DOE/EIS-0568

Joint Lead Agencies:

U.S. DEPARTMENT of ENERGY

DEQ Montana Department of Environmental Quality

Cooperating Agencies:

USDA

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Draft Environmental Impact Statement

North Plains Connector Project

January 2026

Prepared by:

ERM

Montana (Rosebud, Custer, and Fallon counties)
North Dakota (Golden Valley, Slope, Hettinger, Grant, Morton, and Oliver counties)

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Table of Contents

List of Tables (included in Appendix B)

List of Figures (included in Appendix B)

List of Appendices

Abbreviations and Acronyms

Abbreviation/Acronym	Definition
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AADT	average annual daily trip
AC	alternating current
AIMP	Agricultural Impact and Mitigation Plan
AIS	Aquatic Invasive Species
ANS	Aquatic Nuisance Species
ANSI	American National Standards Institute
APE	Area of Potential Effects
ARI	aquatic resource inventory
ARM	Administrative Rules of Montana
ARS	Agricultural Research Service
ATV	all-terrain vehicle
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
BPA	Bonneville Power Administration
CAA	Clean Air Act
CAFE	Corona and Field Effects
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CMRP	Construction, Mitigation, and Reclamation Plan
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CTGNC	Community Types of Greatest Conservation Need
dB	decibel
dBA	A-weighted decibel
DC	direct current
DNRC	Department of Natural Resources and Conservation

Abbreviation/Acronym	Definition
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DPG	Dakota Prairie Grasslands
EHV	extra-high voltage
EIS	Environmental Impact Statement
EMF	electromagnetic field
EO	Executive Order
EOR	enhanced oil recovery
ERM	Environmental Resources Management, Inc.
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FWP	[Montana] Fish, Wildlife & Parks
g	gravity
GHG	greenhouse gas
GHz	gigahertz
GIS	Geographic Information System
GRIP	Grid Resilience and Innovations Partnership
HAP	hazardous air pollutant
HUC	hydrologic unit code
HVDC	high-voltage direct current
I-90	Interstate 90
I-94	Interstate 94
ID	identification
IEEE	Institute of Electrical and Electronics Engineers
IMPROVE	Interagency Monitoring of Protected Visual Environment Program
IPaC	Information for Planning and Consultation
Joint Lead Agencies	DOE and MTDEQ
KOP	key observation point
kV	kilovolt
L50	noise level exceeded 50 percent of the time
L_d	daytime sound level
L_{dn}	day-night sound level: average noise level over a 24-hour period
LE	Listed Endangered
$L_{eq(24)}$	24-hour equivalent sound level

Abbreviation/Acronym	Definition
LMNG	Little Missouri National Grassland
L_n	nighttime sound level
LRMP	Land and Resource Management Plan
LT	Listed Threatened
MA	Management Area
MBMG	Montana Bureau of Mines and Geology
MBTA	Migratory Bird Treaty Act
MCA	Montana Code Annotated
MD	management decision
MDA	Montana Department of Agriculture
MEPA	Montana Environmental Policy Act
MFSA	Major Facility Siting Act
mG	milligauss
MHz	megahertz
MISO	Midcontinent Independent System Operator
MLCF	Montana Land Cover Framework
MMB	Minerals Management Bureau
MOU	Memorandum of Understanding
MP	Milepost
MSTL	Montana State Trust Lands
MT 7	Montana Highway 7
MT 12	Montana Highway 12
MT 39	Montana Highway 39
MT 59	Montana Highway 59
MT 200	Montana Highway 200
MTDEQ	Montana Department of Environmental Quality
MTNHP	Montana Natural Heritage Program
MW	megawatt
MWRF	Montana Wetland and Riparian Framework
N/A	data not available
N_2O	nitrous oxide
NA	not applicable
NAAQS	National Ambient Air Quality Standards
ND 6	North Dakota Highway 6

Abbreviation/Acronym	Definition
ND 8	North Dakota Highway 8
ND 21	North Dakota Highway 21
ND 22	North Dakota Highway 22
ND 25	North Dakota Highway 25
ND 31	North Dakota Highway 31
ND 49	North Dakota Highway 49
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDA	North Dakota Department of Agriculture
NDDEQ	North Dakota Department of Environmental Quality
NDDOT	North Dakota Department of Transportation
NDGFD	North Dakota Game and Fish Department
NDGS	North Dakota Geological Survey
NDSTL	North Dakota State Trust Lands
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NFS	National Forest System
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_X	nitrogen oxides
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NSA	noise-sensitive area
NSPS	New Source Performance Standards
NWI	National Wetlands Inventory
O_3	ozone
Pb	lead

Abbreviation/Acronym	Definition
PE	Proposed Endangered
PEM	palustrine emergent
PFO	palustrine forested
PFYC	Potential Fossil Yield Classification
PI	principal investigator
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PM_{10}	particulate matter with an aerodynamic diameter of 10 micrometers or less
ppb	parts per billion
ppm	parts per million
Project	North Plains Connector Project
Proponent	North Plains Connector LLC
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
PT	Proposed Threatened
PUS	palustrine unconsolidated shoreline
R	Riverine
REE	rare earth element
RFSS	Regional Forester's Sensitive Species
RMP	Resource Management Plan
ROW / ROWs	right-of-way / rights-of-way
RV	recreational vehicle
SCP	Species of Conservation Priority
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
SOC	Species of Concern
SPP	Southwest Power Pool
SPRP	Spill Prevention and Response Plan
SSS	Special Status Species
SW	Southwest
SWAP	State Wildlife Action Plan
SWP	source water protection

Abbreviation/Acronym	Definition
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened and endangered
THPO	Tribal Historic Preservation Office
tpy	tons per year
UR	Under Review
US 12	U.S. Route 12
US 212	U.S. Route 212
US 85	U.S. Route 85
USC	United States Code
USDA	U.S. Department of Agriculture
USDA Forest Service	U.S. Department of Agriculture Forest Service
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UTV	utility terrain vehicle
VMT	vehicle miles traveled
VOC	volatile organic compound
VRM	Visual Resource Management
WECC	Western Electricity Coordinating Council
WEG	Wind Erodibility Group
WHPA	Wellhead Protection Area
wi-fi	Wireless Fidelity
WMA	Wildlife Management Area

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EXECUTIVE SUMMARY

ES-1. INTRODUCTION

The Environmental Impact Statement (EIS) analyzes the potential impacts on the human and Montana / North Dakota environment of granting the various permits or other authorizations for the North Plains Connector Project (Project) proposed by North Plains Connector LLC (the Proponent—a Grid United LLC Company) in accordance with the National Environmental Policy Act (NEPA), the Montana Environmental Policy Act (MEPA), and the Montana Major Facility Siting Act (MFSA). MEPA and Montana MFSA apply to the portions of the Project in Montana only, while NEPA applies to the entire Project (portions located both in Montana and North Dakota).

The Project involves construction and operations of a 525-kilovolt (kV) high-voltage direct current (HVDC) transmission line and three alternating current (AC) transmission lines spanning approximately 422 miles between Montana and North Dakota, as well as auxiliary facilities.

Per NEPA and MEPA, federal and state agencies are required to prepare an EIS prior to taking an action significantly affecting the quality of the human environment, per 42 USC § 4332(C); 42 USC § 4321 et seq.; and § 75-1-201(1)(b)(iv), Montana Code Annotated. The EIS relies on NEPA regulations for the U.S. Department of Agriculture (USDA), the U.S. Department of the Interior (DOI), and the U.S. Department of Energy (DOE) (7 CFR Part 1b; 43 CFR Part 46; 10 CFR Part 1021, respectively). The EIS also relies on DOE NEPA Implementing Procedures and the DOI Handbook of NEPA Implementing Procedures, both dated June 30, 2025. Although the Council of Environmental Quality (CEQ) rescinded its NEPA implementing regulations (40 CFR Parts 1500—1508), agencies may consider voluntarily using those regulations as guidance in completing ongoing NEPA reviews or defending against challenges to reviews completed while those regulations were in effect (CEQ 2025). Accordingly, the EIS may refer to CEQ regulations, as they were in effect at the time when the agencies issued the Notice of Intent (NOI) to prepare an EIS.

