPSC. Regarding the steep slopes referenced in Section 1.4, the postmining topography must demonstrate a gradient more gradual than pre-mining topographic conditions and that are less than 30%.

Wherever possible, the reclamation schedule would be accelerated. In accordance with the North Dakota Century Code (NDCC) 38-14.1-24(14), Falkirk would ensure that all reclamation efforts proceed in an environmentally sound manner and as contemporaneously as practicable to coincide with coal removal operations. All reclamation through the initial planting on any land within the permit boundary would be completed by Falkirk no later than 3 years from the completion of the coal removal operations on such lands, unless otherwise approved by the NDPSC.

Water Requirements

Falkirk would use existing permitted water sources for dust suppression, sanitary use in mine facilities, firefighting reserve, and other mine water requirements. No increase in water use at the mine is anticipated from the leasing and mining of the Federal coal resources.

Waste Management

Falkirk does not store any waste materials on-site. All waste materials are sent off-site for processing and are tracked accordingly.

Estimated Employment Requirements

Mining of the Federal lease tracts would use existing Falkirk mine employees and would not require the hiring of additional personnel.

Design Features

Falkirk's operations in the Federal lease tracts would be compliant with the environmental protection requirements described in North Dakota surface mining laws and regulations and would be implemented in the same manner as described in the existing permit (Permits NAFK-8705, NAFK-9503, and NAFK-8405) for the Falkirk Mine. The environmental protection requirements include the following:

- Construction of sedimentation ponds for all disturbed watersheds.
 - These ponds contain surface water runoff capacity following storms or spring snowmelt
 - After runoff meets effluent standards per the National Pollutant Discharge Elimination System permit, it would be discharged down its normal drainage

- Removal and conserving (stockpiling) all topsoil for reclamation
- Removal and conservation of an adequate amount of subsoil to return mined lands to 100% of their pre-mine productivity
- Maintaining and watering haul roads to reduce dust during soil, spoil, and coal haulage operations
- Monitoring of pits and exposed coal stockpile areas by mine personnel on a regular basis to prevent spontaneous combustion
- Grading spoil to an approximate original contour as required by the NDPSC. The re-spread of soil would not occur until the NDPSC has reviewed and approved the postmining graded topography
- Replacing all required topsoil and subsoil and preparing a seedbed for crop production or seeding to prairie, tame pasture, or hay lands
- Using northern-grown native grass seed in all reclaimed native pastures as provided in approved mine plan and land access agreements
- Replacing native trees and associated shrubs in an amount equal to or greater than existed before mining
- Monitoring reclaimed lands for productivity, nutrient status, differential settling and erosion, and making repairs as needed
- Conducting special erosion control seeding and mulching for disturbed areas, including soil stockpiles, road ditches, drainages, and sedimentation pond slopes
- Seeding grassed waterways through reclaimed croplands as needed
- Constructing wildlife enhancement features, such as wetlands, rock piles, nesting and feeding structures, pollinator plots, and additional tree and shrub plantings as outlined in approved mine and reclamation plans
- Replacing water resources as needed for livestock, including stock ponds and/or wells
- Monitoring groundwater levels and replacing domestic water resources if affected by mining

3. Affected Environment and Environmental Consequences

This Chapter describes the existing environment of the area that would be affected by the No Action Alternative (Alternative A) and the Proposed Action (Alternative B), and Alternative C and discloses the potential effects of implementing these alternatives. Direct impacts are defined as those effects that are caused by the action and occur at the same time and place. Indirect impacts are defined as those effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Aggregate impacts are defined as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (RFFAs) regardless of which agency (Federal or non-federal) or person undertakes such actions. Short-term effects are defined as effects that last through mining and concurrent reclamation activities. Long-term effects are defined as effects that last beyond mining and reclamation activities.

The issues identified in Section 1.7 and associated potential impacts are discussed for the No Action Alternative (Alternative A), the Proposed Action (Alternative B), and Alternative C in this section. Past, Present, and Reasonably Foreseeable Future Actions

Past and Present Actions Summary

Past and present actions in the air quality and climate change analysis area that would contribute to aggregate effects include mining activities and associated power plants, oil and gas development, wind energy development, other industrial activities, and agricultural activities. Active mines in the analysis area include the Freedom Mine, Falkirk Mine, Coyote Creek Mine, and Center Mine. The Freedom Mine produces approximately 14.1 million tons of coal annually; the Falkirk Mine produces approximately 8 million tons of coal annually; the Coyote Creek Mine produces approximately 2.5 million tons of coal annually, and the Center Mine produces approximately 4.5 million tons of coal annually (Lignite Energy Council 2020). Coal mined at Freedom Mine is sold to Dakota Coal Company, a subsidiary of BEPC, and used by the adjacent Dakota Gasification Company's Great Plains Synfuels Plant (mine-mouth⁵), adjacent AVS coal-fired power plant (mine-mouth), and nearby LOS coal-fired power plant. Coal produced at the Falkirk Mine is provided to the adjacent Coal Creek Station (mine-mouth). Coal produced at the Coyote Creek Mine is provided to the jointly owned Coyote Station (mine-mouth) located adjacent to the Coyote Creek mine. Coal produced at the Center Mine is sold to the Minnkota Power Cooperative (mine-mouth) and Center Coal Company (mine-mouth) (NDPSC 2015a). For more information on active surface mining operations in North Dakota, refer to the NDPSC Annual Evaluation Summary Report (NDPSC 2019a).

Land use in the analysis areas are predominately agricultural, and effects would occur from management practices on croplands and grazing areas. Active mines in the region include the Freedom Mine, Falkirk Mine, Coyote Creek Mine, and the Center Mine. Oil and gas activity is also present within Mercer and McLean Counties. Other industrial development including production facilities, water pipelines, gas plants and ethanol plants. Transmission infrastructure exists within Mercer and Oliver Counties, ranging from 230-kV to 345-kV transmission lines. Power plants located within the effects analysis area include the Antelope Valley Station (AVS), Leland-Olds Station (LOS), Coyote Station, and Milton R. Young Station. For more details on past and present actions located within the effects analysis areas, refer to **Appendix C**.

Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Actions (RFFAs) are decisions, funding, or formal proposals that are either existing or are highly probable within the next 25 years, which is the currently defined life of the mine, based on known opportunities or trends. Of the total applications received by NDPSC from 2021 to 2023, the Biennial Report identifies RFFAs occurring within the effects analysis areas that involve coal mining, oil and gas development, wind development, transmission development, agriculture development, and carbon capture activities (NDPSC 2023).

Coal mining projections are associated with the Coyote Creek Mine, the Freedom Mine, the Falkirk Mine, and the Center Mine. Oil and gas development is projected to occur within McLean and Mercer Counties. Capital Power is currently proposed to construct the Garrison Butte Wind project in Mercer County, though the Mercer County Commission passed a moratorium in May of 2020 concerning applications for wind farm permits that is slated to stay in effect for 2 years unless lifted by the Commission earlier (National Wind Watch 2020). As of the writing of this EA, County Commissioners voted to adopt a new ordinance that lays the groundwork for a local wind policy prior to the expiration of the moratorium; the moratorium on wind energy applications expired in March of 2022. It is unknown if the policy was adopted by Mercer County after the expiration of the moratorium. The lignite industry is also investing in carbon capture technologies, with two projects advancing at the Milton R. Young Station and Blue Flint

⁵ A mine-mouth electric plant is a coal burning electricity generating plant that is built close to a coal mine. In these plants, coal is excavated from the dig site, placed on a conveyor belt, and run directly into the plant where the coal will be burned. (www.energyeducation.ca/encyclopedia Accessed 2024.07.02)

facility next to Coal Creek Station. For more details RFFAs located within the effects analysis areas, refer to **Appendix C**.

3.1 Air Quality

This section incorporates by reference the BLM Cumulative Hazardous Air Pollutants Modeling – Final Report, Cumulative HAPS (Ramboll 2024a) and the Air Quality Technical Support Document (Ramboll 2023a) as included in the 2024 NDFO ARMP and FEIS. The BLM Hazardous Air Pollutants Modeling Final Report presents the modeling methodology and results of a regional multi-state assessment for the overall health impacts of hazardous air pollutants (HAPs) originating from oil and gas production in Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming. The study employs photochemical modeling to estimate the ambient air concentrations of six key HAPs (i.e., BTEX [benzene, toluene, ethylbenzene, xylene], n-hexane, and formaldehyde [HCHO]) and compares them to health-based thresholds.

The Air Quality Technical Support Document assesses regional air quality by comparing the concentrations of air pollutants in the ambient atmosphere to regulatory standards and other nonregulatory thresholds that are protective of human health and the environment. In addition to criteria pollutants, the study considers impacts to Air Quality Related Values (AQRV), namely visibility and atmospheric deposition as considered by the Federal Land Managers' Air Quality Related Values Working Group (FLAG) (2010) as well as ambient ozone impacts on vegetation. The purpose of this Air Quality Technical Support Document (AQTSD/TSD) is to provide the potential effects of each alternative considered in the RMP. These effects are estimated using well-established methods using the Comprehensive Air Quality Model with Extensions (CAMx) photochemical grid model.

These two documents and the additional site-specific analysis and information in this section provide a complete analysis of the effects the analyzed alternatives will have on air quality and climate change and the regional and local level. Both incorporated documents can be found here: NDFO ARMP and FEIS (<https://eplanning.blm.gov/eplanning-ui/project/1505069/570>).

Affected Environment

The analysis area associated with direct impacts to ambient air quality from mining operations includes the existing permit boundary for the Falkirk Mine with a 1-mile buffer. The analysis area for indirect and aggregate effects to ambient air quality includes the counties that are largely encompassed by the 50-kilometer (km) radii from the mining locations, and the 50-km radii from downstream combustion and processing sites, including Coal Creek Station. Because air quality related emission data is generally available at a county scale, this analysis area encompasses the entirety of the appropriate counties. These include McLean County, where the mine and Coal Creek Station are located as well as Oliver, and Mercer Counties. For assessing potential air quality impacts to Class I and sensitive Class II areas, all areas within the 50-km radii are included in the analysis. This area was chosen based on the criteria air pollutant impact analysis modeling domain of 50km from the Prevention of Significant Deterioration (PSD) major downstream sources. Due to the long-range transport of coal combustion pollutants and their potential to impact air quality related values within a larger geographical area, the regional analysis area for assessing impacts to far-field air quality related values (such as visibility and deposition) will include the closest Class I areas to the project, as determined by the U.S. Environmental Protection Agency (EPA) under PSD regulations.

Regulatory Compliance

National Ambient Air Quality Standards and State Ambient Air Quality Standards

The EPA has established NAAQS to limit the amount of air pollutant emissions considered harmful to public health and the environment. Primary and secondary standards have been set for six criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO₂), ozone, sulfur dioxide (SO₂), and particulate matter (PM). Geographic areas that do not comply with primary NAAQS requirements for criteria pollutants are considered nonattainment areas. A particular geographic region may be designated an attainment area for some pollutants and a nonattainment area for other pollutants. All counties in the state of North Dakota, including Mercer, Oliver, and McLean Counties, are currently in attainment with the NAAQS (EPA 2025a). As a result, the General Conformity Rule does not apply to the action alternatives. (The General Conformity Rule ensures that actions taken by Federal agencies in nonattainment and maintenance areas are consistent with a state's plans to meet the NAAQS CAA Section 176(c)) [42 USC § 7506].)

Similarly, the NDAC sets ambient air quality standards for particulates and gases (NDAC 33.1-15-02-04) which are the same as the NAAQS except for hydrogen sulfide (H₂S). The NAAQS and NDAC ambient air quality standards are summarized in **Table 5**.

Table 5. National Ambient Air Quality Standards and North Dakota Administrative Code Ambient Air Quality Standards

Pollutant	Primary or Secondary	Form	Averaging Time	NAAQS	NDAC Ambient Air Quality Standards
CO	Primary	Not to be exceeded more than once per year	8 hours	9 parts per million (ppm)	9 ppm
			1 hour	35 ppm	35 ppm
Lead	Primary and secondary	Not to be exceeded	Rolling 3-month average	0.15 microgram per cubic meter (µg/m ³)	0.15 µg/m ³
NO ₂	Primary	Ninety-eighth percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	100 parts per billion (ppb)	100 ppb
	Primary and secondary	Annual mean	1 year	53 ppb	53 ppb
Ozone	Primary and secondary	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	8 hours	0.070 ppm	0.070 ppm
PM	PM _{2.5}	Primary	Annual mean, averaged over 3 years	9 µg/m ³	9 µg/m ³
		Secondary	Annual mean, averaged over 3 years	15 µg/m ³	N/A
		Primary and secondary	Ninety-eighth percentile, averaged over 3 years	35 µg/m ³	35 µg/m ³
	PM ₁₀	Primary and secondary	Not to be exceeded more than once per year on average over 3 years	150 µg/m ³	150 µg/m ³

Pollutant	Primary or Secondary	Form	Averaging Time	NAAQS	NDAC Ambient Air Quality Standards
SO ₂	Primary	Ninety-ninth percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	75 ppb	75 ppb
	Secondary	Annual mean, averaged over 3 years	1 year	10 ppb	10 ppb
H ₂ S	Primary	Maximum concentration not to be exceeded	Instantaneous	None	10 ppm
	Primary	Maximum average concentration not to be exceeded more than once per month	1 hour	None	0.2 ppm
	Primary	Maximum average concentration not to be exceeded more than once per year	24 hours	None	0.1 ppm
	Primary	Maximum arithmetic mean averaged over 3 months	3 months	None	0.02 ppm

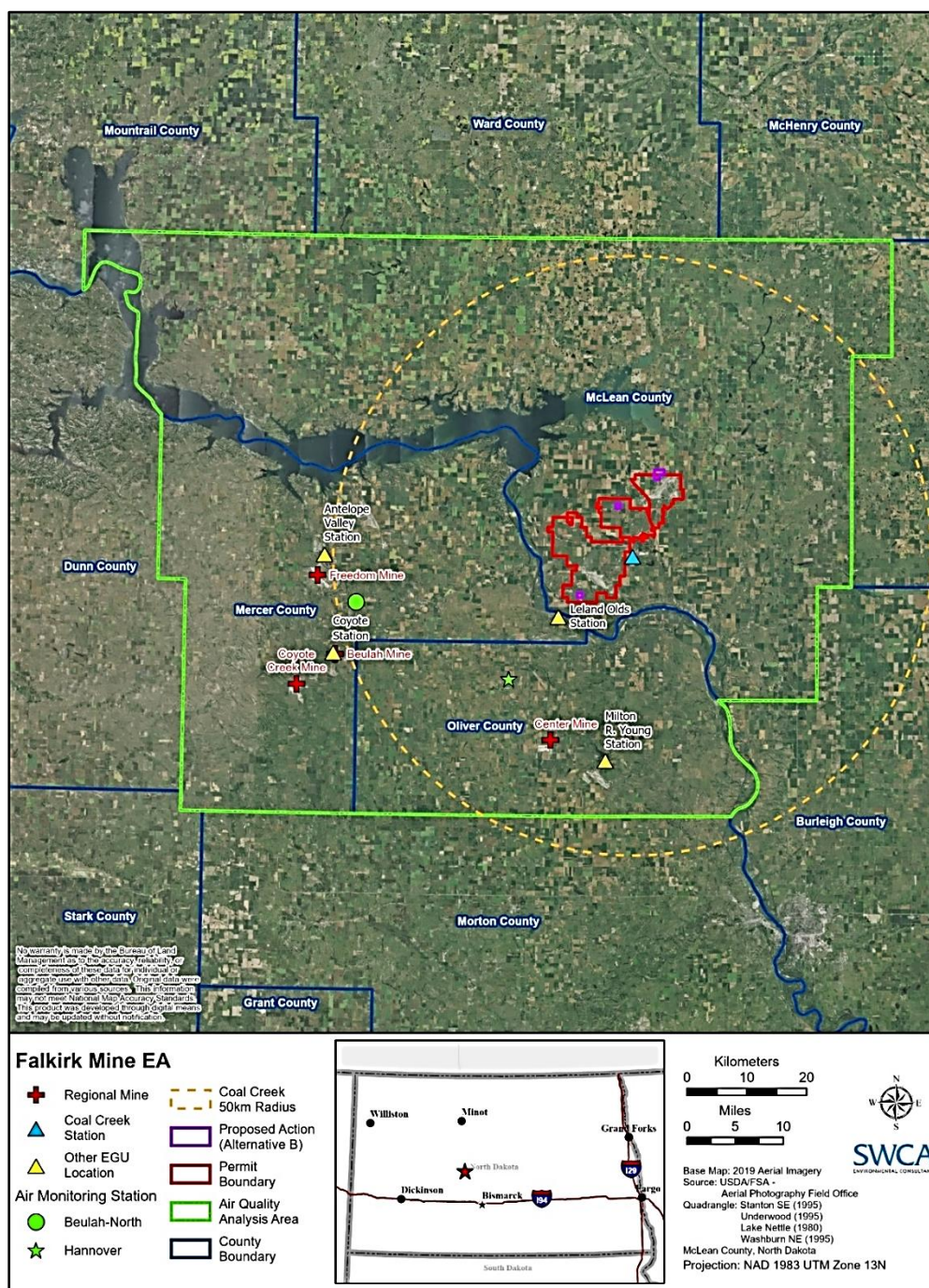
Source: EPA (2024a); NDAC 33.1-15-02-04

Note: N/A = not applicable; PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

Ambient Air Quality

The EPA delegated authority under the Clean Air Act (CAA) for individual states to complete various activities such as air quality monitoring. In North Dakota, the Department of Environmental Quality (NDDEQ) Division of Air Quality is responsible for ambient air quality monitoring under the CAA. The closest monitoring stations to the Federal lease tracts are Hannover (approximately 10 miles to the southwest in Oliver County) and Beulah North (approximately 23 miles to the west in Mercer County) (**Figure 2**). There are no monitoring stations in McLean County; however, the Mercer County and Oliver County monitoring stations were placed centrally to the power plants in the Oliver-Mercer-McLean area to monitor impacts (NDDEQ 2024).

Figure 2. Air Quality Analysis Area



Both the Beulah North and Hanover stations monitor NO₂, ozone, continuous PM_{2.5}, continuous PM₁₀, SO₂, and meteorological parameters; Beulah North also monitors ammonia. **Table 5** provides the 2023 ambient air quality monitoring results (most recent complete annual dataset from the two monitoring stations). The data indicate that there was an exceedance of the 24-hour PM_{2.5} standard at the Hannover station. Otherwise, there were no NAAQS or NDAC ambient air quality standards exceedances or near exceedances in 2023 at the monitoring stations nearest the Federal lease tracts.

Table 6. 2023 Air Quality Monitoring Data from Beulah North and Hannover Monitoring Stations

Pollutant	Primary or Secondary Standard	Units	Form	2023 Monitoring Station Data		NAAQS
				Beulah North	Hannover	
CO	Primary	ppm	Not to be exceeded more than once per year	Not monitored	Not monitored	CO
				Not monitored	Not monitored	9
Lead	Primary and secondary	µg/m ³	Not to be exceeded	Not monitored	Not monitored	Lead
NO ₂	Primary	ppb	Ninety-eighth percentile of 1-hour daily maximum concentrations, averaged over 3 years	16	11	NO ₂
	Primary and secondary	ppb	Annual mean	2.89	1.61	53
Ozone*	Primary and secondary	ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	0.062	0.064	Ozone*
SO ₂	Primary	ppb	Ninety-ninth percentile of 1-hour daily maximum concentrations, averaged over 3 years	23	11	SO ₂
	Secondary	ppb	Annual mean, averaged over 3 years	Not measured	Not measured	500
PM ₁₀	Primary and secondary	µg/m ³	Fourth-highest 24-hour concentration. Not to be exceeded more than once per year on average over 3 years	Not measured	Not measured	PM ₁₀
PM _{2.5}	Primary and secondary	µg/m ³	Annual mean, averaged over 3 years	6.7	8.0	PM _{2.5}
	Primary and secondary	µg/m ³	Ninety-eighth percentile of 24-hour concentrations, averaged over 3 years	32	39	35

Source: EPA (2016a); North Dakota Department of Environmental Quality (2020a)

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

* Final rule for ozone NAAQS effective December 28, 2015.

CO monitoring in North Dakota was suspended in 1994 after a 5-year monitoring study because ambient concentrations of CO in the state were well below the NAAQS and exceedances were unlikely. Between 2009 and early 2019, a trace level CO analyzer was operated at the Fargo NW air monitoring station to comply with applicable requirements. Trace level CO analysis began at the Bismarck Residential monitoring station upon relocation of the monitoring site from Fargo to Bismarck. The 2017 monitoring efforts were the first full year of CO data for the Bismarck Residential station; no NAAQS exceedances or near exceedances occurred at this station in 2023 (1-hour CO concentration design value was 2.8 parts per million (ppm) compared to the 35 ppm NAAQS standard; 8-hour CO concentration design value was 0.4 ppm compared to the 9 ppm NAAQS standard) (NDDEQ 2024). Lead monitoring is not conducted by the state because prior sampling efforts revealed low concentrations and no significant lead sources (EPA 2024b).

Prevention of Significant Deterioration

The PSD is a CAA permitting program for new major sources or major modifications of existing sources of air pollution that are located in attainment areas. PSD is designed to protect public health and welfare

and to preserve, protect, and enhance the air quality in national parks, wilderness areas, monuments, and other areas of special value. The program applies to new (or modified) major stationary sources in attainment areas. Major sources are defined as those sources that emit 100 tpy or more of any criteria pollutants for specifically listed source categories in 40 CFR 51.166(b)(a)(i)(a) or that emit 250 tpy of any criteria pollutants and are not in a specifically listed source category. Neither the operations at the Falkirk Mine nor the Proposed Action would constitute a major PSD project.⁶ The Coal Creek Station is authorized under a PSD permit to construct and is a major PSD source. However, PSD review would not apply following implementation of the Proposed Action because it would not change production levels or annual emissions at the Coal Creek Station.

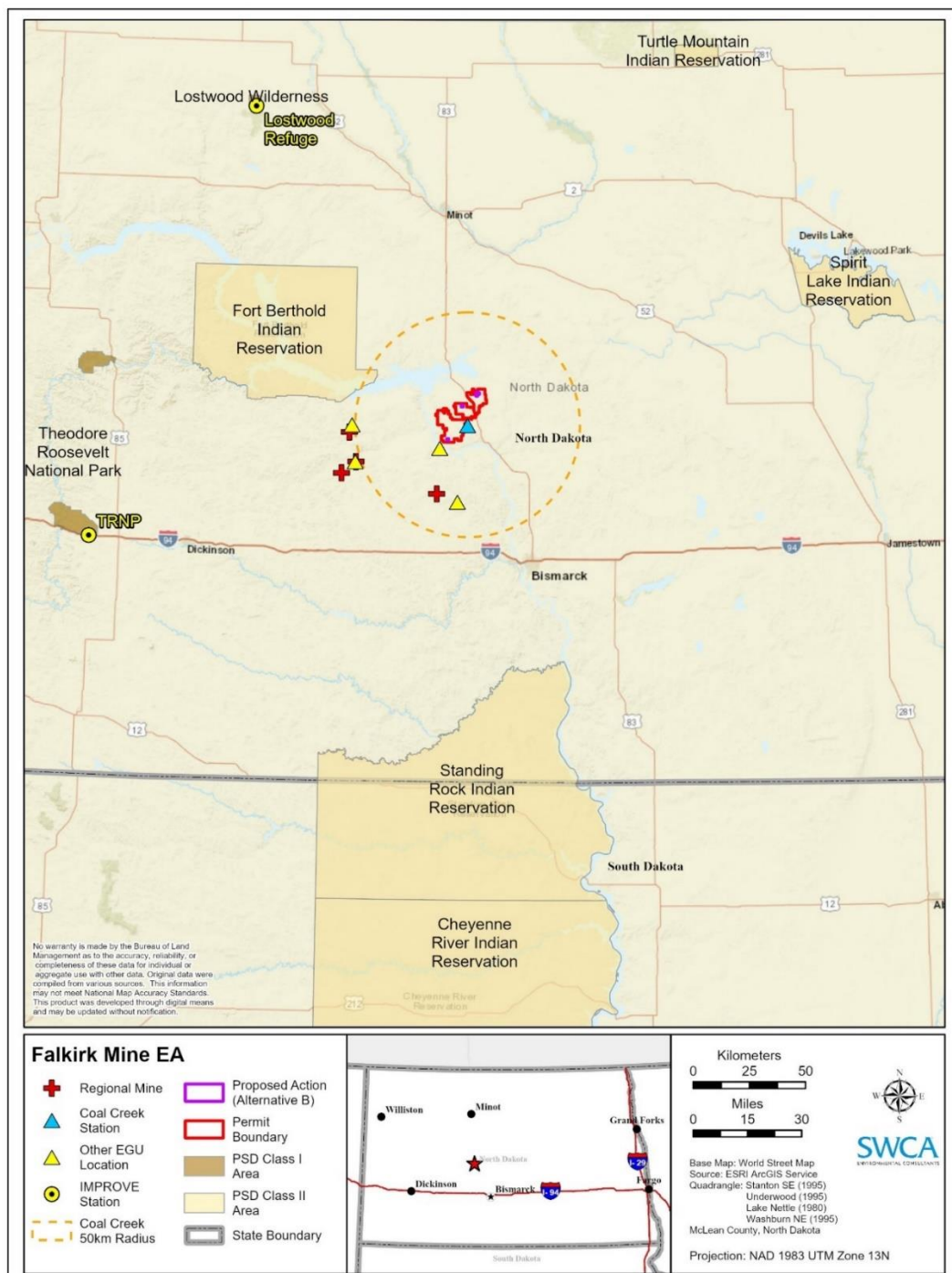
Under PSD regulations, the EPA classifies airsheds as Class I, Class II, or Class III. Class I areas are those areas where almost no change from the existing current air quality is allowed. These are areas of special national or regional natural, scenic, recreational, or historic value, for which PSD regulations provide special protection. Moderate pollution increases and reasonable growth are allowed in Class II areas, but stringent air quality constraints are desired when a PSD Class II baseline is triggered. In Class III areas, substantial industrial or other growth is allowed, and increases in concentrations up to the NAAQS are considered insignificant. No Class III areas have been designated to date; therefore, all areas not designated as Class I areas are known as Class II areas.

North Dakota has two PSD baseline data systems and is divided into two Air Quality Control Regions (AQCR) under the CAA: the Cass County AQCR 130 in the Fargo metropolitan area and AQCR 172, the North Dakota Interstate AQCR that comprises the remaining 52 counties. A minor source PSD baseline is triggered in these areas. Minor source PSD baseline dates are triggered when a major source applies and obtains a permit or permit modification through the state regulatory agency. PSD increments are the amount of pollution an area is allowed to increase. PSD increments prevent the air quality in clean areas from deteriorating to the level set by the NAAQS. The NAAQS is a maximum allowable concentration “ceiling.” A PSD increment, on the other hand, is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant. The baseline concentration is defined for each pollutant and, in general, is the ambient concentration existing at the time that the first complete PSD permit application affecting the area is submitted (40 CFR § 51.166). The PSD rules apply to stationary sources applying for new permits or a permit modification with significant increase in emissions. Mobile and fugitive sources are not included in the PSD analysis. Mobile source emissions are controlled at the manufacturing level.

The Class I areas in North Dakota include the Lostwood National Wildlife Refuge and Wilderness Area (located approximately 91 miles to the north in Burke County) and Theodore Roosevelt National Park (consisting of three separate, distinct units in Billings and McKenzie Counties), which is located more than 90 miles northwest and southwest of the Federal coal tracts (North Dakota Department of Health [NDDOH] 2010). In addition, the Medicine Lake Wilderness Area is west of the North Dakota border in Sheridan County, Montana (located approximately 150 miles to the northwest of the Federal coal tracts). The Federal coal tracts are not located in or near a Class I area (**Figure 3**). PSD regulations would not apply following implementation of the Proposed Action because it would not change production levels or annual emissions at the Falkirk Mine or require changes to its current regulatory permits.

⁶ Note that for the purposes of the PSD program emission thresholds fugitive emissions of a stationary source shall not be included in determining PSD major source applicability unless the source belongs to one of the source categories listed in 40 CFR § 51.166(b)(1)(iii)(a) – (aa). As shown in Environmental Impacts – Alternative B, the mine does not have point source emissions greater than 250 tpy of any criteria pollutant. Because implementation of the project will not cause the downstream end-use facilities from requiring a PSD permit modification, the alternatives associated with the project will not result in a new major PSD project.

Figure 3. Interagency Monitoring of Protected Visual Environments (IMPROVE) stations.



Air Quality–Related Values

An AQRV is defined as a resource “for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the Federal land manager for a particular area” (U.S. Forest Service et al. 2010). The requirement to assess impacts to AQRVs is established in the PSD rules.

Because the Falkirk Mine is over 50 km (31 miles) away from the nearest Class I area and proposes no increase in production, this project does not meet the applicability requirements of the PSD, and no assessment of AQRV impacts directly related to the proposed leasing and ongoing mining of Federal coal is needed. However, to give information on nearby air emissions, this EA analyzes the potential indirect effects of coal combustion and processing practices, which would occur at the nearby Coal Creek Station, where electricity is generated. Coal Creek is a PSD major source and Title V major source under the CAA; therefore, these sites are subject to stringent air emission monitoring, including continuous emission monitoring and compliance assurance monitoring.

Visibility

Section 169A of the CAA established a national visibility goal to prevent future visibility impairment and remedy any existing impairment in Class I areas. Visibility refers to the clarity with which scenic vistas and landscape features are perceived at great distances. Impairment refers to human-caused air pollution. In 1999, the EPA promulgated the Regional Haze Rule to address regional haze, which refers to haze that impairs visibility in all directions over a large area. Haze forms when sunlight encounters particle pollution in the air. The Regional Haze Rule calls for state and Federal agencies to work together to establish goals and emission reduction strategies to improve visibility in Class I areas (EPA 2001). States are required to address visibility in their state implementation plans. There are no Class I areas or sensitive Class II areas within the direct effects analysis area for air quality. Fort Berthold Indian Reservation, a sensitive Class II area, is within the indirect effects analysis area for air quality.

Visibility impairment or regional haze is caused by aerosols or small pollution particles dispersed in the atmosphere. These aerosols scatter and absorb light, impacting visibility. Fossil fuel combustion is a major contributor to ammonium sulfate and ammonium nitrate aerosols, whereas wildland fires are major contributors of organic carbon and elemental carbon. The majority of particulate emissions from surface coal mines are large particles or PM emitted at or near ground level with little or no buoyancy. Best management practices are required by the state of North Dakota to ensure that dust from earth-disturbance activities and overburden handling limit visible emissions from sites. Additionally, lignite, the type of coal mined in North Dakota, has 20% to 40% weight percent moisture content, and mining would result in negligible dust emissions from coal (EPA 1998a); therefore, surface coal mines are not the typical contributors to regional haze. The role of regional transport of fine particles and aerosols that contribute to elevated PM levels and regional haze impairment has been well-documented.

Nearby Class I areas for which potential impacts are being analyzed are shown in **Figure 3**. The NDDOH conducted visibility modeling as part of its 2010 Regional Haze State Implementation Plan (SIP) to determine which major sources are subject to Best Available Retrofit Technology (BART). Modeling was conducted based on the protocol outlined in the Protocol for BART-Related Visibility Impairment Modeling Analysis in North Dakota (NDDOH 2005). Results of the NDDOH's visibility analysis identified emission units at major sources where modeling indicated a maximum 98th percentile delta-deciview prediction exceeding the BART screening threshold of 0.5 deciviews. Coal Creek Station Units 1 and 2 were deemed to be subject to BART based on the NDDOH modeling and were required to develop and implement appropriate BART control strategies. A BART Permit to Construct (PTC10005) was issued to Coal Creek requiring 95 percent reduction efficiency of SO₂ (an improvement from the previous 68% reduction efficiency) based on the BART analysis conducted by the department. This Permit to Construct is available in Appendix D of North Dakota's State Implementation Plan for Regional Haze (NDDOH 2010). Other major sources within the state, including Leland Olds Station Units 1 and 2, Milton R. Young Station Units 1 and 2, and Stanton Station Unit 1, were also required to implement emission reductions under BART as part of the 2010 Regional Haze SIP (NDDOH 2010). These measures have ensured protectiveness of visibility at the nearest Class I areas.

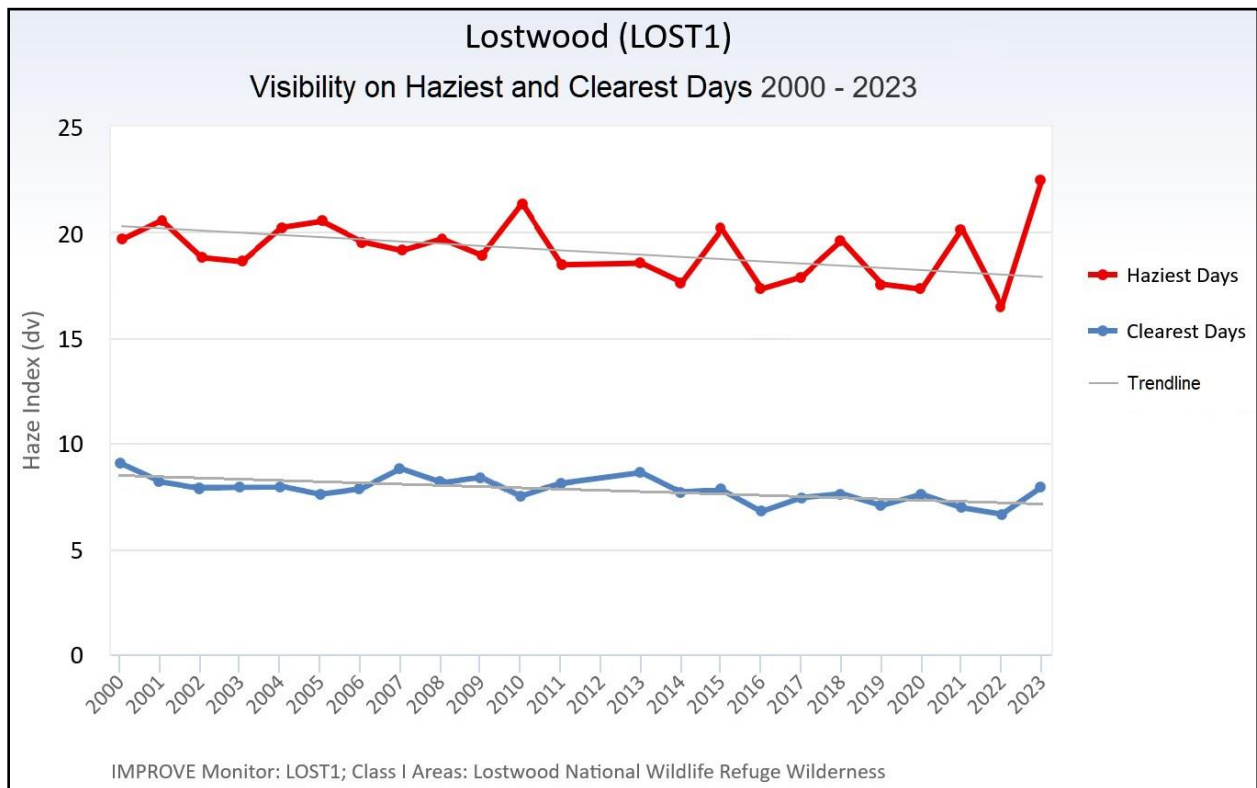
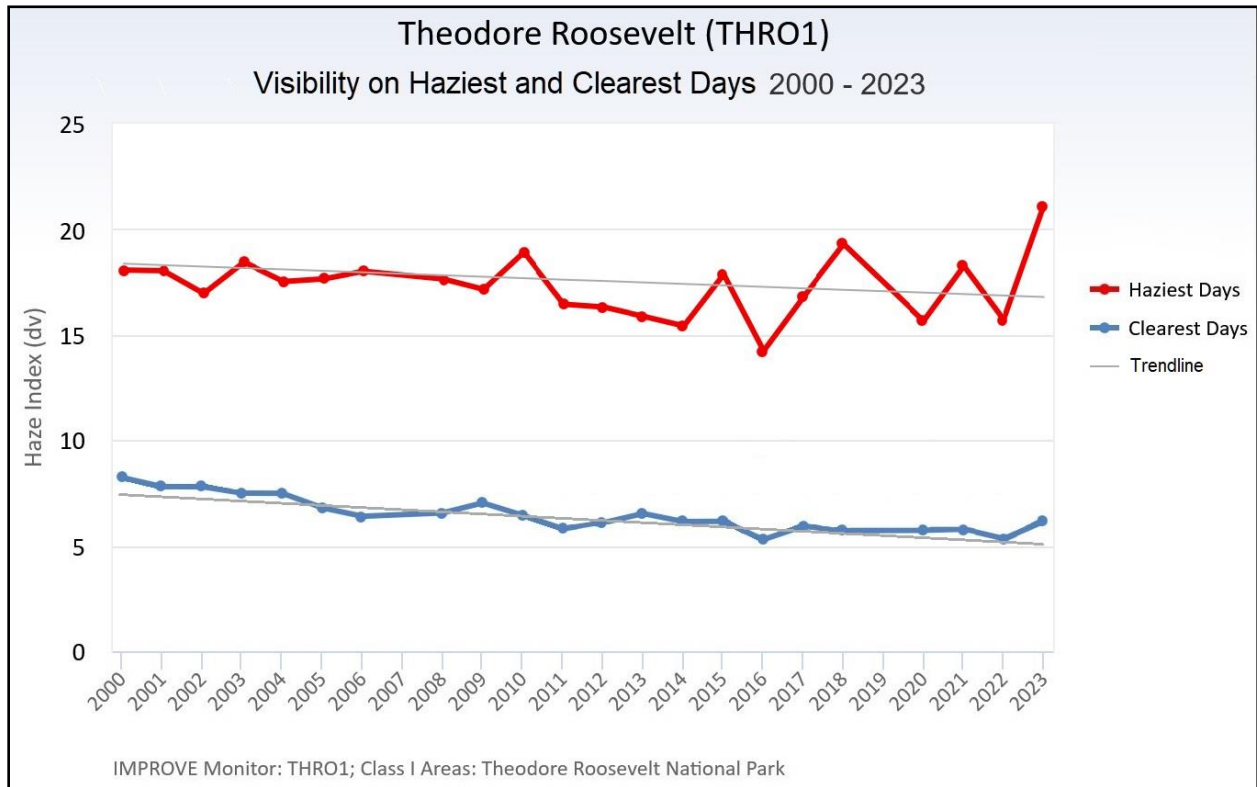
In 2022, NDDEQ adopted a SIP revision addressing regional haze. The SIP revision demonstrated compliance with the regional haze requirements of the Section 169A of the CAA (NDDEQ 2022). A BART Permit to Construct (PTC21001) was issued to Coal Creek that subjects Coal Creek Station Units 1 and 2 each to a BART limit of 0.15 pounds per million Btu of heat input on a 30-day rolling average basis (an improvement from the previous proposed BART limit of 0.17 pounds per million Btu) based on the BART analysis conducted by the department (NDDEQ 2022). This Permit to Construct is available in Appendix F of North Dakota's State Implementation Plan for Regional Haze (NDDEQ 2022).