The DOE and the Montana Department of Environmental Quality (MTDEQ) (i.e., the Joint Lead Agencies) directed Environmental Resources Management, Inc. (ERM) in the preparation of the EIS and independently reviewed and confirmed the accuracy of the information contained herein to inform federal decision-making regarding the issuance of certain federal or state authorizations.

ES-2. PROJECT LOCATION AND BACKGROUND

The Project would span approximately 422 miles, starting near Colstrip, Montana, and ending at two separate locations in North Dakota: one near the town of Center and the other near St. Anthony (Figure ES-1). The Project would include construction of four transmission line segments (HVDC Transmission Line, Rosebud Transmission Line, Oliver Transmission Line, and Morton Transmission Line), two converter stations (Rosebud County Converter Station and Morton County Converter Station), and one switchyard (Morton County Switchyard) (Figure ES-2). The Project would also include construction of auxiliary components and equipment, such as repeater stations, telecommunication systems, and grounding infrastructure. Additionally, the Proponent would install various access roads (new permanent/temporary access roads, overland travel) for construction and operations.

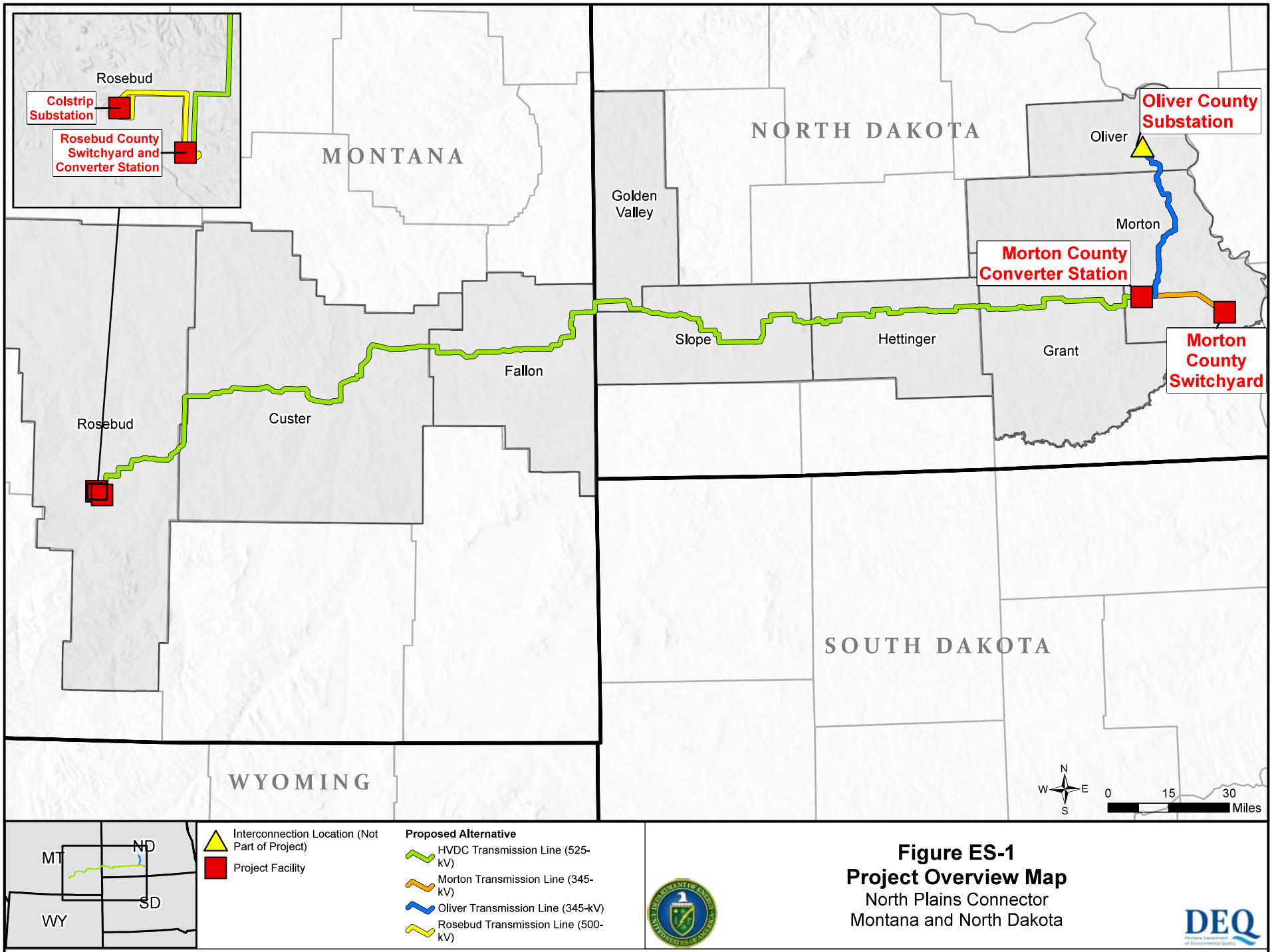
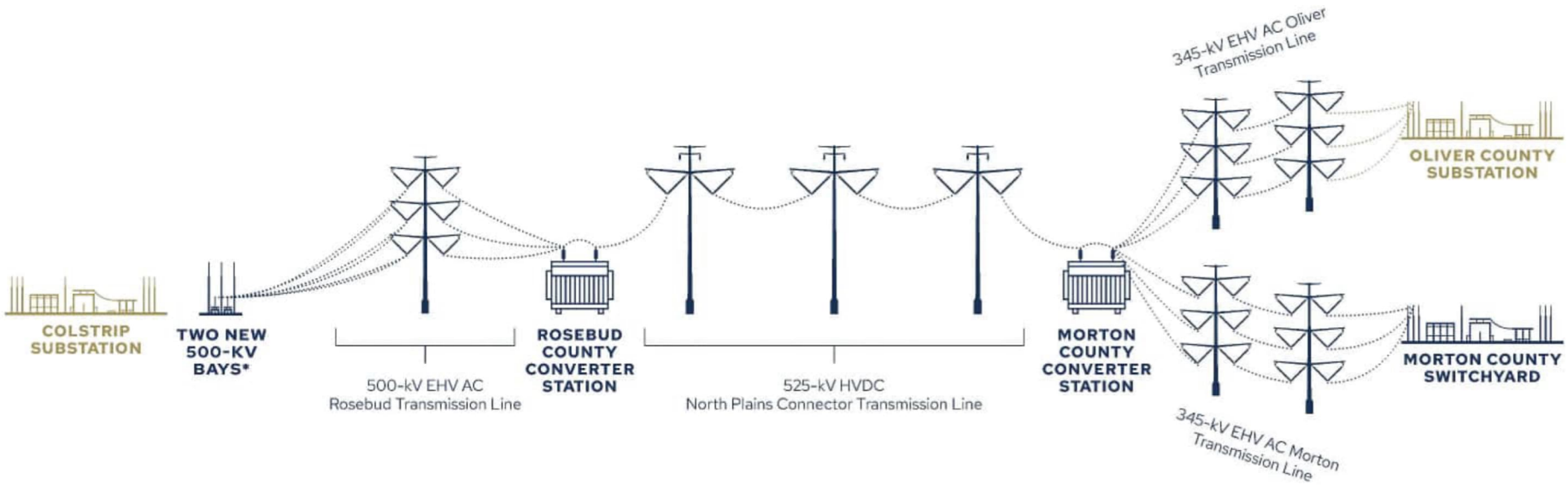
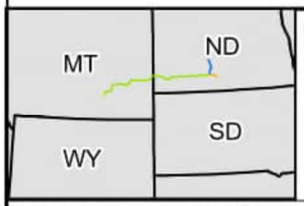


Figure ES-1
Project Overview Map
North Plains Connector
Montana and North Dakota

MPLS \\vmscuspgisfs01\Data\US\Projects\G-L\Grid United\Montana 3rd Party Supt\ArcGIS\Montana3rdParty.aprx\Figure ES-1 NPC Overview | REVISED: 09/18/2025 | SCALE: 1:2,000,000 DRAWN BY: EMH





Legend

New project infrastructure

Pre-existing infrastructure / Future planned / Not part of project

*The existing footprint of the Colstrip Substation is estimated to be expanded by approximately 13.18 acres to accommodate the NPC interconnection

Figure ES-2
Major Project Components
North Plains Connector
Montana and North Dakota

DEQ

MPLS M:\US\Projects\G-L\Grid United\Montana 3rd Party Supt\ArcGIS\Montana3rdParty.aprx\Figure 1.3-2 Major Project Components | REVISED: 08/12/2025 | SCALE: 1:2,000,000 DRAWN BY: EMH

The Proponent would construct a new 500- kV extra-high voltage (EHV) AC transmission line, referred to as the Rosebud Transmission Line, in Rosebud County, Montana. This line would feature two separate, parallel circuits, each approximately 3 miles long with an up to 320-foot-wide right-of-way (ROW) where colocated. It would start at the existing Colstrip Substation, owned by NorthWestern Energy, which would serve as the interconnection point to the Western Electricity Coordinating Council power system for the western grid. The footprint of the existing Colstrip Substation would be expanded by approximately 4.2 acres to the northwest and approximately 9 acres to the south and east. The Proponent would also modify the Colstrip Substation to include two new 500-kV bays and upgrade the electrical components onsite to accommodate a 5,000-amp rating (which increases its capacity to handle a larger electrical current).

The Rosebud Transmission Line would then extend eastward to a new AC / direct current (DC) converter station in Rosebud County (the Rosebud County Converter Station). The station would link the eastern endpoint of the Rosebud Transmission Line with the western endpoint of the new 525±kV HVDC Transmission Line.

The Proponent would install approximately 173 miles of the HVDC Transmission Line from the Rosebud County Converter Station east to the Montana / North Dakota state line in Fallon County, and approximately 168 miles from the state line to a new AC/DC converter station in Morton County, North Dakota (the Morton County Converter Station). The HVDC Transmission Line would have a 200-foot-wide ROW. The Morton County Converter Station would link the eastern endpoint of the new HVDC Transmission Line to the western endpoints of two new 345-kV EHV AC transmission line segments (Oliver Transmission Line and Morton Transmission Line).

Approximately 52 miles of new 345-kV EHV AC transmission line (Oliver Transmission Line) would extend east and north from the Morton County Converter Station to a new separately planned substation in Oliver County (the Oliver County Substation). The Oliver Transmission Line would have a 200-foot-wide ROW. The Oliver County Substation is a 345-kV/230-kV facility being proposed and developed independently of the Project by Minnesota Power. The Oliver County Substation would be the interconnection point to the Midcontinent Independent System Operator system and the eastern grid.

Additionally, the Proponent would construct approximately 22 miles of new 345-kV EHV AC transmission line (Morton Transmission Line), extending east and southeast from the Morton County Converter Station to a new switchyard (the Morton County Switchyard). The Morton Transmission Line would have a 200-foot-wide ROW. The Morton County Switchyard would be the interconnection point for the Southwest Power Pool system and the eastern grid.

ES-3. PURPOSE AND NEED

The terms “objectives and goals” (under federal guidance) or “purpose and need” (under State of Montana guidance) are used interchangeably to describe the intent or outcome of the Project. The objective or purpose of the Project is to connect the western and eastern electrical grids to allow energy transfer between them. This would (1) improve the reliability, efficiency, and resiliency of both grids by increasing transfer capacity and (2) mitigate weather-driven system outages (Grid United 2024). The goals or need for the Project are driven by three primary issues: (1) changes in public policy that decrease historically reliable baseload generation capacity and lower the ability to meet growing energy demands; (2) rapid changes in the sources of energy generation that reduce the ability to balance supply and demand in real time; and (3) extreme weather events that affect

grid resiliency. The Project aims to develop a robust system to address this growing demand and provide stable and reliable energy transfer. For more information on the objective and purpose of the Project, refer to the Montana MFSA Application for a Certificate of Compliance (Grid United 2024).

The purpose and need as well as roles and responsibilities for the Joint Lead Agencies are described in Section 1.2.2, Joint Lead Agencies, of the EIS. The purpose and need for the Cooperating Agencies is described in Section 1.2.3, Cooperating Agencies, of the EIS. A list of anticipated permits, licenses, consultations, or approvals that would be required from federal, state, and local agencies before Project construction could commence are provided in Appendix A, Agency Roles and Responsibilities, of the EIS.

ES-4. PUBLIC PARTICIPATION

ES-4.1. PUBLIC INVOLVEMENT

On October 25, 2024, as part of the NEPA/MEPA scoping process, the DOE published a "Notice of Intent To Prepare an Environmental Impact Statement for the Proposed North Plains Connector Project, Colstrip, Montana to Center/St. Anthony, North Dakota" (89 *Federal Register* 207 [October 25, 2024]),[1] which opened the 45-day scoping period for the MTDEQ and cooperating federal agencies. News agencies, newspapers, and landowners crossed by an alternative were notified of the scoping period (see Appendix C, Scoping Report, of the EIS). Additionally, the DOE issued a press release announcing the public scoping meetings; the MTDEQ issued this same press release on its website. The DOE also published a new webpage via the Office of NEPA Policy and Compliance that included a Project summary, an overview of the EIS process and DOE's role, and information on the scoping meetings (see Appendix C of the EIS). The NOI and press releases disclosed the times and locations of five public scoping meetings and information about the Project. The NOI also provided information on Project alternatives: Alternatives A (Northern Route Alternative), B (Central Route Alternative), C (Southern Route Alternative), D (Proposed Route Alternative), E (Tongue River Route Alternative), the Eastern Route, and the No Action Alternative. Scoping meetings were held virtually and in-person in Montana and North Dakota (Table ES-1).

Table ES-1
Summary of Public Meeting Attendance

Location	Meeting Date and Time	Number of Attendees
Mandan, North Dakota	November 6, 2024, 4–7 p.m. (Central Standard Time)	37
Dickinson, North Dakota	November 7, 2024, 6–9 p.m. (Mountain Standard Time)	5
Miles City, Montana	November 12, 2024, 4–7 p.m. (Mountain Standard Time)	24
Colstrip, Montana	November 13, 2024, 6–9 p.m. (Mountain Standard Time)	7
Virtual	November 19, 2024, 12–3 p.m. (Mountain Standard Time)	40
Total		**113**

[1] https://www.federalregister.gov/documents/2024/10/25/2024-24879/notice-of-intent-to-prepare-an-environmental-impact-statement-for-the-proposed-north-plains

Topics covered during the scoping meetings included a Project overview with map, purpose and need of the Project, Project design, Project alternatives, agency roles and responsibilities, timeline and schedule, and how to submit comments. Public comments were collected in person, on paper, via post mail, and email during the comment scoping period (October 25 to December 9, 2024). A total of 28 public comment submittals were received, which included 85 distinct comments. For more details on this process, see the Scoping Report (Appendix C of the EIS).

ES-5. ALTERNATIVES

ES-5.1. DEVELOPMENT OF ALTERNATIVES

The alternatives evaluated in the EIS include the No Action Alternative and Proposed Alternative. Several additional alternatives were considered but dismissed from detailed analysis as described in Section 2.2, Alternatives Considered but Dismissed from Detailed Analysis, of the EIS).

ES-5.2. NO ACTION ALTERNATIVE

The No Action Alternative provides the baseline against which the impacts of the Proposed Action or Proposed Alternative can be compared. Under the No Action Alternative, the agencies would assume for purposes of the EIS analysis that the MFSA Certificate would not be issued; therefore, the Project would not be constructed. The objective or purpose for the Project to enhance grid reliability and resilience between service areas and provide cross-grid market access for electricity generators between the western and eastern electrical grids would not be met. The No Action Alternative would assume the electrical grids and connections between them remain unchanged from their current status. Any beneficial or adverse impacts associated with the Project would not occur (see Chapter 3, Affected Environment and Environmental Consequences, of the EIS).

ES-5.3. PROPOSED ALTERNATIVE (ROUTE ALTERNATIVE D)

The Proposed Alternative (Alternative D) would encompass approximately 10,125 acres of maintained ROW (a 200- to 320-foot-wide corridor crossing easements for public and private lands), with a centerline of approximately 422 miles. The Proposed Alternative begins at the existing Colstrip Substation, routes east and south to the proposed Rosebud County Converter Station, then heads north and east to the Montana/North Dakota border.