The IMPROVE (Interagency Monitoring of Protected Visual Environments) program was initiated in 1985 to establish current visibility conditions and trends in national parks and wilderness areas. Average visual range in many Class I areas in the western United States is 60 to 90 miles (100 to 150 km), equivalent to 13.6 to 9.6 deciviews (dv), or about 50% to 70% of the visual range that would exist without anthropogenic air pollution from stationary and mobile sources (64 FR 35714). The two IMPROVE stations in North Dakota (see **Figure 3**) were used for characterization of the baseline regional haze level in the indirect effects study area using data for the period from 2000 to 2023.

Figure 4 shows visibility trends at Theodore Roosevelt National Park and the Lostwood National Wildlife Refuge and Wilderness Area. The trends are shown on clearest and haziest days from 2000 to 2023 and include the Theil trendline slope⁷ from the Federal Land Managers Environmental Database (2025a). There is a downward trend in visibility impairment (indicating an improvement in visibility) at both Theodore Roosevelt National Park and Lostwood Refuge and Wilderness Area based on non-parametric statistical analysis of the simple linear regression. For the period of 2000 through 2023, the Theil trend line slope for visibility on the clearest days is -0.11 dv/year and -0.05 dv/year for Theodore Roosevelt and Lostwood, respectively. For the same period, the Theil trendline slope for visibility on the haziest days is -0.07 dv/year and -0.10 dv/year, respectively.

⁷ The Theil trendline slope is an unbiased estimator of the true slope in a simple linear regression which is insensitive to outliers. This metric is what the Federal Land Managers Environmental Database presents to represent significant trends in visibility.

Figure 4. Visibility on haziest and clearest days - Theodore Roosevelt National Park and Lostwood National Wildlife Refuge



Acid Deposition

SO₂ and nitrogen oxide (NO_x) emissions from mining equipment and coal combustion can contribute to acid deposition which occurs when acid-forming precursors are incorporated into rain, snow, fog, mist, dust, or smoke. Atmospheric deposition can increase the acidity of soil or water resources. Nearby Class I areas for which potential indirect project impacts are being analyzed as part of the regional analysis area are shown in **Figure 3**. Wet deposition which is commonly referred to as acid rain. Wet deposition occurs when sulfuric and nitric acids formed in the atmosphere fall to the ground mixed with rain, snow, fog, or hail. Dry deposition occurs when acidic particulates and gases deposit on surfaces and or react during atmospheric transport to form particles that can be harmful to human health. When these dry deposits are washed off a surface by the next precipitation event, the acidic water flows over and through the ground and can cause harm to plants and wildlife such as insects and fish (EPA 2025b).

Deposition trend data at Theodore Roosevelt National Park are available from the Federal Land Managers Environmental Database (2025b, 2025c) and show CASTNET Dry Deposition and National Atmospheric Deposition Network National Trends Network Wet Deposition data. From the early 2000s through 2020 (which is the most recent complete year of data in the dataset), there is a significant downward trend in dry sulfur and nitrogen deposition. There are two monitoring sites for wet deposition at Theodore Roosevelt National Park (one at Painted Canyon and one at the North Unit Headquarters). At both monitoring sites from 1982 through 2023 (the most recent complete year of data in the dataset), there is a significant downward trend in wet sulfate deposition. At the Painted Canyon monitoring site, there is a significant downward trend in wet nitrate deposition, but at the North Unit headquarters, there is not a statistically significant trend in wet nitrate deposition (see **Figure 5, 6, 7, 8**).

Figure 5. Dry deposition of nitrogen – Theodore Roosevelt National Park

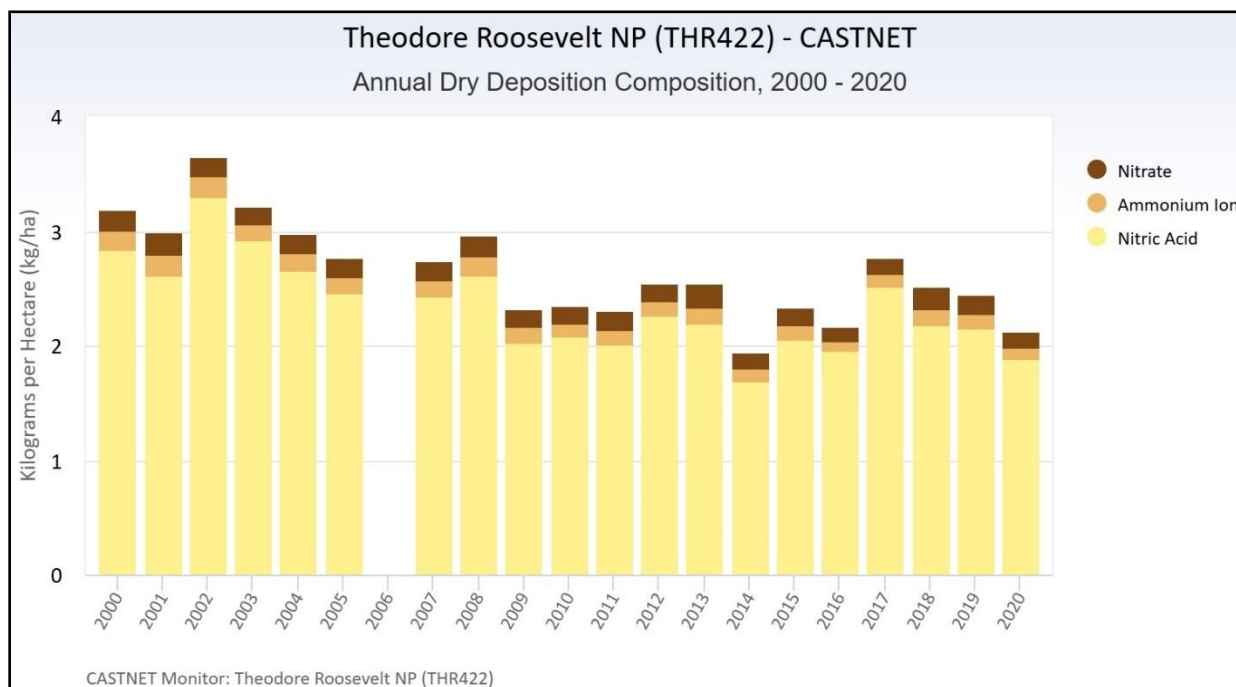


Figure 6. Dry deposition of sulfur - Theodore Roosevelt National Park

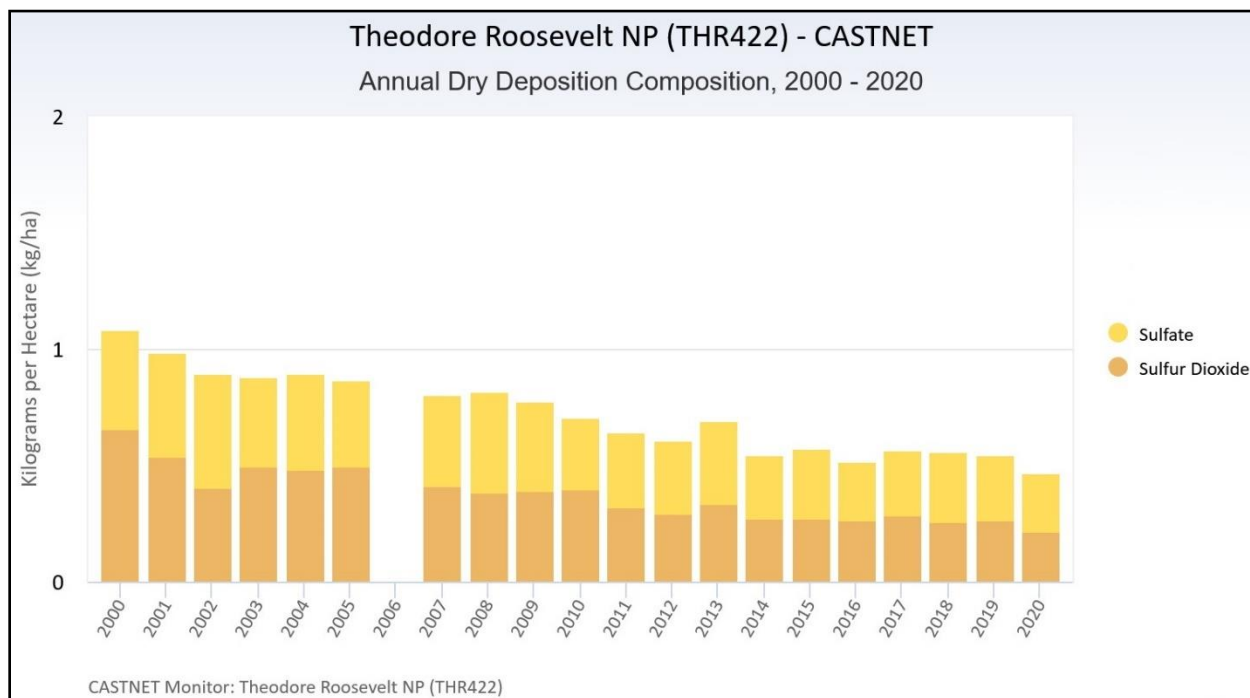


Figure 7. Wet deposition of nitrate - Theodore Roosevelt National Park 1982-2000

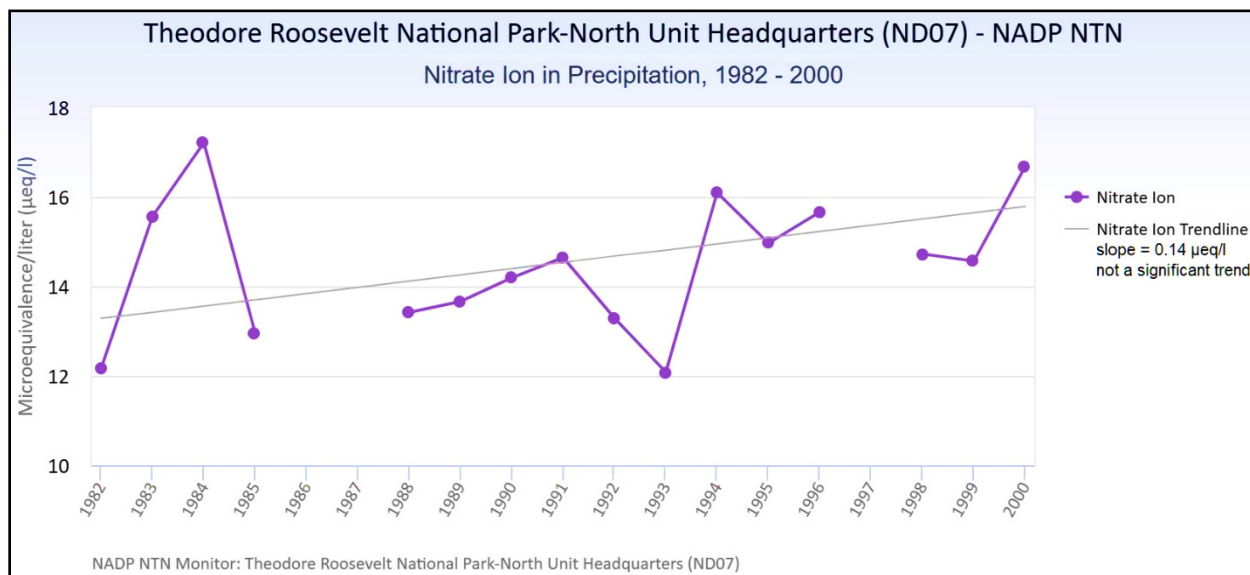


Figure 8. Wet deposition of nitrate - Theodore Roosevelt National Part 2001-2003

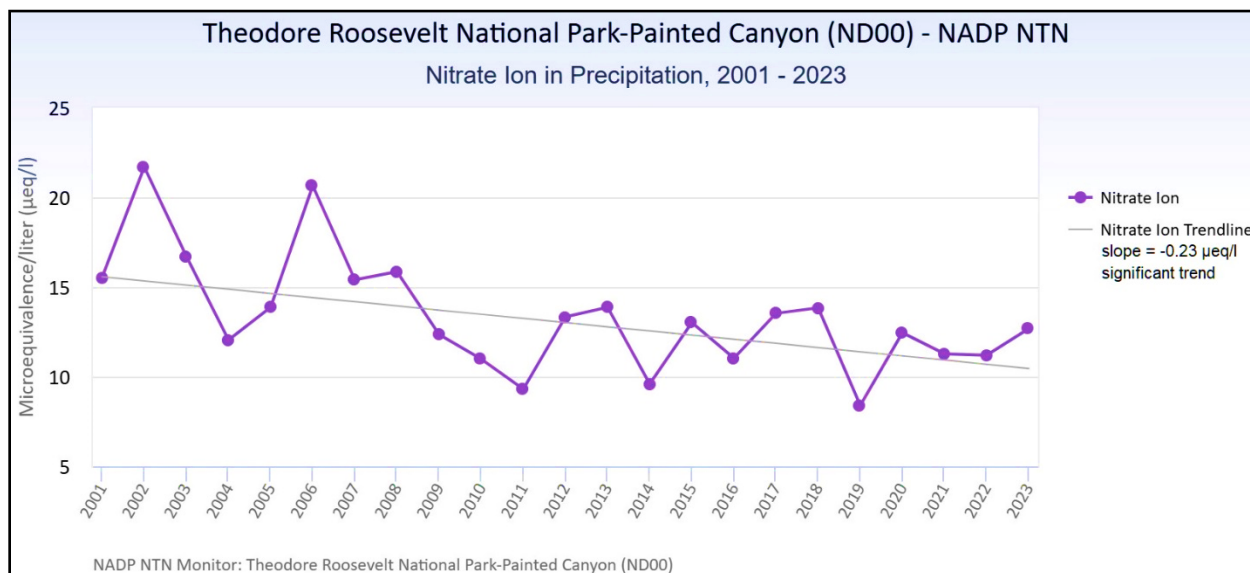


Figure 9. Wet deposition of sulfate - Theodore Roosevelt National park 1982-2000

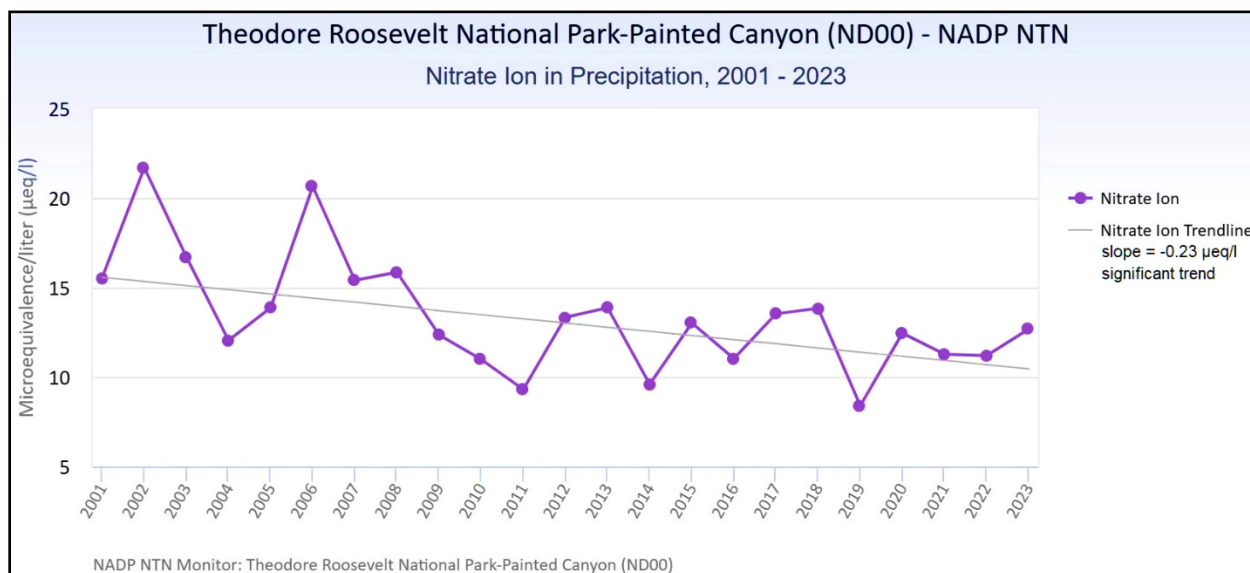
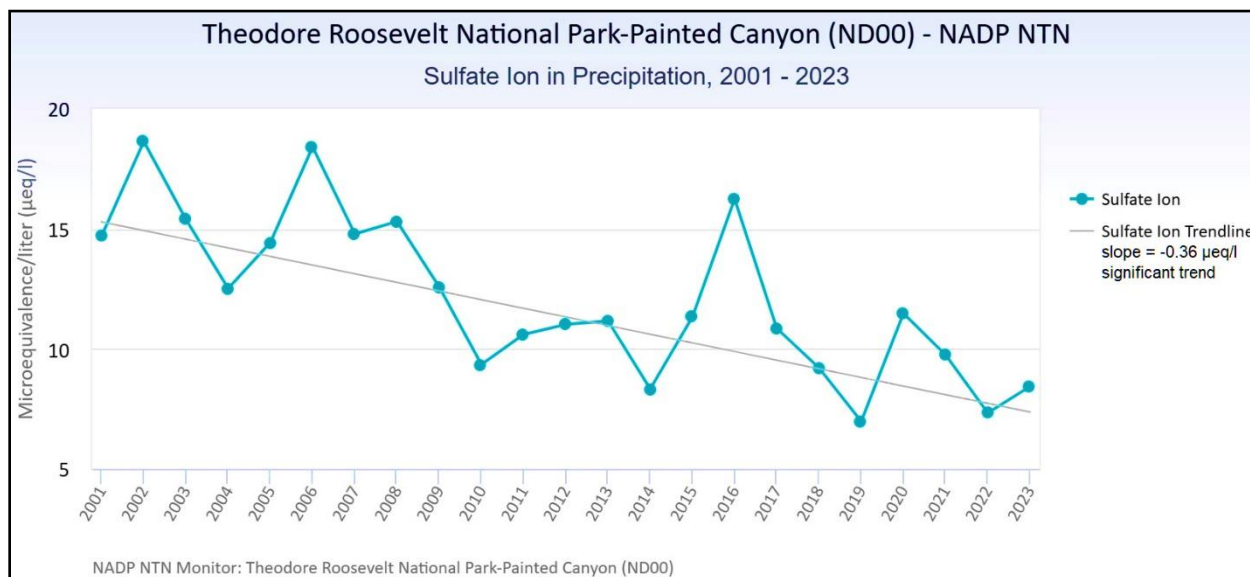


Figure 10. Wet deposition of sulfate – Theodore Roosevelt National Park.



Mercury Deposition

Coal-fired power plants are an anthropogenic contributor to mercury (Hg) emissions. Mercury deposition occurs when atmospheric mercury is deposited on land and water where it accumulates in the food supply and can be toxic to fish, wildlife, and humans. Coal combustion is also a potential source of trace element emissions, including arsenic, barium, boron, cadmium, chromium, lead, molybdenum, and selenium. Increasing concern about the effects of such trace pollutants on the environment has led to the introduction of emission standards for hazardous air pollutants from coal combustion. In 2011, the EPA finalized national standards (the Mercury and Air Toxics Standards [MATS]) to reduce air pollution from new and existing coal- and oil-fired power plants. These rules set emission limitation standards for mercury and other toxic air pollutants such as arsenic, chromium, nickel, and acid gases (e.g., hydrochloric acid and hydrofluoric acid). The final rule sets standards for all HAPs emitted by coal- and oil-fired electric generating units with a capacity of 25 megawatts (MW) or greater. In addition, facilities are required to report emissions and compliance information to the EPA. In April 2024, the EPA finalized revisions to strengthen the rule with more stringent emissions standards and additional monitoring and control methods (EPA 2024c)

A study published in 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) (EPA 2008). 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. Additionally, the study included quantification of the degree of contributions to mercury deposition from various sources as well as estimated maximum levels of contribution from North Dakota stationary sources (removing background mercury contributions). These results are shown in **Figure 11** and **Figure 12**. It is important to note that the emission inventory data used for the modeling study was based on 2001 emission data. For comparison, and to understand the variation in the environmental setting in 2001 versus today, the total modeled mercury emissions for the Antelope Valley, Coal Creek, Coyote, and Milton R. Young Stations, as well as other collective sources in the state, were 1.121 tpy, whereas the total North Dakota mercury emissions reported in the EPA's 2020 National Emissions Inventory (NEI) (finalized in 2023) were 0.53 tons. Therefore, the relative contribution of stationary sources to mercury deposition has been reduced since the study was completed. This is due in large part to implementation of

control technologies to comply with the MATS. The largest stationary source contributor in the study results, Milton R. Young Station, invested around \$425 million between 2006 and 2011 to install emission control technologies to reduce emissions of SO₂, NO_x, and mercury among other pollutants (Minnkota Power Cooperative 2020). Additionally, the Coal Creek Station is in compliance with the applicable requirements of Maximum Achievable Control Technology (MACT) standards to limit mercury emissions and also implemented BART control efficiency measures in 2017. These BART measures to reduce SO₂ also have the co-benefit of reducing mercury emissions.

Figure 11, REMSAD simulated total (wet and dry annual mercury deposition [k/km²]) for North Dakota - highest modeled value shown in blue triangle with data represented in Figure 12

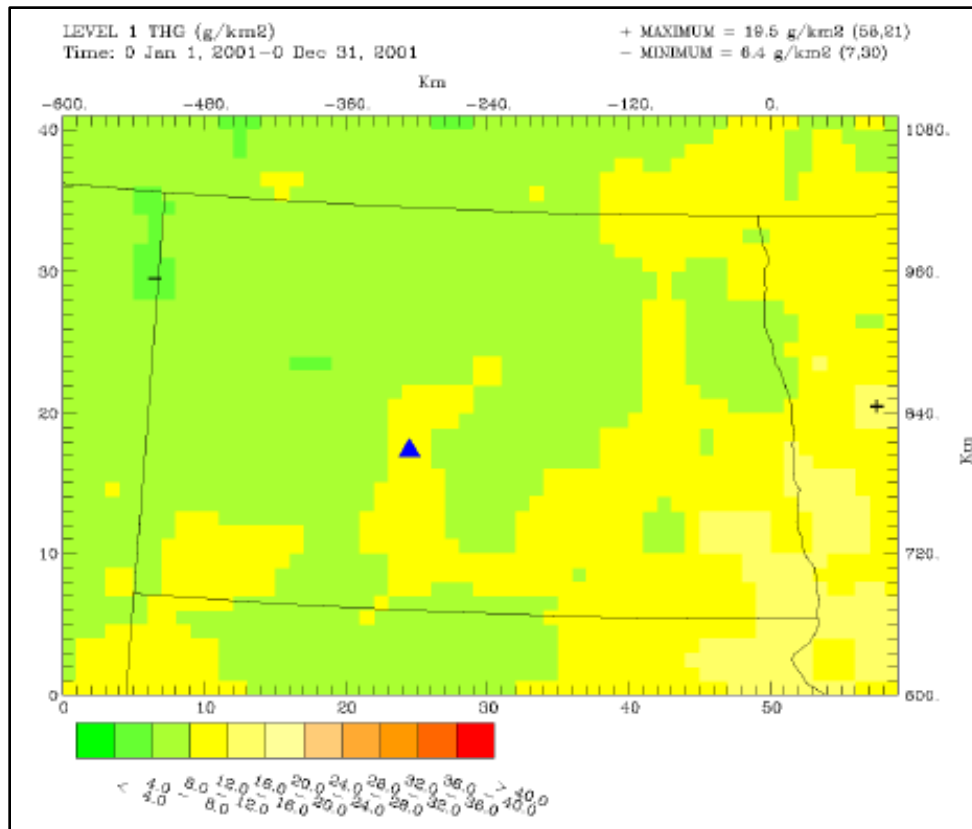
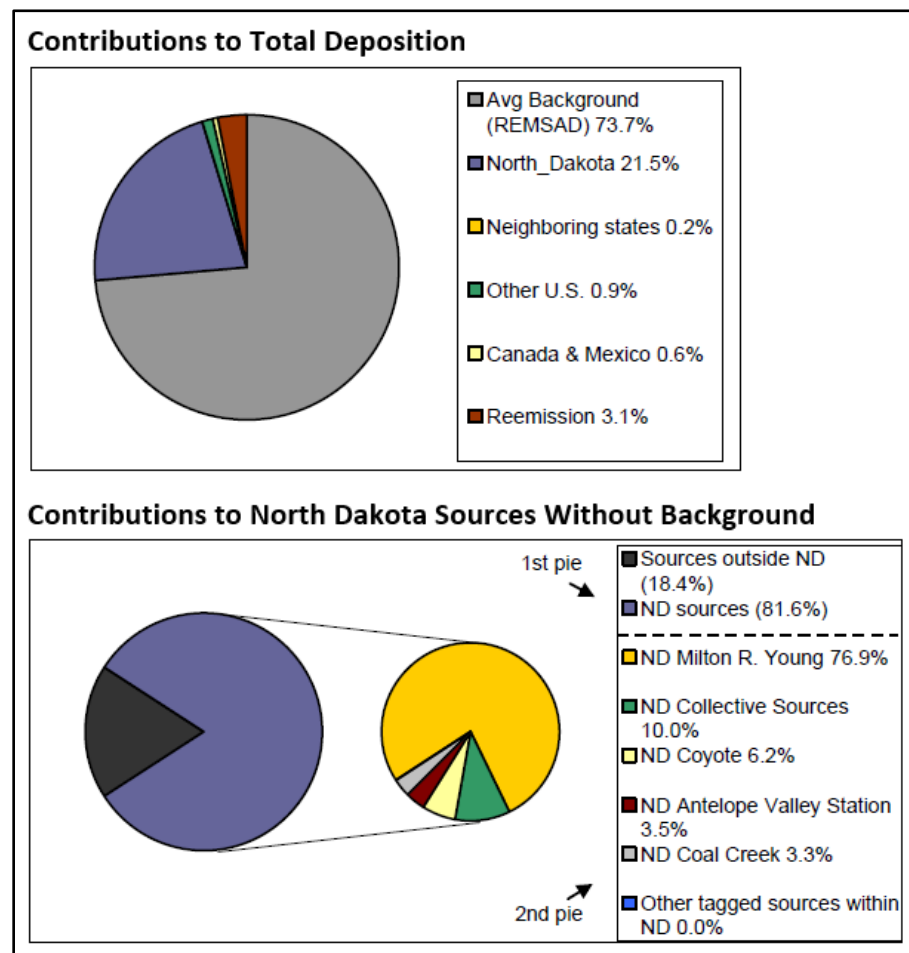
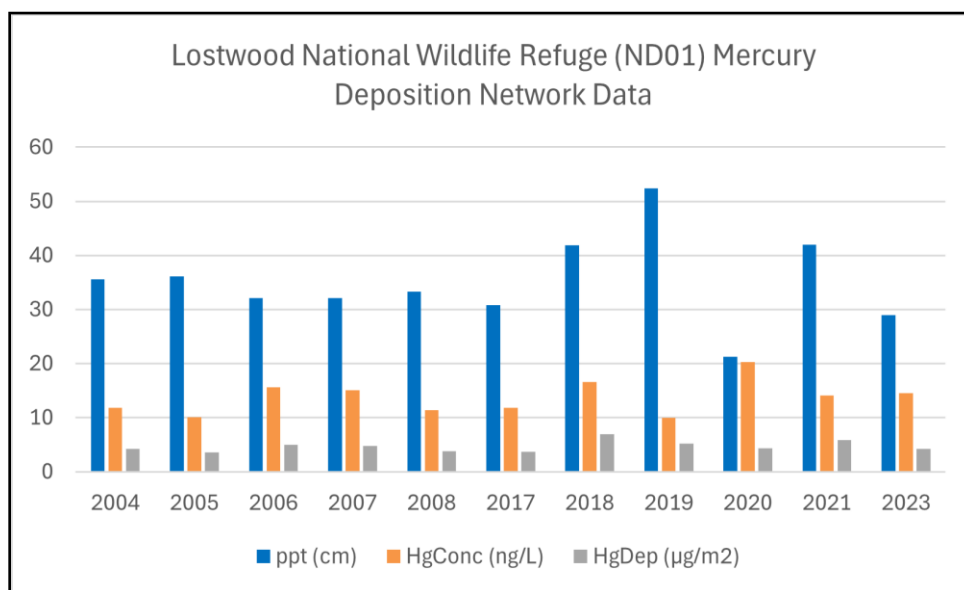


Figure 12. Model-based analysis and tracking of airborne mercury emissions to assist in watershed planning - mercury deposition contribution analysis study results.



The Mercury Deposition Network (MDN) provides long term records of total mercury concentration and deposition in precipitation (wet deposition) in the United States and Canada. **Figure 13** shows the available data on total precipitation, mercury concentration, and mercury deposition at the Lostwood National Wildlife Refuge (MDN site ND01) (National Atmospheric Deposition Program [NADP] 2024). Note that monitoring was halted after 2008 and then reinstituted late in 2016. The monitor is inactive as of March 26, 2024. Available monitoring data since 2004 shows that the annual deposition rate of mercury has recently been between 3.65 micrograms per square meter ($\mu\text{g}/\text{m}^2$) and 6.972 $\mu\text{g}/\text{m}^2$. This level of deposition is characterized as “low” by the National Atmospheric Deposition resulting from a combination of lower mercury concentrations and moderate precipitation (NADP 2015, 2023). The trend from available MDN data at the Lostwood site has stayed fairly constant from year to year and is impacted by many factors including annual rainfall amounts. However, more long-term observations since 1990 have demonstrated a general decline in atmospheric HgO (mercury oxide) concentrations at available surface sites from 1.2% to 2.1% per year at northern midlatitudes, and wet deposition trends from available monitoring sites in North America were similar to trends in atmospheric concentrations (Zhang et al. 2016). A second, separate study confirmed this general decline (Feinberg et al. 2024). It has been demonstrated that locally deposited mercury close in proximity to coal-fired utilities has declined more rapidly than anticipated because of shifts in speciation from air pollution control technology targeted at SO_2 and NO_x (Zhang et al. 2016).

Figure 13. Mercury Deposition Network annual mercury deposition monitoring data.



Emissions

Ambient air quality in the analysis area is influenced by the amount and type of pollutants released near and upwind of the Federal lease tracts. The 2020 NEI data from McLean County (where the mine and Coal Creek Station are located), as well as Mercer and Oliver Counties, are listed in **Table 7** (EPA 2024d). These NEI data include the total criteria pollutant and HAP emissions released from anthropogenic sources (stationary and mobile sources) and natural sources (biogenic sources and wildfires).

Table 7. McLean, Mercer, and Oliver Counties - 2020 National Emissions Inventory Data

Source Type	PM ₁₀	PM _{2.5}	VOCs	NO _x	CO	SO ₂	HAPs
McLean County Pollutant Emissions (tpy)							
Natural sources	133.00	89.00	5,234.00	968.00	2,138.00	12.00	1,047.65
Anthropogenic sources	15,191.00	5,892.00	1,334.00	7,461.00	4,948.00	5,494.00	230.10
Total	15,324.00	5,981.00	6,568.00	8,429.00	7,086.00	5,506.00	1,277.75
Mercer County Pollutant Emissions (tpy)							
Natural sources	210.00	172.00	2,592.00	332.00	2,514.00	14.00	522.16
Anthropogenic sources	9,244.00	2,682.00	2,144.00	17,496.00	6,309.00	31,242.00	626.36
Total	9,454.00	2,854.00	4,736.00	17,828.00	8,823.00	31,256.00	1,148.52
Oliver County Pollutant Emissions (tpy)							
Natural sources	4.00	3.00	1,964.00	324.00	464.00	–	379.99
Anthropogenic sources	3,945.00	922.00	364.00	8,830.00	855.00	2,785.00	87.35
Total	3,949.00	925.00	2,328.00	9,154.00	1,319.00	2,785.00	467.34

Source: EPA (2024d)

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter; VOC = volatile organic compound.

Anthropogenic emission sources generally fall into two broad categories: stationary and mobile. Stationary sources are nonmoving, fixed sources of air pollution that emit pollutants through process vents or stacks or through fugitive releases. Stationary sources are classified as major or minor. A major source emits or has the potential to emit a regulated air pollutant in quantities that are above defined CAA thresholds.

Stationary sources that are not major are considered minor or area sources. Section 111 of the CAA requires the EPA to establish Federal emission standards for source categories that cause or contribute significantly to air pollution (New Source Performance Standards [NSPS]). NSPSs limit emissions from emission source categories to minimize the deterioration of air quality. Stationary sources subject to NSPSs are required to meet these limits through design features or by adding pollution controls.

Section 112 of the CAA requires the EPA to promulgate regulations establishing emission standards for each category or subcategory of major sources and area sources of HAPs. These are known as the National Emissions Standards for Hazardous Air Pollutants. HAPs are known or suspected to cause cancer or other serious health effects. The EPA regulates 187 HAPs through maximum achievable control technology standards, which are individual emission standards developed for a particular stationary source category. Each maximum achievable control technology standard applies to major sources in the industrial source category. Major sources are those that emit more than 10 tpy of a single HAP or 25 tpy of any combination of HAPs (EPA 2016). The EPA also regulates HAPs from mobile sources such as highway vehicles and non-road equipment.

The EPA developed the Air Toxics Screening Assessment (AirToxScreen) program as a screening tool for state, local, and Tribal air agencies to help agencies identify which pollutants, emission sources and places may warrant further study to understand possible risks to public health from air toxics. The EPA publishes AirToxScreen risk estimates every year. The most recent AirToxScreen was published in May 2024 based on 2020 base year data. The publication includes total cancer risk (in cases per million) and hazard indexes for multiple health indicators. Hazard indexes lower than 1 means that adverse noncancer health effects over a lifetime of exposure are unlikely (EPA 2025c). Based on the 2020 AirToxScreen data, cancer risks for the state of North Dakota were modeled to be approximately 19.4 total cancer risk per million people, well below the national average of 30.4. Total cancer risk in McLean, Mercer, and Oliver Counties was below the state average. Additionally, all hazard indices for the tri-county analysis area were well below the threshold where adverse noncancer health effects would be likely (EPA 2024e).

Falkirk Mine

The NDDEQ Division of Air Quality issued the Falkirk Mine a permit to operate in 2021 (No. AOP-28093 v4.0) (NDDEQ 2021). That permit is currently in effect and expires in April 2026. The Falkirk Mine is considered a true minor source by the NDDEQ Division of Air Quality and is considered an area source of HAP emissions (i.e., is not a major source of HAPs). Applicable requirements of 40 C.F.R. Part 60 Subpart Y, Standards of Performance for Coal Preparation and Processing Plants, apply to the Falkirk Mine and are included in its permit to operate. Implementation of the Proposed Action would not require the purchase or use of new equipment or pollutant sources potentially subject to NSPS or National Emissions Standards for Hazardous Air Pollutants, and since the annual production rate will not increase, the implementation of the Proposed Action will not require a new or modified air quality permit. The maximum annual throughput allowed in the permit is 20 million tons of coal per year for emission units 1-6 (truck dump and primary crushing station and conveyor) and 34 million tons of coal per year for emission units 7-11 (secondary crushing station and conveyor). The mine generally produces between 7 to 8 million tons of coal per year. **Table 8** lists the emission units authorized by the permit.

Table 8. Falkirk Mining Company Minor Source Permit to Operate Emission Units

Emission Unit Description	Emission Unit	Emission Point	Air Pollution Control Equipment
Fugitive Emissions Topsoil and subsoil removal and placement Overburden and interburden removal and placement Coal and overburden blasting operations Coal loading and transport to lignite handling facilities	FUG-1	FUG-1	None
One truck dump with two cells, each with a hopper capacity of approximately 700 tons, and total process capacity of 4,000 tons/hour	1	1	Dust System No. 1 (FabriPulse fabric filter)
One primary crushing station utilizing two NICO apron feeders and two Pennsylvania primary crushers. Each crusher has a capacity of approximately 2000 tons/hour	2-5	1	Dust System No. 1 (FabriPulse fabric filter)
One 72-inch conveyor with a rated capacity of 4,000 tons/hour	6	1	Dust System No. 1 (FabriPulse fabric filter)
One secondary crushing station utilizing two Syntron Model MF-1000 B feeders and two Pennsylvania crushers, each rated at 2,000 tons/hour	7-10	2	Dust System No. 2 (FabriPulse fabric filter)
One 72-inch silo feed conveyor rated at 4,000 tons/hour maximum capacity	11	2	Dust System No. 2 (FabriPulse fabric filter)
One 16,000-ton capacity coal storage silo	12	3	None

The Falkirk Mine constructs haul roads used to transport coal from the active mining area to the truck dump facility. These roads, permitted by the NDPSC mining permit, could be temporary for use or could be permanent at the time of bond release, dependent upon the desires of the landowner. The coal processing facility (primary and secondary crushing equipment) and covered conveyor are located adjacent to the stockpile within the existing permit boundary. As needed, a rubber-tire dozer or track dozer feeds coal from the coal storage pile into the coal push pocket. The coal is crushed to a prescribed size and transported on a covered conveyor to the Coal Creek Station. Direct impacts of the mine operation due to mining operations and processing equipment at the Falkirk Mine occur within the existing permit boundary and are covered by Falkirk's air quality permit.

The permit lists the following fugitive dust control requirements:

- Control fugitive particulates from land clearing, topsoil and subsoil removal and placement, overburden and interburden removal and placement in the backfill, and other material handling operations employing measures such as watering, revegetation, delay of topsoil disturbance until necessary, surface compaction, and sealing unless natural moisture is sufficient to control emissions.
- Use fugitive dust preventative measures such as watering, covering, shielding, or enclosing active or inactive stockpiles as necessary to control emissions (unless natural moisture is sufficient to control emissions).
- Use fugitive dust preventative measures such as watering, covering, shielding, or enclosing stockpiles, both active and inactive, as necessary to control emissions unless natural moisture is sufficient to control emissions.
- Construct, protect, or treat all conveyors, transfer points, crushers, screens, and dryers to minimize particulate emissions.

The Falkirk Mine has developed a fugitive dust control plan to comply with the permit requirements. **Table 9** lists the dust control measures described in the plan.

Table 9. Dust Control Measures in Falkirk Mine's Fugitive Dust Control Plan

Facility Operation	Dust Control Method
Stabilization of Disturbed Areas	Only the required area necessary for operations will be disturbed at any one time. Topsoil and subsoil will be removed in increments, as necessary. Strategies to control fugitive emissions include watering, revegetation, delay of topsoil disturbance until necessary, surface compaction, and sealing. Emission control measures for stockpiles include watering, covering, shielding, or enclosing stockpiles as necessary to control emissions. Disturbance associated with mining operations will be minimized. All areas of disturbance will be stabilized as soon as possible using approved revegetation techniques.
Haul Roads and Access Roads	Dust from haul roads and access roads will be minimized by treating road surfaces with approved stabilization agents. Water will be used extensively on roads and on problem areas associated with mining operations. During dry periods, water agents such as Lignin Sulfate, magnesium chloride dust suppressants, or other approved material may also be used on haulage and access roads to reduce fugitive dust.
Coal Handling Facilities	The use of a covered coal conveyor reduces potential equipment haulage dust. A dust control system approved by the NDDEQ (fabric filters) control emissions from the coal truck dump, crushing and handling facilities (emission units 1 and 2) of PTO AOP-28093 v4.0.

The mine must also comply with all applicable requirements of NDAC 33-15-08-01 for internal combustion engine emissions. This regulation states that no internal combustion engine can be operated that emits unreasonable and excessive smoke, obnoxious or noxious gases, fumes, or vapors.