The route generally traverses open, undeveloped lands and passes through predominately private lands in Montana and North Dakota. The route also crosses Montana State Trust, Bureau of Land Management (BLM), and USDA Agricultural Research Service (ARS) lands within Montana, and North Dakota State Trust and National Forest System (NFS) lands within North Dakota. Where it crosses the Montana/North Dakota border, the Proposed Alternative generally routes east to the proposed Morton County Converter Station. From there, the route splits, with an approximate 52-mile section heading north to the Oliver County Substation near Center, North Dakota, and an approximate 22-mile section heading east/southeast to the proposed Morton County Switchyard near St. Anthony, North Dakota.

The Proponent anticipates starting construction in 2028 and estimates that it would take approximately 3 to 4 years to complete with concurrent construction on the transmission line, converter stations, and switchyard. Transmission line construction generally follows a sequence, including survey and staking, access road construction, work area clearing, foundation installation, structure assembly and erection, conductor and optical power ground wire installation, and site cleanup and restoration. Construction crews (peak temporary workforce of approximately

800 workers) would operate simultaneously at different locations throughout the Project area[2]. Crews could assemble and erect structures at an average pace of around 1 to 2 miles per day. Conductor and optical power ground wire installation could be completed at an estimated average pace of about 2 miles per day.

Transmission structures (steel monopole and lattice towers) height would range from approximately 110 to 195 feet. Structures would typically be spaced approximately 900 and 1,600 feet apart and with an average span of 1,200 feet, resulting in three to six structures per mile. The Project would generally require a typical 200-foot-wide maintained ROW.[3]

The self-weathering steel finish on the structures would initially appear dark and industrial but would develop a rust-brown color over time that might blend somewhat with earth tones in the landscape.

The Project would be accessed by existing roads, overland travel, and new temporary and permanent access roads. The Proponent has identified Project access roads that would minimize travel through sensitive resources at site-specific locations, avoid large waterway crossings, provide safe pathways, and allow access across agricultural areas as preferred by landowners. Permanent access roads would affect 314.9 acres, temporary access roads would affect 360.4 acres, and overland travel would affect 899.4 acres (Grid United 2025; see Appendix D, Project Work Area Requirements, Typicals, and Designs, of the EIS).

The Project would require new permanent facilities that would remain in place for the life of the Project. These facilities would include the Morton County and Rosebud County Converter Stations, Morton County Switchyard, and six fiber repeater stations. These facilities would collectively have a permanent footprint of approximately 380.3 acres and 150.8 acres of temporary construction footprint (see Appendix D of the EIS).

ES-6. ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ALTERNATIVE

This section provides a summary of the potential impacts the Proposed Alternative may have on each resource. Detailed impact analyses for each alternative and resource can be found in Chapter 3 of the EIS. Table ES-2 summarizes and compares the impacts of the two alternatives considered in detail. Proposed activities were found to have minimal-to-no impact on air quality, public health and safety, groundwater hydrology, surface water hydrology, and noise; therefore, these resources are not discussed further in this summary.

ES-6.1. CULTURAL/TRIBAL/HISTORICAL RESOURCES

Impacts on cultural resources within the Project area (physical Area of Potential Effects) where construction would occur would be direct, permanent, and localized. Impacts on cultural resources could be caused by vibrations generated by heavy equipment activities and would be considered short- or medium-term; however, if such vibration caused physical damage to a cultural resource,

[2] "Project area" is the permanent, operational ROW and areas with temporary/permanent impacts within and outside of the ROW.

[3] The maintained ROW would be permanently maintained through the life of the Project. The Rosebud Transmission Line would have a typical ROW of 320 feet (due to colocation of parallel lines), while the HVDC Transmission Line, Oliver Transmission Line, and Morton Transmission Line would have a typical ROW of 200 feet.

the damage would be permanent. Agencies anticipate addressing effects on historic properties through a Programmatic Agreement[4].

Impacts on cultural resources within the non-physical Area of Potential Effects could include visual and acoustic changes that would alter the setting or feeling of the resources. This type of impact would endure as long as construction was occurring within view and hearing of people using those resources and during operations. Visual impacts could occur during construction and operations and would be direct, with potential for secondary impacts, long-term to permanent, and localized. Acoustic impacts could occur primarily during construction, but would persist throughout operations, and would be direct, short- to medium-term, and localized.

ES-6.2. MINERALS AND GEOLOGY

There would be direct, permanent, and localized impacts on shallow bedrock, including a conservative maximum amount of as-needed blasting impacts on up to 708.0 acres for construction of structures, facilities, and access roads. Direct impacts on paleontological resources would be avoided or mitigated through implementation of the Paleontological Resources Management and Mitigation Plan (see Appendix E, Construction, Mitigation, and Reclamation Plan, of the EIS). Mining activities would likely not be permitted within the maintained ROW, and coal mining activities would be limited to 35 feet of the transmission line infrastructure. Outside of mining limitations, operations would have a minor impact on geological, mineral, and paleontological resources. However, ROW operations would not have an impact on the overall availability of these materials, as they are abundant throughout surrounding areas.

ES-6.3. LAND USE AND RECREATION

Transmission lines would cross land owned by state and federal agencies for 49.6 miles, including the following landowners: State of Montana (17.0 miles); State of North Dakota (4.7 miles); the BLM (9.8 miles); NFS (10.2 miles); and USDA ARS (7.9 miles). The remaining 371.9 miles of transmission lines would cross privately owned lands and public or private roads.

Construction activities would result in direct, short-term, and localized disruptions on recreational users and may restrict specific areas while construction activities (e.g., temporary facilities/access roads, equipment presence) are occurring. In addition to permanent structure footprints and access roads, vegetative cover would be permanently altered within the operational ROW where tall woody shrubs, trees, and forested areas need to be cleared and converted to grasslands. Operational impacts would result in direct, permanent, and localized impacts on land use and public lands in Montana and North Dakota.

ES-6.4. VISUAL AND AESTHETICS

There would be both short-term and permanent visual impacts on the landscape. Visual impacts would vary based on viewer sensitivity, distance, and landscape context. Direct, short-term, localized impacts would occur from construction activities and maintenance of the ROW during operations. Direct, permanent, localized impacts would result from permanent transmission line structures, facilities, and vegetation clearing within the ROW.

[4] Programmatic Agreements allow for the resolution of adverse effects for complex projects through negotiation and agreement between the lead federal agency, state historic preservation offices, tribal historic preservation offices, and the Advisory Council on Historic Preservation (36 CFR § 800.14(b)).

ES-6.5. SOCIOECONOMICS

Construction would have beneficial and direct and secondary, medium- and long-term, and regional impacts on socioeconomics due to increased population, increased employment, increased demand for housing and public services and facilities, increased taxes and revenues, and increased air traffic. Construction of the Proposed Alternative would have beneficial and adverse, direct and secondary, long-term, regional impacts on population due to increased full-time employment opportunities, increased taxes and revenues, and affected residential property value. The Proposed Alternative would generate an average of 2,055 jobs annually in Montana and North Dakota during a 3-year construction period (Bureau of Business and Economics Research, University of Montana 2025), which would be beneficial and medium-term. Construction may occur for an additional year with the total economic impacts distributed over the longer time period. Given the shortage of housing reported by state and local agencies, housing needs during construction could strain an already limited supply of affordable rental housing.

ES-6.6. SOILS

Most soil impacts (1,780.7 acres in Montana and 2,459.8 acres in North Dakota) would be direct, short-term, localized, and occur within temporary impact areas for structure pads, wire pulling and tensioning areas, temporary access roads, overland travel paths, and facility sites. However, permanent work areas would have direct, permanent, localized and impacts on soils (295.6 acres in Montana and 70.8 acres in North Dakota).

ES-6.7. VEGETATION

There would be direct and secondary; medium-term, long-term, and permanent; localized impacts on vegetation communities and special status plant species through clearing, filling, and other construction activities. Direct impacts would be due to vegetation loss in the ROW, and secondary impacts on vegetation may include changes in hydrology, deposition of particulate matter (dust), changes in successional stage, decline in species structure, and/or invasion of noxious weeds. However, these impacts would be expected to be mitigated through required construction best management practices. The Proposed Alternative would disturb approximately 10,963.8 acres of vegetation in temporary impact areas (4,393 acres in Montana and 6,570.9 acres in North Dakota) and 780.6 acres in permanent impact areas (682.7 acres in Montana and 98 acres in North Dakota).

ES-6.8. FISHERIES AND WILDLIFE

Construction would lead to direct, secondary, and cumulative; medium-term, long-term, and permanent; localized and regional impacts. Direct impacts may occur from habitat loss/conversion, degradation, and fragmentation through grading and vegetation removal, including mortality to ground dwelling species (such as small mammals, ground-nesting bird species, reptiles, and amphibians). Construction of traffic and operational transmission lines could result in mortality to big game species, small mammals, and birds. Additionally, construction-related noise from equipment would exceed ambient noise levels in some areas, potentially altering wildlife behavior and leading to increased stress and mortality. Helicopter use and blasting would generate the highest noise levels; however, they would only be used for brief periods. Noise impacts would be localized and expected to attenuate to ambient levels past 1,000 feet from construction activities. Use of stream crossing access roads may result in changes to water quality and cause ongoing direct or secondary impacts on aquatic organisms, particularly benthic invertebrates, through injury or

mortality. Operational impacts on fisheries and wildlife would be direct and secondary, permanent, and localized due to increases in noise and light and conversion and maintenance of the ROW. The Proposed Alternative would permanently affect approximately 780.6 acres and temporarily affect 10,963.8 acres of wildlife habitat. Impacts on aquatic species (fisheries) are unlikely due to the Project largely avoiding impacts on surface waters.