Emissions are limited through the established maximum annual production rate. Emissions from the Falkirk Mine are predominantly PM. CO, SO₂, NO_x, VOCs, and HAPs are also emitted from mining equipment and vehicles.

EPA's NSPS standard 40 C.F.R. Part 60 Subpart Y, Standards of Performance for New Stationary Sources: Coal Preparation Plants, applies to the mine. Requirements of NSPS Subpart Y include visible emissions performance testing on the coal processing equipment.

Downstream End-Use Facilities

Coal produced from the Federal lease tracts would be transported from the coal processing facility via a covered conveyor system to the Coal Creek Station, located approximately 4,260 feet from the Falkirk Mine. Coal Creek combusts the coal produced at the Falkirk Mine to produce electricity, which is an indirect impact of coal mining at the Falkirk Mine. Coal Creek currently also dries a portion of the coal using waste heat, which increases the coal British thermal unit (Btu) value.

The proposed LBA would not change allowable production rates at Coal Creek Station or require changes to the current air permits. Although the end-use facility is not considered a connected action because there is no Federal action associated with its operation, historical emissions data from the facility, as well as estimated emissions that would result from use of Federal coal, are included in this analysis to provide context for the indirect impact analysis in this section.

Coal Creek Station emits criteria pollutants and HAPs and is a PSD and Title V major source of air pollutants. Coal Creek Station operates under a Title V Operating Permit (Permit No. T5-F82006). The Title V Operating Permits for the Coal Creek Station includes emission limitations and compliance assurance monitoring requirements. During the PSD construction permitting process, ambient air quality modeling is required to determine whether off-site impacts from operation of the facilities would cause or contribute to a violation of the NAAQS. An additional impacts analysis is also required during the PSD construction permitting process to assess the impacts of air, ground, and water pollution on soils,

vegetation, and visibility caused by facility operation (EPA 2024f). A Best Available Control Technology evaluation was conducted for each emission unit at Coal Creek Station at the time of each major modification requiring a PSD construction permitting evaluation. Additionally, as part of the Regional Haze SIP, Best Available Retrofit Technology limitations for the Coal Creek Station were imposed and a Permit to Construct issued to Coal Creek on February 23, 2010, implements these requirements (NDDOH 2010). As part of the revised Regional Haze SIP, additional BART limitations for the Coal Creek Station were imposed and a Permit to Construct issued to Coal Creek on July 27, 2022 (NDDEQ 2022). A brief discussion of the main emission sources and the implemented emission control technology, as well as applicable NSPS and MACT standards at the Coal Creek Station, is included below. The Best Available Control Technology and BART control requirements, as well as the applicable NSPS and MACT standards, are designed to reduce criteria air pollutant and HAP emissions from these major sources.

At Coal Creek Station, the primary regulated emission units include two 6,015 million British thermal units (MMBtu)/hour lignite coal-fired boilers (Units 1 and 2), two auxiliary boilers rated 172 MMBtu/hour, a lignite handling system, fly-ash handling system, a coal drying system, an air jig system and ancillary equipment. The air pollution control equipment for Unit 1 and 2 includes an Electrostatic precipitator and wet scrubber to control criteria pollutants and HAP emissions. The lignite handling system, fly-ash handling system, a coal-drying system, an air jig system, and lignite rail loading operations are controlled by baghouses that control PM emissions. Additionally, affected emission units at Coal Creek Station have applicable Federal requirements under NSPS A – General Provisions, NSPS D – Standards of Performance for Fossil-Fuel-Fired Steam Generators, NSPS Y – Standards of Performance for Coal Preparation and Processing Plants, NSPS IIII – Standards of Performance for Stationary Compression Ignition Engines, MACT A – General Provisions, MACT DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, MACT UUUUU – National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units, and MACT ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, and are subject to applicable state specific pollution control regulations in the North Dakota Administrative Code Chapter 33.

The most recent, currently available emission data for the down-stream combustion facility is shown in **Table 10** to provide context and to assist with analysis of the combustion and use of coal mined from the Federal lease tracts (NDDEQ 2023).

Table 10. Coal Creek Station 2019, 2020, 2021, and 2022 Emissions (tpy)

Pollutant	2019	2020	2021	2022
Coal Creek Station	1,640.51	1,611.88	1,763.35	1,667.25
CO	6,517.56	6,264.89	6,453.45	5,872.93
NO _x	959.90	965.70	1,087.29	1,013.40
PM ₁₀	906.30	912.50	1,004.90	935.00
PM _{2.5}	6,281.00	5,200.30	6,745.70	6,192.50
SO ₂	131.17	128.95	140.99	133.30
VOC	0.16	0.17	0.18	0.16
Mercury	0.00	0.00	0.18	0.17
Ammonia	31.00	30.40	33.20	31.30
Hydrochloric acid	26.00	26.00	27.00	26.00
Hydrofluoric acid	< 0.10	< 0.10	< 0.10	< 0.10
Lead	62.84	62.24	64.93	61.69
Total HAPs*	1,640.51	1,611.88	1,763.35	1,667.25

Source: NDDEQ (2023)

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

* HAPs associated with the facility include heavy metals, hazardous volatile organic compounds, and inorganic hazardous air pollutants. These include lead, ethyl benzene, n-hexane, hydrochloric acid, hydrogen fluoride, arsenic, chromium (VI) compounds, mercury, nickel, and manganese.

Annual coal receipts at Coal Creek Station were 7,591,423 tons in 2022, 6,448,995 tons in 2023, and 7,510,413 tons in 2024 (U.S. Energy Information Administration [EIA] 2025a). To increase plant efficiency, the steam produced at the Coal Creek Station is sold to the adjacent ethanol plant, reducing the need for energy use at the ethanol plant. Fly ash produced on-site is sold to concrete companies in the upper Midwest, which reduces the need for businesses to use Portland cement, which will indirectly reduce emissions from cement production operations (Lignite Energy Council 2023).

Environmental Impacts – Alternative A (No Action)

Air Quality

Under the No Action Alternative, the Federal coal resources contained in the lease tracts at the Falkirk Mine would not be leased and/or a Federal mining plan would not be approved; thus, no Federal coal within those tracts would be mined. No emissions of air pollutants, including criteria pollutants, or HAPs from the mining or combustion of the Federal coal would occur.

The non-Federal coal surrounding the Federal lease tracts would be mined, leaving the Federal tracts unmined and isolated in a mined and reclaimed landscape. Although the Federal coal would not be leased at this time under the No Action Alternative, the mine would conduct surface-disturbance operations on the private land overlying the unmined tracts. The anticipated surface disturbance under the No Action Alternative would be approximately 1,600 acres. Emission of air pollutants would occur during surface-disturbance operations, including criteria pollutants (from vehicles and equipment) and fugitive dust from coal processing and topsoil stockpiles. As discussed in Chapters 1 and 2, due to the availability of leased private coal resources located within the permit boundary and adjacent areas, the projected life of the Falkirk Mine would not change under the No Action Alternative and is anticipated to continue through 2045 regardless of whether the Federal coal is leased and mined. Therefore, an evaluation of emissions from ongoing mining is included below.

Coal Mining

Emissions of air pollutants at the Falkirk Mine are currently limited by a maximum permitted production rate condition established in its 2021 air quality permit (Permit No. AOP-28093 v4.0). Under the No Action Alternative, the mine would be limited to a production rate of 34 million tpy resulting in estimated criteria pollutant and HAP emission rates shown in **Table 11**.

Table 11. Falkirk Mine Emissions from Coal Mining - Annual Emission Rate Based on Maximum Allowable Production (in tons per year).

Source	Pollutant Emissions (tpy)						
	PM ₁₀	PM _{2.5}	CO	NOx	SO ₂	VOC	HAP
Point sources	12.49	2.02	–	–	–	–	–
Fugitive dust sources (direct)	2,328.02	266.39	17.96	4.56	0.54	–	–
Mobile source exhaust (direct)	87.67	85.04	523.25	3,701.61	6.13	108.92	42.50
Total	2,428.18	353.45	541.21	3,706.16	6.66	108.92	42.50

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter. Fugitive dust sources also include low levels of emissions from blasting operations (combustion of ammonium nitrate/fuel oil).

All direct emission sources (coal processing equipment, off-road equipment operation, and fugitive dust generated from mining activities) are included in the emission summary in **Table 11** above to quantify the emissions from surface mining operations. The Falkirk Mine typically operates well below the maximum permitted emission rate of 34 million tons of coal production annually; therefore, the emissions presented in **Table 11** represent the maximum estimated permitted annual emission rate from the Falkirk Mine, which are provided for reference. However, Falkirk is unlikely to attain that coal production rate.

However, the most likely scenario is that the Falkirk Mine would continue to operate at current production levels, and direct and indirect effects to air quality would continue based on the production and combustion of approximately 7 to 8 million tpy of coal (Table 3-8). The average annual production rate for 2021, 2022, and 2023 was about 7.4 million tons (EIA 2025b). Estimated emissions based on this 3-year average production rate are presented in **Table 12**.

Table 12. Falkirk Mine Emissions from Coal Mining - Annual Emission Rate Based on Typical Annual Production (in tons per year)

Source	Pollutant Emissions (tpy)						
	PM ₁₀	PM _{2.5}	CO	NOx	SO ₂	VOC	HAP
Point sources	0.91	0.15	–	–	–	–	–
Fugitive dust sources (direct)	503.24	57.58	3.88	0.98	0.12	–	–
Mobile source exhaust (direct)	18.95	18.38	113.11	800.17	1.32	23.55	9.19
Total	523.10	76.11	116.99	801.16	1.44	23.55	9.19

The emission calculations shown in **Table 12** are based on information regarding the surface mining operations and mobile source equipment fleet. Detailed emission calculations are presented in Appendix D.

Emissions point sources include the truck dump facilities, primary and secondary crusher units, and associated transfer points. Emissions from the stationary source equipment are estimated based on their controlled emission rates, which include the control efficiency of the Federally enforceable air pollution control equipment represented to control emissions in Permit Number AOP-28093 v4.0 (see Appendix D).

Table 13 shows the emissions of the No Action Alternative to mine 11.3 million tons of non-Federal coal over the course of 15 years. This includes shipping coal to Spiritwood Station in 2026. Because the mining of the coal would occur while having to work around the Federal coal tracts, additional equipment would be needed and, conservatively, there would be approximately twice as much disturbance compared to the Proposed Action (see Chapter 2).

Table 13. Falkirk Mine No Action Alternative Emissions - Total Emissions from Extraction of 11.3 Million Tons of Non-Federal Coal

Source	Pollutant Emissions (tpy)						
	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	HAP
Point sources	1.48	0.24	–	–	–	–	–
Fugitive dust sources (direct)	844.11	96.38	6.32	1.60	0.19	–	–
Mobile source exhaust (direct)	35.72	34.65	212.85	1,548.63	2.54	44.88	17.40
Total	881.31	131.27	219.16	1,550.23	2.73	44.88	17.40

Fugitive dust sources include dust generated from vehicles traveling over paved and unpaved roads, wind erosion, coal unloading, coal pile bulldozing, drilling, topsoil and subsoil removal and placement, overburden and interburden removal and placement in the backfill, and reclamation operations. Fugitive dust emissions from the mine were calculated based on EPA’s calculation methodologies, including AP-42 Chapter 11.9 and AP-42 Chapter 13.2 (EPA 1998a, 2006, 2011a), EPA’s *Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources* (Axetel and Cowherd 1984), and EPA’s *Control of Open Fugitive Dust Sources* (EPA 1988). Control efficiencies discussed in the *WRAP Fugitive Dust Handbook* (Western Regional Air Partnership 2006) for the Federally enforceable fugitive dust control requirements of Permit No. AOP-28093 v4.0 were applied to determine the emissions.

Mobile source exhaust emissions from on- and off-road vehicles are calculated based on the mining fleet data provided by Falkirk Mine and the EPA’s MOVES model on-road and nonroad emission factors for McLean County (EPA 2025d).

The emission rates in **Table 12** are representative of the typical Falkirk Mine emission rates and can be compared against the McLean County NEI data (see Table 3-3) to determine the relative magnitude of the Falkirk Mine emissions. Overall, the Falkirk Mine is estimated to contribute approximately 5.75% of the PM₁₀ emissions, 2.19% of the PM_{2.5} emissions, 3.09% of the CO emissions, 18.39% of the NO_x emissions, 0.05% of the SO₂ emissions, 0.68 % of the VOC emissions, and 1.36% of the HAP emissions in McLean County under the No Action Alternative.

Under the No Action Alternative, no emissions from the mining of approximately 11.3 million tons of Federal coal would occur. However, emissions of air pollutants would occur during the surface-disturbance mining operations over the 1,600-acre area, which would be an incremental impact to past, present, and RFFAs. Note that surface disturbance on the tracts would not be part of a Federal action, and emissions associated with this surface disturbance would be part of the direct fugitive dust emissions

associated with normal mine operation presented in **Table 7**. No NAAQS exceedances or near exceedances and, therefore, impacts to human health are expected to occur as a result of the ongoing mining operation at the mine.

Employee Commutes

Mobile source combustion emissions and associated paved road dust generation associated with Falkirk Mine employee commuting activities are an indirect impact of the Falkirk Mine's operation. An estimate of worker commute emissions for the No Action Alternative are included in Appendix D. Worker commute emissions are at least one order of magnitude less than the emissions resulting from the direct impacts from the mine operations for every pollutant. There are no substantive changes in current levels of commuter activity under the No Action Alternative.

Coal Combustion

Under the No Action Alternative, no Federal coal would be leased, extracted, or combusted. Operations at Coal Creek Station would continue unchanged. The annual emissions from 2021, 2022, and 2023 from Coal Creek Station are presented in **Table 10** (refer to the Air Quality Affected Environment: Downstream End-Use Facilities section). The amount of coal leased and extracted at the Falkirk Mine and delivered to the Coal Creek Station for combustion would remain unchanged from current production levels. There would be no Federal coal combusted under the No Action Alternative. As the Federal coal will be bypassed, only privately owned coal will be combusted under the No Action Alternative. Under the No Action Alternative, emissions from non-Federal coal combustion would contribute emissions at levels similar to those presented in **Table 15** in the Air Quality Environmental Impacts Alternative B: Coal Combustion section. Thus, the indirect effects of coal combustion from the No Action Alternative are not expected to cause NAAQS exceedances or near exceedances, exceed PSD Class I and II increments (including visibility, and acid deposition impacts), or cause increases in cancer risk or health indices (including HAPs impacts). Furthermore, indirect emissions at Coal Creek could be lower than what is calculated if the carbon sequestration plans are implemented.

Mined coal is also shipped to Spiritwood Station. Coal Creek Station dries and refines coal down to a quarter of an inch or less diameter product and ships it to Spiritwood Station. Spiritwood Station is the only facility that was designed specifically for this refined coal product. Coal shipped to Spiritwood Station required the design of a specially enclosed rail car to prevent product loss. These rail cars and their associated coal handling facilities are unique to Coal Creek Station and Spiritwood Station. It is estimated that approximately 330,000 tons of coal would be shipped to Spiritwood Station between 2024 and 2026. The contract with Spiritwood Station ends at the end of 2026. The unique load out facility at Coal Creek Station is currently scheduled for demolition as part of the carbon capture project and there is currently no plan to rebuild the load out facility.

Air Quality Impacts

Because the annual emission rates from the mine and the Coal Creek Station are not increasing, impacts to air quality would effectively be the same under the No Action Alternative compared to the Proposed Action. Although the No Action Alternative would not result in an annual increase in mercury emissions, the combustion of non-Federal coal would contribute mercury emissions at levels similar to those disclosed in **Table 15** of the Air Quality Environmental Impacts Alternative B: Coal Combustion section. The combustion of Federal coal under the Proposed Action would also contribute mercury emissions at the levels in **Table 15**. Refer to the Air Quality Environmental Impacts Alternative B: Air Quality Impacts section for a comprehensive discussion of potential air quality impacts.

Environmental Impacts – Alternative B (Proposed Action)

Coal Mining

Under the Proposed Action, a coal lease for the Federal lease tracts would be issued to Falkirk, OSMRE would recommend approval of the Federal mining plan to the ASLM, and the ASLM would approve the mining plan (with or without conditions), allowing the Federal lease tracts to be mined. No impacts to air quality would occur from the leasing action; however, impacts to air quality from surface mining are evaluated in this section.

Because the proposed LBA is a continuation (rather than an increase) of current surface mining, no air quality permit modification would be required if the Proposed Action is implemented, and total annual emissions are expected to be similar to those presented in **Table 12**. Mining of the Federal lease tracts would occur under the current air quality permit. The Proposed Action would not authorize a change in the current air quality permit or in production levels; therefore, there would be no incremental increase in annual emissions from implementation of the Proposed Action. Based on Falkirk's mine plan, mining would progress into the Federal lease tracts. Though the Proposed Action would not result in an annual emission rate increase, or a change in the life of the mine, the Proposed Action would contribute to criteria pollutants and HAPs being emitted based on extraction of approximately 11.3 million tons of Federal coal instead of privately leased coal.

Under the Proposed Action, emissions would be generated in the same manner as under the No Action Alternative. PM emissions would be generated from surface mining operations such as land clearing, topsoil and subsoil removal and placement, and overburden/interburden removal and placement in the backfill, coal extraction, loading and transporting to handling facilities, coal processing and storage, mine haul roads, coal transportation, and reclamation. Dust suppression techniques are used throughout mine operations to manage fugitive particulate emissions. Permit No. AOP-28093 v4.0 mandates the control of fugitive dust through the requirements listed in the Affected Environment section: Falkirk Mine, including watering; revegetation; delay of topsoil disturbance until necessary; surface compaction; sealing; covering, shielding, and enclosing stockpiles; and adding dust palliatives, pavement, or other surface treatment to haul roads. The permit also requires that conveyors, transfer points, and crushers be constructed or treated to minimize PM emissions. The Falkirk Mine uses bag filters to control certain emission units associated with the coal processing facilities. These required fugitive dust control measures would limit direct PM impacts to air quality.

The Falkirk Mine complies with the Federally enforceable dust control requirements of Permit No. AOP-28093 v4.0 through compliance with the EPA's NSPS Subpart Y and by following a site-specific fugitive dust control plan. Haul road and access road dust is controlled by several methods: main haul roads are periodically treated with a dust suppression agent that binds and hardens the running surface. Large capacity water trucks are also used to wet down haul roads, trails, pit ramps, and exposed coal roads. Motor graders blade roads as needed to reduce dust formation material.

Criteria pollutants such as CO, SO₂, exhaust PM, and NO_x would also be emitted from vehicles and mining equipment under the Proposed Action, along with HAPs and VOCs. CO, SO₂, and NO_x would be emitted as a result of detonation of explosives in infrequent blasting operations (included in the summary table below under direct fugitive dust sources). The same annual emissions would occur under the No Action Alternative.

The Proposed Action emissions are listed in **Table 14** and are based on approximately 11.3 million tons of minable Federal coal mined over 15 years. **Table 14** presents the total criteria pollutant and HAP emissions for the life of the project, which would occur over 15 years. These emissions would also occur under the No Action Alternative by mining 11.3 million tons of coal around the Federal coal tracts over 15 years. This estimate includes 1 year of shipping coal to Spiritwood.

Table 14. Falkirk Mine Proposed Action Emissions - total Emissions from Extraction of Federal Coal

Source	Pollutant Emissions (total tons)						
	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	HAP
Point sources	1.48	0.24	–	–	–	–	–
Fugitive dust sources (direct)	818.77	93.69	6.32	1.60	0.19	–	–
Mobile source exhaust (direct)	30.99	30.06	186.47	1,309.11	2.16	38.58	14.95
Total	851.24	123.99	192.79	1,310.71	2.35	38.58	14.95

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

The Proposed Action would not result in an increase in the average annual production at the Falkirk Mine and employee levels would remain unchanged because the 11.3 million tons of coal would be mined around the Federal coal tracts (rather than directly from the Federal coal tracts) over 15 years under the No Action Alternative. Direct effects to air quality from mining, transportation, and reclamation of the Federal lease tracts would continue at current levels. The Proposed Action represents approximately 11.3 million tons of Federal coal mined over 15 years. These emissions are accounted for in the annual emissions provided in **Table 12**. This specific Federal coal would not be mined under the No Action Alternative; however, other coal privately leased around the Federal coal tracts would be mined. The lessor (private or Federal) of 11.3 million tons of coal is the only difference when comparing the Proposed Action to the No Action Alternative. No NAAQS exceedances or near exceedances, nor impacts to human health, are expected to occur as a result of the ongoing mining operation at the mine.

The emissions from the Falkirk Mine would not impact visibility at Class I areas. Fugitive dust emissions from mine operations include PM₁₀ and PM_{2.5} emissions. The majority of particulate emissions from surface coal mines are large particles or PM emitted at or near ground level with little or no buoyancy. Best management practices are required by the state of North Dakota to ensure that dust from ground-disturbance operations and overburden handling limit visible emissions from sites. Additionally, lignite, the type of coal mined in North Dakota, has 20% to 40% weight percent moisture content, naturally mitigating impacts from fugitive dust emissions from coal (EPA 1998b); therefore, surface coal mines are not the typical contributors to regional haze. The role of regional transport of fine particles and aerosols that contribute to elevated PM levels and regional haze impairment has been well-documented. There are no Class I areas or sensitive Class II areas within the direct effects analysis area for air quality. The nearest Class I area is more than 150 km away from the Falkirk Mine.

In addition, the mine continues to operate in compliance with Permit No. O85004, its fugitive dust control plan, and NDAC Chapter 33-15-03: Restriction of Emission of Visible Air Contaminants. NCAC Chapter 33-15-03 specifies that no person may discharge into ambient air, meaning outside the property boundary, visible emissions that exceed an opacity greater than 20%, except that a maximum of 40% opacity is permissible for not more than one 6-minute period per hour.

Employee Commutes

Employees commuting to and from the Falkirk Mine on paved and unpaved roads would create criteria pollutants and HAP emissions, as well as fugitive dust emissions, which are an indirect impact of mining operations at the Falkirk Mine. However, the Proposed Action is not expected to contribute to additional

employee commutes when compared to the No Action Alternative. The total estimated emissions from employee commutes during the 15-year duration of the Proposed Action are disclosed in Appendix D.

Coal Combustion

The Coal Creek Station has been granted a Title V permit to operate and PSD permit, and the facility is required to comply with Federally enforceable permit conditions. Future emissions from the combustion of coal from the Federal lease tracts are not expected to change the total annual emissions at the Coal Creek Station because the amount of coal produced at the Falkirk Mine and delivered to the Coal Creek Station would remain unchanged from current production levels. Thus, the indirect effects of coal combustion from the Proposed Action are not expected to cause NAAQS exceedances or near exceedances, exceed PSD Class I and II increments (including visibility, and acid deposition impacts), or cause increases in cancer risk or health indices (including HAPs impacts). Furthermore, indirect emissions at the Coal Creek Station could be lower than what is calculated if the carbon sequestration plans are implemented. Emissions from the combustion of Federal coal associated with the Proposed Action at Coal Creek Station are presented in **Table 15**. Note that these levels of emissions would also occur under the No Action Alternative but would result from combustion of non-Federal coal.

Table 15. Estimated Emissions Associated with Combustion of the Federal Coal from the Lease by application Tracts at the Coal Creek Station (tons)

Pollutant	One Year	Total (over 15 years)
Coal Creek Station		
CO	178.70	2,680.44
NO _x	658.84	9,882.59
PM ₁₀	108.67	1,630.01
PM _{2.5}	101.08	1,516.25
SO ₂	642.79	9,641.91
VOC	14.29	214.35
Mercury	0.02	0.27
Ammonia	0.01	0.19
Hydrochloric acid	3.36	50.45
Hydrofluoric acid	2.80	41.99
Lead	0.00	0.00
Total HAPs*	6.69	100.39

Source: NDDEQ (2023)

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

* HAPs associated with the facility include heavy metals, hazardous VOCs, and inorganic hazardous air pollutants. These include lead, ethyl benzene, n-hexane, hydrochloric acid, hydrogen fluoride, arsenic, chromium (VI) compounds, mercury, nickel, and manganese.

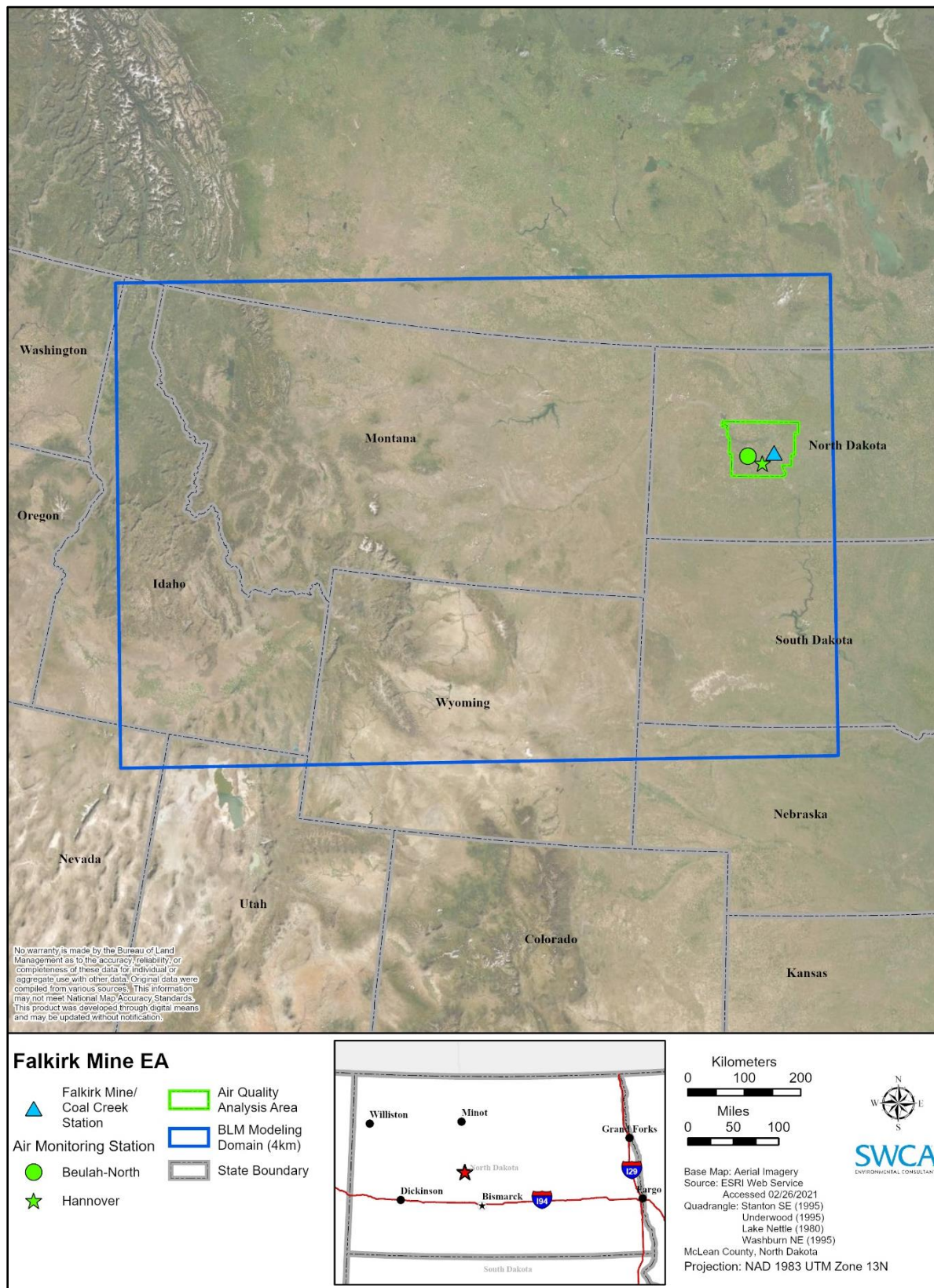
Air Quality Impacts

Past and present actions that contribute to baseline air quality conditions in the analysis area are described herein. Most past and present action emissions (that are still occurring) consist of fugitive dust, criteria pollutant and HAP emissions from coal mining operations, coal-fired power plants, oil and gas wells, other industrial sources, and agriculture. Active mines in the air quality impacts analysis area include the Falkirk Mine, Freedom Mine, Coyote Creek Mine, and Center Mine. The emissions from the mines and their associated coal combustion facilities are limited by Permits to Construct issued by NDDEQ, which

specifies each mine's maximum allowable coal production rate. Typically, the Falkirk Mine produces approximately 8 million tpy, the Freedom Mine produces approximately 14 tpy, the Coyote Creek Mine produces approximately 2 tpy, and the Center Mine produces approximately 4 million tpy (Lignite Energy Council 2020). Current levels of emissions from the Falkirk Mine and downstream facilities are disclosed in the Air Quality Affected Environment: Downstream End-Use Facilities section. Other coal mines located within the analysis area have emissions of similar character (mostly fugitive dust emissions and off-and on-road equipment combustion emissions from mining operations). Coal-fired power plants and other major industrial sources using coal as a feedstock within the analysis area include Coal Creek Station, Antelope Valley Station, Coyote Station, Leland Olds Station, Milton R. Young Station, and the Dakota Gasification Plant. These stations are PSD major source facilities and subject to PSD and BART Applicability Review as part of the Regional Haze Rule planning process. Production rates for these stations are available on the EIA website; annual criteria pollutant and HAP emission rates are available on the NDDEQ website (NDDEQ 2023; EIA 2025a).

Additionally, there is ongoing oil and gas development and production occurring within McLean and Mercer Counties in North Dakota, as well as within the wider effects analysis area (**Figure 14** shows the effects analysis area for air quality and AQRVs). Oil and gas development operations emit criteria pollutants (primarily VOCs and NO_x) and HAPs. Various wind development projects are occurring within the impacts analysis area, which will contribute fugitive dust and construction equipment exhaust emissions associated with development (see **Appendix C**). Agricultural practices are also present within the analysis area including haylands, row crops, small grains, and grazing. Typically, emissions from these sources are predominated by fugitive dust; however, some minor emissions from off-road and on-road equipment also occur.

Figure 14. Air quality effects analysis area



Emissions of air pollutants at the Falkirk Mine are currently limited by a production rate condition in its 2021 air quality permit (Permit No. AOP-28093 v4.0). Because the proposed LBA is a continuation (rather than an increase) of current surface mining, no air quality permit modification would be required if the Proposed Action is implemented. The Proposed Action would not change the annual coal production levels; therefore, there would be no incremental increase in annual emissions from implementation of the Proposed Action. Mining would transition from mined-out areas of the Falkirk Mine into the Federal lease tracts. Similarly, there would be no incremental increase in combustion emissions of the Federal coal mined from the lease tracts. Impacts from emissions due to combustion of Federal coal from the Falkirk Mine would occur over a period of 15 years.

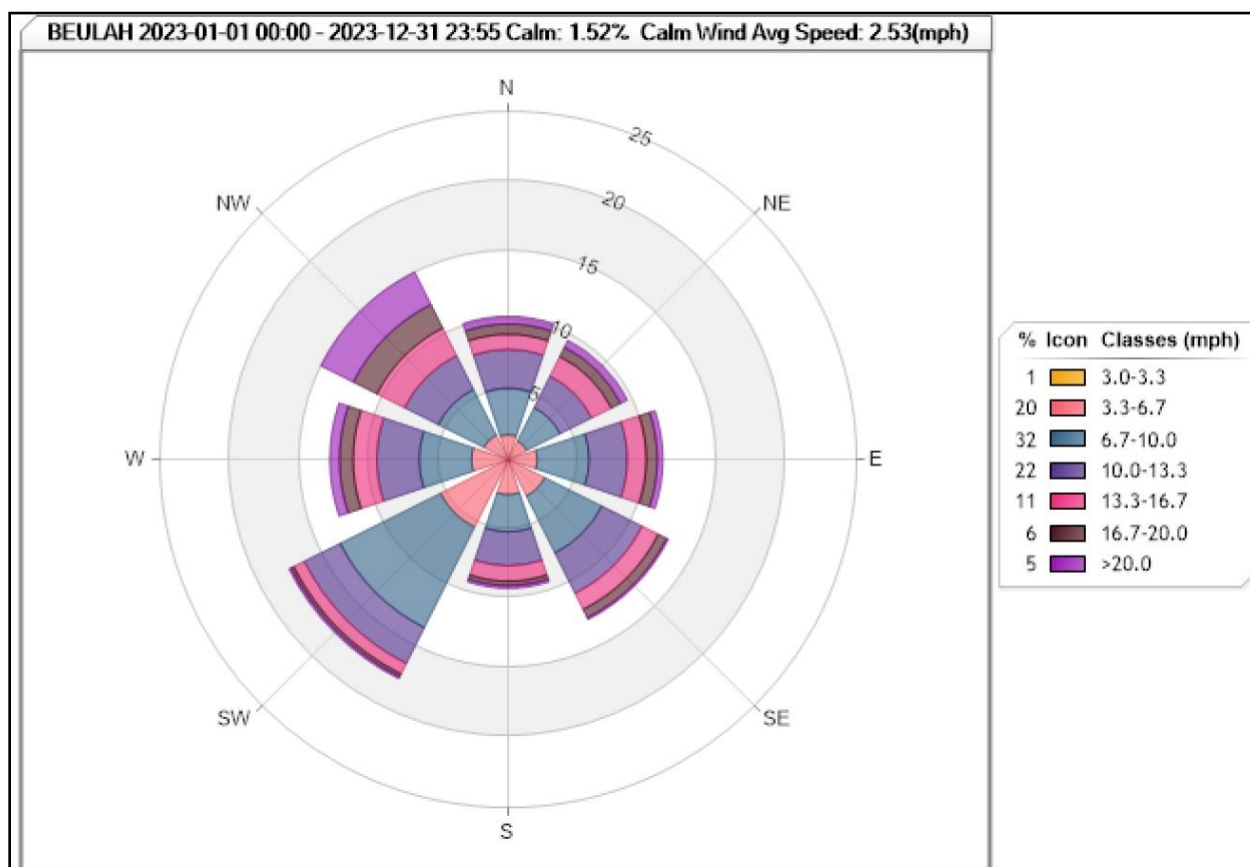
Reasonably foreseeable development includes continuation of mining activities (and associated coal combustion) as follows: mining operations at the Coyote Creek Mine are expected to continue through 2040; mining operations at the Freedom Mine and the Falkirk Mine are expected to continue through 2045. Mining operations at the Center Mine are expected to continue through 2042. It is not anticipated that the annual rate of coal production or consumption will increase during this time frame (EIA 2023).

Oil and gas development is projected to continue in North Dakota and the wider effects analysis area. It is estimated that Federal oil and natural gas production in Montana, the Dakotas, and Wyoming will be approximately 3 million barrels per year and 13.1 billion cubic feet per year, respectively per the Miles City Field Office Approved Resource Management Plan Amendment (BLM 2024a).

Impacts related to foreseeable future oil and gas development (in combination with existing and future projected levels of coal mining and coal combustion) were assessed in a photochemical modeling study conducted for the BLM (Ramboll 2024a). The modeling study modeled emissions based on a base case, a high-growth, and a low-growth oil and gas development future emissions scenario that included fugitive sources, point sources, natural sources, and all major sources with emissions projected for the year 2032. This study modeled potential NAAQS impacts out to 2032 based on the baseline conditions and both high- and low-growth oil and gas development scenarios. The study included 36-, 12-, and 4-km impact assessment modeling domain. There were no projected exceedances of the NAAQS under the modeled scenarios.

Far-field visibility and deposition impacts were also modeled based on baseline conditions and reasonably foreseeable oil and gas development and other future projected emissions in the RMP area. The study projects that reasonably foreseeable development in the RMP area may cause exceedances of the 1-dv change threshold and 0.5-dv change threshold for visibility at several Class I areas, including Theodore Roosevelt National Park, which is approximately 94 miles northwest and southwest of the Proposed Action area. However, the degree that the Proposed Action itself would contribute to the AQRV impacts is likely to be minor because of the distance from the Class I areas and because the Proposed Action would not increase existing emission rates. The Beulah North wind rose for 2023 shows calm wind at an average wind speed of 2.53 miles per hour (**Figure 15**). The wind rose indicates winds from the southwest have the greatest frequency, followed by winds from the northwest (NDDEQ 2024). Because the Proposed Action area is located east of Theodore Roosevelt National Park and the primary wind direction is generally from the west, this further reduces the potential contribution of the project to impact visibility at this Class I area.

Figure 15. Beulah North Wind Rose



Additionally, in response to the photochemical grid modeling study, the BLM is taking appropriate action to monitor impacts from oil and gas development in the area to lessen impacts to AQRVs. For example, the BLM has funded a deposition study at Medicine Lake that is being implemented by Colorado State University. Because of the BLM's actions to monitor and lessen impacts to AQRVs, impacts to AQRVs are not expected to be significant.

Although the Proposed Action would not result in an annual increase in mercury emissions, the combustion of the Federal coal would contribute mercury emissions at the levels disclosed in **Table 15** of the Air Quality Environmental Impacts Alternative B: Coal Combustion section. The combustion of non-Federal coal under the No Action Alternative would also contribute mercury emissions at the levels in **Table 15**. As discussed in the Air Quality Affected Environment Regulatory Compliance: Mercury Deposition section, mercury emissions have been regulated by the MATS rule and associated MACT regulations, which has led to the coal-fired power plants within the analysis area to install and implement control technologies. Coal Creek Station has installed control technology to reduce mercury emissions and complies with the applicable MACT standards. Since the reductions have been in place, the available mercury deposition data shows relatively steady levels of mercury deposition at the Lostwood National Wildlife Refuge (see **Figure 13**). Since these regulatory requirements were implemented, the stationary source emissions have been reduced, and the Proposed Action would not increase the currently permitted emission levels of mercury.

Similarly, increased regulation of major sources of HAP emissions and implementation of control technologies have the co-benefit of reducing impacts to human health. It is not anticipated that the cancer

risk and health indices discussed in the Air Quality Affected Environment Regulatory Compliance: Emissions section would worsen. Therefore, additional effects to human health are not anticipated.

Environmental Impacts – Alternative C

Coal Mining

Under Alternative C only tracts 2 and 3 (320 acres) that have split mineral ownership would be leased. No impacts to air quality would occur from the leasing action; however, similarly to Alternative B, impacts to air quality from surface mining are evaluated in this section. Alternative C would result in leasing a total of 320 acres comprising the Federal coal tracts, including approximately 3.7 million tons of Federal coal. Similar to Alternative B, mining of the Federal lease tracts would occur under the current air quality permit. Should Alternative C be the selected alternative, the same Federally enforceable requirements and best management practices as discussed in Environmental Impacts Alternative B (Proposed Action) would be implemented. Because of the additional work needed to mine around the other tracts of Federal coal, the direct and indirect emissions associated with Alternative C would be of the same character, but of greater quantity than those associated with the Proposed Action. Under Alternative C, the coal is anticipated to be mined over the same time period (approximately 15 years) as the Proposed Action.

The Alternative C emissions are listed in **Table 16** and are based on 3.7 million tons of total minable Federal coal. **Table 16** presents the total criteria pollutant and HAP emissions for the life of the project, which would occur over the timeframe needed to mine the Federal coal.