Table ES-2
Comparison of Project Impacts by Alternative

Resource Area/Impact	No Action Alternative	Proposed Alternative
Air Quality		
Ambient Air Quality Standards	No change from current condition.	Air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on air quality in the area. The Proposed Alternative would have negligible operational emissions and, therefore, is not expected to have impacts on air quality.
Regional Haze/Visibility	No change from current condition.	Haze precursor air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on regional haze and visibility in the area and the closest Class I areas (Northern Cheyenne Reservation and Theodore Roosevelt National Park). No emissions are expected during operations; therefore, there would be no operational impacts on regional haze/visibility.
Chemical Deposition	No change from current condition.	Air emissions resulting from the construction activities are expected to be localized and short-term, resulting in negligible direct and secondary impacts on acidic deposition in the area and the closest Class I areas (Northern Cheyenne Reservation and Theodore Roosevelt National Park). No emissions are expected during operations.
GHG Emissions	No change from current condition.	GHG (CO_2e) emissions resulting from the construction activities and operations of the Project are expected to be negligible direct, secondary, and cumulative; localized; and short-term in nature.
Cultural/Tribal/Historic Resources		
Cultural Resources	No change from current condition.	The Project would avoid physical impacts on historic properties plus buffer areas to the extent practical. Whenever avoidance is not feasible, physical impacts would be direct, localized, permanent, and of varying degrees specific to the sensitivity of the resource and how its ongoing use and/or research value would be impacted. For physically impacted historic properties, mitigation measures would be developed through the Programmatic Agreement. The potential for non-physical impacts on historic properties are anticipated to be primarily visual and are in the process of being evaluated. Minor acoustic impacts are anticipated during construction and operations. Non-physical visual impacts would last for the duration of the Project, and the degree of significance would vary per resource. Should any significant non-physical impacts on historic properties be identified, they would be avoided if possible or reduced below the level of significance through strategies such as visual buffering with vegetation plantings. Should non-physical impacts on historic properties be unavoidable, mitigations would be developed through historic property treatment plans as described in the Programmatic Agreement.
Public Health and Safety		
EMFs	No change from current condition.	EMFs generated during the construction and operations of the Project would be localized, permanent (for the life of the Project), and negligible. No significant EMF impacts are expected from construction or operations of the Proposed Alternative. The EMF levels associated with the Project would result in no impacts on people with implantable medical devices, audible noise levels, or radio and television services. With the implementation of appropriate conductors across various routes, operational impacts due to radio interference would be direct and secondary, permanent, and localized.
Stray Voltage	No change from current condition.	Impacts due to stray or induced voltage would be reduced by proposed implementation of safety measures. Appropriate signage and fencing would result in no change in stray voltage hazards from the current conditions; therefore, no impacts from stray or induced voltage during construction or operations are anticipated.
Public Services	No change from current condition.	Public service impacts during construction would be direct, localized, and short-term. The Proposed Alternative may require temporary suspension of nearby utility services (e.g., water, cable, transmission) during construction. There would also be direct, localized, and short-term traffic disruptions for construction occurring near public roadways.
Corona and Surface Gradient	No change from current condition.	Corona analysis indicated that the permanent impacts of the Proposed Alternative would be localized, and negligible and, therefore, would not have an impact on public health and safety.
Erionite Features	No change from current condition.	The HVDC Transmission Line crosses erionite testing radii, and erionite is known to occur in the geologic formations crossed in Slope and Hettinger counties, North Dakota. Erionite could be encountered during ground disturbance during construction of the Proposed Alternative. If lands contaminated with erionite are encountered during construction, the Proponent would implement established BMPs, which include notifying contractors of the potential for erionite so that the contractor can implement the necessary measures to protect their employees, and using water to reduce dust, particularly when working within erionite testing radii. If erionite is encountered, impacts could be direct, localized, and short-term; however, impacts are anticipated to be mitigated through BMPs. During operations, there would be no ground disturbance and no impacts from erionite features are anticipated.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Agricultural Operations	No change from current condition.	Project construction activities would have 3,958.2 acres (1,548.3 in Montana and 2,409.9 in North Dakota) of direct, localized, and short-term impacts on grasslands, shrublands, and agricultural lands, resulting in some temporary interruptions to farming and ranching activities. During operations, the Proposed Alternative would result in direct, localized, and permanent impacts on 405.1 acres of shrublands, grasslands, and agricultural lands (170.1 in Montana and 235.0 in North Dakota).
Floodplains	No change from current condition.	Floodplain impacts during construction would be direct, localized, and short-term to permanent. The implementation of construction best practices for floodplain areas would prevent impacts on public health and safety.
Extreme Weather Interactions	No change from current condition.	There is the potential for direct, localized, short-term to permanent health and safety hazards caused by extreme weather events during construction; however, these would be minimized through the implementation of safety practices, and no impacts are anticipated. During operations, the Proposed Alternative would be designed to prevent structural failure in the case of extreme weather and would be regularly inspected and maintained; therefore, impacts from extreme weather interactions would be short-term and localized.
Groundwater Hydrology		
Groundwater Quantity	No change from current condition.	Construction activities such as access road creation, surface grading, and excavation for foundation installation may temporarily affect groundwater by altering stormwater flow and precipitation infiltration, resulting in direct and secondary, medium- to long-term localized, impacts on groundwater quality during Project construction. Approximately 2.4 million gallons of water would be needed for concrete batching, and approximately 272,000 gallons of water per mile would be needed for dust control along access roads based on the anticipated construction duration, which would be obtained from municipal sources. If additional water is needed, it would be supplied by existing water rights holders via groundwater wells near the Project. By sourcing water from municipal sources or, if necessary, from existing water rights holders, use of groundwater in the Project area would mitigate impacts on groundwater quantity. Groundwater quantity impacts resulting from the construction activities would be direct, short-term, and localized. There are 58 private wells identified within 150 feet of Project impacts areas that could be damaged during construction. BMPs would be in place to avoid the wells and surface disturbance near wells would be monitored. If any wells are impacted, impacts would be direct, short-term, and localized. Dewatering may be necessary during construction, which would comply with necessary permits and water quality standards. Direct and secondary impacts on groundwater due to construction dewatering would be short-term, localized, and minimal. The Proposed Alternative would not result in operational groundwater quantity or quality impacts and, therefore, is not expected to have an impact on overall groundwater conditions in the region.
Groundwater Quality	No change from current condition.	Unintended leaks or spills of petroleum-based fluids during construction activities could potentially directly affect groundwater quality to varying degrees. With implementation of a Project-specific Spill Prevention and Response Plan and Hazardous Materials and Waste Management Plan (Appendix E), impacts due to a petroleum spill or other hazardous material spill would be avoided or mitigated and are not anticipated.
Surface Water Hydrology		
Watersheds	No change from current condition.	Temporary and permanent surface water impacts due to construction activities and changes in land cover would not be detectable at a watershed scale. Within each HUC 8 watershed crossed by the Project, the total impacts due to tree clearing and other construction activities would be <0.1% of the watershed areas. There are no watershed impacts anticipated during operations.
Floodplains	No change from current condition.	The Proposed Alternative would have direct, localized, medium- to long-term temporary impacts on approximately 13.4 acres of 100-year floodplains (approximately 9.2 acres in Montana and 4.2 acres in North Dakota) during the construction phase from overland travel, access roads, and temporary work areas. There would be approximately 19.2 acres (approximately 18.4 acres in Montana and 0.8 acres in North Dakota) of direct, localized, permanent impacts on 100-year floodplains during operations from tree removal, structure placement, and access roads. The Proposed Alternative would follow local floodplain ordinances and implement required BMPs to minimize impacts on floodplains.
Waterbodies	No change from current condition.	The Proposed Alternative would result in direct, localized, short- to long-term temporary impacts on approximately 0.8 acre of waterbodies (approximately 0.6 acre in Montana and 0.3 acre in North Dakota) during the construction phase from access roads and temporary work areas. There would be secondary, medium-term and permanent impacts on waterbodies from the clearing of trees adjacent to waterbodies within the maintained ROW and for temporary access roads and work areas. The Proposed Alternative would result in direct, localized, permanent impacts on approximately 0.4 acre of waterbodies (approximately 0.4 acre in Montana and less than 0.1 acre in North Dakota) through tree clearing and establishment of access roads, which would persist through Project operations. All waterbody impacts would occur under state and federal permit requirements.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Wetlands	No change from current condition.	The Proposed Alternative would result in direct, localized, medium-term temporary impacts on approximately 10.1 acres of wetlands (approximately 10 acres on PEM wetlands [3.2 in Montana and 6.8 in North Dakota] and 0.1 acre of riverine wetlands [0.01 acre in Montana and 0.1 acre in North Dakota]) during the construction phase from temporary construction activities such as timber matting or culverts for construction work areas or access roads. There would be secondary, medium-term and permanent impacts on wetlands from the clearing of trees adjacent to wetlands for temporary access roads and work areas and within the maintained ROW. The Proposed Alternative would result in direct, localized, and permanent impacts on 3.3 acres of wetlands (2.9 acres of PEM wetlands in Montana and 0.1 acre of PEM wetlands in North Dakota, and the conversion of less than 0.1 acre of PFO and 0.3 acre of PSS wetland in North Dakota to PEM/PSS wetlands through tree removal within the maintained Project ROW), which would persist through Project operations. All wetland impacts would occur under state and federal permit requirements, including meeting compensatory mitigation requirements.
Public Surface Water Sources and Source Water Protection Areas	No change from current condition.	The Proposed Alternative would not result in impacts on public surface water sources and source water protection areas due to the location of Project impact areas relative to the surface water intake locations.
Minerals and Geology		
Geologic, Mineral, and Paleontological Resources	No change from current condition.	Impacts on mineral and paleontological resources resulting from the construction activities are expected to be direct, localized, and short-term, resulting in negligible impacts on access and development of existing mineral resources and the preservation of paleontological resources in the Project area. There would be direct, localized, permanent impacts on shallow bedrock, including a conservative maximum amount of blasting impacts on approximately 708 acres for construction of structures, facilities, and access roads. Operations would have minor impacts on geologic, mineral, and paleontological resources. However, ROW operations would not have an impact on the overall availability of these materials as they are abundant throughout surrounding areas. Any direct impacts on paleontological resources would be mitigated through implementation of the Paleontological Resources Management and Mitigation Plan (Appendix E). While mining activities would likely not be permitted within the maintained ROW and coal mining activities would be limited within 35 feet of the transmission line infrastructure, the Proposed Alternative construction and operational phases are not expected to have long-term impacts on the availability of construction materials or future mining activities in the region.
Geologic Hazards	No change from current condition.	Geologic hazards (faults, seismicity, and soil liquefaction) are not anticipated to affect the Proposed Alternative. Approximately 350.7 acres of Project impact areas cross terrain with a slope percentage of 30% or higher. To mitigate landslide risks, the Proponent would place structures to avoid slopes greater than 30% and areas along streams and drainages. Additionally, the Proponent would conduct geotechnical surveys to assess subsurface suitability to ensure that the subsurface is geotechnically suitable for construction and operations of the Proposed Alternative. The Proponent would design structures to withstand and not exacerbate landslide activity.
Land Use and Recreation		
Land Ownership and Land Cover	No change from current condition.	Lands crossed by the Proposed Alternative transmission lines would be subject to temporary easements for construction work areas and temporary access roads and permanent easements for the transmission line ROW and permanent access roads. Ownership of the land would remain with the current owner. Construction of the proposed converter stations and switchyard would result in both temporary and permanent conversion of land from Grassland/Shrubland or Agricultural land to Developed land. The Proposed Alternative would have permanent, direct, localized impacts on approximately 311.4 acres of land: 0.2 acre for the Rosebud Transmission Line (Montana), 270 acres in Montana and 17 acres in North Dakota for the HVDC Transmission Line, 7 acres for the Oliver Transmission Line (North Dakota), and 18 acres for the Morton County Transmission Line (North Dakota). Construction of the Proposed Alternative would have a medium-term, direct, localized impact on land cover categories. Operations would have a permanent, direct, localized impact on land cover categories. During operations, certain land use activities within the permanent ROW, such as grazing and farming, would generally be allowed to continue while structure placement may be restricted. Periodic disruptions to agricultural activities within the permanent ROW may occur during transmission line inspections, vegetation maintenance, or facility repairs.
Existing Residential and Commercial/ Industrial Development	No change from current condition.	The Project has been routed to avoid impacts on existing structures. Residences near the Project would be subject to direct and secondary, medium-term, localized noise, dust, visual impacts and road traffic during construction. Project operations would not disrupt or constrain residential land uses; however, depending on distance and topography, operations could result in a permanent, direct, and localized visual impact on existing residential developments. Construction and operations would have no impact on existing commercial or industrial development.
Planned Residential and Commercial Development	No change from current condition.	Based on county planning documents, the Proposed Alternative would not conflict with land use plans or policies.
Other Land Uses	No change from current condition.	Mining impacts are addressed in Section 3.7, Minerals and Geology. Air transportation/airports are addressed under Transportation in Section 3.10, Socioeconomics. The Project is not anticipated to affect the Gold Creek Cellular of Montana Limited Partnership/Verizon cell tower due to its distance from Project impact areas.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Recreational and Managed Lands	No change from current condition.	Construction activities would result in short-term, direct, localized impacts on recreational and managed lands; however, the degree of impact would vary depending on the location of the users relative to construction activities. Construction activities may require users to avoid areas due to safety or site restrictions. Once construction activities are completed and temporary work areas are restored, recreational activities would be allowed to resume to the degree permitted prior to construction. The Project would permanently affect approximately 47 acres of Montana DNRC trust recreational lands and 2 acres of North Dakota trust recreational lands. While most recreation activities on trust lands would be able to continue during operations, some areas would be impacted where land uses are modified for Project infrastructure. In Montana, the Project would permanently affect approximately 20 acres of BLM recreational lands resulting in direct, permanent, localized impacts. In North Dakota, the Project would permanently affect approximately 4 acres of NFS recreational lands, resulting in direct, permanent, localized impacts.
U.S. Agriculture Research Lands	No change from current condition.	The Project would have direct, medium-term, localized impacts where it would permanently affect 18 acres of USDA ARS land at Fort Keogh in Custer County, Montana. The Proponent has coordinated with the USDA ARS to site Project components in areas where impacts on research activities would be limited. Impacts from operations would be permanent, direct, and localized to areas where Project components would alter existing land use within Fort Keogh.
Scenic Rivers	No change from current condition.	The HVDC Transmission Line crosses the Little Missouri River in Slope County, North Dakota, at approximately MP 187.5. Primary impacts from construction and operations would be changes to viewshed from the transmission infrastructure. Impacts would be direct, localized, and permanent.
Visual and Aesthetics		
Visual Resources	No change from current condition.	The Project's transmission line segments would permanently affect visual conditions along the Project corridor by introducing tall vertical structures and horizontal linear conductors that would be visible from up to approximately 20 miles away. While the impact on visual conditions would be permanent, visual impacts would diminish as distance away from the Project increases. The increased footprint of the Colstrip Substation would be noticeable from the town of Colstrip and surrounding municipal park areas. The HVDC Transmission Line crosses a total of 9.7 miles of BLM land, including 1.0 mile on BLM VRM Class II lands, 2.3 miles on BLM VRM Class III lands, and 6.8 miles on BLM VRM Class IV land. Project features (temporary and permanent access roads; turnaround areas; guard structure pads; pulling sites; structure footprints; and structure pads) cross a total of 164.9 acres on BLM land (31.7 acres on BLM Class II land, 27.2 acres on BLM VRM Class III land, and 106.0 acres on BLM VRM Class IV land). Additionally, the Project would introduce bare earth and/or gravel access roads to structures during construction and operations. The overall visual impact from the Project's transmission line segments would be characterized as a direct, permanent impact that would affect regional conditions. The overall visual impact from construction and operational phases of the Proposed Alternative would also be characterized as direct, permanent impacts that would affect regional conditions.
Socioeconomics		
Population Increase	No change from current condition.	The Proponent estimates a construction period of 3 to 4 years with a peak temporary workforce of 800 workers. Workers residing temporarily in the socioeconomic analysis area could produce a medium-term increase in population within socioeconomic analysis area towns and cities during construction. Workers assigned to the Rosebud County Converter Station, Morton County Converter Station, and Morton County Switchyard are anticipated to work at these sites for the full construction period, resulting in a medium-term population increase within commuting distance of these facilities. Given the current populations of Rosebud, Custer, and Morton counties, impacts on population levels are anticipated to be minimal. The remaining workers would be distributed along the proposed transmission lines, resulting in an insignificant population change among the multiple towns and cities along the routes. Thus, construction would have a direct, medium-term, regional impact on the socioeconomic analysis area population; and operations would have a direct, long-term, regional impact on the socioeconomic analysis area population. Population change would have both beneficial and adverse impacts, resulting in beneficial economic activity and labor force resources within the Project area, as well as impacts due to demand for public services and potential competition for strained housing resources.
Economy, Employment, and Income	No change from current condition.	Direct economic benefits within the socioeconomic analysis area would include wages paid to workers and purchase of Proposed Alternative supplies and services from socioeconomic analysis area businesses to support construction. The Proponent's Economic Impact Analysis estimates the Proposed Alternative would generate an average of 2,055 jobs annually in Montana and North Dakota during a 3-year construction period (Bureau of Business and Economics Research, University of Montana 2025). Construction may occur for an additional year with the total economic impacts distributed over the longer time period, as noted in the Proponent's Economic Impact Analysis. Operations would result in two to four full-time equivalent jobs within the socioeconomic analysis area, as well as periodic contracts or hiring of line crews for transmission line maintenance. Construction would result in beneficial, direct and secondary, regional, medium-term impacts on economics, employment, and income in the socioeconomic analysis area, while operations would result in negligible beneficial impacts.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Housing	No change from current condition.	Housing impacts would result from increased demand for rental or for-sale housing due to the influx of workers. Given the shortage of housing reported by state and local agencies, housing needs during construction could strain an already limited supply of affordable rental housing. The supply of hotel and motel rooms within the socioeconomic analysis area (supplemented by RV campgrounds) is sufficient to support the Proposed Alternative workforce that chooses this option. Operations would require only two to four full-time equivalent jobs plus periodic line maintenance workers and, therefore, would not affect regional demand for permanent or transient housing. The impact on hotels, motels, and campgrounds is likely to be beneficial in providing demand for the existing businesses. Construction would have a direct, regional, medium-term impact on housing supply and a potential beneficial, direct, regional, medium-term impact on businesses providing transient lodging in the socioeconomic analysis area. Proposed Alternative operations would have neither adverse nor beneficial negligible, direct, long-term impact on housing.
Public Services and Facilities	No change from current condition.	Impacts on schools would be small, as construction workers would most likely be residents of the socioeconomic analysis area or only relocate for short periods of time; thus, most construction workers would be unlikely to temporarily relocate with their families. Due to potential demands on emergency responders, medical services, and law enforcement resources, construction would have a medium-term, secondary, regional impact on public services and facilities. Operations would generate an imperceptible incremental demand for public services and facilities.
Taxes and Revenues	No change from current condition.	Taxes and revenues resulting from construction would include income taxes, goods and services taxes on certain items, and fees. Benefits would accrue to socioeconomic analysis area counties through revenue sharing by Montana or North Dakota or through the state facilities and services funded within the socioeconomic analysis area. Construction would have a beneficial, direct and secondary, regional, medium-term impact on taxes and revenues, while operations would have a beneficial, secondary, regional, long-term impact.
Transportation	No change from current condition.	Construction-generated traffic (e.g., commuting workers) would not result in significantly increased congestion on the highways serving the region. Area highways and roads have capacity to carry increased traffic volumes without congestion. Project construction traffic would be dispersed among the regional highways and even more dispersed on local roads to reach the worksites or contractor yards. The Proponent would provide mitigation for the delays by traffic management measures that include providing road improvements where required by road authorities, mapping authorized transportation routes, providing marking of these routes using signs or flagging, and providing training for field personnel that includes instruction to use only the approved roads and observe speed limits. Project construction would have medium-term, regional, and direct impacts on air traffic due to the use of helicopter transport. Project operations would have no impact on air traffic.