Table 16. Falkirk Mine Alternative C Emissions – Total Emissions from Extraction of Federal Coal

Source	Pollutant Emissions (total tons)						
	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	HAP
Point sources	0.46	0.07	–	–	–	–	–
Fugitive dust sources (direct)	252.65	28.90	1.95	0.49	0.06	–	–
Mobile source exhaust (direct)	9.68	9.39	59.26	409.19	0.67	12.10	4.61
Total	262.78	38.36	61.21	409.68	0.73	12.10	4.61

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

Employee Commutes

Employees commuting to and from the Falkirk Mine on paved and unpaved roads would create criteria pollutants and HAP emissions, as well as fugitive dust emissions, which are an indirect impact of mining operations at the Falkirk Mine. However, Alternative C is not expected to contribute to additional employee commutes when compared to the No Action Alternative. The total estimated emissions from employee commutes during the 15-year duration of Alternative C are disclosed in Appendix D.

Coal Combustion

Indirect air pollutant emissions from the combustion of the coal mined from the Federal lease tracts under Alternative C can be estimated using current emissions from the downstream end-use facilities. Approximately 3.7 million tons of minable coal are in the Federal lease tracts associated with Alternative C, and for this analysis it is assumed that all 3.7 million tons of coal would be removed and sent to downstream facilities over a 15-year period. Emissions from the combustion of Federal coal associated with Alternative C at Coal Creek Station are presented in **Table 17**.

Table 17. Estimated Emissions Associated with Combustion of the Alternative C Coal from the Lease by of Tracts 2 and 3 at the Coal Creek Station (tons)

Pollutant	One Year	Total (over 15 years)
Coal Creek Station		
CO	55.17	827.57
NO _x	203.41	3,051.18
PM ₁₀	33.55	503.25
PM _{2.5}	31.21	468.13
SO ₂	198.46	2,976.87
VOC	4.41	66.18
Mercury	0.01	0.08
Ammonia	0.00	0.06
Hydrochloric acid	1.04	15.57
Hydrofluoric acid	0.86	12.97
Lead	0.00	0.00
Total HAPs*	2.07	31.00

Source: NDDEQ (2023)

Note: PM₁₀ = PM between 2.5 and 10 micrometers in diameter; PM_{2.5} = PM less than 2.5 micrometers in diameter.

* HAPs associated with the facility include heavy metals, hazardous VOCs, and inorganic hazardous air pollutants. These include lead, ethyl benzene, n-hexane, hydrochloric acid, hydrogen fluoride, arsenic, chromium (VI) compounds, mercury, nickel, and manganese.

Air Quality Impacts

Overall impacts in the analysis area of Alternative C and impacts related to foreseeable future oil and gas would be similar to the impacts discussed in Alternative B. The impacts discussion is relevant to both Alternatives B and C.

3.2 Greenhouse Gas Emissions

The analysis area used primarily to assess any impacts to climate change in the Northern Great Plains Region (encompassing the states of Montana, Wyoming, North Dakota, South Dakota, and Nebraska).

Further discussion of climate science and predicted impacts, as well as the reasonably foreseeable and cumulative greenhouse gas (GHG) emissions associated with BLM's fossil fuel actions, are included in the *BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends* (BLM, 2023) (Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to development and consumption of fossil fuels produced on public lands and mineral estate managed by the BLM. The Annual GHG Report is incorporated by reference as an integral part of this analysis and is available at <https://www.blm.gov/content/ghg/>

Affected Environment

The climate of North Dakota is characterized by large seasonal temperature variations, light to moderate irregular precipitation, plentiful sunshine, low humidity, and almost continuous wind. The annual average temperature ranges from approximately 37 degrees Fahrenheit (°F) in the northeastern part of the state to 44°F along most of the southern border. Annual average precipitation ranges from approximately 14 to 22 inches, and winter snowpack averages 9 to 15 inches, depending on the area of the state. In the western portion of the state, prevailing wind directions are west, northwest, and north during most of the year,

although this depends somewhat on the season. In the summer, winds blow from the south. Average wind speeds range from 10 to 13 miles per hour (Enz 2003).

From 1999 through 2023 in McLean County, the average maximum yearly temperature was 52.5°F. The average minimum yearly temperature was 30.0°F (Midwestern Regional Climate Center [MRCC] 2025). During the same period, the maximum yearly precipitation was 30.5 inches. The minimum yearly precipitation was 10.9 inches, with a normal of 18.0 inches (MRCC 2025).

The EPA regulates GHG emissions under several initiatives, including the Mandatory Greenhouse Gas Reporting Rule, the Final Greenhouse Gas Tailoring Rule, geologic sequestration requirements, and EPA and National Highway Traffic Safety Administration standards for new motor vehicles. Under the Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98), coal mines subject to the rule are required to report emissions in accordance with the requirements of Subpart FF. Subpart FF is applicable only to underground coal mines and would not apply to the Proposed Action. Because no change to the production levels or annual emissions at the Falkirk Mine would occur under the Proposed Action, no other GHG reporting or permitting requirements would apply.

CO₂ is the primary GHG emitted through human activities, accounting for 80% of the total U.S. GHG emissions in 2022. By comparison, CH₄ accounted for 12% of the total U.S. GHG 2020 emissions, N₂O accounted for 6%, and fluorinated gases accounted for nearly 3% (EPA 2024h). The main human activity emitting CO₂ is the combustion of fossil fuels (including the combustion of coal) for electricity, heat, and transportation (EPA 2025e). CH₄ is released from coal after it has been uncovered during surface mining operations. In addition, minor amounts of CH₄ are released during coal extraction, storing, loading, transportation, crushing, and storage. CH₄ is also emitted from the production and transport of natural gas and oil as well as from livestock, other agricultural practices, and the decay of organic waste in municipal solid waste landfills (EPA 2025e). N₂O is emitted from agricultural and industrial operations as well as during the combustion of fossil fuels and solid waste. Fluorinated gases, which are synthetic, are emitted from a variety of industrial processes (EPA 2025e).

The term *carbon dioxide equivalent* (CO₂e) is used to describe different GHGs in a common unit. For reference, see the below sources:

- The 100-year time horizon in its *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022* (EPA 2024h)
- The GHG Reporting Rules requirements under 40 CFR 98(A)
- The GWPs and time horizon consistent with the *IPCC Sixth Assessment Report, Climate Change 2021: The Physical Science Basis, Chapter 7: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity* (Forster et al. 2021)

Surface coal mines in the United States reported emissions of approximately 6.0 million metric tons (MMmt) CO₂e in 2022 (compared to a total of 43.6 MMmt CO₂e emissions from all U.S. coal mining and a total of 6,343.2 MMmt of CO₂e emissions from all sources across the country) (EPA 2024h). The surface coal mine emissions represent approximately 13.8% of all coal mining CO₂e emissions and about 0.09% of all CO₂e emissions in the United States for 2022.

The EPA's Mandatory Greenhouse Gas Reporting Rule requires industrial facilities and suppliers of fossil fuels or industrial gases that result in greater than 25,000 metric tons (MT) CO₂e of GHG emissions per year to report emissions. **Table 18** lists the industry sector, number of reporting facilities, and total GHG emissions for the United States and the state of North Dakota for reporting year 2023 from the EPA's Facility Level Information on Greenhouse Gases Tool (FLIGHT) (EPA 2024i). These data are useful to

understand which large sources of anthropogenic emissions are contributing to GHG emissions both nationally and at the state level.

Further insight into trends in GHG emissions in the state of North Dakota can be seen in **Figure 16**. FLIGHT data from 2010 through 2023 show variations in GHG emissions year-over-year, with an overall 2% decrease in emissions in the state of North Dakota from 2010 through 2023 (EPA 2024i). For further context, the Coal Creek Station, for which indirect impacts of the Proposed Action were evaluated, emitted 7.72 MMmt of CO₂e in 2023.

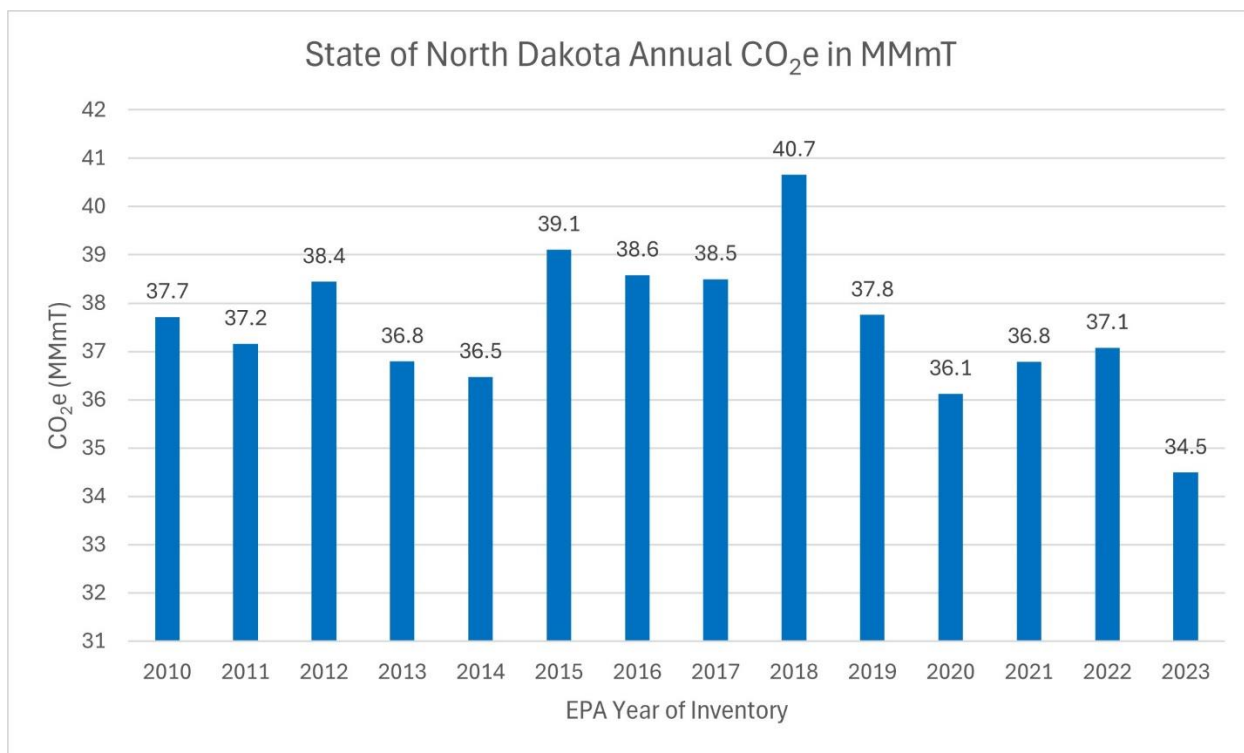
Table 18. 2023 Greenhouse Gas Large Emitters by Sector

Industry Sector	Number of Reporting Facilities (United States)	Number of Reporting Facilities (North Dakota)	United States Reported GHG Emissions (MMmt of CO ₂ e)	North Dakota Reported GHG Emissions (MMmt of CO ₂ e)	Global Anthropogenic GHG Emissions (MMmt of CO ₂ e)
Power plants	1,320	10	1,471	26	—
Petroleum and natural gas systems	2,298	32	322	2.5	—
Refineries	133	1	162	0.7	—
Chemicals	462	2	185	2.9	—
Other	1,332	10	118	0.8	—
Minerals	385	3	109	1.1	—
Waste	1,453	11	100	0.5	—
Metals	295	0	79	0	—
Pulp and paper	208	0	32	0	—
Total*	7,544	64	2,578	34.5	51,800[†]

* Total reporters shown may be less than the sum of the number of reporters in the selected source categories because some facilities fall within more than one source category.

[†] Rivera et al. (2024)

Figure 16. State of North Dakota annual carbon dioxide equivalent in million metric tons.



Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the lease tracts at the Falkirk Mine would not be leased and/or a Federal mining plan would not be approved. Thus, no Federal coal within those tracts would be mined, and no emissions from mining or combustion of the Federal coal would occur. Although the Federal coal would not be leased under the No Action Alternative, the mine would conduct surface-disturbance operations on the private land overlying the unmined tracts. The anticipated surface disturbance under the No Action Alternative would be approximately 1,600 acres. As discussed in Chapters 1 and 2, due to the availability of leased private coal resources located within the permit boundary and adjacent areas, the projected life of the Falkirk Mine would not change under the No Action Alternative and is anticipated to continue through 2045 regardless of whether the Federal coal is leased and mined.

Coal Mining

Direct impacts of coal mining include the emissions of GHGs from combustion emissions from on- and off-road equipment used in mining operations, as well as coal methane venting. Emission of GHGs would occur during surface-disturbance operations, including GHG emissions from vehicles and equipment, which would be a subset of emissions due to normal mining activities. Based on the 3-year average of coal mining activities (a coal production rate of approximately 7.4 million tpy), the annual GHG emissions from mining under the No Action Alternative are estimated to be approximately 104,078 MT of CO₂e based on 100-year GWPs or 179,874 MT CO₂e based on 20-year GWPs. At the maximum annual permitted production rate for the mine (34 million tpy), the estimated GHG emissions from mining could be up to 478,694 MT of CO₂e per year based on 100-year GWPs or 829,278 MT of CO₂e per year based on 20-year GWPs. The mine is unlikely to achieve this production rate, although it is authorized for this level of production.

Employee Commutes

Mobile source combustion emissions associated with Falkirk Mine employee commuting activities are an indirect impact of the mine's operation. An estimate of worker commute GHG emissions for the No Action Alternative are included in Appendix D. This source could result in approximately 765 MT CO₂e per year on a 100-year GWP basis or 778 MT CO₂e per year on a 20-year GWP basis.

Coal Combustion

Under the No Action Alternative, no Federal coal would be leased, extracted, or combusted. Operations at Coal Creek Station would continue unchanged. GHG emissions from the Coal Creek Station were 7,717,340 MT of CO₂e in 2023 based on the 100-year GWP values (EPA 2024i). On a 20-year GWP basis, GHG emissions from the Coal Creek Station were 7,762,300 MT of CO₂e in 2023.

It is estimated that approximately 330,000 tons of coal would be shipped to Spiritwood Station in between 2024 and 2026 via a process unique to Coal Creek Station and Spiritwood Station. The unique load out facility at Coal Creek Station is currently scheduled for demolition as part of the carbon capture project and there is currently no plan to rebuild the load out facility.

Climate Impacts

The estimated total GHG emissions associated with mining and handling of coal under the No Action Alternative through 2045 are listed in **Table 19**. The values listed below represent estimated total emissions over the life of the mine at the average annual production rate of 7.4 million tons per year for years 2021 through 2045.

Table 19. Summary of Total Greenhouse Gas Emissions from the No Action Alternative over the Life of Mine

GHG	Mining (MT)	Postmining (MT)	Mobile Equipment Source Emissions (MT)	Combustion (MT)	Total Emissions (MT)	100-Year GWP CO ₂ e* (MT)	20-Year GWP CO ₂ e* (MT)
CO ₂	–	–	1,527,134	191,450,950	192,978,084	192,978,084	192,978,084
CH ₄	29,592	6,341	18	21,328	57,279	1,706,902	4,725,484
N ₂ O	–	–	136	3,103	3,238	884,081	884,081
Total	–	–	–	–	–	195,569,067	198,587,649

Note: CH₄ = methane

Note: Mining and post-mining emissions include only methane off-gassing

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

It is assumed for the No Action Alternative analysis that mining and end-use combustion emissions would continue based on the historical average annual production rate of 7.4 million tpy until 2045, assuming a base year of 2021. The estimated annualized emission rates of GHGs are 7,719,123 MT CO₂ per year, 2,291 MT CH₄ (68,276 MT as 100-year CO₂e) per year, and 130 MT N₂O (35,363 MT as 100-year CO₂e) per year over the life of the mine. Emissions from coal extraction, transportation, mining operation, and end-use combustion are assumed to result from currently authorized coal and the new Federal coal tracts would not be mined.

To put the estimated GHG emissions shown in Table 19 in context, potential emissions that could result can be compared to other common activities that generate GHG emissions, and 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 the activity contemplated under the No Action is equivalent to 1.65 million gasoline-fueled passenger vehicles driven for one year, or the emissions from 0.95 million homes' electricity use for one year.

Table 20 shows the GHG emissions of the No Action Alternative to mine 11.3 million tons of non-Federal coal over the course of 15 years. This includes shipping coal to Spiritwood Station in 2026. Because the mining of the coal would be done while having to work around the Federal coal tracts, additional equipment will be needed to mine the same amount of coal compared to the Proposed Action. A detailed description of the types of emissions can be found in the Proposed Action discussion (Alternative B).

Table 20. Summary of Total Greenhouse Gas Emissions from 11.3 Million Tons of Non-Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use combustion under the No Action Alternative

GHG	Mining (MT)	Postmining (MT)	Mobile Equipment Source Emissions (MT)	Combustion (MT)	Total Emissions (MT)	100-Year GWP CO ₂ e* (MT)	20-Year GWP CO ₂ e* (MT)
CO ₂	–	–	116,080	16,604,697	16,720,777	16,720,777	16,720,777
CH ₄	1,926	413	1.4	1,869	4,209	125,428	347,242
N ₂ O	–	–	10.3	272	282	77,034	77,034
Total	–	–	–	–	–	16,923,240	17,145,054

Note: Mining and post-mining emissions include only methane off-gassing

To put the estimated GHG emissions for shown in Table 20 in context, potential emissions that could result can be compared to other common activities that generate GHG emissions, and 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 mining non-Federal coal under the No Action is equivalent to 0.24 million gasoline-fueled passenger vehicles driven for one year, or the emissions from 0.14 million homes' electricity use for one year.

Environmental Impacts – Alternative B (Proposed Action)

Coal Mining

GHG emissions from surface mining under the Proposed Action are evaluated in this section. The Proposed Action would result in direct CH₄ emissions from Federal agency action from 1) exposure of the coal and other gas-bearing strata during mining operations (mining emissions), 2) coal processing or handling, and 3) coal storage and transportation. As discussed in Chapters 1 and 2, due to the availability of leased private coal resources within the permit boundary and adjacent areas, the projected life and annual emissions of the Falkirk Mine would be the same under the Proposed Action as under the No

Action Alternative and is anticipated to continue through 2045 regardless of whether the Federal coal is leased and mined. That said, the specific emissions associated with the Federal coal mining disclosed below would be the result of Federal agency action, unlike the No Action Alternative.

The GWPs used to calculate CO₂e emissions presented in this section are based on the IPCC’s Sixth Assessment Report *Climate Change 2021: The Physical Science Basis* and are listed in **Table 21** for the 100-year and 20-year timescale (Forster et al. 2021). Refer to Section 3.4 of the BLM Annual GHG for additional information regarding GWPs.

Table 21. Global Warming Potential of Project Greenhouse Gases (Proposed Action)

Pollutant	100-Year GWP	20-Year GWP
CO ₂	1	1
CH ₄	29.8	82.5
N ₂ O	273	273

Most of the CH₄ emitted would be from the coal beds through natural fractures when it is uncovered in the mine pit. Coal is uncovered in the pit, loaded, and hauled out based on the mining sequence. The time between coal uncovering and excavation can vary between days or weeks, pending mine scheduling needs. Some CH₄ that remains in the coal is liberated during processing (Kirchgessner et al. 2000). Following excavation, hauling, and handling, very little CH₄ likely remains in the coal. Coal storage-related and transportation emissions are termed *postmining emissions*.

Estimated total CH₄ emissions from Proposed Action Federal coal mining and postmining operations are shown in **Table 22**. These emissions, as well as those in

Table 23, would also occur under the No Action Alternative over the 15-year period encompassing the Proposed Action, but the emissions would be from mining non-Federal coal.

Table 22. Estimated Total Methane Emissions from mining and Postmining Operations (Proposed Action)

Proposed Action Activity	Total Coal Production from Lease-by-Application Tracts (tons)	Methane Emission Factors*	Estimated Total Methane Emissions from Mining and Postmining		
			MT of CH ₄	100-Year GWP MT of CO ₂ e [†]	20-Year GWP MT of CO ₂ e [†]
Mining	11,957,859	8.4 cubic feet/ton or 0.161 kilogram/ton	1,926	57,389	158,880
Postmining (includes storage and transportation)	11,957,859	1.8 cubic feet/ton or 0.0345 kilogram/ton	413	12,298	34,046
Total	11,957,859	–	2,338	69,687	192,925

* Data from EPA (2024i).

For the Proposed Action, the total estimated CH₄ emissions from the mining of the Federal lease tracts is expected to be 2,338 MT, or 69,687 MT of CO₂e on a 100-year GWP basis. Assuming these emissions

occur over 15 years, this would represent 0.077% of the 6.0 MMmt of CH₄ CO₂e reported from U.S. surface coal mines in 2022 on the basis of a 100-year GWP.

The combustion of fuel by off-road equipment at the mine, as well as transport of coal to the Coal Creek Station, would also result in GHG emissions. These emissions are estimated and listed in **Table 23**.

Table 23. Estimated Greenhouse Gas Emissions from Mine-Related Mobile Source Equipment over the Life of the Project (Proposed Action)

Source	MT of CO ₂	MT of CH ₄	MT of N ₂ O	100-Year GWP MT of CO ₂ e*	20-Year MT GWP of CO ₂ e*
Off-road equipment (direct)	97,701.6	1.10	8.83	100,146	100,204
Total	97,701.6	1.10	8.83	100,146	100,204

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's Sixth Assessment Report *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

Employee Commutes

The Proposed Action (like the No Action Alternative) will result in indirect impacts from workers commuting to the Falkirk Mine. Worker commute emissions are presented in Appendix D. GHG emissions from worker commutes associated with mining of Federal coal are estimated to be approximately 1,232 MT of CO₂e and 1,673 MT CO₂e on a 100-year and a 20-year GWP basis, respectively. However, employee commute emissions are expected to be the same over the life of the mine under the Proposed Action and No Action scenarios.

Coal Combustion

The Proposed Action would also result in indirect emissions of CO₂, CH₄, and N₂O from the combustion of mined coal at the Coal Creek Station. Coal from the Federal lease tracts would not change the annual GHG emission levels at the Coal Creek Station because combustion of coal is a continuation of existing authorized operations at the facilities. That said, the combustion of approximately 11.3 million tons of Federal coal mined from the Federal lease tracts would produce GHG emissions. These emissions would also occur under the No Action Alternative over the 15-year period encompassing the Proposed Action, but the emissions would be from non-Federal coal.

There is not expected to be an annual increase in GHG emissions as a result of the Proposed Action, and the Federal coal emissions would be a subset of those emissions presented in the No Action Alternative. The combustion of Federal coal would likely occur over 15 years. However, the presence of GHG emissions in the atmosphere are long lived. **Table 24** shows the estimated GHG emissions resulting from the combustion of approximately 11.3 million tons of Federal coal contained in the lease tracts. The estimate of GHG emissions from coal combustion are based on default CO₂, CH₄, and N₂O Emission Factors in 40 C.F.R. § 98(C):

$$\begin{aligned} \text{emissions (mass of GHGs emitted – kg)} &= \text{fuel (mass of fuel combusted – short tons)} \\ &\times \text{lignite coal HHV (MMBtu/short ton)} \times \text{emission factor (kg GHG/MMBtu)} \end{aligned}$$

Table 24. Estimated Total Greenhouse Gas Emissions Associated with the Combustion of the Federal Coal from the Lease-by-Application Tracts over the Life of the Project (Proposed Action)

GHG	Estimated Total GHG Emissions from Combustion				
	CO ₂ (MT)	CH ₄ (MT)	N ₂ O (MT)	100-Year GWP MT of CO ₂ e*	20-Year GWP MT of CO ₂ e*
Coal Creek Station	16,604,697	1,869	272	16,734,619	16,833,122
Total	16,604,697	1,869	272	16,734,619	16,833,122

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

The total estimated GHG emissions from the off-site combustion and processing of coal mined from the Federal lease tracts is about 16,734,619 MT of CO₂e (16.7 MMmt of CO₂e) on a 100-year GWP basis. The CO₂e emissions can reasonably be divided over 15 years based on the planned production rate of the Federal coal to obtain annual emission estimates.

Climate Impacts

Total GHG emissions associated with mining and handling the Federal coal and the off-site combustion of the mined coal from only the Federal lease tracts are summarized in **Table 25**. The values listed below represent estimated total emissions over the life of the project.

Table 25. Summary of Total Greenhouse Gas Emissions from Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use Combustion under the Proposed Action

GHG	Mining (MT)	Postmining (MT)	Mobile Source Emissions (MT)	Combustion (MT)	Total Emissions (MT)	100-Year GWP CO ₂ e* (MT)	20-Year GWP CO ₂ e* (MT)
CO ₂	–	–	100,224	16,604,697	16,704,921	16,704,921	16,704,921
CH ₄	1,926	413	1.2	1,869	4,209	125,423	347,229
N ₂ O	–	–	8.9	272	281	76,642	76,642
Total	–	–	–	–	–	16,906,986	17,128,792

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's Sixth Assessment Report *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

It is assumed that the Federal coal would be mined over a period of 15 years as specified in the mine plan. Federal coal would be mined from 2026 through 2035, then from 2041 through 2045. The total estimated annualized emission rate of 7,719,126 MT CO₂ per year, 2,291 MT CH₄ (68,276 MT as 100-year GWP CO₂e) per year, and 130 MT N₂O (35,363 MT as 100-year GWP CO₂e) per year is used in the analysis over the life of the mine. These annualized emission rates represent the emissions from mining both private and Federal coal at the average annual production rate of 7.4 million tons per year. Part of those annualized emission rates, approximately 1,113,661 MT CO₂, 281 MT CH₄ (8,362 MT as 100-year GWP CO₂e), and 18.7 MT N₂O (5,109 MT as 100-year GWP CO₂e) would be specific to Federal agency action from the mining of Federal coal under the Proposed Action.

To put the estimated GHG emissions from mining the Federal coal at the mine under the Proposed Action alternative in context, potential emissions that could result can be compared to other common activities

that generate GHG emissions, and 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 the activity contemplated under the Proposed Action for mining of the Federal coal is equivalent to 0.24 million gasoline-fueled passenger vehicles driven for one year, or the emissions from 0.14 million homes' electricity use for one year. Likewise, the projected average annual GHG emissions from the activity contemplated under the Proposed Action for mining of both the Federal and non-Federal coal is equivalent to 1.6 million gasoline-fueled passenger vehicles driven for one year, or the emissions from 0.94 million homes' electricity use for one year.

Regional Climate Impacts

This section discusses the regional effects resulting from the BLM's Federal coal leasing program (wherein the Proposed Action is contextualized).

Federal Regional Coal Program Emissions

Table 26 shows historical Federal coal production trends for North Dakota, Montana, and Wyoming and compares them to total United States coal production (BLM 2024b). The Federal coal production in Montana, North Dakota, and Wyoming are shown as a percentage of total U.S. production and as a percentage of total Federal coal production based on the averages of the full 5 years of data presented.

Table 26. Total U.S. and Regional Federal Coal Production Trends (tons)

State/Region	2019	2020	2021	2022	2023	Percentage of Total U.S. Coal Production (%)*	Percentage of Federal Coal Production (%)
U.S. total	706,309,263	535,434,354	577,431,278	594,155,282	580,386,061	100	N/A
Federal total	302,146,258	246,492,649	252,264,178	270,194,425	242,842,109	43.89	100
Montana (Federal)	18,067,706	13,407,510	10,614,886	12,759,947	9,207,466	2.14	4.88
North Dakota (Federal)	4,375,332	2,996,726	4,340,950	5,349,940	4,423,101	0.72	1.64
Wyoming (Federal)	251,903,536	206,625,803	217,807,957	232,982,333	217,134,087	37.63	85.73

* Federal coal production makes up 43.9% of total U.S. production on a 5-year annual average basis.
Source: BLM (2024b).

Emissions in MMmt of CO₂e based on 2023 Federal coal production (see **Table 26**) and Federal production of oil and gas are presented in **Table 27** for calendar year 2023. These estimates are based on the percentage of Federal minerals and emission factors for mineral end-use extraction, combustion, transportation, and processing. **Table 27** lists total Federal mineral leasing emissions for 2023. For context, the Proposed Action would result in Federal coal production of about 0.8 million tons of coal per year, which would be approximately 0.35% of the combined 2023 Federal coal production in Montana, North Dakota, and Wyoming (the Northern Great Plains states with significant Federal coal production) and 0.33% of the 2023 U.S. total Federal coal production.

Table 27. Estimated Emissions from Federal Mineral Combustion, Extraction, Transportation, and Processing (MMmt of CO₂e)

State/Region	Extraction	Processing	Transportation	Combustion	Total CO ₂ e
U.S. total (Federal)	67.23	37.05	62.00	880.04	1,046.33
Montana (Federal)	0.35	0.17	0.55	23.08	24.16
North Dakota (Federal)	3.90	2.40	2.02	31.45	39.76
Wyoming (Federal)	12.10	5.16	18.80	440.96	477.02
Montana/Dakotas/Wyoming (Federal)	16.35	7.73	21.37	495.49	540.94

Source: BLM (2024b).

The estimated emissions associated with Federal mineral leasing for the region (Northern Great Plains) are approximately 51.7% of the total U.S. Federal mineral leasing emissions. The regional and national scale emissions from the Federal mineral leasing program represent approximately 8.5% and 16.5% of the total U.S. emissions (6,343 MMmt of CO₂e), respectively, based on the Inventory of U.S. Greenhouse Gas Emissions and Sinks data from 2022. The regional and national scale emissions estimate from the Federal mineral leasing program represents 1.0% and 2.0% of 2023 global emissions (51,800 MMmt of CO₂e), respectively (BLM 2024b). The Proposed Action (on an annual basis over 15 years) is estimated to represent approximately 2.83% of 2023 Federal emissions in North Dakota, 0.21% of 2023 Federal emissions in the Northern Great Plains, and 0.11% of 2023 Federal mineral leasing emissions nationally.

There are a variety of ways to project emissions forward in time to estimate the impacts of the BLM mineral leasing program for the purpose of analysis. The availability of data, the projection time frame, and the nature of the action itself will often dictate the appropriate methodology (and corresponding assumptions) to be used.

Table 28 shows estimated Federal GHG total emissions based on long-term Annual Energy Outlook (AEO) forecasts for development over the next 28 years. **Table 28** also lists the 28-year projected Federal emissions at a state and national level resulting from existing leases, the development of approved applications for permits to drill, and emissions related to reasonably foreseeable lease actions. The total emissions from development and operation of these near-term Federal projects are considered reasonably foreseeable emissions from Federal mineral development. Additional discussion on projection methods used to estimate future production and GHG emissions from Federal fossil fuel authorizations is presented in Chapters 6 and 7 of the Annual GHG and Climate Trends Report (BLM 2024b).

Table 28. Projected 2022 to 2050 Greenhouse Gas Emissions from Fossil Fuel Combustion, Extraction, Transportation, and Processing (MMmt of CO₂e) (Proposed Action)

State/Region	2022–2050 Total CO ₂ e Emissions (MMmT)
U.S. total (Federal and non-Federal)* AEO outlook data (long-term development projections)	190,997.00
U.S. total (Federal) AEO outlook data (long-term development projections)	24,845.00
U.S. total (Federal) existing and reasonably foreseeable development	12,678.28
Montana (Federal) existing and reasonably foreseeable development	314.42

State/Region	2022–2050 Total CO ₂ e Emissions (MMmT)
Wyoming (Federal) existing and reasonably foreseeable development	7,148.56
North Dakota (Federal) existing and reasonably foreseeable development	440.04
Montana/North Dakota/Wyoming (Federal) existing and reasonably foreseeable development	7,903.02

* Based on projections made from the 2023 AEO data, fossil fuel mineral development on Federal land accounts for 13.01% of total U.S. GHG emissions (BLM 2024b).

Based on the AEO data presented in **Table 28**, Federal fossil fuel extraction, transportation, processing, and combustion emissions could constitute up to 13.0% of total U.S. GHG fossil fuel extraction, transportation, processing, and combustion emissions over the period of 2022 to 2050. Existing and reasonably foreseeable Federal projects (including oil and gas applications for permits to drill and potential lease sales) could contribute to emissions from fossil fuel extraction, transportation, processing, and combustion within the United States. These emissions are projected to result in 12,678 MMmt of CO₂e in the United States from 2022 to 2050 (BLM 2024b).

Table 29 shows how the Proposed Action estimated percentage of the total emissions (as shown in **Table 28**) over 15 years (total life of the project).

Table 29. Proposed Action Portion of Projected 2022 to 2050 Greenhouse Gas Emissions from Fossil Fuel Combustion, Extraction, Transportation, and Processing (MMmt of CO₂e)

State/Region	Percentage of Proposed Action Contribution to 2022–2050 Total 100-Year GWP CO ₂ e Emissions
U.S. total (Federal and non-Federal)	0.01%
U.S. total (Federal) AEO outlook data (long term development projections)	0.07%
U.S. total (Federal) existing and reasonably foreseeable development	0.13%
North Dakota (Federal) existing and reasonably foreseeable development	3.84%
Montana/Dakotas/Wyoming (Federal) existing and reasonably foreseeable development	0.21%

Source: BLM (2024b).

Environmental Impacts – Alternative C

For the purpose of brevity, much of the discussion and explanation of environmental effects of GHG emissions under Alternative C is omitted here. For additional context, please refer to Environmental Impacts – Alternative B (Proposed Action) section as the relevant descriptions of table data and emission calculation methodology applies. To reduce redundancy, only tables disclosing the estimated emissions under Alternative C and a brief comparison of emissions at multiple scales are included below.

Coal Mining

Estimated total CH₄ emissions from Alternative C mining and postmining operations are shown in **Table 30**.

Table 30. Estimated Total Methane Emissions from Mining and Postmining Operations (Alternative C)

Proposed Action Activity	Total Coal Production from Lease-by-Application Tracts (tons)	Methane Emission Factors*	Estimated Total Methane Emissions from Mining and Postmining		
			MT of CH ₄	100-Year GWP MT of CO ₂ e [†]	20-Year GWP MT of CO ₂ e [†]
Mining	3,691,903	8.4 cubic feet/ton or 0.161 kilogram/ton	595	17,719	49,053
Postmining (includes storage and transportation)	3,691,903	1.8 cubic feet/ton or 0.0345 kilogram/ton	127	3,797	10,511
Total	3,691,903	—	722	21,515	59,564

* Data from EPA (2024i).

[†] CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

Assuming the emissions listed in **Table 30** would occur over 15 years, the annualized Falkirk Mine Alternative C CH₄ venting emissions would represent 0.024% of the 6.0 MMmt of CH₄ CO₂e reported from U.S. surface coal mines in 2022 on the basis of a 100-year GWP.

The combustion of fuel by off-road equipment at the mine, as well as transport of coal to the Coal Creek Station, would also result in GHG emissions. These emissions are estimated and listed in **Table 31**.

Table 31. Estimated Greenhouse Gas Emissions from Mine-Related Mobile Source Equipment over the Life of the Project (Alternative C)

Source	MT of CO ₂	MT of CH ₄	MT of N ₂ O	100-Year GWP MT of CO ₂ e*	20-Year GWP MT of CO ₂ e*
Off-road equipment (direct)	30,164.7	0.34	2.73	30,919	30,937
Total	30,164.7	0.34	2.73	30,919	30,937

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's Sixth Assessment Report *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

Employee Commutes

Alternative C will result in indirect impacts from workers commuting to the Falkirk Mine. Worker commute emissions are presented in Appendix D. GHG emissions from worker commutes associated with mining of Federal coal are estimated to be approximately 516 MT of CO₂e and 517 MT CO₂e on a 100-year and a 20-year GWP basis, respectively.

Coal Combustion

Alternative C would also result in indirect emissions of CO₂, CH₄, and N₂O from the combustion of mined coal at the Coal Creek Station. **Table 32** shows the estimated GHG emissions resulting from the combustion of approximately 3.7 million tons of Federal coal contained in the lease tracts.

Table 32. Estimated Total Greenhouse Gas Emissions Associated with the Combustion of the Federal Coal from the Lease-by-Application Tracts over the Life of the Project (Alternative C)

GHG	Estimated Total GHG Emissions from Combustion				
	CO ₂ (MT)	CH ₄ (MT)	N ₂ O (MT)	100-Year GWP MT of CO ₂ e*	20-Year GWP MT of CO ₂ e*
Coal Creek Station	5,126,581	577	84	5,166,693	5,197,106
Total	5,126,581	577	84	5,166,693	5,197,106

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

The total estimated GHG emissions from the off-site combustion and processing of coal mined from the Federal lease tracts is about 5,166,693 MT of CO₂e (16.7 MMmt of CO₂e) on a 100-year basis. The CO₂e emissions can reasonably be divided over 15 years based on the planned production rate of the Federal coal.

Climate Impacts

Total GHG emissions associated with mining and handling the coal and the off-site combustion of the mined coal from the Federal lease tracts are summarized in **Table 33**. The values listed below represent total emissions over the life of the project.

Table 33. Summary of Total Greenhouse Gas Emissions from Federal Coal Extraction, Transportation, Associated Mining Operations, and End-Use Combustion under Alternative C

GHG	Mining (MT)	Postmini ng (MT)	Mobile Source Emissions (MT)	Combustion (MT)	Total Emissions (MT)	100-Year GWP CO ₂ e* (MT)	20-Year GWP CO ₂ e* (MT)
CO ₂	—	—	31,535	5,126,581	5,158,116	5,158,116	5,158,116
CH ₄	595	127	0.42	577	1,299	38,725	107,208
N ₂ O	—	—	2.75	84	87	23,667	23,667
Total	—	—	—	—	—	5,220,507	5,288,991

* CO₂e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's Sixth Assessment Report *Climate Change 2021: The Physical Science Basis* (Forster et al. 2021).

It is assumed that the Federal coal would be mined over a period of 15 years as specified in the mine plan. In the United States, the Falkirk Mine direct and indirect emissions under Alternative C would contribute

0.01% of total U.S. GHG emissions if all 3.7 million tons of Federal coal was extracted and delivered to down-stream facilities.

Impacts from Alternative C would be similar to the impacts discussed in Alternative B. The impacts discussion for Alternative B is relevant to both Alternatives B and C.

Trends in Global, United States, and North Dakota Greenhouse Gas Emissions

Emissions Levels

Preliminary estimates from the Rhodium Group for 2023 show global emissions at 51.8 gigatons of carbon dioxide equivalent (Gt of CO₂e), representing a 1.2% increase from 2022 levels (Rivera et al. 2024). In 2022, China accounted for 25% of all global emissions, the United States accounted for 12% of global GHG emissions, and India and the European Union accounted for 7% each (Rivera et al. 2024). In 2022, GHGs were emitted across the following primary economic sectors globally: industry (30%); electric power generation (28%); land use, agriculture, and waste (19%); transportation (16%); and buildings (7%) (Rivera et al. 2024). The Proposed Action (mining, commuting, transportation, and combustion) annual emissions represent approximately 0.002% of 2023 global annual GHG emissions.

The EPA tracks GHG emissions in the United States through two complementary programs. First is the Inventory of U.S. Greenhouse Gases and Sinks, which is the annual GHG emissions inventory published by EPA that represents all United States emissions (EPA 2024h). The second is the Greenhouse Gas Reporting Program (GHGRP), which generally applies to facilities that emit more than 25,000 metric tons of carbon dioxide equivalent (MT of CO₂e) each year (EPA 2021). The facility-level emissions reported under GHGRP are published through FLIGHT (EPA 2024i). The EPA estimates that the FLIGHT data reported by large emitters reflect 50% of the total U.S. emissions (EPA 2024i).

In 2022, total gross U.S. GHG emissions were 6,343 MMmt of CO₂e, and net emissions were 5,489 MMmt of CO₂e (EPA 2024h). Net GHG emissions include both anthropogenic and natural emissions of GHGs as well as removals by sinks (e.g., carbon uptake by forests). From 2005 to 2022, net GHG emissions in the United States declined by 18%. This decline reflects the combined impacts of long-term trends in population and economic growth, energy markets, technological changes including energy efficiency, and energy fuel choices. Net GHG emissions increased from 2021 to 2022 by 1.3%. The primary driver for the increase was an 0.7% increase in CO₂ emissions and a 2.7% increase in fluorinated gases. The economic sectors that were primarily responsible for this increase consist of a 4.5% increase in the commercial businesses sector and a 5.9% residential homes sector increase. CO₂ is the primary GHG contributing to total U.S. emissions, accounting for 80% of the total GHG emissions in 2022. By comparison, CH₄ accounted for 12% of emissions, N₂O accounted for 6% of emissions, and fluorinated gases accounted for 3% of emissions. In 2022, GHGs were emitted across the following primary economic sectors in the United States: transportation (28%), electric power/electricity generation (25%), industry (23%), agriculture (10%), residential homes (6%), and commercial businesses (7%) (EPA 2024h). The Proposed Action annual emissions represent approximately 0.02% of 2022 net annual U.S. GHG emissions.

In 2023, total North Dakota GHG emissions from large emitters were 34.5 MMmt of CO₂e. GHGs were emitted across the following primary economic sectors in North Dakota: electric power/electricity generation (77%), chemical producers (9%), petroleum and natural gas systems (6%), mineral mining (3%), refineries (3%), waste management (1%), and other sources (1%) (EPA 2024i). In 2022, the gross total North Dakota GHG emissions from all sources was 87.8 MMmt of CO₂e. The Proposed Action annual emissions represent approximately 1.3% of 2022 gross annual North Dakota GHG emissions.

Federal lands contribute GHG emissions, from activities such as fossil fuel extraction and combustion, as well as carbon sequestration, which is the process of capturing and storing atmospheric CO₂ through uptake into soils, vegetation, aquatic environments, and other ecosystems (biologic sequestration) or

through injection into porous underground rock formations (geologic sequestration). The USGS has estimated GHG emissions and carbon sequestration on Federal lands for the 18-year period from 2005 to 2022 (Merrill et al. 2024). GHG emissions (when considering just CO₂) associated with the combustion and extraction of fossil fuels from U.S. Federal lands decreased from 1,362 MMmt of CO₂e in 2005 to 1,081 MMmt of CO₂e in 2022. CO₂, CH₄, and N₂O emissions from Federal lands all decreased over the 18-year period. When the Federal lands' fossil fuel extraction and combustion emissions are combined with ecosystem emissions and sequestration estimates, the annual net carbon emissions from Federal lands within the conterminous United States (48 contiguous states) ranged from 422 MMmt of CO₂e to 915 MMmt of CO₂e from 2005 to 2021. The annual net carbon emissions from North Dakota ranged from 2.3 to 33.4 MMmt of CO₂e from 2005 to 2021. (Merrill et al. 2024). The Proposed Action annual emissions represent approximately 3.4% of North Dakota's Federal lands 2021 emissions and 0.1% of national Federal lands' 2021 emissions.

The BLM's 2023 *Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends* also presents the estimated emissions of GHGs attributable to fossil fuels produced on lands and mineral estate managed by the BLM. More specifically, the report estimates GHG emissions from coal, oil, and gas development that is occurring, and is projected to occur, on the Federal onshore mineral estate. The BLM estimated a total of 434.78 MMt CO₂e from all coal production on Federal lands in 2023 and 6.26 MMt CO₂e from all coal production on Federal lands in North Dakota in 2022 (BLM 2024b). The Proposed Action's annual emissions represent approximately 0.26% of national 2023 Federal coal emissions, and 2.44% of North Dakota's 2023 Federal coal emissions. However, the Coal Creek Station is planning implementation of Carbon Capture, Utilization, and Storage (CCUS) facilities. Under the Proposed Action, approximately 1.13 MMmt of CO₂e would be emitted annually from 2026 to 2035 and from 2041 to 2045 which represents approximately 0.02% of the annual U.S. GHG emissions.

The contribution from a single proposed land management action to global GHGs cannot be accurately translated into its potential effect on global climate 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 resulting from a specific subset of emissions. A discussion of past, current, and projected future climate impacts is described in Chapters 8 and 9 of the BLM 2023 Annual GHG Report which describe observed climate impacts globally, nationally, and in each State, and present a range of projected impacts depending on future GHG emissions. These chapters are incorporated by reference in this analysis. The United States currently does not have a carbon budget with which to compare the Proposed Action's potential emissions. Although a global carbon budget does exist, a comparison of the Proposed Action's potential emissions to the global carbon budget would not be useful given the relative size of the global carbon budget.

Irretrievable and Irreversible Effects

The Falkirk Mine does not currently employ any CCUS technology, and there are no permit requirements to employ CCUS or reduce GHG emissions through other means; therefore, direct GHG emissions from the Proposed Action and their contribution to global GHG levels will likely occur throughout the life of the mine. Indirect GHG emissions resulting from downstream combustion of the coal at power plants can be mitigated through carbon capture and emission control technologies, if implemented.

Analysis and Conclusion

Coal is transported to the associated Coal Creek Station via a conveyor system or truck loading operations. Falkirk Mine has a contract with the Coal Creek Station to supply coal at a maximum permitted production rate of 34 million tons per year that extends through 2045. Coal Creek Station is permitted to operate through 2040, and Falkirk Mine is anticipated to operate through the lifetime of the

Coal Creek Station. Falkirk has non-Federal coal leases sufficient to supply Coal Creek Station through 2045. Although Falkirk Mine could supply Coal Creek Station with non-Federal coal sources, Falkirk Mine has applied to mine coal within Federal leases through 2045 because this would make for a more efficient mine plan. The Falkirk Mine is expected to have a mining rate of approximately 7.4 million tons per year and the life of the mine is planned through 2045, regardless of whether the Proposed Action is approved or not. Additional equipment would be needed under the No Action Alternative to mine at the same rate but around the Federal coal tracts. Given this, annual GHG emissions from mining, commuting, transportation, and combustion under the Proposed Action would be approximately the same as or less than the emissions under the No Action Alternative. Therefore, regardless of whether the Proposed Action is approved or not, average annual emissions from Proposed Action mining, commuting, transportation, and combustion are expected to be approximately 0.03% of 2020 global emissions, 0.01% of 2022 U.S. emissions, 3.0% of 2021 North Dakota emissions, 3.8% of 2023 North Dakota's Federal lands emissions, and 0.13% of 2023 national Federal lands emissions.

Overall, there is very little increase in life of the project GHG emissions between the No Action and the Proposed Action from the inclusion of the Federal coal to the overall project.

The BLM lacks the data and tools to estimate specific, climate-related effects from the project alternatives. Nor has the EPA set specific limits on GHG emissions. As a result, there are no established thresholds, qualitative or quantitative, for the NEPA analysis to assess the GHG emissions of an action in terms of the action's effect on climate, incrementally or otherwise. Further, no scientific data in the record would allow the BLM, in the absence of an agency carbon budget or similar standard, to evaluate the significance of the GHG emissions from this proposed action or the other alternatives analyzed.

3.3 Cultural Resources and Native American Religious Concerns

Affected Environment

Cultural Resources

The cultural resources in the affected environment consist of all cultural resources present. These include prehistoric and historic-age archaeological resources, historic-age architectural resources, and tribal resources that may be present on the Federal lease tracts. Such resources may include, but are not limited to, buildings, sites, objects, structures, and districts that are at least 50 years of age and represent human social interaction and/or interaction with the natural or built environment as well as cultural landscapes, traditional cultural properties (TCPs), and cemeteries (National Park Service 1997). Past and present actions in the cultural resource analysis area that would contribute to aggregate effects include active mining activities at the Falkirk Mine, agricultural activities, and previous archaeological studies that may have caused disturbance.

A literature review of the North Dakota State Historic Preservation Office site and manuscript files was completed on August 14, 2018. It revealed that 20 previous investigations were conducted within a one-mile radius of the area of potential effects (APE) from 1976 to 2017. A Class III cultural survey was completed in June 2020 for the Falkirk Mine East Permit Extension 8 in McLean County, ND.

A total of 3,680 block acres were surveyed, which cover lands identified in Alternatives B (800 acres) and C (320 acres) and an additional 2,880 acres surrounding the proposed lease tracts. The majority of the survey area was completed in 2018 but was not fully completed because of land access issues and the presence of crops that obscured the ground. The Class III inventories identified 10 prehistoric sites, 12 historic sites, and 20 isolated finds (See **Table 34**). The areas surveyed for alternatives B and C included only two of those sites. Isolated finds typically lack the integrity to convey their significance and are usually not eligible for inclusion on the National Register of Historic Places (NRHP).

Table 34. Cultural Resources within Alternatives B and C

Temporal Affiliation	Site Type	Eligibility	# of Resources
Prehistoric	Lithic Scatter	Eligible	0
		Not eligible	0
		Unevaluated	1
	Stone Ring(s)	Eligible	0
		Not eligible	0
		Unevaluated	6
	Stone Features/Arcs/Cairn(s)	Eligible	0
		Not eligible	0
		Unevaluated	3
	Isolated lithics	Eligible	0
		Not eligible	0
		Unevaluated	13
Historic	Windmill	Eligible	0
		Not eligible	1
	Residence/Farmstead	Eligible	1
		Not eligible	6
	Historic Cultural Material Scatter/Stock Dam	Eligible	0
		Not eligible	4
	Isolated Finds	Eligible	0
		Not eligible	7
Total			42

Prehistoric archaeological sites represent 55% of the cultural resources documented during the survey. They include a handful of isolated lithics as well as numerous sites with various types of stone features including stone rings, cairns, and arcs. None of the sites possess temporal indicators, although the types of sites identified indicate use of the area by Northern Plains Native American groups. Historic-age sites consist primarily of early to mid-twentieth-century farmsteads and are associated with the onset of homesteading in the region. Also present are 4 material scatters, 1 windmill, 7 residences/farmsteads, and 7 isolated finds, all dating to the early to mid-twentieth century. The BLM has determined that the 18 historic-age sites are not eligible for the NRHP. All 23 prehistoric archaeological sites remain unevaluated. As these sites cannot currently be shown to be ineligible for the NRHP, they are considered eligible and treated as historic properties for the purposes of this assessment. No sites located in the analysis area are listed in the NRHP. Coordination and consultation between the BLM, OSMRE and the North Dakota SHPO will continue during planning and any potential steps for resolution of adverse effects.

From the cultural resources surveys, 2 cultural resource sites exist within the tracts. One of the cultural resources sites is a historical farm with standing structures located within tract 1, which has been recommended not eligible for the National Register of Historic Places. The other cultural resources site includes a historical windmill base and dump located within Tract 4; recordation and land ownership research show that the site has been recommended ineligible for the National Register of Historic Places.

All 23 prehistoric archaeological sites remain unevaluated. As these sites cannot currently be shown to be not eligible for the NRHP, they are considered eligible and treated as historic properties for the purposes of this assessment. No sites located in the analysis area are listed in the NRHP. Coordination and consultation between the BLM, OSMRE and the North Dakota SHPO will continue during planning and any potential steps for resolution of adverse effects. No known TCPs, or those resources of religious and cultural importance to Native Americans, are present in the analysis area. However, the 23 prehistoric archaeological sites containing stone features may represent TCPs. Consultation between the BLM and the 19 Native American tribes is ongoing (refer to Section 4.2 of this EA).

Based on these findings, the BLM and OSMRE recommend a determination of no historic properties affected for the 800 acres of Federal coal proposed in the LBA and the area identified for the mining plan. The BLM made a recommendation of No Historic Properties Affected for leasing the Federal coal, and concurrence was met on this decision with the ND SHPO on May 12, 2021, under ND SHPO Ref: 20-0400, 20-MT030-089. Further analysis of cultural resources is not required.

For all projects, Consultation, collaboration, and coordination for the identification of cultural resources and mitigation of disturbance or detrimental effects is robust and ongoing. The BLM will not approve any ground disturbing activities that may affect such properties or resources until it completes its obligations and applicable requirements under the National Historic Preservation Act (NHPA) and any other authorities. The BLM may require modification to the development of proposed tracts to protect such properties or may disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Further, Native American belief systems and traditional practices can vary widely across traditional tribal lands and require ongoing consultation and coordination to ensure that an action authorized by the BLM will not impede or impair practices or locations that are deemed as Traditional Cultural Properties or are otherwise important. The BLM has reviewed all tracts that may have possible historic properties and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O 13007, or other statutes and executive orders. The BLM may require modification to the development of proposed tracts to protect unevaluated, eligible, or other such properties, or may disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the Federal coal resources contained in the Federal lease tracts would not be leased and/or a Federal mining plan would not be approved; thus, no Federal coal within those tracts would be mined. Approximately 1,600 acres of private land overlying the Federal coal tracts and adjacent areas would experience surface-disturbance activities as Falkirk has an access agreement in place with private landowners as well as approval from NDPSC and OSMRE that allows the mine to conduct surface disturbance activities on these tracts. Upon completion of disturbance activities, such as overburden stock piling to support the mining of private coal resources in areas adjacent to the Federal lease tracts, the area would be reclaimed as described in the current NDPCS permit documents. Impacts to cultural resources could occur from the No Action Alternative, as surveys indicate there are cultural resources in and near the proposed tracts. The disturbance of cultural resources as a result of the No Action Alternative would be mitigated through the issuance and administration of the NDPSC mine permit as the NDPSC is required to coordinate with the ND SHPO prior to initiating any surface disturbance.

Environmental Impacts – Alternative B (Proposed Action)

Under the Proposed Action, a coal lease for the Federal lease tracts would be issued to Falkirk, OSMRE would recommend approval of the Federal mining plan to the ASLM, and the ASLM would approve the mining plan (with or without conditions), allowing the Federal lease tracts to be mined. No impacts to cultural resources would occur from the leasing action.

Environmental Impacts – Alternative C

The Environmental Impacts under Alternative C would be equal to, or less than, those described for Alternative B, the Proposed Action, above.

3.4 Socioeconomics

Affected Environment

The analysis area for potential socioeconomics effects is McLean County. This analysis area was selected because it is a political boundary for which economic and demographic data are available and includes the communities that could experience direct and indirect impacts from the proposed LBA and subsequent mining operations.

North Dakota Coal Industry

North Dakota contains an estimated 25 billion tons of economically minable lignite coal (Murphy 2020). In 2022, North Dakota had 7 surface coal mines that produced coal to supply electric-generating stations in the state. These seven mines produced approximately 26.7 million tons in North Dakota (**Table 35**). The Falkirk Mine produced approximately 7.5 million tons of coal in 2022, which was approximately 28% of the 2022 coal production in North Dakota (**Table 35**) (North Dakota Office of State Tax Commissioner 2022a). There are currently five coal-fired power plants in North Dakota (EIA 2020b). Falkirk supplies coal to Coal Creek Station and on an as-needed basis to the Spiritwood Station. At both stations, the coal is combusted to generate electricity.

Table 35. North Dakota Coal Production

Mining Company	County	Coal Production (million tons)
American Colloid	Bowman	0.03
BNI Coal, Ltd	Oliver	3.79
Coteau Properties	Mercer	13.42
Falkirk Mining Co.	McLean	7.53
Leonardite Products	Williams	0.03
Westmoreland Beulah Mining	Mercer	0.04
Coyote Creek	Mercer	1.84
Total		26.68

Taxes and Revenue

Fiscal effects resulting from the coal mining industry are provided in the form of various taxes and revenues paid by mining companies and from the Federal government to state and local governments

where coal production occurs. In addition to the fiscal effects from taxing coal mining-related income, state and local governments receive other types of taxes, royalties, and funds as a result of mining operations conducted in McLean County. The following types of revenues to state and local governments result from mining operations in McLean County:

- Coal severance tax: A volume-based tax levied by the State of North Dakota with revenues primarily distributed to coal-producing counties or non-producing counties within 15 miles of a mine (North Dakota Office of the Tax Commissioner 2022b).
- Coal conversion facilities privilege tax: A volume-based tax levied on operators of a coal conversion facility for the privilege of producing electricity or other products from coal conversion plants (North Dakota Office of the Tax Commissioner 2022b).
- State mineral leasing royalty: A value-based royalty negotiated by lease, paid on the gross value of coal on state lands (NDCC 27-20-34).
- Federal coal royalty payments received by the DOI Office of Natural Resources Revenue (ONRR), a portion of which are disbursed to the State of North Dakota.

Coal produced from the Federal mineral estate is subject to royalty payments and disbursements under the MLA. The current Federal royalty rate for surface-mined coal is 12.5% of the gross sales value of the coal produced and is paid to the DOI ONRR; however, Section 39 of the MLA, as amended and supplemented (30 USC § 209), authorizes the Secretary of the Interior to temporarily permit royalty rates that are lower than the statutory minimum Federal royalty rate (12.5%). Royalties are paid by mining companies to the Federal government, which in turn dispenses them to the state of origin, typically at the rate of 50%. In calendar year 2022, the State of North Dakota reported \$2,072,319 in Federal coal rents and royalty payments to the DOI ONRR (ONRR 2022a). Royalty disbursement data are not released by the Federal government for the county level.

Distribution of coal royalty revenue from the state is derived from North Dakota's Coal Development Fund. Thirty percent of the distributed funds are placed into a Constitutional Trust Fund administered by the Board of University and School Lands. These funds are used to supply loans to school districts, cities, or counties impacted by coal development (North Dakota Office of the Tax Commissioner 2022b). Seventy percent of the distributed coal royalty revenues are provided to the counties apportioned by the amount of coal each county produces. This revenue is distributed to the county's general fund (40%), cities within the county (30%), and school districts within the county (30%) (North Dakota Office of the Tax Commissioner 2022b).

In 2022, McLean County's annual budget actuals reported a total general fund revenue of \$8,566,203, of which approximately \$283,000 was derived from coal severance tax revenue and \$226,000 came from coal conversion tax revenue disbursed from the state (Knutson 2023). The total coal severance tax disbursed to McLean County was approximately \$773,000. However, approximately \$490,000 of that amount was used to repay the state for coal impact loans and did not contribute to the general fund. These tax revenues represent approximately 6% of the county's general fund revenue (Knutson 2023).

Reclamation Fee

As per SMCRA Section 402 (a): All operators of coal mining operations subject to the provisions of this Act shall pay to the Secretary of the Interior, for deposit in the fund, a reclamation fee of 22.4 cents per ton of coal produced by surface coal mining...except for the reclamation fee for lignite coal shall be at a rate of 2 per centum of the value of the coal at the mine, or 6.4 cents per ton, whichever is less. Further, Section 402 (g)(A) states that 50% of the reclamation fees collected annually in any State...shall be allocated annually by the Secretary to the State, subject to such State having each of the following (i) An

approved abandoned mine reclamation program pursuant to section 405..and (C) The fund allocated by the Secretary under this paragraph to States and Indian tribes shall only be used for annual reclamation project construction and program administration grants.

Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the Federal coal resources contained in the tracts would not be leased and/or a federal mining plan would not be approved; thus, no Federal coal would be mined. Therefore, the Federal government, the State of North Dakota, and McLean County would not receive the resultant royalties, bonus payments, and resulting tax revenue associated with the bypassed Federal coal tracts, which would be based on approximately 11.3 million tons of Federal coal mined during a 15-year period. Socioeconomics in the analysis area would continue to be affected by ongoing mining operations at the Falkirk Mine through the life of the mine, which is scheduled to remain open through 2045. Existing employment at the mine would not be affected. **Table 36** presents the expected tax revenue generated under the No Action Alternative. Estimates are calculated over a 15-year period for comparison to the Proposed Action.

Table 36. Taxable Coal Severed from Non-Federal Land During a 15-year Period

Coal Production (million tons)*	Taxable Coal Production (million tons)†	2 Cent/Ton Lignite Research Fund Tax (millions of 2023 dollars)	37.5 Cent/Ton Coal Severance Tax (millions of 2023 dollars)	Tax Revenue Disbursed to McLean County (millions of 2022 dollars)
112.5	110.1	\$2.2	\$41.3	\$28.9

* Estimated as Falkirk Mine's 2022 coal production projected for 15 years, or 7.5 million tons × 15.

† Estimated as 112.5 million tons × 97.9%. In 2022, 97.9% of coal produced at Falkirk Mine was taxable.

Because the No Action Alternative would not affect coal production levels, employment levels, or life of mine at the Falkirk Mine, it would have no overall impacts on revenue, taxes, royalties, employment, demographics, or housing in the socioeconomics analysis area.

Environmental Impacts – Alternative B (Proposed Action)

Approximately eleven million (11.3M)) tons of coal would be mined for either action alternative during the 15-year period. Under the No Action Alternative, the coal would be exclusively private coal, and under the Proposed Action, the coal would be a combination of private and Federal coal. Coal mined from a Federal lease in North Dakota is subject to the Federal royalty in addition to the state coal severance tax (North Dakota Office of State Tax Commissioner 2023). Falkirk would pay a royalty on the amount of Federal coal that is severed from the tracts, and about half of the royalty payments will be directed to the state/county. Additionally, the mineral ownership of Federal coal in sections 2 and 3 is 50% undivided, meaning that 50% of the royalty revenue stream would be allocated to non-Federal owners, and the other 50% of royalty revenue would be allocated to the United States, of which approximately half would then be paid to the state/county. As outlined in Falkirk (2021), Federal coal in secs. 2 and 3 totals approximately 6.7 million tons. Therefore, of the approximate 11.3 million tons of coal in the Federal tracts, effectively 8.6 million tons, would be subject to the full Federal royalty. When Federal coal is being produced from the tracts, royalties are paid monthly by the operator.

Under the Proposed Action, a coal lease for the Federal tracts would be issued to Falkirk, and OSMRE would recommend approval of the Federal mining plan with or without conditions. The Proposed Action would result in the mining of approximately 11.3 million tons of Federal coal. The average sales price for coal in North Dakota in 2019 was \$18.93 per short ton (EIA 2020a). The EIA projects that mine-mouth (coal purchased at the mine rather than delivered) prices for Dakota medium sulfur (lignite) will decrease

from approximately \$19.80 per short ton in 2022 to approximately \$18.20 per short ton in 2045 (EIA 2023). Therefore, the price of coal is anticipated to be greater than or equal to \$18.20 at the time of sale. At a cost of \$18.20 per ton, the total amount of coal leased and mined under the Proposed Action would sell for approximately \$217.7 million.

The royalty rate that would apply to the coal mined from the tracts would be 12.5%. Typically, royalty rates paid to private (fee) coal owners in the region are significantly lower than the Federal rate of 12.5% and are currently closer to 1% or less. **Table 37** presents the estimated state and Federal tax revenue generated under the Proposed Action.

Table 37. Taxable Coal Severed Under the Proposed Action

Lease Type	Coal Production (million tons)	State-Taxable Coal Production (million tons) [†]	Total State Tax Collected (millions of 2023 dollars) [†]	Royalties Paid to Federal Government (millions of 2023 dollars) [‡]	Tax Revenue Disbursed to McLean County (millions of 2022 dollars)
Non-Federal	100.54	98.4	\$38.9	\$0	\$25.8
Federal (Tracts 1-5)	11.96	11.7	\$4.6	\$19.6	\$8.0
Total	112.5 [§]	110.1	\$43.5	\$19.6	\$33.8

[†] Estimated as 112.5 million tons x 97.9%. 97.9% of coal produced at Falkirk Mine in 2022 was taxable.

[‡] Includes Lignite Research Fund tax and Coal Severance tax.

[§] Based on a 12.5% Federal royalty rate applied to 8.625 million tons of coal. 8.625 is equal to the total quantity of Federal coal, less half the amount located in secs. 2 and 3.

[§] Estimated as Falkirk Mine's 2022 coal production projected for 15 years, or 7.5 million tons x 15.

Under the Proposed Action, approximately 11.3 million tons of Federal coal would be mined from the Federal lease tracts at an arithmetic average rate of approximately 0.8 million tons annually. However, annual production rates will vary based on the mine plan and the scattered nature of the tracts. At the 12.5% Federal royalty rate and considering that ownership of a portion of the Federal lease tracts is 50% undivided, the Proposed Action would result in approximately \$327,000 per year from Federal coal royalties that would be distributed to McLean County, directly contributing to the general fund for 15 years. Because these royalty revenues may only be used for “the planning, construction, and maintenance of public facilities and the provision of public services” (NDCC 15.1-27-25), McLean County residents could be indirectly impacted through the construction of new public facilities, maintenance of existing public infrastructure, or increased levels of public service.

The Proposed Action would not extend the life of the mine and would not result in additional employment in the analysis area because mining of the tracts would use existing Falkirk employees and would not require the hiring of additional personnel. Therefore, the Proposed Action would only impact socioeconomic conditions by increasing tax revenue for McLean County and the state of North Dakota. Relative to the No Action Alternative, the Proposed Action would increase tax revenue for McLean County by approximately \$4.9 million over 15 years. This impact would be beneficial and would last for the duration of the Proposed Action.

Environmental Impacts - Alternative C

Alternative C would lease only tracts 2 and 3, projected by Falkirk (2021) to produce 3.69 million tons of coal (**Table 38**). These tracts have a 50% ownership split between Federal and non-Federal coal. Thus, only half would be subject to the 12.5% Federal royalty rate, while the other half of production would be

fall under state taxes rate. Table 37 presents the estimated state and Federal tax revenue generated under Alternative C.

Table 38. Taxable Coal Severed Under Alternative C

Lease Type	Coal Production (million tons)	State-Taxable Coal Production (million tons)*	Total State Tax Collected (millions of 2023 dollars)†	Royalties Paid to Federal Government (millions of 2023 dollars)‡	Tax Revenue Disbursed to McLean County (millions of 2022 dollars)
Non-Federal	108.81	106.52	\$42.1	\$0	\$28.0
Federal (Tracts 2 & 3)	3.69	3.61	\$1.4	\$4.2	\$2.0
Total	112.5 [§]	110.1	\$43.5	\$4.2	\$30.0

* Estimated as 112.5 million tons x 97.9%. 97.9% of coal produced at Falkirk Mine in 2022 was taxable.

† Includes Lignite Research Fund tax and Coal Severance tax.

‡ Based on a 12.5% Federal royalty rate, but only 50% of federal ownership of coal.

§ Estimated as Falkirk Mine's 2022 coal production projected for 15 years, or 7.5 million tons x 15.

3.5 Threatened and Endangered Species

Affected Environment

A December 2024 Information for Planning and Consultation (IPaC) report showed that the ESA-listed species identified for McLean County within the existing mine plan boundary include three endangered species: Northern Long-eared Bat (*Myotis septentrionalis*), Whooping Crane (*Grus americana*) and Pallid Sturgeon (*Scaphirhynchus albus*), one proposed endangered species: Suckely's Cuckoo Bumble Bee (*Bombus Suckleyi*), three threatened species: Piping Plover (*Charadrius melodus*), Rufa Red Knot (*Calidris canutus rufa*), Dakota skipper (*Hesperia dacotae*), and two proposed threatened species: Western regal fritillary (*Argynnis idalia occidentalis*) and monarch butterfly (*Danaus plexippus*).

The analysis areas used to assess impacts to threatened and endangered species vary based on the species and are described below and shown in **Figure 17**:

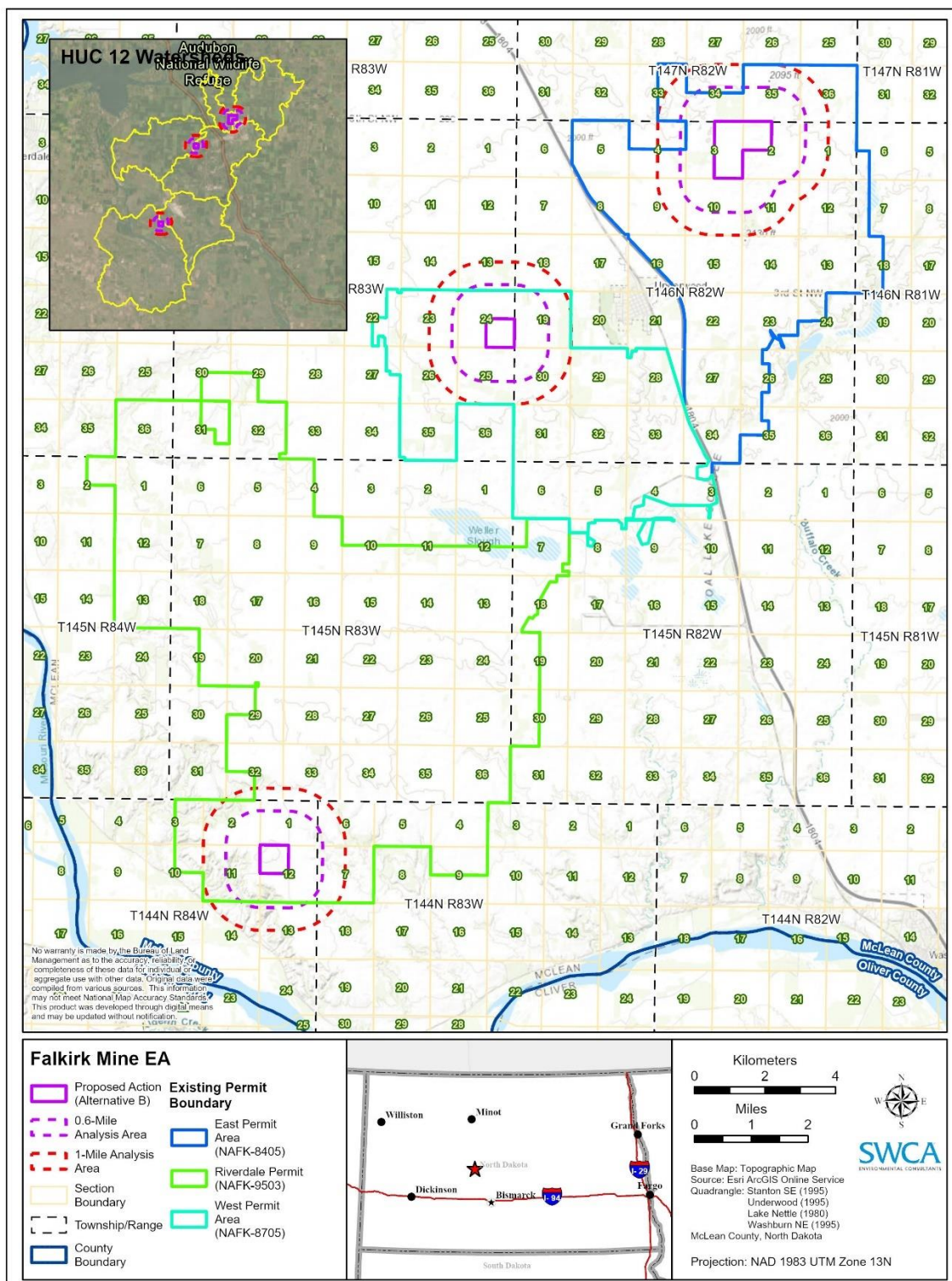
- Six Hydrologic Unit Code (HUC) 12 watersheds intersected by the Proposed Action area were used as the analysis area for whooping crane, pallid sturgeon, piping plover, and rufa red knot. This overview area was selected because these species depend on aquatic landscape networks for suitable habitat and watershed boundaries (HUC 12) are an appropriate scale to define those networks.
- A 1-mile buffer around the Proposed Action area was selected as the analysis area for northern long-eared bat. Studies on northern long-eared bats showed home range sizes varying from 3.5 acres to 425 acres. Additionally, the distance between roost trees and foraging areas ranged from 197 feet to 5,640 feet (80 FR.17974 (Apr. 2, 2015)). A 1-mile buffer was selected as the analysis area because it covers the average traveled distance between roosting sites and foraging areas while also covering an average northern long-eared bat's home range.
- A 0.6-mile buffer around the Proposed Action area was used as the analysis area for the Dakota skipper. This analysis area was selected because species dispersal is geographically limited due to the skipper's short adult lifespan and the fact that it makes only one annual flight per year (Dana 1991). The Dakota skipper may disperse an average of 0.6 mile to an area that contains enough vegetative diversity and emigrants.
- A buffer was not identified for the analysis area for the monarch butterfly, as the results from the IPaC report identified the analysis area for the monarch butterfly as *wherever found*. As such, the analysis area used for the Dakota skipper (0.6-mile buffer around action alternatives) will be used to identify the potential for overwintering habitat and locations that possess high nectar sources

and locations that could be suitable for reproduction. This buffer is appropriate as it represents the disturbance area.

- A buffer was not identified for the analysis area for the western regal fritillary, as this species is a prairie specialist and prefers high densities of forbs and a diversity of flowering plants, including violets (*Viola* spp.) as a food source and larval host plants. As such, the 0.6-mile buffer will be used to analyze effects to this species as it represents the disturbance area.
- A buffer was not identified for Suckely's cuckoo bumble bee as it is a social parasite that uses the western bumble bee (*Bombus occidentalis*), among others, as its host species. This species is native to grasslands where the availability of other bees nests provides ideal locations to lay eggs. Further, adult food plant species include aster (*Aster*), rubber rabbitbrush (*Chrysothamnus*), thistle (*Cirsium*), and goldenrod (*Solidago* spp.) (Williams et al. 2014). The 0.6-mile buffer will be used to analyze this species as it represents the disturbance area.

A detailed analysis of the three endangered species and three threatened species is also included as part of the Final Biological Assessment for the Falkirk Mining Company, North American Coal Corporation, McLean County, North Dakota (see Appendix E). A discussion of the U.S. Fish and Wildlife Service consultation can be found in Section 4.2 of this document. the USFWS concurred that the Proposed Action “may affect, but is not likely to adversely affect” the whooping crane, pallid sturgeon, and northern long-eared bat. The USFWS did not comment on the “no effect” determinations for the remaining species, as the USFWS is not required to concur with “no effect” determination under the implementing regulations of the ESA (50 CFR 402).

Figure 17. Threatened and endangered species analysis areas



A detailed analysis of the analyzed species is also included as part of the *Final Biological Assessment for the Falkirk Mining Company, North American Coal Corporation, McLean County, North Dakota* (see Appendix E).

The overview area for whooping crane, piping plover, and rufa red knot consists of six HUC 12 watersheds, which total approximately 200,133 acres in size: Alderin Creek-Missouri River, Clark Landing Field, Coal Lake Coulee-Missouri River, Hanson Slough-Turtle Creek, Weller Slough-Coal Lake Coulee, and 101101013603. USGS Gap Analysis Project (GAP) landcover data was used to classify habitats in the analysis area. **Table 39** shows the GAP classes in the analysis area and their acreages (USGS Gap Analysis Project 2018).

Table 39. Gap Analysis Project Landcover Classes in the Analysis Area for Whooping Crane, Pallid Sturgeon, Piping Plover, and Rufa Red Knot

Landcover Class	Acres	Percent of Analysis Area
Cultivated Cropland	101418.79	50.68%
Northwestern Great Plains Mixedgrass Prairie	30184.49	15.08%
Western Great Plains Depressional Wetland Systems	13772.22	6.88%
Open Water	10522.60	5.26%
Western Great Plains Floodplain Systems	8006.65	4.00%
Developed & Urban, High Intensity	5931.71	2.96%
Pasture/Hay	5691.30	2.84%
Western Great Plains Dry Bur Oak Forest and Woodland	5063.70	2.53%
Western Great Plains Wooded Draw and Ravine	4795.05	2.40%
Quarries, Mines, Gravel Pits and Oil Wells	4346.03	2.17%
Northwestern Great Plains Shrubland	3672.85	1.84%
Developed & Urban, Open Space	3073.71	1.54%
Ruderal Forest	1073.72	0.54%
Western Great Plains Sand Prairie	654.51	0.33%
Western Great Plains Badland	583.56	0.29%
Introduced Upland Vegetation - Perennial Grassland and Forbland	413.88	0.21%
Developed, Low Intensity	379.63	0.19%
Western Great Plains Tallgrass Prairie	182.36	0.09%
Modified/Managed Southern Tall Grassland	148.56	0.07%
Disturbed, Non-specific	106.97	0.05%
Inter-Mountain Basins Big Sagebrush Shrubland	33.14	0.02%
Inter-Mountain Basins Big Sagebrush Steppe	30.02	0.02%
Inter-Mountain Basins Greasewood Flat	23.80	0.01%
Developed, Medium Intensity	23.35	0.01%
North-Central Interior Dry-Mesic Oak Forest and Woodland	0.89	0.00%

*Calculations were conducted using GIS spatial files and therefore may be different than the calculations provided for the legal descriptions.

*Source: <https://www.sciencebase.gov/catalog/item/5b030c7ae4b0da30c1c1d6de> Accessed 2025.03.24

The Missouri River runs through the southern portion of the analysis area in the Alderin Creek-Missouri River and Coal Lake Coulee-Missouri River watersheds. Lake Audubon overlaps the northwestern part of the analysis area in the 101101013603 watershed. Based on National Wetlands Inventory data, approximately 1.6% (3,139 acres) of the analysis area overlaps the Missouri River and Lake Audubon. Approximately 6.0% of the analysis area (11,975 acres) overlaps other National Wetlands Inventory wetlands, including tributaries to the Missouri River. Major tributaries of the Missouri River that cross the

analysis area include Alderin Creek, Chardon Creek, Clarks Creek, Coal Lake Coulee, and Turtle Creek. Lake Audubon, the Missouri River and its tributaries, and other wetland and riparian areas in the analysis area provide suitable breeding/nesting, foraging, and/or migratory habitat for all 4 threatened and endangered species.

Northern Long-Eared Bat

The analysis area for northern long-eared bat consists of a 1-mile buffer around the Proposed Action area. This bat species occupies a wide range of rocky and forested habitats including intact mixed-type forests having small gaps in forest with sparse or medium vegetation for forage and travel (81 FR 1900). Suitable winter habitat consists of large caves and mines (USFWS 2020b). Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, spaces under loose bark, and rock fissures (Jones and Choate 1978). No known hibernacula or maternity roosts exist in North Dakota and individuals have only been documented in forested habitat in the Turtle Mountains, and the riparian corridors of the Little Missouri and Missouri rivers (NDGFD 2019). The nearest known recording of an individual of this species is approximately 9 miles southeast along the Missouri River (Gillam and Barnhart 2012). McLean County has not had presumed positive cases of white-nose syndrome in bats but is within the white-nose syndrome zone (USFWS 2020c). The GAP vegetation classes present in the analysis area that could provide suitable habitat for northern long-eared bats include western great plains dry bur oak forest and woodland, western great plains wooded draw and ravine, quarries, mines, gravel pits and oil wells, and ruderal forest. The potential habitats constitute approximately 15,278.50 acres (7.63%) of the overview area. Suitable summer roosts exist within the analysis area, though the trees are few in number. No suitable winter habitat exists in the analysis area.

Piping Plover

In North Dakota, piping plovers use exposed, sparsely vegetated shores and islands of shallow, alkali lakes and impoundments for breeding. Salt-encrusted, alkali, or sub-saline semi-permanent lakes, ponds, and rivers with wide shorelines of gravel, sand, or pebbles are preferred. The GAP vegetation classes present in the analysis area that could provide suitable habitat for piping plovers include western great plains depressional wetland systems, open water, and western great plains floodplain systems. These potentially suitable habitats constitute approximately 32,301.47 acres (16.14%) of the overview area (USGS Gap Analysis Project 2018). Critical habitat has been designated for piping plover along sections of the Missouri River that intersect with the Alderin Creek and Coal Lake Coulee watersheds, and where Lake Sakakawea intersects with watershed 101101013603.

Rufa Red Knot

During migration, rufa red knots use key staging and stopover areas to rest and feed. In North Dakota, the rufa red knot is a very rare migrant that uses both alkaline and freshwater lakes during migration (78 FR. 60024). In North Dakota, rufa red knots have been observed in the Missouri River system, as well as sewage lagoons and large permanent freshwater wetlands (Dyke et al. 2015). However, observations are scattered throughout the state, and no stopover sites are consistently used by this species (Dyke et al. 2015). It is thought that less than 100 individuals migrate through North Dakota (Dyke et al. 2015). This species could use habitat along Lake Sakakawea as a stopover during migration. The GAP vegetation classes present in the analysis area that could provide suitable habitat for rufa red knot western great plains depressional wetland systems, open water, and western great plains floodplain systems. These potentially suitable habitats constitute approximately 32,301.47 acres (16.14%) of the overview area (USGS Gap Analysis Project 2018).

Pallid Sturgeon

Pallid sturgeon have been documented in the Missouri River between Fort Benton and the headwaters of Fort Peck Reservoir, Montana; downstream from Fort Peck Dam, Montana, to the headwaters of Lake

Sakakawea, North Dakota; downstream from Garrison Dam, North Dakota, to the headwaters of Lake Oahe, South Dakota (USFWS 2014).

Pallid sturgeon generally can be found in large, free flowing, warm-water, and turbid rivers with a diverse assemblage of dynamic physical habitats (USFWS 2014). The only GAP vegetation class present in the analysis area that could provide suitable habitat for pallid sturgeon is open water. This habitat constitutes approximately 10,522.60 acres (5.26%) of the overview area (USGS GAP 2018).

The primary causes for the decline of the pallid sturgeon include large river habitat alternations (including river channelization, impoundment, and altered flow regimes), water quality degradation, entrainment, and climate change (USFWS 2014). The Missouri River is located within the overview area but not within the Federal lease tracts.

Mercury Deposition effects to Pallid Sturgeon

Emissions from combustion of coal can emit mercury in several forms: Elemental mercury, particulate mercury (generally mercury that has combined with chlorine, sulfur, or other elements to form inorganic salts), and ionic (i.e., reactive gaseous mercury). Generally, elemental mercury is not readily dry or wet deposited, and the conversion to other forms of mercury is relatively slow. Particulate mercury is moderately susceptible to dry and wet deposition, and ionic mercury is very susceptible to dry and wet deposition. Estimated relative percentages of each type of mercury from coal-fired power plants range widely due to several variables including composition of the coal and the type of emission control device. A USGS presentation related to source apportionment for mercury deposition shows that coal combustion in integrated planning model (IPU) electric-generating units (EGUs) is estimated to be around 43% ionic mercury, 2% particulate mercury, and around 55% elemental mercury (USGS 2004). It is important to note that flue gas desulfurization (FGD) and selective catalytic reduction along with activated carbon injection technologies over the last few decades have led to the decrease in US emissions from coal combustion by 75% (Zhang et al. 2016). Additionally, it has been estimated that FGD technologies may reduce the relative percentage of ionic mercury from around 43% to around 24% over the last decade (Zhang et al. 2016).

Mercury deposition is controlled by a variety of factors including concentrations of key reactants that could change mercury from one form to another, levels of mercury emissions (both regionally and globally),⁸ and precipitation and other meteorological conditions. There is a great deal of uncertainty in each one of these variables, and drawing conclusions about source apportionment for mercury deposition without detailed modeling studies is not reliable. Detailed modeling that reflects recent implementation of control technology installation from to mid-2010 BART implementation at Antelope Valley, Leland Olds Station, and Great Plains Synfuels Plant has not been done. However, for some degree of context, the USGS source apportionment for atmospheric mercury deposition presentation from 2004 as revised January 2005 is used to evaluate potential mercury deposition rates within a given radius. This is a highly simplified exercise for informational purposes only and is not meant to be a quantitative impact evaluation but rather serves as a tool for understanding the general magnitude of impacts from the Proposed Action based on highly generalized and conservative assumptions.

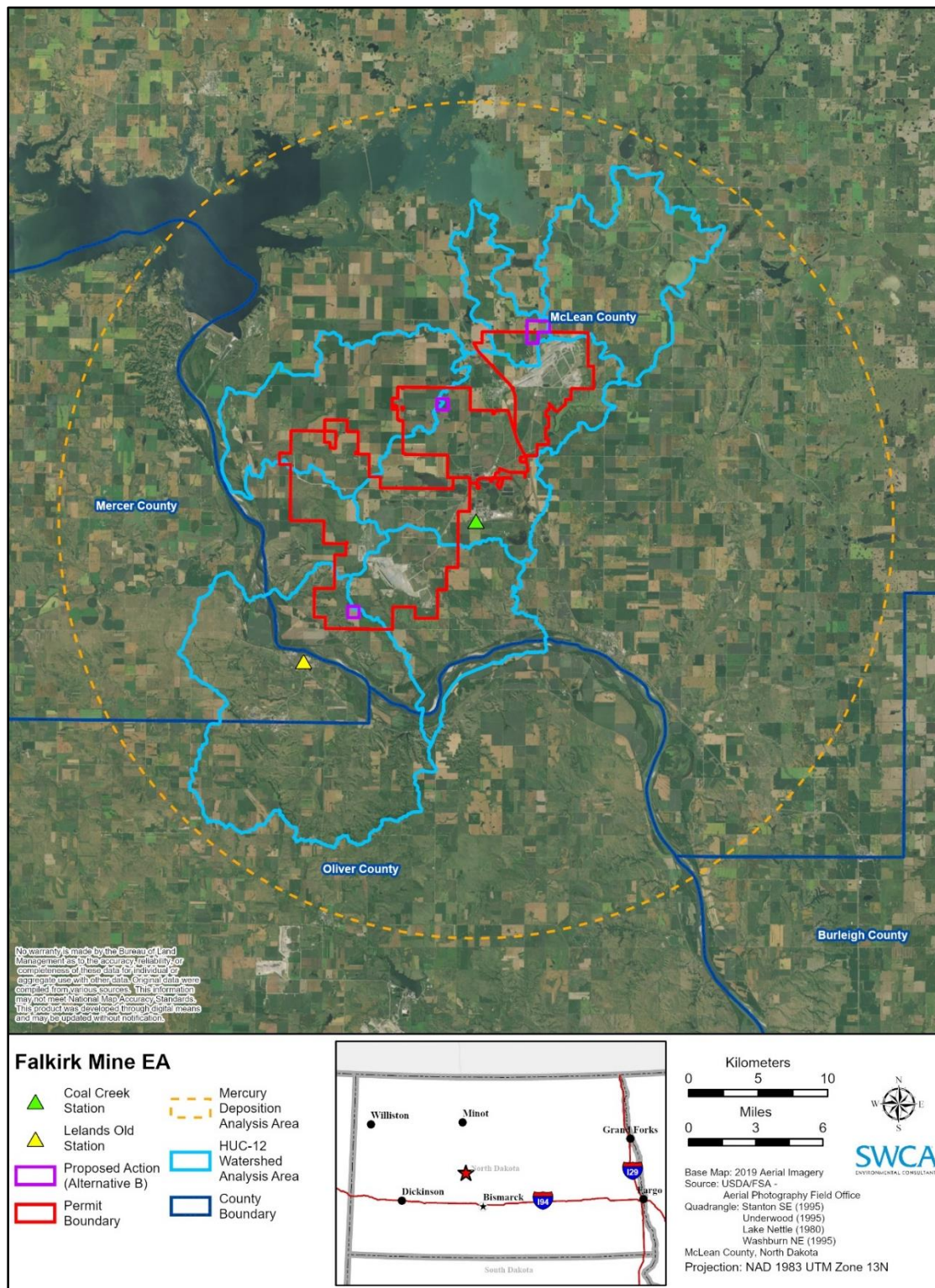
To analyze impacts of the Proposed Action in terms of mercury deposition, SWCA conducted a simplified mercury deposition analysis. This analysis estimated the emissions from the Proposed Action on an annual basis (over 15 years), then determined a hypothetical daily emission rate. Next, SWCA

⁸ For context, a 2008 EPA modeling report estimated that more than 70% of mercury deposition at the location of maximum mercury deposition modeled for the state of North Dakota was due to “background” mercury levels. In other words, this is the percentage of deposition not explainable by source groups modeled in North Dakota, neighboring states, the remaining United States, Canada, and Mexico, or Reemission of previously deposited mercury (EPA 2008).

estimated the proportion of the total mercury emissions based on the values from the USGS presentations Estimated Speciation Profile for 1999 U.S. atmospheric anthropogenic mercury emission estimations for coal EGUs.

Once these rates were derived, SWCA used the USGS “Example simulation of the atmospheric fate and transport of mercury emissions” to derive an estimated impact potential for a given radius (note that assumptions are not corrected for this specific Proposed Action from the assumptions made in the report since detailed modeling is not available for this project). USGS’s example simulation used a hypothetical 1 kilogram per day source of ionic mercury, particulate mercury, and elemental mercury emitted from a point source with height of 50/250 meters on a $1^{\circ} \times 1^{\circ}$ receptor grid. Using the results of the hypothetical source study’s fraction deposited by distance, SWCA estimated the potential deposited emissions at different ranges as applied to the Proposed Action. The results of the USGS study are shown below in **Figure 18**.

Figure 18. Mercury deposition analysis area



Much of the available information regarding the likely effects to pallid sturgeon from contaminants comes from information obtained for shovelnose sturgeon, which can be used as a surrogate species to evaluate

environmental contaminant exposure. Shovelnose sturgeon are considered a suitable surrogate species for pallid sturgeon because they live for 20 years or longer, inhabit the same river basins, spawn at similar intervals and locations, and accumulate similar inorganic and organic contaminants (Buckler 2011; Ruelle and Keenlyne 1994). However, while inferences can be drawn from data related to shovelnose sturgeon, limitations of using this species as a surrogate for pallid sturgeon are based on life history differences between the two species. Pallid sturgeon have a longer lifespan, attain a larger size, are more piscivorous, and contain a higher percentage of body fat (Ruelle and Keenlyne 1994). These differences may contribute to different contaminant effects or pathways. For instance, pallid sturgeon may be at greater risk to contaminants that bioaccumulate and cause reproductive impairment because they have a more piscivorous diet, greater maximum life-span, and a longer reproductive cycle than shovelnose sturgeon (USFWS 2014). High levels of mercury have been shown to lead to lower condition factors, gonadal abnormalities, and hermaphroditism in fish. The presence and effects of contaminants are also critical factors for egg survival and yolk reserves of sturgeon hatchlings (Web et al. 2019).

Benchmarks established by the Web et al. (2019) assessment to protect fish and their habitat from mercury were $0.7 \mu\text{g L}^{-1}$ (water), 0.18 mg kg^{-1} (sediment), and $0.04 \mu\text{g g}^{-1}$ (fish tissue). The current depositional rate of mercury at the plants is very low (estimated concentrations of mercury that could potentially enter the waters range from 1.2 to 2.4 nanograms per liter over 15 years, or an average of 0.08 to 0.16 nanograms per liter per year). This deposition will occur no matter which alternative is chosen, and no measurable/appreciable change in the amount of depositional mercury is anticipated. Thus, impacts to the pallid sturgeon and its habitat from depositional mercury would not be significant. The Proposed Action would not impact pallid sturgeon in any other way.

Whooping Crane

Within North Dakota, all of McLean County is within the primary migration pathway of whooping cranes (Dyke et al. 2015). Whooping cranes have been recorded in riverine habitats during their migration (Canadian Wildlife Service and USFWS 2007). During migration, whooping cranes use shallow, seasonally, and semi-permanently flooded palustrine wetlands for roosting and use various cropland and emergent wetlands for feeding (Austin and Richert 2001; Johns et al. 1997). It is thought these wetlands are tied to large-scale spatial patterns of wetland mosaics, with most suitable wetlands between 1.2 acres and 9.9 acres in size and located within 0.62 miles of a suitable feeding site (USFWS 2007). The GAP vegetation classes present in the analysis area that could provide suitable habitat for whooping cranes include all lands listed in **Table 39** with the exception of open water, ruderal forest, and all developed or disturbed ecosystems constituting approximately 174,675 acres (82.28%) of the overview area (USGS Gap Analysis Project 2018). Whooping cranes have been observed in the analysis area with seven records from 1961 to 2019 (USFWS 2019a). The nearest observation 3.7 miles northwest from the Federal lease Tract 4. Two observations, one near Underwood, North Dakota, and the second just south of the Missouri River, were of flying individuals. The remaining five observations were of whooping cranes using wetland habitats, including one observation along the Missouri River, two observations along the shorelines of Lake Audubon, and two observations near Underwood, North Dakota.

Reasonably Foreseeable Future Actions that could contribute to effects to whooping crane include ongoing coal mining at the Falkirk, Freedom and Center mines, oil and gas development, other industrial development, electric transmission, continued power plant operations, wind energy projects, and agricultural practices (See Appendix C). It is likely that whooping cranes would continue to experience habitat loss and degradation within the overview area. Whooping cranes migrating through the area would be displaced within close proximity to human activity and development and could avoid adjacent areas due to minimal increased noise, human presence, dust, and other visual intrusions. Although little quantitative information exists regarding human disturbance impacts on whooping crane, it is thought that

whooping cranes will avoid developed areas anywhere from 328 to 2,625 feet depending on the intensity of development (Armbruster 1990) and can respond negatively to human disturbance (USFWS 2007).

Dakota Skipper

The analysis area for Dakota skipper consists of a 0.6-mile buffer around the Proposed Action area. Two habitat types have been described for Dakota skipper in North Dakota:

- Type A habitat is low, wet-mesic prairie with little topographic relief occurring in nearshore glacial lake deposits (Royer et al. 2008; Royer et al. 2014). Three plant species dominate Type A habitat: wood lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain deathcamas (*Zigadenus elegans*) (USFWS 2016).
- Type B habitat occurs on rolling terrain over gravelly glacial moraine deposits and is dominated by big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and needlegrasses (*Stipa* spp.), and may include bluebell bellflower and wood lily (USFWS 2016). Additionally, Type B habitat supports extensive stands of purple coneflower (*Echinacea angustifolia*), upright prairie coneflower (*Ratibida columnifera*), and common gaillardia (*Gaillardia aristata*) (USFWS 2016).

Dakota skipper has been recorded in McLean County (USFWS 2018a, 2019a). Falkirk conducted habitat surveys for Dakota skipper in 2019 on the Federal coal tracts and within 250 meters of the tracts (Falkirk 2021). No suitable habitat was found within the survey area (Falkirk 2021); therefore, no adult occupancy surveys were conducted. However, habitat surveys were not conducted within the entire 0.6-mile analysis area. Detailed native grassland inventories are based on the pre-mining land use narratives found in Section 2.7 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503. Additional details can be found in these permits. In all the native grassland inventories conducted for the three permit areas, most of the grasslands found in the permit areas contained Type B habitat species. Thus, the three permit areas may contain suitable Dakota skipper Type B habitat. However, Dakota skipper has not been observed in the permit boundary based on previous wildlife investigations. The remaining portions of the overview area outside the three permit areas contain similar grassland characteristics as those described in the three permit areas based on field observations (Zachmeier 2020).

Monarch Butterfly

The geographic range of the monarch butterfly encompasses a large portion of the North American continent and is primarily composed of two subpopulations with independent migratory patterns (Dilts et al. 2019).

During the western migration, the overwintering sites are along the Pacific coast of North America, and the breeding grounds are characterized as west of the Rocky Mountains (Dilts et al. 2019). As this is the case, it is arguable that any groups of monarch butterflies or individuals discovered within the project area are outside the normal and predicted ranges for migration, overwintering, and breeding habitat. The monarch butterfly is considered a host specialist and a habitat generalist because adults travel great distances and are expected to find host plants under a wide range of conditions (Dilts et al. 2019).

Milkweed is especially important to the monarch butterfly as it is the only plant on which they can lay their eggs and their caterpillars can feed. Milkweed species found within the analysis area can include *Asclepias speciosa*, *A. fascicularis*, *A. subulate*, *A. eriocarpa*, *A. californica*, *A. Asperula*, *A. tuberosa*, *A. viridiflora*, *A. erosa*, *A. subverticillata*, *A. cryptoceras*, *A. syriaca*, and *A. incarnata*. Of these species the most common include swamp milkweed (*A. incarnata*), showy milkweed (*A. speciosa*), common milkweed (*A. syriaca*), whorled milkweed (*A. verticillata*) and green comet milkweed (*A. vifidiflora*). These milkweed species can be found in many habitats including, but not limited to, prairies, marshes,

ditches, edges of ponds, lakes, and streams, in disturbed areas, open woods, fields, and flood lands. According to the IPaC, in North Dakota the species are wide-ranging and are listed as *wherever found*; however, areas with a high density of milkweed are likely to contain a higher density of both caterpillars and adult monarch butterflies.

The primary causes for decline in monarch butterfly populations include loss and degradation of habitat including locations of breeding, migratory, and overwintering habitat from grassland and shrubland conversion to agriculture. Urban development and widespread use of herbicides also contributes to loss of habitat. As of the publication of the *Federal Register* Notice on December 12, 2024 (89 FR 100662), this species is a proposed threatened species, and critical habitat may be designated under the authority of the ESA.

Although there have been no specific sightings of the monarch butterfly within the proposed project area, it is assumed for the purpose of this analysis that the species is present in or near the proposed disturbance area. There are no overwintering locations present in the analysis area; the monarch prefers to overwinter in Oyamel fir forests in Mexico but can also overwinter along the California coast.

Western Regal Fritillary

Western regal fritillary are found in tallgrass prairie remnants and other native prairie habitats. Regal fritillaries prefer wetter grasslands and prefer prairies that include moist, low areas and drier areas for host plants on the uplands. Host plants include species of violet, including prairie violet (*Viola pedatifida*) and bird's-foot violet (*V. pedata*). The species larva relies exclusively on native violets as a food source. Therefore, areas with high density of violets will contain both caterpillars and adults (NDGFD 2025). Nectar preference does not seem to be a limiting factor for this species; therefore, they will feed on a variety of mid-to late-summer blooming flowers including dotted gayfeather (*Liatris punctata*), thistles (*Cirsium* spp.), beebalm (*Monarda fistulosa*), and coneflower (*Echinacea angustifolia*) (McCullough et al. 2019). According to the NDGFD, the southeast quarter of the state provides the best habitat remaining for this species, but the species may be encountered state-wide in patches of quality habitat.

The loss and degradation of tallgrass prairie has reduced populations of many prairie-obligate species including the regal fritillary. Population abundance and occupied range have declined >99% restricting many populations to isolated, remnant patches of tallgrass prairie (McCullough et al. 2019). This decline has resulted in consideration of the regal fritillary for protection under the ESA; the USFWS proposed to list the Western Regal Fritillary as a threatened species under the ESA on August 6, 2024 (89 FR 63888). As of the publication of the *Federal Register* notice, the USFWS found that a designation of critical habitat for both subspecies (Eastern Regal Fritillary [*Argynnis idalia idalia*] and Western Regal Fritillary) were not determinable at the time.

Although there have been no documented sightings of the western regal fritillary within the proposed project area, it is assumed for the purpose of this analysis that the species is present in or near the proposed disturbance area.

Suckely's Cuckoo Bumble Bee

Suckely's cuckoo bumble bee⁹ is a social parasite that uses several other bee species as its host species, and therefore has declined, likely in parallel, with those host species. The specific host species listed for this analysis is the western bumble bee, although the Suckely's cuckoo has been found in the nests of

⁹ At this time, there has not been any determination made of jeopardy/no jeopardy for the species listed. Section 7 consultation is ongoing with the USFWS. This analysis will be updated to reflect the results of the consultation and will be available prior to the date of sale.

other species (Thorp 1983; Williams et al. 2014). Because cuckoo bumble bees rely on other species to feed their larvae and do not forage for a colony, they play a limited role in pollinating plants. They do, however, require nectar and pollen from a variety of flowers as a food source and can obtain this nectar from flowering prairie flora.

The loss and degradation of habitat or range, the increase in disease or predation, and the decline of host species from pathogens, pesticides, habitat fragmentation and conversion, and climate change has contributed to the decline of this species. As of the publication of the *Federal Register* notice on December 17, 2024 (89 FR 102074), the USFWS proposed to list this species as an endangered species under the ESA. The USFWS determined that due to the current lack of data sufficient to perform required analyses, the designation of critical habitat for the species was not determinable at the time.

Although there have been no specific sightings of Suckely’s cuckoo bumble bee within the proposed project area, it is assumed for the purpose of this analysis that the species is present in or near the proposed disturbance area.

Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the Federal coal resources contained in the Federal lease tracts would not be leased and/or a federal mining plan would not be approved; thus, no Federal coal within the tracts would be mined. Although the Federal coal resources contained within the tracts would not be leased under the No Action Alternative, surface disturbance would occur on approximately 1,600 acres of private lands overlying the Federal coal resources in conjunction with mining operations conducted on adjacent private coal leases. The increase would be attributed to the mine rerouting haul roads and relocation of infrastructure to facilitate going around (bypassing) the five Federal lease tracts. **Table 40** provides an estimate of the acreage that would be disturbed under the No Action Alternative for each habitat type.

Table 40. Acres of Habitat Disturbed by the No Action Alternative

Habitat Type	Acres Disturbed
Ruderal Forest	11.79
Northwestern Great Plains Shrubland	0.44
Western Great Plains Dry Bur Oak Forest and Woodland	5.12
Western Great Plains Wooded Draw and Ravine	2.22
Western Great Plains Floodplain Systems	0.44
Northwestern Great Plains Mixedgrass Prairie	30.47
Western Great Plains Depressional Wetland Systems	72.06
Inter-Mountain Basins Big Sagebrush Shrubland	0.22
Cultivated Cropland	1173.13
Pasture/Hay	8.45
Open Water	12.23
Developed & Urban, Open Space	27.35
Developed & Urban, High Intensity	60.5
Total	1404.42

*Calculations were conducted using GIS spatial files and therefore may be different than the calculations provided for the legal descriptions.

Northern Long-Eared Bat

The primary causes for decline in northern long-eared bat include disease (particularly white-nose syndrome), impacts to hibernacula habitat, loss or degradation of summer habitat (such as conversion to

commercial development and highways), and mortality due to wind farm operations (USFWS 2015). The No Action Alternative would remove approximately 7.34 acres of potential woodland roosting and foraging habitat for northern long-eared bat.

Previous land use and wildlife investigations within and adjacent to the mine permit boundary suggest this is suitable habitat because of the presence of both live trees and snags at least 3 inches diameter at breast height that could retain bark or provide cavities or crevices. These woodland acreages and descriptions are based on the pre-mining land use narratives found in Section 2.7 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503. Additional details regarding these acreages and descriptions can be found in these permits.

This conversion of summer habitat may result in impacts to this species, including loss of potential roosting or foraging habitat; longer flights between suitable roosting and foraging habitat; removal of travel corridors and fragmenting colonies; and injury or mortality (during active season clearing) (80 FR 17974). But this loss of summer habitat would result in negligible direct and indirect impacts to this species because northern long-eared bat summer habitat is not limited or in short supply, this summer habitat loss is not a range-wide threat to the species, and this species is flexible with regards to summer habitat requirements (81 FR 1900).

Consistent with the Final 4(d) Rule (81 FR 1900), Falkirk would only remove trees larger than 3 inches in diameter at breast height between October 31 and April 1 to avoid take of this species. The implementation of the Final 4(d) Rule would avoid injury or mortality to this species (81 FR 1900). Individual bats may fly through the Federal lease tracts to forage or travel between roosting sites, but human activity at the mine could cause them to avoid the area. Additionally, the postmining woodlands will be reclaimed in the same approximate locations and areal extent (including identical pre-mine acres of each respective community) as their pre-mine counterparts. This would minimize long-term habitat impacts for this species.

Piping Plover and Rufa Red Knot

The primary causes for decline of piping plover include habitat loss, modification, and degradation (USFWS 2020d). The primary causes for decline of rufa red knot include loss of breeding and non-breeding habitat; likely effects related to disruption of natural predator cycles on the breeding grounds; reduced prey availability throughout the nonbreeding range; and increasing frequency and severity of asynchronies (mismatches) in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions (USFWS 2019b). Research suggests that rufa red knots can be disturbed by human activities from 1,000 meters away (Peters and Otis 2007).

Pre-mining land use and wildlife investigations within and adjacent to the mine permit boundary suggest habitats are not suitable for piping plover or rufa red knot. Habitats are considered unsuitable for piping plover because none of the wetlands or other water features were identified as sandbars, alkaline lakes, alkaline wetlands, semipermanent lakes, ponds, or rivers. Habitats are considered unsuitable for rufa red knot because none of these features were identified as alkaline and freshwater lakes, which are used by this species in North Dakota during migration. All these wetland categories, acreages, and descriptions are based on the pre-mining wetland narratives found in Section 5.1 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503. Additional details regarding these categories, acreages, and descriptions can be found in these permits. Under the No Action Alternative, no suitable habitat for piping plover or rufa red knot would be impacted. There would be the ongoing aggregate impacts from past, present, and future development as outlined in Appendix C.

At its closest point, the Federal lease Tract 2 is approximately 4.1 miles from the shores of Lake Audubon. The shores provide foraging, nesting, and stopover habitat for both bird species and where piping plover critical habitat has been designated; however, this distance is large enough to prevent birds using these habitats from being visually or auditorily disturbed by mining operations. Birds transiting through the area would be displaced within the tracts and could avoid adjacent areas due to increased noise, human presence, dust, and other visual intrusions.

No adverse effects to the water quality of Lake Audubon or Missouri River are anticipated from the No Action Alternative because of adequate separation distance and suitable terrain occurring for runoff control by the North Dakota Pollutant Discharge Elimination System (NDPDES), which will prevent significant changes in surface hydrology (see Section 3.7 for more details on surface water quality and the Cumulative Hydrologic Impact Assessment [CHIA]). Therefore, no habitat degradation is anticipated for piping plover and rufa red knot.

Pallid Sturgeon

Under the No Action Alternative, there would be no direct impacts to the Missouri River or potential habitats for pallid sturgeon, and therefore no direct or indirect impacts to the species. Additionally, no adverse effects to the water quality of Lake Sakakawea or the Missouri River are anticipated.

Under the No Action Alternative, Federal coal would not be extracted or combusted, and operations at Antelope Valley Station, Leland Olds Station, and Great Plains Synfuels Plant would continue unchanged. Because the annual emission rates from the mine and the Antelope Valley Station, Leland Olds Station, and Great Plains Synfuels Plant are not increasing, mercury deposition impacts to pallid sturgeon would effectively be the same under the No Action Alternative and the Proposed Action. Because the annual emission rates from the mine and the Antelope Valley Station, Leland Olds Station, and Great Plains Synfuels Plant are not increasing, overall mercury deposition impacts to pallid sturgeon would effectively be the same under the No Action Alternative as under the Proposed Action.

Whooping Crane

The primary causes for decline in whooping crane include habitat loss and degradation, shooting, and displacement activities of man (USFWS 2007). Approximately 1292.55 acres of potential migration habitat for whooping cranes would be removed under the No Action Alternative.

The previous land use and wildlife investigations conducted within and adjacent to the mine permit boundary suggest there is potential migration (and associated foraging habitat) in the Federal lease tracts because whooping cranes can use shallow, seasonally (i.e., ephemeral) and semi-permanently flooded palustrine wetlands like those found during these previous studies. These wetland categories, acreage, and descriptions are based on the pre-mining wetland narratives found in Section 5.1 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503. Additional details regarding these categories, acreages, and descriptions can be found in these permits. However, no observations of this species have been recorded in the Federal lease tracts or within the mine wildlife survey boundary.

At its closest point, the Federal lease tract located in T. 146 N., R. 82 W. sec. 3, NE¼ is approximately 4.1 miles from the shores of Lake Audubon. The shores provide foraging and stopover habitat for whooping cranes; however, this distance is large enough to prevent birds using these habitats from being visually or auditorily disturbed by mining operations. Birds transiting through the area would be displaced within the tracts and could avoid adjacent areas due to increased noise, human presence, dust, and other visual intrusions. No adverse effects to the water quality of Lake Audubon or the Missouri River are anticipated from the No Action Alternative because of the separation distance and the existence of suitable terrain being available for runoff control by NDPDES, which will prevent significant changes in surface hydrology (see Section 3.7 for more details on surface water quality and CHIA). Therefore, no

habitat degradation for whooping crane along Lake Audubon or along the Missouri River are anticipated as a result of the No Action Alternative.

Because of surface disturbance associated with the No Action Alternative, there is the potential for short-term habitat loss; however, whooping cranes have sufficient suitable migration habitat available throughout the analysis area (165,436 acres) during mining. As part of the reclamation process, seasonal and semipermanent wetlands greater than 0.5 acre will be replaced by designed basins in approved, reclaimed topography. Temporary wetlands will be field constructed during reclamation, along with semi-permanent and seasonal wetlands that are less than 0.5 acre in size. Hydrologic analysis and design were completed to ensure that the functions of the disturbed wetlands would be returned to the watershed postmining. The acreage of any wetland will be reclaimed to ensure no net loss of wetland acreage occurs within the permit area (i.e., a 1:1 ratio). This reclamation plan will include designing these wetlands using a series of elongated basins in the drainage that have pothole zones and characteristics to replace linear wetlands. These wetlands will be designed to possess a more diverse depth zonation than the pre-mining linear wetlands because they will have smaller pool areas that are a few feet deep, rather than having an entire channel, as is the case with most linear pre-mining wetlands.

Additionally, all postmining land uses will approximate the land uses that existed pre-mining. Falkirk will minimize impacts to surface water through establishment of sediment control structures and the implementation of reclamation techniques that will minimize changes to surface hydrologic characteristics (Section 2.2 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-960 1; CHIA). The Reclamation Division of the NDPSC has conducted its CHIA of all anticipated mining in the area and found that the operations proposed by Falkirk have been designed to prevent material damage to the hydrologic balance outside the permit area (NDPSC 2018).

Dakota Skipper

The primary causes for decline in Dakota skipper populations include the loss or fragmentation of high-quality native prairie habitat from overgrazing, conversion to agriculture, invasion by non-native plants, urbanization, and disruption of natural prairie fire cycles (USFWS 2018b). While surface disturbing activities relating to by-passing the Federal lease tracts under the No Action Alternative could disturb 30.47 acres of suitable habitat for Dakota skipper, the Dakota skipper has not been documented on the mine site but has been documented in McLean County (USFWS 2019c). As no known occurrence of Dakota skipper exists within the analysis area, no impacts to Dakota skipper are anticipated.

Monarch Butterfly

The No Action Alternative would disturb approximately 1,316.57 acres of potential habitat for the monarch butterfly, most importantly 80.5 acres of shrubland, forest and woodland, wooded draw and ravine, floodplain systems, Mixedgrass prairie, depressional wetland systems and big sagebrush shrubland that could provide the appropriate ecological conditions required for many species of milkweed and larvae food sources. Further, 30.47 acres of Great Plains mixed grass and fescue prairie that has the potential to provide nectar in the form of flowering flora, would be removed. Impacts are expected to be short term and will last from 3 to 5 years, with mature vegetation for woody species being achieved within 10 years. There would be no effect to overwintering locations from the No Action Alternative.

Suckely's Cuckoo Bumble Bee

The No Action Alternative would disturb approximately 1,404.42 acres of potential habitat for the Suckely's cuckoo bumble bee, but moreover it would disturb the acreage associated with the habitat for host nests and additional nectar food sources for all bee species. Disturbance and reclamation will take place as stated in Section 2.3 of this document. Impacts are expected to be short term and would last from 3 to 5 years, with mature vegetation for woody species being achieved within 10 years.

Western Regal Fritillary

Like the monarch butterfly and Suckely's cuckoo bumble bee, the No Action Alternative would disturb approximately 1,404.42 acres of potential habitat and most importantly 74.94 acres of shrubland, wooded draw and ravine, floodplain systems, and depressional wetland systems that the western regal fritillary prefer for habitat. The No Action Alternative would disturb approximately 30.47 acres of mixed grass upland species that are preferred habitat for larvae host species. Disturbance and reclamation will take place as stated in Section 2.3 of this document. Impacts are expected to be short term and would last from 3 to 5 years, with mature vegetation for woody species being achieved within 10 years.

Environmental Impacts – Alternative B (Proposed Action)

Under the Proposed Action, the BLM would issue a coal lease for 800 acres to Falkirk, OSMRE would recommend approval of the Federal mining plan to the ASLM, and the ASLM would approve the mining plan (with or without conditions), allowing the Federal lease tracts to be mined.

Approximately 11.3 million tons of Federal coal would be mined and combusted under the Proposed Action, whereas non-Federal coal would be combusted under the No Action Alternative. Mercury deposition from emissions associated with the mining and burning of coal under the Proposed Action could result in impacts to the pallid sturgeon and its habitat, as described below. A simplified mercury depositional analysis for the Coal Creek Station was conducted **Figure 18** and shows that the average areal deposition for the entire six 12-digit HUCs in the analysis area is equal to approximately 1.2 µg/m² over 15-year mining sequence of the Federal tracts. The estimated concentrations of mercury that could potentially enter the waters range from 1.2 to 2.4 nanograms per liter over 15 years, or an average of 0.08 to 0.16 nanograms per liter per year.

Table 41. Acres of Habitat Disturbed by the Action Alternative

Habitat Type	Acres Disturbed
Ruderal Forest	0
Northwestern Great Plains Shrubland	0
Western Great Plains Dry Bur Oak Forest and Woodland	2.44
Western Great Plains Wooded Draw and Ravine	0.44
Western Great Plains Floodplain Systems	0.44
Northwestern Great Plains Mixedgrass Prairie	1.33
Western Great Plains Depressional Wetland Systems	11.57
Inter-Mountain Basins Big Sagebrush Shrubland	0.22
Cultivated Cropland	743.47
Pasture/Hay	1.33
Open Water	5.56
Developed & Urban, Open Space	12.44
Developed & Urban, High Intensity	25.36
Total	804.6

*Calculations were conducted using GIS spatial files and therefore may be different than the calculations provided for the legal descriptions.

Northern Long-Eared Bat

The Proposed Action would remove approximately 2.88 acres of potential roosting and foraging habitat for the northern long-eared bat. Impacts to the northern long-eared bat would be similar to those in the No Action Alternative. Aggregate effects would be similar to those in the No Action Alternative.

Piping Plover and Rufa Red Knot

Under the Proposed Action, the impacts to the piping plover and rufa red knot or their associated habitat would be similar to those described above for the No Action Alternative. Under the proposed action alternative there is no suitable habitat for piping plover or rufa red knot impacted. There would be the ongoing aggregate impacts from past, present, and future development as outlined in Appendix C.

Pallid Sturgeon

The Missouri River is located within the analysis area but not within the Federal lease tracts. Pallid sturgeon could be present within the 10,522.60 acres (5.26%) representing the open water portion of the overall analysis area that overlaps the Missouri River (Table 39). Under the Proposed Action, there would be no direct impacts to the Missouri River or potential habitats for pallid sturgeon.

Whooping Crane

Approximately 761.24 acres of potential migration habitat for whooping cranes would be removed under the Proposed Action. Impacts to whooping crane would be similar to the No Action Alternative; there would be short-term habitat loss, sufficient suitable migration habitat available throughout the analysis area, and avoidance of developed areas. Aggregate effects would be similar to those in the No Action Alternative.

Dakota Skipper

The Proposed Action would disturb approximately 1.33 acres of suitable Mixed grass prairie (i.e. Dakota skipper Type B habitat (SWCA 2019)). No documented occurrence of Dakota skipper exists within the analysis area (SWCA 2019) or within McLean County (USFWS 2019c). No impacts to Dakota skipper are anticipated. As such, there would be no incremental impacts for Dakota skipper.

Monarch Butterfly

The Proposed Action would disturb approximately 16.44 acres of potential habitat for the monarch butterfly that could serve as a source of nectar and milkweed habitat, including forest and woodland, wooded draw and ravine, floodplain systems, Mixedgrass prairie, and depressional wetland systems. Aggregate effects would be similar to those in the No Action Alternative.

Suckely's Cuckoo Bumble Bee

The Proposed Action would remove approximately 765.45 acres of potential habitat for the Suckely's cuckoo bumble bee, and more importantly, nest host species. The lack of nectar bearing species that would be removed because of the Proposed Action could have an effect on all bee species, but the likelihood of any lasting effect is unlikely. The Suckely's cuckoo bumble bee has alternative food sources other than the lands proposed for disturbance. Aggregate effects would be similar to those in the No Action Alternative.

Western Regal Fritillary

Like the monarch butterfly, the Proposed Action would remove approximately 16.44 acres of potential habitat for the western regal fritillary that could serve as a source of nectar and larval habitat, including forest and woodland, wooded draw and ravine, floodplain systems, Mixedgrass prairie, and depressional wetland systems. Aggregate effects would be similar to those in the No Action Alternative.

Environmental Impacts – Alternative C

Under Alternative C, Falkirk is proposing to produce Federal coal from approximately 320 acres.

Table 42. Acres of habitat disturbed by Alternative C

Habitat Type	Acres Disturbed
Ruderal Forest	0
Northwestern Great Plains Shrubland	0
Western Great Plains Dry Bur Oak Forest and Woodland	1.11
Western Great Plains Wooded Draw and Ravine	0.22
Western Great Plains Floodplain Systems	0.44
Northwestern Great Plains Mixedgrass Prairie	0
Western Great Plains Depressional Wetland Systems	5.34
Inter-Mountain Basins Big Sagebrush Shrubland	0
Cultivated Cropland	299.12
Pasture/Hay	0.67
Open Water	2.67
Developed & Urban, Open Space	4.22
Developed & Urban, High Intensity	8.23
Total	322.02

Northern Long-Eared Bat

Alternative C would remove approximately 1.33 acres of potential roosting and foraging habitat for northern long-eared bat. Impacts to the northern long-eared bat would be similar to those in the No Action Alternative. Aggregate effects would be similar to those in the No Action Alternative.

Piping Plover and Rufa Red Knot

Under Alternative C, no suitable habitat for piping plover or rufa red knot would be impacted.

Pallid Sturgeon

The aggregate effects of Alternative C are the same as those described for the Proposed Action Alternative.

Whooping Crane

Approximately 306.90 acres of potential migration habitat for whooping crane would be removed under Alternative C. Impacts to whooping crane would be similar to the No Action Alternative; there would be short-term habitat loss, sufficient suitable migration habitat available throughout the analysis area, and avoidance of developed areas. Aggregate effects would be similar to those in the No Action Alternative.

Dakota Skipper

Alternative C would not disturb any acres of suitable Dakota skipper Type B habitat (SWCA 2019). No impacts to Dakota skipper are anticipated. As such, there will be no incremental impacts for Dakota skipper.

Monarch Butterfly

Alternative C would disturb approximately 7.11 acres of potential habitat for the monarch butterfly that could serve as a source of nectar and milkweed habitat, including forest and woodland, wooded draw and ravine, floodplain systems, and depressional wetland systems. Aggregate effects would be similar to those in the No Action Alternative.

Suckely's Cuckoo Bumble Bee

Alternative C would remove approximately 306.9 acres of potential habitat for the Suckely's cuckoo bumble bee, and more importantly, nest host species. The lack of nectar bearing species that would be removed because of the Proposed Action could have an effect on all bee species, but the likelihood of any lasting effect is unlikely. The Suckely's cuckoo bumble bee has alternative food sources other than those on the lands proposed for disturbance. Aggregate effects would be similar to those in the No Action Alternative.

Western Regal Fritillary

Like the monarch butterfly, Alternative C would remove approximately 7.11 acres of potential habitat for the western regal fritillary that could serve as a source of nectar and larval habitat, including forest and woodland, wooded draw and ravine, floodplain systems, and depressional wetland systems. Aggregate effects would be similar to those in the No Action Alternative.

3.6 Water Resources

Geology and Affected Environment

Regional Geology

The proposed Federal lease tracts are located within glaciated subsection of the Missouri Plateau, part of the Great Plains Physiographic Province. The formations of sedimentary origin were deposited in the Williston Basin, the dominant structural feature of western North Dakota. The center of this essentially symmetrical basin is located near Williston, North Dakota, approximately 125 miles northwest of the Falkirk Mine. The basin consists of approximately 15,000 feet of sedimentary rock overlying a basement complex of gneisses, schists, and granites. This sequence records a geologic time interval spanning late Precambrian (1 to 2 billion years ago) to Holocene (last 10,000 years (Coteau, 2015)). The Falkirk Mine is located on the east flank of the Williston Basin.

The structural influence of the Williston Basin is reflected in the dip to the formations underlying the regional geological area. Drill hole data concludes that the Sentinel Butte Formation dips westward toward the center of the Williston Basin at 50 to 75 feet per mile (about ½ to 1 degree). The dip of the bedrock strata increases with depth due to the physical characteristics of the Williston Basin (Coteau, 2022). The subsidence of the Williston Basin began early in the Paleozoic Era (425 to 542 million years ago). Subsidence has not been continuous, nor has sedimentation occurred at a constant rate. These irregularities are evidenced by the presence of several unconformities in the stratigraphic column of North Dakota (Coteau 2022).

From the Cambrian Period (539-487 million years ago) through the early Paleocene Epoch (55.8 to 65.5 million years ago) numerous shallow, inland seas advanced and retreated across the area now known as west-central North Dakota, depositing a wide range of marine and lagoonal sediments, mainly shales, limestones, and evaporites. Since the early Paleocene Epoch, only stream and lake sediments have been deposited in Western North Dakota. Deposition of these sediments was interrupted during the late Tertiary Period (13 to 36 million years ago) by episodes of regional uplift, faulting, warping, and erosion (Coteau 2022).

During the Pleistocene Epoch (10,000 to 2.6 million years ago), continental glaciers advanced and retreated, modifying the existing topography by depositing varying thicknesses of glacial materials in the uplands area. The reserve area for Falkirk Mine is situated on a glacially modified upland drainage divide of relatively low relief. The reserve is defined on the south and west by the present-day Missouri River Valley. The northern and eastern extents of the field are defined by pre-glacial channels that have subsequently been modified by glacial and interglacial activity. The valley to the east is incised by a glacial meltwater channel (Coal Lake Coulee). The valley bisecting the reserve, whose surface is now occupied by

the Weller Slough Complex, appears to have been a main tributary of the pre-glacial Knife River. This bisecting valley divides the reserve into two coal fields, locally referred to as the Underwood Coal Field to the north and the Riverdale Coal Field to the south (Falkirk 2022).

Local Geology

The Bullion Creek Formation (Paleocene) underlies much of the reserve area. The Sentinel Butte Formation (Paleocene) conformably overlies the Bullion Creek Formation. Lithologically, the two formations are very similar; Interbedded silts and clays that occur in beds that range in thickness from less than on foot to tens of feet make up about 60-80% of the sediment of the Bullion Creek and Sentinel Butte Formations. Fifteen to 35% of the sediment making up these formations consist of silty, fine-grained to medium-grained sand in beds that range in thickness from 0.5 feet to 100 feet.

The Coleharbor Formation (Pleistocene) unconformably overlies the Sentinel Butte and Bullion Creek Formations and includes all of the unconsolidated sediments resulting from deposition during glacial and interglacial periods. Lithologic types include gravel, sand, silt, clay, and till. The modified glacial channels that delineate the reserve limits are in-filled with sediments of the Coleharbor Formation. The channel fill systems contain a complex of interbedded glaciofluvial gravels, sands, silts, and clays overlain by till. The coarser gravel and sand beds are generally limited to near the bottom of the channel fill.

The minable coals in the study area include the Sentinel Butte Formation, the Bullion Creek Formation, and the Coleharbor Formation (Falkirk, 2022). The general stratigraphic sequence in the upland portions of the reserve area (Sentinel Butte Formation) consists of till, silty sands and clayey silts, main Hagel (Hagel A) lignite bed, silty clay, lower lignite of the Hagel lignite interval (Hagel B), and silty clays. Both the Hagel A Bed and the Hagel B Bed are split by clay partings in portions of the reserve, although not split in the same areas. Where the beds have partings, the splits are referred to as Hagel A1, Hagel A2, Hagel B1, and Hagel B2 (Falkirk 2022).

General Conditions

The Falkirk Mine is required to obtain a Surface Coal Mining Permit through the North Dakota Public Service Commission. Requirements of obtaining this permit include modeling to ensure the disturbance to the hydrological balance, from a pre-mining to postmining state, is minimized and that no adverse effects are expected due to mining. In addition, a surface water monitoring plan is required to ensure water quality is not being affected during mining and for a minimum of 10 years after reclamation has been completed. After 10 years, the reclaimed land is eligible for final bond release if it meets the required standards.

Prior to disturbance in a watershed, Falkirk would construct sedimentation ponds which are capable of containing runoff from a 10-year/24-hour storm event from all areas that are disturbed within the watershed. The water is retained temporarily to capture sediment, and effluent monitored for compliance with Falkirk Mine's water quality standards in the North Dakota Pollutant Discharge Elimination System (NDPDES) permit. After surface water management structures are constructed, Falkirk would use standard surface mining techniques to extract coal from the Federal lease tracts. Falkirk will coordinate with the Office of the State Engineer as needed for any proposed disturbances that may impact water storage impoundments (including stock ponds or sedimentations ponds [NDCC 61-16.1-38]) and waterbodies (including rivers, streams, agricultural drains, and wetlands). There are no floodplain areas associated with the Federal lease tracts.

Mining activities will result in disturbed areas, which will be susceptible to accelerated erosion and runoff; however, sediment control and monitoring measures established through the NDPSC, SMCRA, and the NDPDES Program permits will prevent degradation to the surface water quality outside the permit area. Reclamation techniques, as approved by NDPSC, will be implemented which will result in

surface hydrologic characteristics which are not significantly different than those which exist prior to mining.

Surface Water

North Dakota surface water quality standards are regulated in NDCC 33-16-02.1-09. These standards are specified for six classes of surface waters that include Class I, IA, II, and Class III streams, wetlands, and lakes and reservoirs. Surface waters in the state are specifically listed by classification in Appendix I and Appendix II of NDCC 33-16. There are a number of minor or intermittently flowing watercourses, unnamed creeks, or draws, etc., which are not listed in Appendix I and Appendix II. All tributaries not specifically mentioned in Appendix I and Appendix II are classified as Class III streams. Detailed numeric standards for physical and chemical criteria are listed in NDCC 33-16-02.1-09.3.

The surface water sources near the study area are ephemeral streams, Weller Slough south of the study area, Coal Lake Coulee east of the study area, and small wetland areas scattered on the north part of the study area. There are some local springs feeding surface waters; these springs are discharging into Landenberger Slough and Coal Lake Coulee. All streams within the mine area would be classified Class III Stream according to NDCC 33-16, which are suitable for agricultural and industrial uses. Surface water use is generally limited to wildlife habitat with seasonal stock use (NDPSC 2018).

Surface water features have been identified and inventoried by Falkirk to support the NDPSC permitting application. See **Figure 19, 25, and 26**. The results, including detailed mapping and a description of each wetland's characteristics, complex, and vegetative composition, is described in greater detail in Permits NAFK-8405, NAFK-8705, NAFK-9503. Additionally, the Cumulative Hydrologic Impact Assessment (CHIA) was completed for the NDPSC Reclamation Division and includes an assessment of potential mining impacts to all hydrologic features including wetlands within and surrounding the analysis area.

Before it submitted its application, Falkirk conducted an aquatic resources inventory within the Federal lease tracts themselves and delineated Class III (seasonal) and IV (semipermanent) wetland complexes (Class III and IV wetlands are defined in Stewart and Kantrud 1971), wetland complexes including 22 seasonal wetlands totaling approximately 21 acres, and 14 temporary wetlands totaling approximately 5 acres (Falkirk 2019).

Figure 19. Surface Water Features for Falkirk Lease Tracts 1, 2, 3.

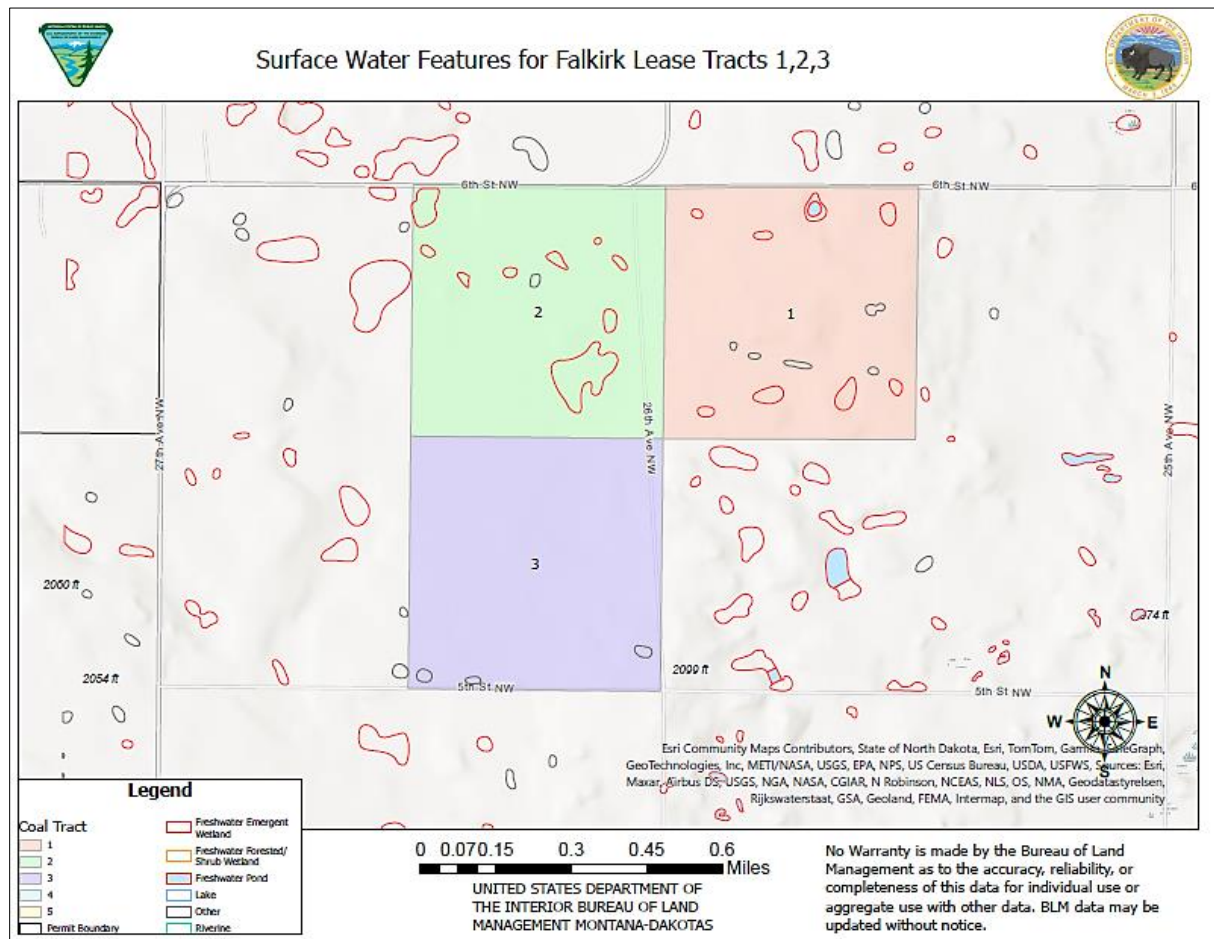


Figure 20. Surface Water Features for Falkirk Lease Tract 4

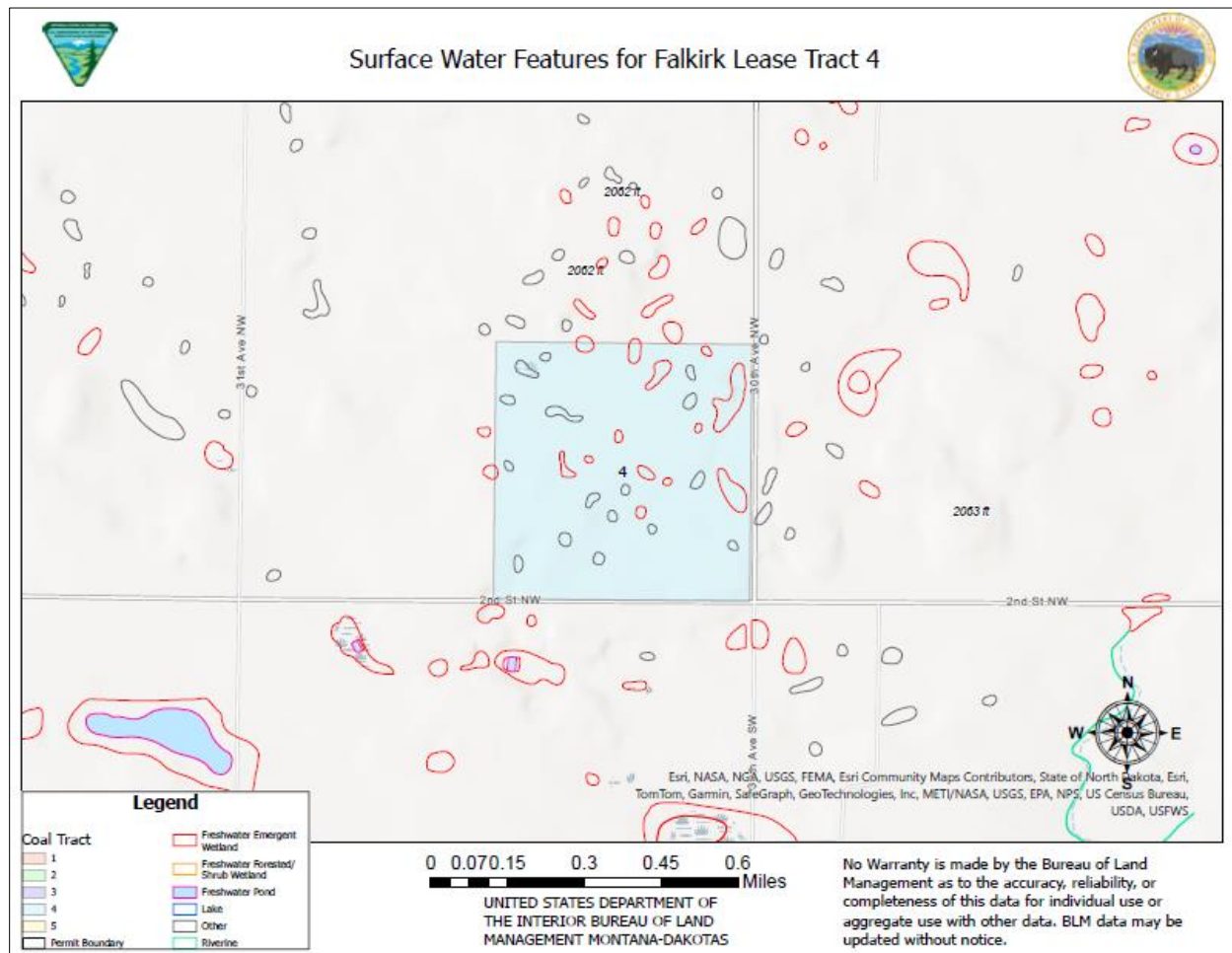
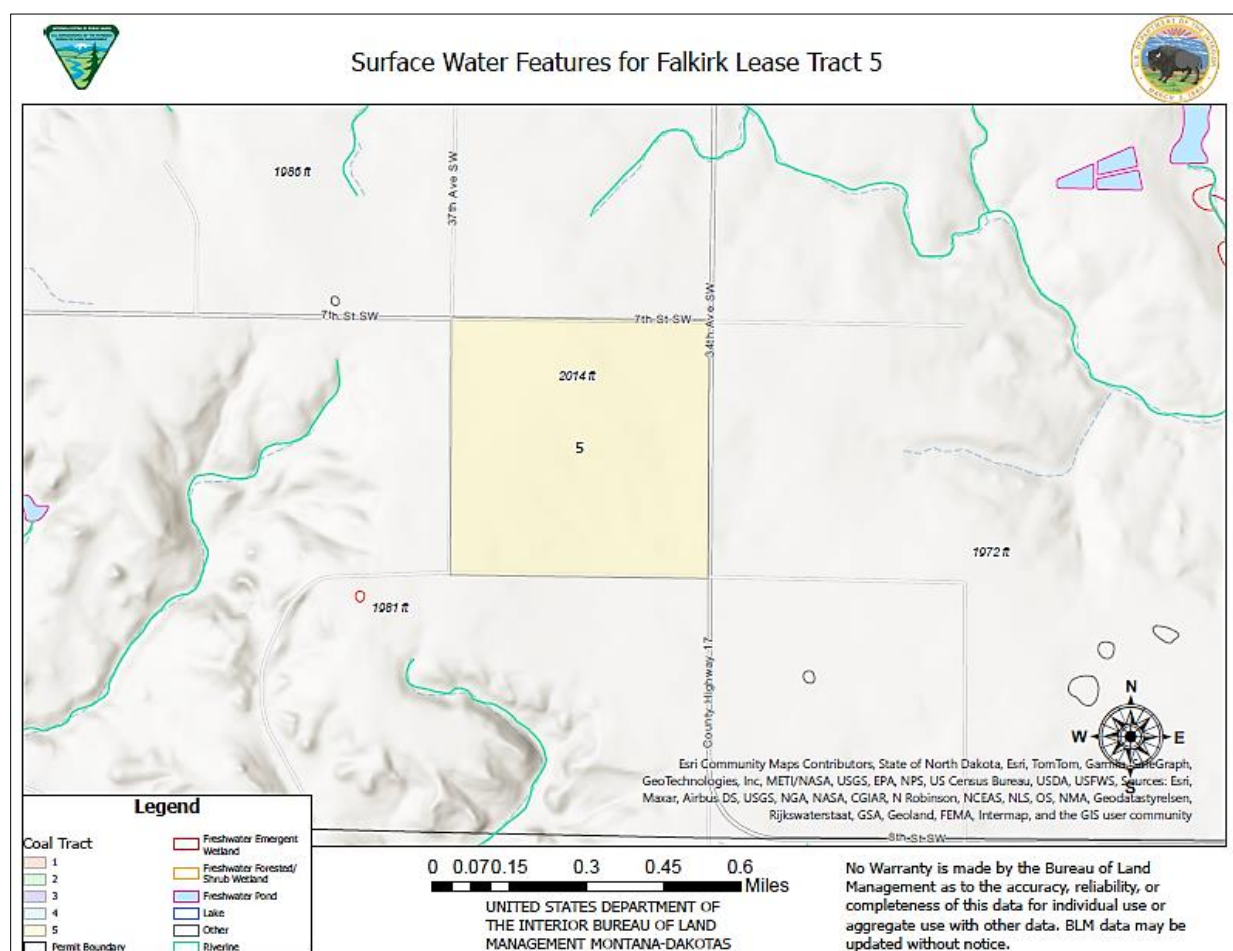


Figure 21. Surface Water Features for Falkirk Lease Tract 5



Groundwater¹⁰

The major hydrostratigraphic units in the study area consist of the glacial till and glaciofluvial sands and gravels of the Coleharbor Formation; the Underwood Sand, Hagel A lignite bed, the B lignite bed, and the Sheet Sand of the Sentinel butte Formation; the Tavis Creek Lignite bed of the Bullion Creek Formation; and the Hensler Sand bed of the Bullion Creek Formation. The area has a drainage system of ephemeral streams generally flowing in a north to south direction and discharging to Weller Slough or Coal Lake Coulee that subsequently discharges to the Missouri River. Small, ephemeral streams that flow ultimately to the Missouri River drain the western edge of the study area.

The primary water bearing strata in the Falkirk Mine permitted areas include a series of shallow glacial depressions (known locally as prairie potholes) within a zone limited by the trenches carved along Weller Slough and Coal Lake Coulee. The prairie potholes are the main sources of recharge of the local ground water system as a result of snowmelt and rainfall. The vertical hydraulic conductivity of the soils and depth

¹⁰ Citing: NDPSC 2018. Section 2.2 Underwood Groundwater Hydrology (NAFK-8405, NAFK-8705, NAFK-9601) Revision 38, Seventh Addition for Ground Water, Groundwater Quantity, Groundwater Quality and Water Monitoring sections unless otherwise noted.

of the water table determine the quantity of recharge; the recharge area feeds the water table aquifer (Underwood Sand, Hagel A Bed, Hagel B Bed, and Sheet Sand).

Groundwater drawdown will occur in advance of the active mine pits. Variables associated with the various lignite beds will dictate the radius of influence. Those variables include the height of the hydraulic head ahead of the active pits, the specific yield and specific retention of the aquifer material, the permeability of the aquifer, the degree of fracturing induced by blasting of the exposed lignite, and the availability of water to replace the groundwater that is being intercepted or withdrawn. The make-up waters may be supplied by precipitation at the ground surface or by vertical or lateral inflows from other aquifers.

Groundwater Quantity

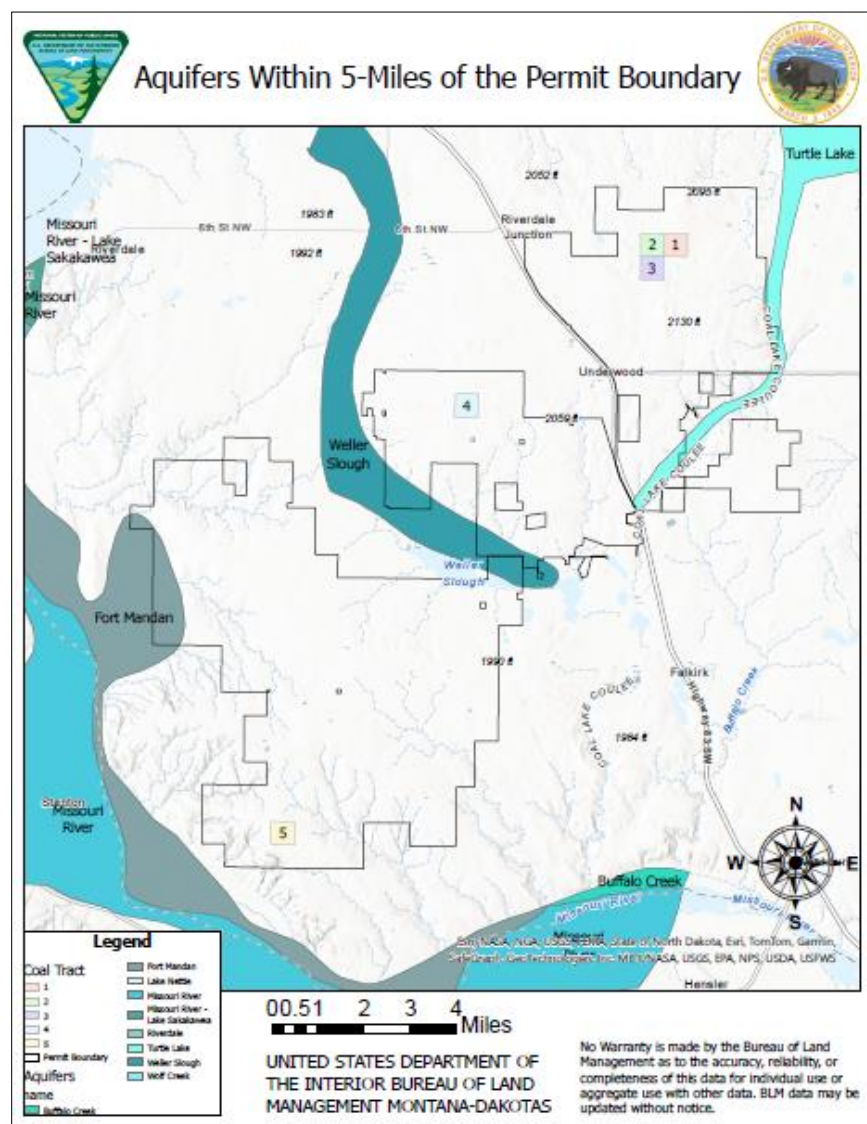
The Weller Slough Aquifer is nearly fourteen miles long and extends from Lake Sakakawea southeast toward sec. 8, T. 145 N., R. 82 W. and varies in width from half a mile to a mile. Test holes indicated that the aquifer consists of beds and lenses of sand and gravel extending to depths of 300 feet with an average thickness of about 40 feet. Estimated available water storage from the Weller Slough Aquifer is about 54,000 acre-feet. (Klausing 1974)

The Turtle Lake Aquifer underlies an area extending southeastward from the southeast arm of Lake Audubon to about half a mile to east of State Highway 41. The top of the aquifer is anywhere from 3 to 84 feet below land surface, and the average thickness is about 42 feet. The aquifer consists of very fine to very coarse sand that is interbedded and intermixed with fine to coarse gravel and may consist entirely of either gravel or sand. Estimated available water storage from the Turtle Lake Aquifer, based on an areal extent of 26 mi² is about 100,000 acre-feet of water. (Klausing 1974)

The Fort Mandan Aquifer underlies an area of about 16 mi² and is adjacent to the Missouri River southwest and west of the town of Falkirk. The aquifer is composed of glaciofluvial deposits that are generally overlain by undifferentiated glacial deposits and alluvium. Test holes indicated that the aquifer ranges from 11 to 53 feet in depth with an average thickness of about 46 feet. The aquifer materials consist of fine to coarse sand that is interbedded and intermixed with medium to coarse gravel. Estimated available water storage from the Fort Mandan Aquifer, based on an areal extent of 16 mi² is about 71,000 acre-feet of water. (Klausing 1974)

Pre-mining infiltration rates vary by soil type and range from 0.0 to 0.30 inches per hour. The lower rates are related to fine-grained soils, such as clays, or contain thick (15-65 feet) of glacial drift. Higher recharge rates occur where glacial drift soils are less than 15 feet thick and are underlain by the Underwood Sand. A significant topographic feature that impacts groundwater is the north-south valley extending south from the City of Underwood, known as Underwood Coulee; because of the valley being incised into the Underwood Sand, the valley acts as a local recharge area. Potential metric levels of sites monitored in the Technical Report show the water table depth ranging from 44.81 feet to 79.29 feet with hydraulic gradient varying between -7.5 and +6.00 feet. The gross effect of recharge by surface waters in reclaimed areas is also shown in the Annual Groundwater Reports, submitted by the Falkirk Mining Company to the Public Service Commission illustrates the proximity of the proposed tracts and the city of Underwood to current mapped aquifers; none of the proposed tracts lie within mapped aquifer areas.

Figure 22. Aquifers withing 5-miles of the existing permit boundary



Groundwater Quality and Water Monitoring

Parameters tested for water quality determination include pH, electrical conductivity, temperature, total alkalinity, phenolphthalein alkalinity, bicarbonate, carbonate, total dissolved solids, sulfate, chloride, nitrate, calcium, magnesium, potassium, hardness, cation summation, anion summation and sodium adsorption ratio. Trace metal analyses include arsenic, barium, boron, cadmium, chromium, iron, lead, manganese, mercury, molybdenum, selenium, silver, strontium and fluoride. (NDPSC CHIA 2018)

Water in units of the Coleharbor Formation is generally hard, with total dissolved solids ranging from 260 mg/l to 6570 mg/l. The dominant cations are calcium and magnesium, and the dominant anions are sulfate and bicarbonate. Total dissolved solids of the Underwood Sand aquifer generally range from 600 mg/l to 1500 mg/l. The dominant cations are calcium and magnesium with increasing sodium and the dominant anion is bicarbonate. The Hagel A and B Beds have a calcium-magnesium-bicarbonate-sulfate type of water. Sodium concentrations vary depending on the distance from the main recharge area and the thickness of bedrock clays. As the thickness of the bedrock clays increase, the sodium concentrations also increase indicating cation exchange of calcium for sodium. Total dissolved solids for these the Hagel A

and Hagel B lignite aquifers range from 260 mg/l to 8160 mg/l. Water quality in the underlying Sheet and C Sands is somewhat similar to the Hagel A and B Beds. (NDPSC CHIA 2018)

One hundred and sixty-two (162) water supply wells have been identified in the study area, of which 95% are not being used. These wells have been identified in the NDPSC *Ground Water Hydrology of the Underwood Coal Field* technical report (Technical Report) (NDPSC 2018) and includes permit areas NAFK-8405, NAFK-8705, and NAFK-9601. Further, monitoring wells completed in the Coleharbor Formation, Underwood Sand, Hagel A Bed, Hagel B Bed, Sheet Sand, and Hensler bed provide the data in the Technical Report. These wells are used to monitor groundwater quality and quantity throughout all mining processes. Last, the North Dakota Department of Water Resources (https://www.swc.nd.gov/info_edu/map_data_resources/waterresourcesites/) identifies 41 wells within the permit boundary: 1 domestic well, 6 industrial wells, 24 observation wells (2 destroyed, 5 plugged), 6 stock wells, and two wells that have an unknown use. None of these wells identified have viable water data that can be used for analysis purposes in this EA.

Potential metric data illustrates that ground water flows radially from the recharge area (City of Underwood and surrounding area) and ground water recharge can remain relatively unaffected. Because mined spoil does not have the transmissivity that undisturbed material does, the postmining Underwood Sand aquifer may see an increase in water levels. The unmined corridors near populated areas or those that are undisturbed by the mine serve as a discharge relief system that will prevent the ground water levels from rising too high. The average aerial depth of ground water recharged identified in the Technical Report was over a 150km² area and was on the order of 1.0 to 4.7 inches per year. Within the Coleharbor formation, total dissolved solids (TDS) range from 246 to 7740 mg/l, with the general range being 600 to 1200 mg/l. Iron content is generally low, and manganese content is generally high. Within the Underwood Sand and Hagel A and B Beds, TDS ranged from 475 to 1820 mg/l. Iron content is generally low and manganese content is generally high for both formations.

Regulatory Compliance

Multiple state and Federal regulatory authorities consider wetland impacts in the permitting and consultation process. Regulatory agencies that have been consulted as a part of this application process include the following:

- NDPSC and OSMRE to issue surface coal mining permits
- North Dakota State Engineer Permit to Drain
- USACE as authority on CWA Section 404 permit issuance
- NDPDES Permit (NDDEQ Permit No. ND0024791)

Environmental Impacts Common to All Alternatives

The mining operations and methods, as outlined in SEC S-K 1300 Technical Report Summary (Falkirk 2022) will be the same for all alternatives, including the No Action Alternative. Impacts to hydrogeologic resources as related to mining operations and methods will be the same for all alternatives with the exception of the differences in disturbed acreage, as outlined in each alternative description. The increase, or decrease in disturbance acreages may increase or decrease the spatial impacts to hydrologic resources.

Surface Water Quality

Mining activities will result in disturbed areas which will be susceptible to accelerated erosion and runoff. Surface water quality is protected with the implementation of sediment control measures to limit sediment

from entering streams and creating impacts to surface water hydrology outside the permit area. Reclamation techniques are outlined in the permit application, which will result in surface hydrologic characteristics that are not overly different from those that existed prior to mining. Prior to mulching and vegetation establishment, suitable plant growth material stockpiles may experience erosion rates similar to those for fallowed fields. Runoff and erosion rates from spoil piles may be high during significant precipitation events, but numerous small catchments created by the configuration of adjacent spoil piles will hold much of the runoff and sediment at the spoil pile sites. After the spoil pile sites are graded, respread with suitable plant growth material and revegetated, the surface configuration will be more subdued with fewer abrupt changes in topography. Gullies and other severely eroded features will be eliminated. Surface water quality impacts are expected to be short-term and negligible. Monitoring at surface water sites is conducted a minimum of 2 years prior to mining, throughout the mining process until bond release of the area. The data is used to prove the lands and surface water have been restored to their pre-mining condition. (NDPSC CHIA 2018)

Groundwater Quantity

A significant volume of groundwater is pumped from active mining pits by means of an extensive collection, distribution, and pit water pond system and is discharged through NDPDES points to the surface water flow system. The groundwater is discharged to larger surface water bodies or to drainages covered by drainage easements; all of Falkirk's pit water discharges are pumped into the same major drainageway leading to the Missouri River. The dewatering of shallow aquifers at active pits is probably balanced somewhat by increased natural recharge of glacial aquifers within the larger wetlands drainage systems that receive mine NDPDES discharges. Wetlands are being constructed on areas of reclaimed spoil as part of the reclamation plan to replace the wildlife habitat and surface water storage benefits of natural wetlands lost to mining. One objective of future groundwater monitoring in reclaimed spoils by Falkirk Mining Co. will be to evaluate the ability of reclaimed wetlands to replace the ground water recharge functions provided by natural wetlands in the pre-mining environment. (NDPES CHIA 2018) For all alternatives, groundwater quantity impacts are expected to be short-term and minor.

Groundwater Quality

The North Dakota Department of Health (NDDH) Standards of Quality for Waters of the State establishes parameter-specific standards for water quality in surface and ground water, and NDAC 69-05.2-16-04(1)(g) makes them part of the hydrologic performance standards for mining operations. These standards are consistent with the federal Safe Drinking Water Act of 1974, the established North Dakota anti-degradation policy, and they accommodate situations where preexisting water quality exceeds the standards. The rules basically require that discharges into the waters of the State not cause concentrations of substances in the receiving water body to exceed the established limits. Developed water supplies created in the reclamation process as new property improvements, or replacement for supplies destroyed or diminished by mining must meet NDDH water quality standards or other appropriate guidelines for their intended use regardless of water quality in similar pre-mining supplies.

Falkirk's ground water monitoring plan has been designed to detect any changes in groundwater quality or quantity that occur as a result of mining activities. Nested monitor wells are generally screened in all water bearing units above the mined lignite seam(s) that are being mined, within the lignite seam(s) and in hydrostratigraphic units below the mined seam(s). Pump tests and slug tests in determination of aquifer characterization have been conducted by Falkirk Mine and those results are located in the permit. (NDPES CHIA 2018)

Although the result of the increased infiltration and reduction processes in the spoil after reclamation causes a higher concentration of total dissolved solids (TDS) in the groundwater for a period of time after reclamation, the reestablishment of groundwater flow will tend to flush or drop out ions with

nonequilibrium concentrations, until a new chemical equilibrium is achieved. With time, the weathering condition of oxidized spoil should again approach the quasi-equilibrium pre-mining condition. For all alternatives, groundwater quality impacts are expected to be short-term and minor.

Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the Federal coal resources contained in the Federal lease tracts would not be leased and/or a Federal mining plan would not be approved; thus, no Federal coal within those tracts would be mined. The No Action Alternative assumes surface disturbance to the private land overlying the Federal coal tracts and mining of the non-federal coal resources located adjacent to the lease tracts is reasonably foreseeable. The resultant bypass of the Federal coal resources by the applicant would result in increased surface disturbance area of approximately 1,600 acres (an increase of 800 acres from all proposed tracts).

As the No Action Alternative will not be a Federal action, other than the acres identified, the agencies do not know specifically where disturbance will occur. It is assumed, then, for the purposes of this analysis, that the effects for the No Action Alternative would be consistent with those identified in the Environmental Impacts Common to All Alternatives, as written above.

Under the No Action Alternative, surface-disturbance operations (see Section 2.4) on the Federal tracts would take place during by-pass activities to reach private coal on adjacent tracts. The surface operations could cause areas to be susceptible to accelerated erosion and runoff; however, as with actual mining operations, sediment control measures established through the NDPSC, SMCRA, and NDPDES permits will prevent significant changes in surface hydrology. Reclamation techniques will be implemented, which will result in surface hydrologic characteristics which are not significantly different than those which existed prior to surface-disturbance operations (Probable Hydrologic Consequences [PHC], Section 2.2 of Permit NAFK-8405, NAFK-8705, and Permit NAFK-9503, and CHIA). No significant change in the quantity of water leaving the mine area is expected from the flow that would have occurred in the drainage without the impoundment (PHC, Section 2.2 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503).

In areas completely mined through, reclaimed wetlands will retain some surface water runoff and groundwater seepage, but their basin and flow-through designs will approximate the features in the pre-mining landscape. Thus, the quality of flow down reclaimed ephemeral drainages is not expected to be significantly different from the range and variability seen in runoff in the pre-mining environment (PHC, Section 2.2 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503). However, some minor to negligible direct and indirect impacts associated with site-specific differences in flow and quality can be expected, cannot be reliably predicted beforehand, and can be a consequence of any land and water reclamation process.

Surface water quality is predicted to be equal to or better than pre-disturbance water quality and is likely to be improved over pre-disturbance water quality (PHC, Section 2.2 of Permit NAFK-8405, Permit NAFK-8705, and Permit NAFK-9503).

As required in NDCC 38-14.1-21(3)(c), and as documented in the October 17, 2018, CHIA report, the Reclamation Division of the NDPSC made an assessment of the probable aggregate hydrologic impacts of all anticipated mining in the area and found that operations associated with Permit NAFK-8405 are designed to prevent material damage to the hydrologic balance outside the permit area. As specified in NDCC 38-14.1-14(1)(0), this assessment was based in part on a review of the determination by the permit applicant of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site, with respect to the hydrologic regime, quantity and quality of water in surface and groundwater systems, and particularly upon water availability.

There will be no long-term or widespread impacts to surface or subsurface water quality or quantity from this alternative.

Environmental Impacts – Alternative B (Proposed Action)

Under the Proposed Action, Falkirk would lease and mine approximately 800 acres comprising all proposed federal lease tracts. The BLM would approve the LBA and issue a Federal coal lease for all or a portion of the proposed tracts subject to standard and special lease stipulations developed. OSMRE would review the mining plan and recommend a decision to either approve, disapprove, or approve with conditions to the ASLM, as required by 30 CFR Part 746. The NDPSC would not be required to review an application for revision to the existing SMCRA permits (NAFK-8405, NAFK-8705, NAFK-9503) as the current permit boundaries include the Federal coal.

The effects for the Proposed Action Alternative would be consistent with those identified in the Environmental Impacts Common to All Alternatives, as written above, and less than those discussed in Alternative A (No Action Alternative) as written above. The effects to groundwater would be applicable to 800 acres only and all other operations and results are anticipated to be consistent with the No Action Alternative.

There will be no long-term or widespread impacts to surface or subsurface water quality or quantity from this alternative.

Environmental Impacts - Alternative C

Under Alternative C, the BLM would approve the LBA and issue a Federal coal lease for only tracts 2 and 3 (320 acres) subject to standard and special lease stipulations developed. OSMRE would review the mining plan and recommend a decision to either approve, disapprove, or approve with conditions to the ASLM, as required by 30 CFR Part 746. The NDPSC would not be required to review an application for revision to the existing SMCRA permits (NAFK-8405, NAFK-8705, NAFK-9503) as the current permit boundaries include the Federal coal.

Like the Proposed Action Alternative (Alternative B), the effects for the Alternative C would be consistent with those identified in the Environmental Impacts Common to All Alternatives, as written above, and less than those discussed in Alternative A (No Action Alternative) as written above. The effects to groundwater would be applicable to 320 acres only and all other operations and results are anticipated to be consistent with the No Action Alternative.

There will be no long-term or widespread impacts to surface or subsurface water quality or quantity from this alternative.

3.7 Big Game

Affected Environment

The analysis area includes of 1075 mi² (688,000 acres) designated for big game species and is within the Northwestern Great plains ecoregion (Level III). This ecoregion is described as a semiarid rolling plain of shale and sandstone derived soils punctuated by occasional buttes and badlands. The elevation of the ecoregion ranges from 1500 to 3900 ft (McNab and Avers, 1994).

Habitat types for big game in this ecoregion are diverse ranging from expansive grasslands and mixed-grass prairies to riparian zones along rivers and streams. Tracts 2,3, and 5 are primarily agriculture interspersed with wetlands, Tracts 1,4 are tame pasture also interspersed with wetlands. All tracts are flat to gently rolling in topography.

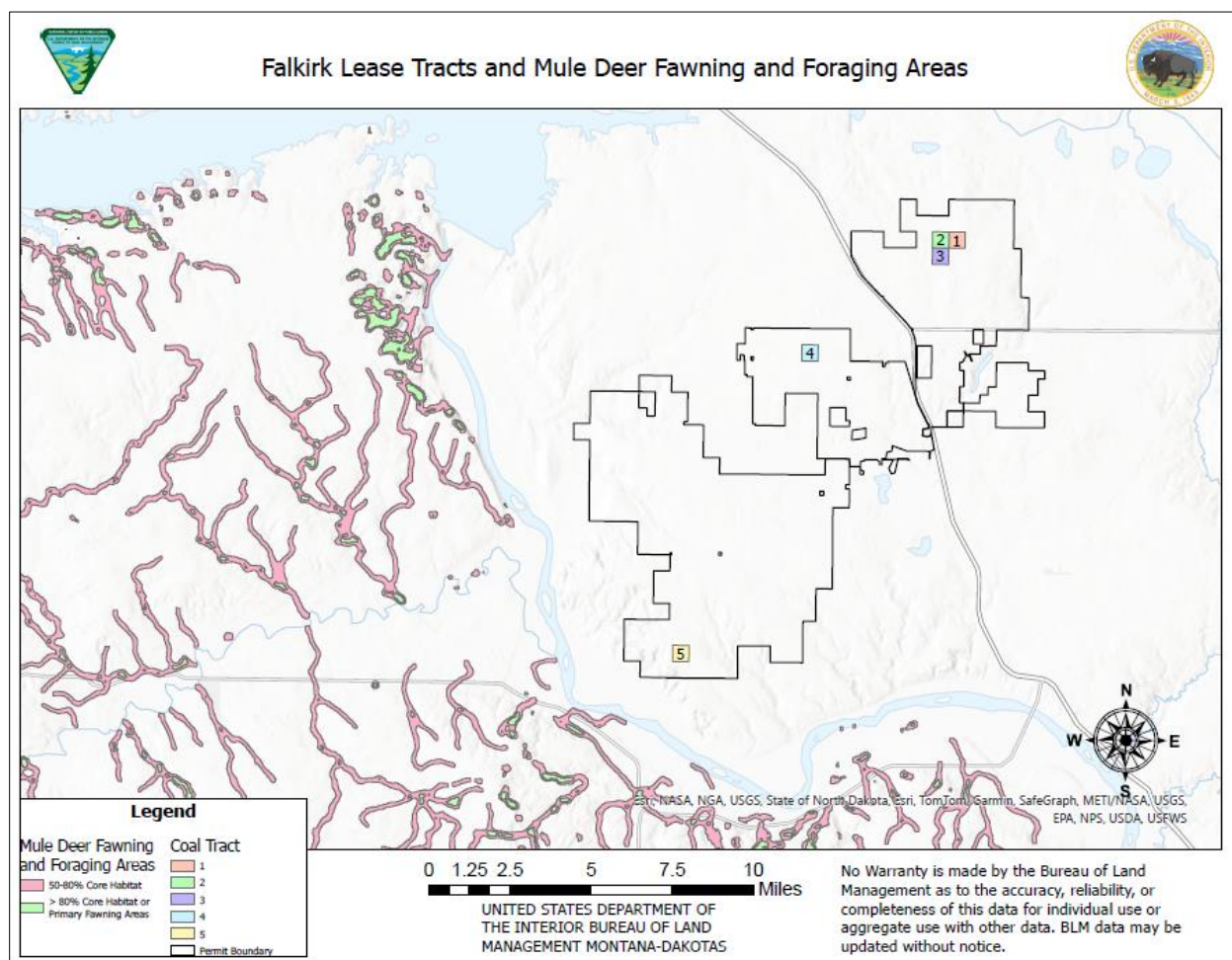
These habitats provide essential resources for a variety of big game species such as mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and pronghorn (*Antilocapra americana*). As per the NDFO RMP (1988) and FEIS (2025) habitat is present for mule deer and pronghorn within the analysis areas. The analysis areas are adjacent to North Dakota Fish and Game (NDFG) designated range for both species (NDFG 2024a, NDFG 2024b).

Mule Deer

Mule deer in North Dakota primarily inhabit the badlands in the southwestern part of the state, characterized by rugged clay buttes adorned with Rocky Mountain Juniper and green ash, amidst a blend of sagebrush, deciduous shrubs, and grasses. Adjacent river bottoms and flats support agricultural crops, which serve as additional habitat for mule deer. Secondary ranges extend eastward from the badlands to the Missouri River, featuring agricultural areas interspersed with wooded draws, Conservation Reserve Program (CRP) lands, and native grasslands, including rugged buttes (NDGFD 2024a). Mule deer fawning habitat typically consists of areas with a mix of grasslands, shrubs, and low vegetation that provide ample cover for newborn fawns. These areas often include riparian zones along streams or rivers, as well as brushy areas with dense vegetation where fawns can hide from predators. Habitat with abundant food resources, such as forbs and browse plants, is important to support the nutritional needs of nursing does and growing fawns. Areas with minimal human disturbance and relatively low predator populations are preferred for successful survival of mule deer fawns (Murphy et al. 2023).

The NDGFD annual mule deer survey indicates western North Dakota's mule deer population is 1% higher than last year (2023) but 4% below the long-term average (NDFGD 2024). The primary causes for the decline of pronghorn populations include severe weather, drought, predation, harvest, and rapid oil and gas development (Christi et al 2015). Mule deer face similar impacts from weather and anthropogenic disturbances including habitat fragmentation. The proposed tracts lie outside of mapped mule deer fawning and foraging areas (**Figure 23**).

Figure 23. Falkirk Lease Tracts and Mule Deer Fawning and Foraging Areas



Pronghorn

Pronghorn in western North Dakota inhabit open and arid landscapes, often associating with sagebrush and grassland communities. Pronghorns utilize grass plantings and consume a varied diet of forbs, shrubs, and grasses, as well as unconventional food sources like cereal grains, corn, sunflowers, and alfalfa.

Water conservation is intrinsic to their survival in arid environments, met through streams, lakes, stock tanks, dug-outs, rain, snow, dew, and water within forage. Pronghorns seek cover from topography and vegetation, utilizing leeward sides of hills and buttes for refuge from harsh weather and bedding beneath trees and tall shrubs during extreme heat. Female pronghorns select areas of shrub and grasslands with adequate vegetation for concealment of newborns and foraging opportunities (NDGFD 2024b). Adult pronghorn populations in North Dakota have fluctuated over time, showing an upward trend from 1974 to 2007, followed by a significant decline from 2008 to 2012 (Christi et al 2015).

On November 15, 2018, the Department issued Secretary's Order (S.O.) 3362: Site Specific Management Activities to Conserve or Restore Big Game Habitat. Secretary's Order 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. Note that although S.O. 3362 does not include North Dakota in the list of western states identified with big game habitat, the guidance therein will be used as a guideline to assess the effects to big game habitat in this analysis.

Further, although neither the 1988 NDFO RMP nor the 2025 NDFO FEIS identify pronghorn or mule deer as priority species, nor do the RMPs identify migration corridors, the BLM's goals for management of wildlife resources across the state of North Dakota include maintaining or improving habitats for big game, especially pronghorn, elk, and bighorn sheep (BLM FEIS 2025). Surface disturbances in pronghorn and mule deer habitats could also impact these species through the loss of plant communities, food sources, cover, breeding areas, and interference in species' movement patterns (BLM FEIS 2025). The lands analyzed for the action alternatives include what is described as 'high use fawning and foraging areas' for both mule deer and pronghorn by the NDFG. As such, the BLM has used the North Dakota GIS Hub (gishubdata-ndgov.hub.arcgis.com) to obtain spatial data for pronghorn and mule deer general range and high use fawning and foraging areas. The lands proposed for lease lie outside of mapped pronghorn high use fawning and foraging areas.

Adult pronghorn counts in North Dakota have fluctuated over time with an increasing trend from 1974 to 2007, followed by a rapid decline from 2008 to 2012. The 2008 decline was primarily due to severe winter weather conditions. Also, populations were negatively correlated with the increased road density associated with oil and gas development in western North Dakota. There was little evidence that coyote populations, drought, and human harvest were major drivers in observed population declines. Further, roads, fences, and development may impede pronghorn movement to more hospitable areas during winter storms allowing them to escape extreme conditions (Christie et al. 2015)

Coal Screening

The coal screening process for federal lands described in Section 1.4 includes screening lands with coal development potential for 20 unsuitability criteria. Criteria 15 screens for unsuitability due to the presence of suitable habitat for species of high concern to the state which includes pronghorn and mule deer. All of the proposed lease tracts in the action alternatives were identified as a multiple use conflict for the leasing of coal within all lands analyzed for the 1988 NDFO RMP (see Table 1-4) and identified as "unsuitable with exception" for leasing in the 2025 ND FEIS (see table 1-5). Section 1.4 of this EA describes the unsuitability criteria; the effects of disturbances to big game are analyzed here.

Analysis Methods

The BLM assessed baseline condition of open road density and surface disturbance in a 1705.69 mi² (41.3 mi x 41.3 mi) area surrounding the proposed tracts, which are metrics reported to influence pronghorn movements and habitat use. The size of the analysis area was selected because 41.3 miles is the mean spring migration distance reported by Jakes et al. (2015) in northeastern Montana, and is a large enough area to capture direct, indirect, and incremental effects (Jakes et. al. 2015) for this analysis in North Dakota. The orientation of the analysis area was adjusted to the north of the Missouri River and assumes that the river would naturally act as a barrier to movement. The analysis area represents the best available information regarding pronghorn seasonal migration in eastern Montana/western North Dakota and can be used a metric to analyze seasonal migration for populations in western North Dakota. The ecoregion of western North Dakota (Northwestern Great Plains) extends from northern Nebraska into southern Canada, encompassing the analysis area.

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. 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.

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. Fox et al. (2009) identified impact thresholds based on acreage of disturbance and disturbance densities associated with energy development (primarily oil and gas) that correspond to moderate, high, and extreme impacts to habitat effectiveness. All three level of impact – moderate, high, and extreme – result in a loss of habitat effectiveness.

- Moderate Impact: Impacts can be minimized or avoided through effective management practices and habitat treatments; <20 acres disturbed/section
- High Impact: Impacts are increasingly difficult to mitigate and may not be completely offset by management and habitat treatments; 20-80 acres disturbed/section
- Extreme Impact: Habitat function is substantially impaired and cannot generally be recovered through management or habitat treatments; >80 acres disturbed/section.

This analysis assumes that other facilities identified by Fox and others (2009) can be associated with coal mining disturbances and are applicable to determining impacts to big game species. These disturbances include disturbance acreage associated with mining, roads, equipment staging areas, shops, power supplies, traffic, and human activity.

Road Density

The 2025 NDFO FEIS identifies average distances from roads to areas of high winter use by mule deer as 0.27 to 0.60 miles (Sawyer et al. 2006). Overall, approximately 20 percent of the analysis area provides areas with road densities less than 1.0 mi/mi². Both mule deer and pronghorn are expected to use these areas. Approximately 14 percent of the analysis area has a road density between 1.01 mi/mi² and 1.5 mi/mi², which corresponds to a moderate impact. Literature suggests that pronghorn will use these areas to a lesser degree (than mule deer) than the areas free from roads but may use roads to facilitate movement during winters with high snowfall. Approximately 67 percent of the analysis areas are highly impacted by open roads. It is important to note that average avoidance distances do not correspond to total habitat loss, as some ungulates will use habitats closer to disturbances, depending on individual responses (BLM NDFO DRMP 2024 p 3-100). Refer to **Table 43** and **Figure 29** below.

Table 43. Road Density Degree of Impact

Road Density (mi/mi ²)	Percent of Analysis Area	Degree of Impact
0-0.30	8.12	Very Low
0.31-1.0	11.45	Low
1.01-1.5	13.47	Moderate
1.51-2.0	17.22	High
2.01-5.0	45.73	Very High
5.01-10.0	3.49	
10.01-20.0	0.52	

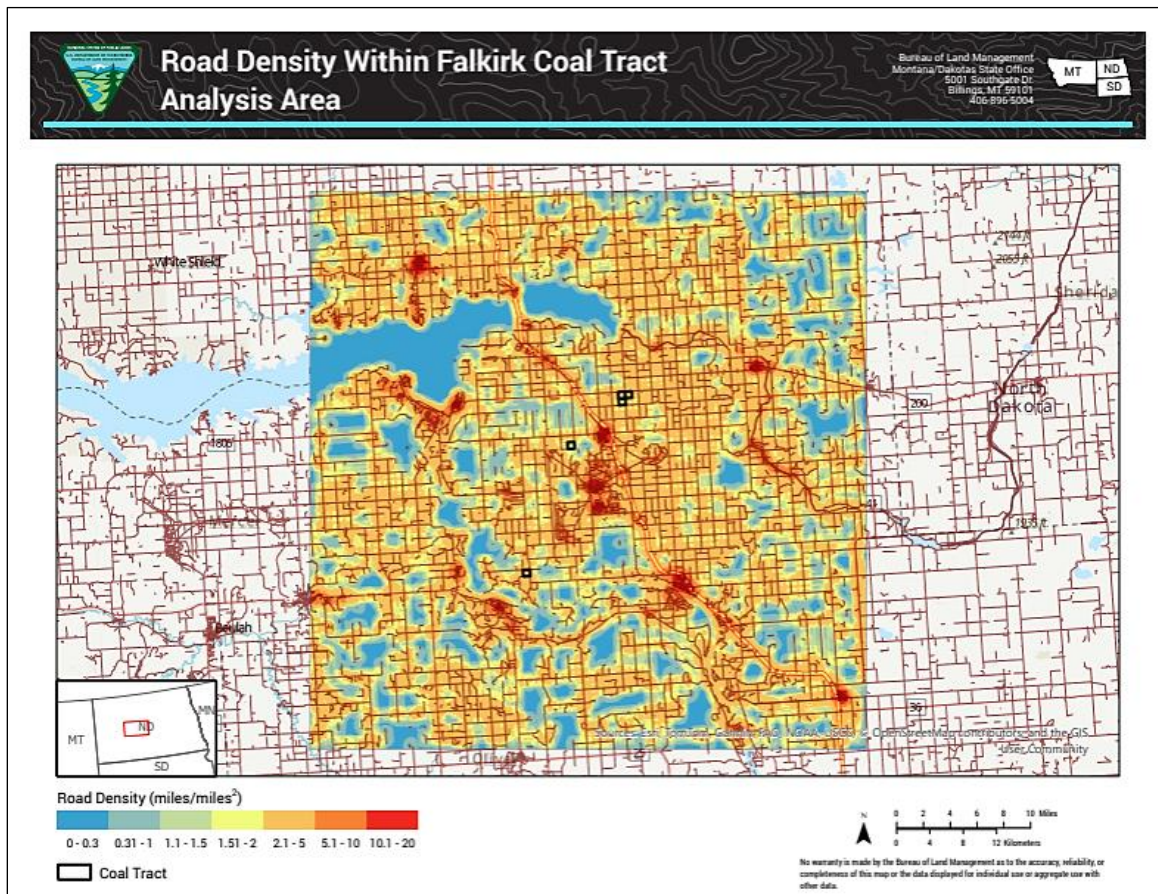


Figure 29. Big Game Habitat Effectiveness (Road Density) around Falkirk Tracts and Mine Permit Boundary

Landcover

The analysis area identified several plant communities that serve as predominant food sources for ungulates. Mule deer are primarily browsers, with a majority of their diet comprised of forbs, leaves, and

twigs of woody shrubs. Mule deer select the most nutritious plants, and those parts of other plants that will provide the most nutrition; because of this, deer have more specific forage requirements than other larger ruminants. The presence and condition of the shrub component is an important factor affecting mule deer populations and is a key element to maintaining high quality deer habitat (Fox et al. 2009).

Some agricultural types are suitable habitat for pronghorn, such as wheat, alfalfa, and pasture/rangeland used by cattle, especially in the summer months. Pronghorn fitness, fawn recruitment, and winter foraging depend on sufficient grasses, forbs, and woody shrubs that are available annually. Pronghorns are more heavily dependent on shrubs like sagebrush for food during the winter months because woody shrubs are the only available vegetation above the snow (Christie et al. 2015).

Table 44. Landcover and Percentage of Analysis Area

Landcover	Percent of Analysis Area
Alfalfa/other Hay	4.52
Agricultural Crops	41.87
Fallow/Idle Cropland	0.08
Developed	4.3
Forest	1.44
Shrubland	0.01
Barren/Snow/Ice	0.21
Water	9.17
Wetlands	6.07
Grassland/Pasture	32.33

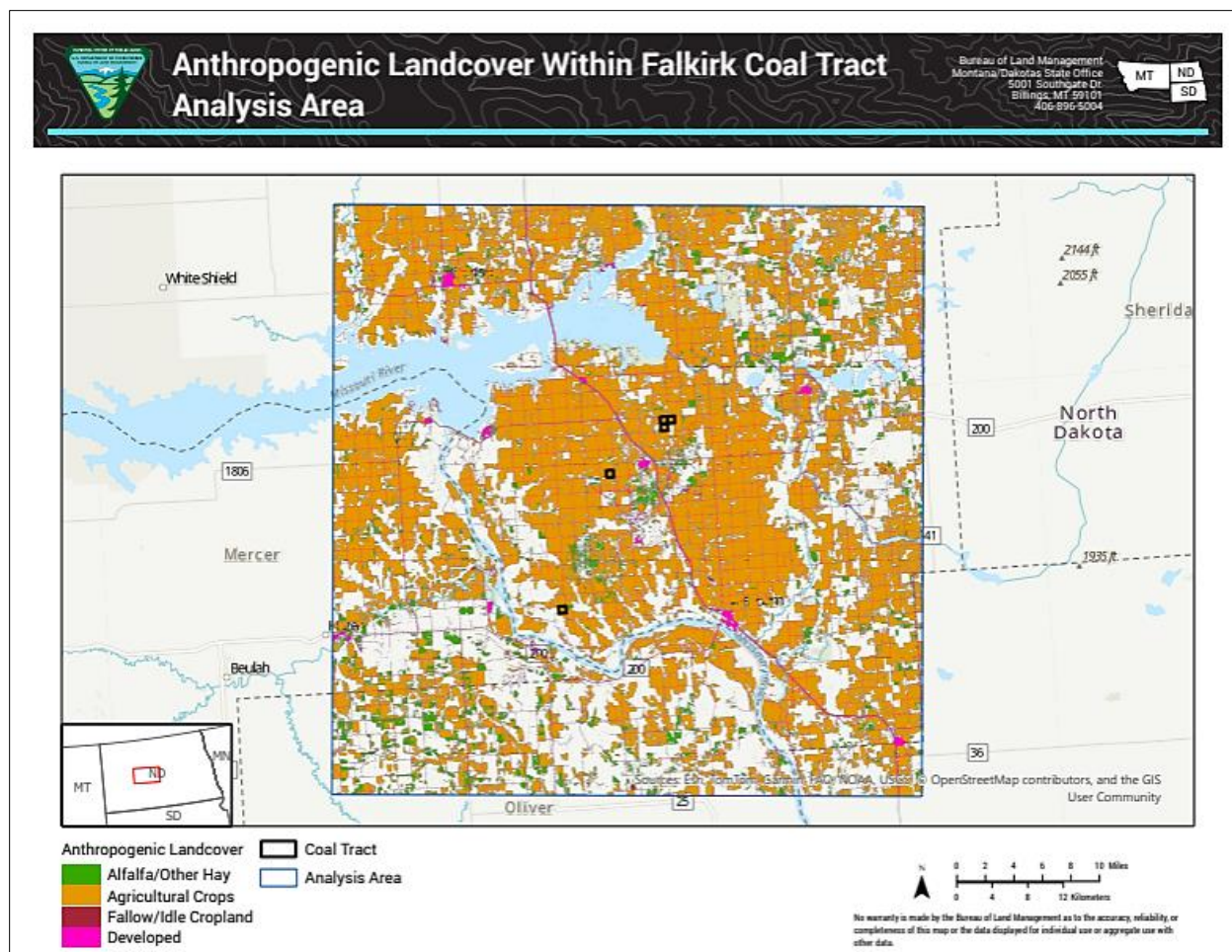


Figure 30. Anthropogenic Landcover in Falkirk Tracts and Mine Permit Boundary Analysis Area

Spatial and Temporal Displacement

Temporal disturbance of lands used for foraging are generally 3-5 years, but could vary dependent upon the mine plan, thickness of coal seam, and conditions that favor reclamation. Time, equipment, and dedication to reclamation can also play into the temporal disturbance as the spatial disturbance of a mine can vary, resulting in a variable amount of time to respread topsoil, depending on acreage to reclaim.

In winter, nutrient-rich vegetation is scarce, and the majority of ungulate diets consist of evergreen browse. However, during the summer, forage quantity peaks and ungulates forage on diverse vegetation, including forbs, legumes, and perennial crops (Jakes 2015).

Anthropogenic features, including surface development from coal mining, would eliminate this acreage of foraging areas resulting in ungulate populations avoiding these lands during the times of active mining.

As mining in the proposed area progresses, open-cut areas will be closed and reclaimed as new areas are opened for coal extraction. The process for reclaiming the land includes placing overburden in the mined pit area followed by topsoil recontouring and revegetation of the surface. Postmining land uses will be similar to pre-mining land uses. Postmining land use decisions will be based on the landowner post-mining preference statements, which will be obtained prior to submittal of the surface mine permit.

Seasonal pothole and drainage type wetlands will be reconstructed in the same acreage that occurred prior to mining. Shelterbelts will be replaced according to the surface owner's preference statement and will likely be planted by the McLean County Soil Conservation District (SCD). Any disturbed areas within the native woodlands will be reclaimed and randomly planted with mixed native tree and tall and low shrub species that can include (but are not limited to) boxelder, green ash, cottonwood, buffaloberry, chokecherry, rose, junberry, and silverberry and may vary from year to year. Grasses will be reseeded with native species including (but not limited to) western wheatgrass, blue grama, little bluestem, green needlegrass, alfalfa, and yellow sweet clover. Vegetation assessments on reclaimed lands will be conducted to achieve the requirements for successful vegetation specified in the latest version of the North Dakota Public Service Commission Standards for Evaluation of Revegetation Success and Recommended Procedures for pre-and-post mining Vegetation Assessments.

Successful vegetation and the use of reclaimed mined areas by pronghorn can be limited to areas with shorter vegetation that resembles pre-mine conditions, as these locations allow for high visibility and are most prevalent on mine sites with large tracts of contiguous reclaimed grassland. Pronghorn do not favor reclaimed mine locations containing structures or those that are fragmented by roads, although pronghorn are able to tolerate some human activity as long as it is within their field of view; therefore, a combination of short plant structure, unobstructed viewing distance, and terrain that lacks severe topographical features are preferable (Gamo et al. 2002).

Whereas pronghorn prefer areas with less topographic relief, the survival of mule deer is dependent on thermoregulation; the ability to seek refuge in any rugged landform from the elements, or to randomly use other topography types that provide relief from extreme weather conditions is preferable. The recontouring of the disturbed surface during reclamation provides relief from winter winds as well as providing shade during the summer. Reclaimed locations can provide sloped areas and drainages that provide these important features for mule deer during inclement weather (Gamo et al. 2002).

Successful reclamation and revegetation not only allow for mule deer and pronghorn to have availability to important nutrients but also allows for concealment for fawns and thus decreasing fawn susceptibility to predation. Further, physical barriers or suitable concealment cover habitat adjacent to surface disturbance can allow deer, specifically, to tolerate anthropogenic disturbances (Murphy et al. 2022).

Environmental Impacts – Alternative A (No Action)

Under the No Action Alternative, the Federal coal resources contained in the Federal lease tracts would not be leased and/or a mining plan would not be approved; thus, no Federal coal within those tracts would be mined. Surface disturbance would occur approximately 1,600 acres of private lands overlying the Federal coal resources in conjunction with mining operations conducted on adjacent private coal leases.

The effects to big game from this disturbance does not include direct loss of fawning habitat. Road density, the proximity to Highway 200, and the location of the towns of Underwood and Falkirk may already contribute to avoidance of this area and the effects of surface disturbance may be minimal. Within the analysis area there will be no disturbance to high use mule deer fawning and foraging habitat for the No Action Alternative; Within the analysis area, no locations identified as high use pronghorn fawning and foraging habitat will be disturbed. As previously discussed, the disturbance of areas associated with the No Action Alternative would last 3-5 years until reclaimed and revegetated. Dependent upon weather patterns and precipitation, vigorous and mature vegetation could be present at the location anywhere from 3-10 years; this timeframe is also dependent upon the species planted, as woody species would take longer to grow to maturity than grasses and forbs.

For this analysis, it is assumed that ± 150 additional disturbance will be adjacent to the tracts identified in the proposed action, thus totaling $\pm 1,600$ acres for all tracts.

Summary

The No Action Alternative will result in impacts to habitat effectiveness:

Table 45. No Action Alternative Impacts to Habitat Effectiveness

Tract EA Reference number	Legal Land Description	Current Anthropogenic disturbance acres*	Acreage of additional disturbance from No Action Alternative	Short-term Impact	Habitat Use
1	T. 146 N., R. 82 W. Sec. 2: NW1/4	13.79	296.21	Extreme	General
2	T. 146 N., R. 82 W. Sec. 3: NE1/4	12.90	297.10	Extreme	General
3	T. 146 N., R. 82 W. Sec. 3: SE1/4	15.79	294.21	Extreme	General
4	T. 146 N., R. 83 W. Sec. 24: SE1/4	16.46	293.54	Extreme	General
5	T. 146 N., R. 84 W. Sec. 12: NW1/4	27.58	282.42	Extreme	General

*Anthropogenic disturbance acres include acreage associated with mining, roads, equipment staging areas, shops, power supplies, traffic, and human activity. Does not include agricultural or hay crops.

Baseline road development patterns suggest that a high road density reduces habitat effectiveness to a larger degree compared to disturbance associated with coal mining. Approximately 46% of the analysis area is comprised of areas containing high road density. Zero acres affect mule deer high-use fawning and foraging habitat and no locations identified as high-use pronghorn fawning and foraging habitat will be disturbed. The No Action Alternative will have an extreme impact to habitat effectiveness for the lands associated with this alternative. Impacts are expected to be short-term lasting from 3-5 years, with mature vegetation for woody species being achieved within 10 years.

Environmental Impacts – Alternative B (Proposed Action)

Under the Proposed Action, the BLM would issue a coal lease for the Federal lease tracts to Falkirk, OSMRE would recommend approval of the Federal mining plan to the ASLM, and the ASLM would approve the mining plan (with or without conditions), allowing the Federal lease tracts to be mined. Surface disturbance would occur on approximately 800 acres of private lands overlying the Federal coal resources in conjunction with mining operations conducted on adjacent private coal leases.

Summary:

Alternative B, Proposed Action will result in the following impacts to habitat effectiveness:

Table 46. Proposed Action Alternative Impacts to Habitat Effectiveness

Tract EA Reference number	Legal Land Description	Current Anthropogenic disturbance acres*	Acreage of additional disturbance from No Action Alternative	Short-term Impact	Habitat Use
1	T. 146 N., R. 82 W. Sec. 2: NW1/4	8.67	151.33	Extreme	General
2	T. 146 N., R. 82 W. Sec. 3: NE1/4	3.11	156.89	Extreme	General
3	T. 146 N., R. 82 W. Sec. 3: SE1/4	2.00	158.00	Extreme	General
4	T. 146 N., R. 83 W. Sec. 24: SE1/4	5.56	154.44	Extreme	General
5	T. 146 N., R. 84 W. Sec. 12: NW1/4	13.79	146.21	Extreme	General

Baseline road development patterns suggest that a high road density reduces habitat effectiveness to a larger degree compared to disturbance associated with coal mining. Approximately 46% of the analysis area is comprised of areas containing high road density. Zero acres affect mule deer high-use fawning and foraging habitat and no locations identified as high-use pronghorn fawning and foraging habitat will be disturbed. The Proposed Action alternative will have an extreme impact to habitat effectiveness for the lands associated with this alternative.

The stipulation for Criterion 15 (NDFO 2025) states that “Stipulated methods of mining include reclamation of the disturbed essential habitat to a value that is equal to or greater than the time of disturbance” Impacts, based on reclamation standards and the stipulation listed, are expected to be short-term lasting from 3-5 years, with mature vegetation for woody species being achieved within 10 years.

Environmental Impacts – Alternative C

Under Alternative C, the BLM would issue a coal lease for Federal tracts 2 and 3 (tracts with split mineral ownership) to Falkirk, OSMRE would recommend approval of the Federal mining plan to the ASLM, and the ASLM would approve the mining plan (with or without conditions) allowing the two Federal lease tracts to be mined. Surface disturbance would occur on approximately 320 acres of private lands overlying the Federal coal resources in conjunction with mining operations conducted on adjacent private coal leases.

Summary:

Alternative C will result in the following impacts to habitat effectiveness:

Table 47. Alternative C Impacts to Habitat Effectiveness

Tract EA Reference number	Legal Land Description	Current Anthropogenic disturbance acres*	Acreage of additional disturbance from No Action Alternative	Short-term Impact	Habitat Use
2	T. 146 N., R. 82 W. Sec. 3: NE1/4	3.11	156.89	Extreme	General
3	T. 146 N., R. 82 W. Sec. 3: SE1/4	2.00	158.00	Extreme	General

Like Alternative B, Alternative C will have no effect on mule deer high-use fawning and foraging habitat, and no locations identified as high-use pronghorn fawning and foraging habitat will be disturbed. All other spatial and temporal disturbances, including road disturbances are the same as the No Action Alternative, respectively.

4. Consultation and Coordination and List of Preparers

4.1 Persons, Groups, and Agencies Consulted

Table 48 and **Table 49** identify BLM and OSMRE staff and consultants used in the preparation of this EA. **Table 50** identifies other Federal and state agencies that were consulted during the preparation of this EA.

Table 48. Bureau of Land Management and Office of Surface Mining Reclamation and Enforcement Staff Participating in the Preparation of this Environmental Assessment.

Name	Position	Role
Tessa Wallace	BLM Chief, Branch of Solid Minerals	Project co-lead; geology/water resources
Roberta Martinez-Hernandez	OSMRE Natural Resource Specialist	Project co-lead; air quality/climate
John Zeise	BLM State Geologist	Mining engineering
Gideon Maughan	BLM Archaeologist	Cultural and Tribal Resources
Jeremy Iliff	OSMRE Archaeologist	Cultural and Tribal resources
Amy Stillings	BLM Economist	Socioeconomics
Scott Rickard	BLM Economist	Socioeconomics
Paul Barnhart	BLM Wildlife Biologist	Wildlife and threatened and endangered species resources
Erica Trent	OSMRE Natural Resource Specialist	Wildlife and threatened and endangered species resources

Table 49. Environmental Consultants Staff Participating in the Preparation of this Environmental Assessment

Name	Position	Role
Amanda Nicodemus	Project Manager	NEPA oversight and compliance
Cody MacDonald	Assistant Project Manager	Administrative record, project coordination, wildlife resource lead
Rio Franzman	Project Principal	Client point of contact and advisor
Andrew Harley	Mining Director	Soil and geological resources
Carrie Steinhorst	Hydrogeologist	Water resource author
Michele Rowe	Air Quality Specialist	Air resource author
Colin Agner	Environmental Planner	Wildlife resource author
Jason Kline	Regional Fish Biologist	Fisheries author
Kim Ip	Senior Biologist	Wildlife resource lead
Don Kelly	Senior Environmental Project Manager	Socioeconomic resource author
Aidan McCarty	Cultural Resource Team Lead	Cultural resource author
Kerri Linehan	Technical Editor	Document production specialist
Debbi Smith	Desktop Publisher	Formatting/Section 508 accessibility

Table 50. Federal and State Agencies Consulted in the Preparation of this Environmental Assessment

Name	Position	Role
Dean Moos	Director of Reclamation and Abandoned Mine Land Divisions, NDPSC	Participating agency
Luke Toso	North Dakota Ecological Services Deputy Field Supervisor	ESA Section 7 Consultation
Jerry Reinisch	Fish and Wildlife Biologist, USFWS	ESA Section 7 consultation

4.2 Public Involvement, Consultations, and Coordination

Public Involvement

The BLM and OSMRE initiated a 30-day public scoping period on August 17, 2020, with the posting of the action alternatives and associated maps to the BLM ePlanning website (NEPA number DOI-BLM-MT-0000-2020-0008-EA) and the OSMRE website. Letters seeking comments on the action alternatives) were sent to members of the public and other interested stakeholders on August 17, 2020. The public scoping period ended on September 17, 2020. Three comments were received during the scoping period and identified concerns included historical properties, tribal artifacts, and surface water resources including floodplains. A list of all comments received is included in Appendix B. Issues identified through the scoping process that warranted detailed analysis in this EA are described in Section 1.6.

Tribal and National Historic Preservation Act Section 106 Consultation

The BLM and OSMRE consulted with Native Americans under various statutes, regulations, and EOs, including the American Indian Religious Freedom Act, the NHPA, the Native American Graves Protection and Repatriation Act, NEPA, and EO 13175, Consultation and Coordination with Indian Tribal Governments. On August 17, 2020, the BLM and OSMRE sent letters to 19 consulting Tribes for the 30-day scoping period, informing them of the Proposed Action. Letters were sent to the Tribal president/chairperson, Tribal Historic Preservation Officer, and other cultural contacts for the Cheyenne River Sioux Tribe; the Crow Tribe of Montana; the Crow Creek Sioux Tribe; the Flandreau Santee Sioux Tribe; the Fort Belknap Indian Community; the Fort Peck Tribes; the Lower Brule Sioux Tribe; the Three Affiliated Tribes: Mandan, Hidatsa, and Arikara Nation; the Northern Cheyenne Tribe; the Oglala Sioux Tribe; the Rosebud Sioux Tribe; the Standing Rock Sioux Tribe; the Turtle Mountain Band of Chippewa; the Yankton Sioux Tribe; the Santee Sioux Nation of Nebraska; the Lower Sioux Indian Community; the Northern Arapaho Tribe; the Spirit Lake Sioux Tribe; and the Sisseton-Wahpeton Oyate Tribes.

In response to the scoping letters, two comments were received from the Santee Sioux Nation of Nebraska and the Northern Cheyenne Tribe (see Appendix B). Santee Sioux Nation of Nebraska indicated no adverse effect on historic properties were found but that they wanted to continue the consultation process and be notified as the project progresses. The Northern Cheyenne Tribe requested a copy of the Class III Cultural Survey Report and requested to participate in any additional surveys if required. Coordination and consultation with these two Tribes are ongoing pursuant to NHPA Section 106 requirements.

Subsequently, the BLM and OSMRE provided follow up information to all Tribes on July 16, 2021, to include additional information pertaining to previous cultural resources survey work that had been completed for the parcels in the Proposed Action. No responses were received. Tribal consultation and coordination will continue throughout the analysis and permitting process.

U.S. Fish and Wildlife Service Consultation

Under the provisions of Section 7(a)(2) of the ESA of 1973, a Federal agency that carries out, permits, licenses, funds, or otherwise authorizes an activity must consult with the USFWS, as appropriate, to ensure that the Proposed Action is not likely to jeopardize the continued existence of any species listed under the ESA of 1973 or result in the destruction or adverse modification of designated critical habitat. A USFWS IPaC query for the Proposed Action was conducted in April 2021 to identify species and other resources that are known or expected to be on or near the Proposed Action area. During preparation of the environmental analysis, the BLM and OSMRE informally consulted with the USFWS regarding the effects of the Proposed Action on the Dakota skipper, northern long-eared bat, piping plover, pallid sturgeon, rufa red knot, and whooping crane. To develop the biological assessment (BA), the BLM and OSMRE met with the USFWS in July 2020 and January 2021 to discuss the project, issues, and potential impacts to listed species. The BA is provided in Appendix E.

On May 27, 2021, the BLM and OSMRE requested concurrence from the USFWS regarding the determination of effects for Federally listed species contained in the BA (see Appendix E) for the Proposed Action. On June 9, 2021, the USFWS concurred that the Proposed Action “may affect, but is not likely to adversely affect” the whooping crane, pallid sturgeon, and northern long-eared bat. The USFWS did not comment on the “no effect” determinations for the remaining species, as the USFWS is not required to concur with “no effect” determination under the implementing regulations of the ESA (50 CFR 402). The USFWS did not recommend any additional conservation measures, and their response concluded informal consultation.

On April 7, 2025, the BLM and OSMRE requested concurrence from the USFWS regarding the determination of effects for Federally listed species including the uplisting of the northern long-

eared bat, and the nomination of three proposed species (western regal fritillary, Suckley's cuckoo bumble bee, and the monarch butterfly) since the 2021 concurrence was issued.

On April 15, 2025, the USFWS concurred with the BLM and OSMRE determinations that the Proposed Action “may affect but is not likely to adversely affect” the endangered northern long-eared bat (*Myotis septentrionalis*) and whooping crane (*Grus americana*), and the threatened Dakota skipper (*Hesperia dacotae*), piping plover (*Charadrius melodus*) and rufa red knot (*Calidris canutus rufa*). The USFWS, again, did not comment on the “no effect” determinations for pallid sturgeon (*Scaphirhynchus albus*) and the threatened Dakota skipper (*Hesperia dacotae*), as the USFWS is not required to concur with “no effect” determination under the implementing regulations of the ESA (50 CFR 402). The USFWS did not recommend any additional conservation measures, and their response concluded informal consultation.

The USFWS also determined that the Proposed Action is “not likely to jeopardize” the western regal fritillary (*Argynnis idalia occidentalis*), monarch butterfly (*Danaus plexippus*), or Suckley's cuckoo bumble bee (*Bombus suckleyi*), species proposed for listing but that do not yet have formal status as threatened or endangered under the ESA. The USFWS noted that, should these species be listed following the rulemaking period, consultation should be reinitiated within 30 days to finalize informal consultation for the species.

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