Public Health, Welfare, and Safety	No change from current condition.	Based on the relatively small influx of workers necessary for construction, construction would have a secondary, regional, medium-term impact on public health, welfare, and safety due to the introduction of transient workers from outside the area to small towns and rural areas. Operations would have a beneficial, secondary, regional, permanent impact on public health, welfare, and safety due to the generation of tax revenues that would accrue to county governments, fire districts, schools, and other public service authorities.
Property Value	No change from current condition.	The Project was routed to avoid proximity to residences with transmission line centerlines at least 600 feet from all residences. Construction and operations are generally not anticipated to affect property values for land use types crossed by the transmission lines. Proposed Alternative transmission lines could potentially have limited secondary, regional, long-term impact on property values for residential properties. The impact on residential properties would vary depending on proximity, topography, and intervening uses and vegetation; and the impact may dissipate with the length of time that the lines are in place.
Soils		
Prime Farmland and Farmland of Statewide Importance	No change from current condition.	Activities required to build the Proposed Alternative in Montana and North Dakota, including vegetation clearing, grading, structure and facility foundation excavations and installation, and movement of construction equipment and materials within the Project impact areas have the potential to affect soils designated as prime farmland or farmland of statewide importance. Approximately 62.5 acres of prime farmland in Montana and 66.4 acres in North Dakota, as well as 364.6 acres of farmland of statewide importance in Montana and 1,120.3 acres in North Dakota would be temporarily affected. Approximately 7.5 acres of prime farmland in Montana and 10.5 acres in North Dakota, as well as 56.6 acres in Montana of farmland of statewide importance and 34.6 in North Dakota would be permanently affected. Impacts from temporary construction activities on farmland soils would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Hydric Soils and Compaction-Prone Soils	No change from current condition.	Impacts on wet soils during periods of water saturation in Montana and North Dakota are expected to occur. Hydric or wet soils are at greater risk of rutting and compaction from movement of heavy equipment. The Proposed Alternative would temporarily affect approximately 2 acres in Montana and 21.6 acres in North Dakota and permanently affect approximately 2.9 acres in Montana and 0.1 acre in North Dakota of hydric soils. The Proposed Alternative would temporarily affect approximately 2.7 acres in Montana and 11.5 acres in North Dakota and permanently affect approximately 3.1 acres in Montana and less than 0.1 acre in North Dakota of compaction-prone soils. Soil impacts due to construction would be direct, short-term, and localized, and impacts due to operations would be direct, permanent, and localized.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Highly Water Erodible and Wind Erodible Soils	No change from current condition.	Soil loss impacts caused by water and wind erosion in Montana and North Dakota are expected to occur. There would be direct, short-term, localized impacts in temporary work areas with highly erodible soils (approximately 714.2 acres in Montana and 448.4 acres in North Dakota) and wind (approximately 2.1 acres in Montana and 156.5 acres in North Dakota). There would also be direct, permanent, and localized impacts to highly erodible soils (approximately 109.1 acres in Montana and 10.1 acres in North Dakota) and wind (less than 0.1 acre in Montana and approximately 1.6 acres in North Dakota).
Soils with Low Revegetation Potential	No change from current condition.	Following ground-disturbing activities in Montana and North Dakota, successful restoration and revegetation efforts are essential in maintaining soil productivity by avoiding and minimizing impacts on soils, particularly erosion. The Proposed Alternative would temporarily affect approximately 1,273.1 acres in Montana and 960.2 acres in North Dakota and permanently affect approximately 175.8 acres in Montana and 18.4 acres in North Dakota of soils identified as having a low revegetation potential. Ground disturbance activities would generally be limited to vehicle travel, equipment and material staging, and vegetation clearing and grading that may be necessary for structure pads, wire pulling and tensioning areas, temporary access roads, overland travel paths, and facility sites. Soil impacts from temporary construction activities would be direct, short- to medium-term, and localized. The Proponent has identified specific areas within the ROW where vegetation clearing would be required. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Rocky and Shallow Bedrock Soils	No change from current condition.	During grading and excavation activities in Montana and North Dakota, construction crews could encounter shallow bedrock soils and rocks on the surface or within the surface soil horizon. The Proposed Alternative would temporarily affect approximately 157.4 acres in Montana and 18.2 acres in North Dakota and permanently affect approximately 9.7 acres in Montana and less than 0.1 acre in North Dakota of rocky soil. Approximately 1,082.8 acres of shallow to bedrock soil and 1,482.9 acres in North Dakota would be temporarily affected and approximately 147.5 acres of shallow bedrock soil in Montana and 27.4 acres in North Dakota would be permanently affected. These impacts are expected to be direct, short-term to permanent, and localized. However, most areas with temporary impacts on soils with shallow bedrock would not require blasting. While the soil itself may have shallow bedrock, the primary construction activity within the approximately 2,565.7 acres of soils with shallow bedrock would be overland travel.
Topsoil	No change from current condition.	Construction of the Proposed Alternative would disturb topsoil and subsoil where grading or excavation are required and where heavy equipment travels along access roads. These activities have the potential to cause mixing of topsoil and subsoil, which would result in a loss of soil productivity. With implementation of mitigation measures and BMPs, impacts on topsoil would be direct and secondary, short- to medium-term, and localized.
Slope Gradient	No change from current condition.	Steep slopes can affect constructability, water erosion potential, revegetation efforts, soil compaction, and rutting potential, in addition to other soil properties. The Proposed Alternative would temporarily affect approximately 3,449.0 acres (74.8%) of soils with a 0 to 15% slope, 453.8 acres (9.9%) of soils with a 15 to 30% slope, and 319.4 acres (6.9%) of soils with 30% or greater slope. The Proposed Alternative would permanently affect approximately 260.6 acres (5.7%) of soils with a 0 to 15% slope, 62.9 acres (1.4%) of soils with a 15 to 30% slope, and 31.2 acres (0.7%) of soils with 30% or greater slope. With implementation of mitigation measures and BMPs, impacts on soils with steep slope gradients from temporary construction activities would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.
Noise		
Sound Levels at Residential/Recreational Receptors	No change from current condition.	Construction activities could result in direct, short-term, localized increases in noise at residential locations that are in closer proximity to the ROW, although no residences were identified within 600 feet of the ROW. Helicopter use for line stringing would also result in direct, short-term, localized increases in noise. Blasting, if used, may also result in very short duration increases in noise at any one residence. Construction noise would only occur for brief periods in the vicinity of any residence, and no long-term impacts would occur. Operational noise along the transmission lines could consist of corona noise (i.e., crackling, hissing sound) or aeolian noise (whistling sound). While these noises are expected to be mostly limited to the edge of the ROW, they would be permanent impacts. Operational noise from the Morton County Converter Station would result in minor increases to noise at nearby noise sensitive locations. No increases in noise would occur at noise sensitive locations for the Rosebud County Converter Station. Projected noise levels due to operations of both converter stations would remain below the USEPA recommended noise level for noise sensitive areas. In addition, the cumulative noise level (converter station plus existing ambient) would also remain below the USEPA recommended level. Overall, noise increases from operations would result in direct, short-term to permanent, and localized impacts.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Vegetation		
Vegetation Loss	No change from current condition.	During construction, the Proponent would remove trees, shrubs, and brush as necessary within the Project impact areas. Vegetation would be cut at or above the ground surface to leave the rootstock intact, which would help maintain soil stability and erosion control. Additionally, trees and tall shrubs would be permanently removed from the ROW for the entire duration of construction and operations of the Proposed Alternative. The Proposed Alternative would temporarily disturb approximately 10,556.1 acres (4,139.5 acres in Montana and 6,416.4 acres in North Dakota) and permanently affect 750.3 acres (662.9 acres in Montana and 87.4 acres in North Dakota) within the Project area due to aboveground infrastructure. These disturbances during construction would cause direct, localized, and permanent impacts on existing vegetation in the Project area. One RFSS plant was documented during surveys and has the potential to be impacted as a result. Other secondary impacts on vegetation could include changes in hydrology, changes in successional stage, and a decline in species structure. No vegetation loss is anticipated during operations aside from the initial clearing of the ROW and subsequent maintenance.
Noxious Weeds and Invasive Species	No change from current condition.	Grading and removal of grassland habitat could introduce invasive species that would decrease forage and habitat quality. Prior to construction, noxious weeds would be marked to limit the infestation to the construction area. Noxious weeds would be treated with herbicide or mowed as needed. BMPs would be installed to prevent the herbicide used from affecting other plants, wildlife species, or waterbody. The duration of impacts on vegetation communities would be influenced by the type of vegetation, the presence of noxious weeds, and growing conditions. Potential introduction of invasive species during construction and lasting into operations would be direct, localized, short-term impact on vegetation.
Dust Deposition	No change from current condition.	Construction of the Proposed Alternative would temporarily increase fugitive dust emissions, particularly in areas with erosion-prone soils where vegetation clearing and heavy equipment operations occur. Factors such as precipitation, wind, and soil disturbance from activities like vehicle movement, excavation, grading, and blasting would contribute to dust generation. As a result, construction activities would have secondary, localized, medium-term impacts on plants due to dust deposition. To mitigate these impacts, the Proponent would use water for dust control on unpaved roads, minimize sediment tracking, and promptly remove soil from paved roadways. In erosion-prone areas, the Proponent would minimize surface disturbances, use soil stabilization practices, and cover material stockpiles to minimize the potential of dust, implementing reclamation efforts to reduce erosion after construction activities. No dust deposition impacts are anticipated during operations.
Fisheries and Wildlife		
Threatened and Endangered Species	No change from current condition.	Fifteen terrestrial federally listed, proposed, or under review species were observed to potentially occur within 1 mile of Project impact areas. Of the 15 species, 5 were identified in or adjacent to Project impact areas during the field surveys. Impacts on threatened and endangered species due to construction and operations are varied and described in rows below.
Special Status Species	No change from current condition.	Montana classifies special status species as SOC, and North Dakota classifies special status species as SCP: Level I, II, or III. A total of 65 terrestrial wildlife species classified as Montana SOC have potential to occur in Project impact areas, of which 31 were identified during surveys. Similarly, four North Dakota SCP: Level I species and one SCP: Level II species were observed in Project impact areas. Populations of greater sage-grouse are overall declining due to habitat loss and degradation. The species is not listed by the ESA; however, states with known greater sage-grouse populations have formed management plans. There were 24 terrestrial BLM SSS species identified to have documented occurrences within Project impact areas. Additionally, there were eight documented RFSS species within Project impact areas. Impacts on special status species due to construction and operations are varied and described in rows below.
Habitat Loss and Degradation	No change from current condition.	Construction of the Proposed Alternative would lead to habitat loss/conversion and degradation through grading and vegetation removal. The Proposed Alternative would permanently affect approximately 780.6 acres and temporarily affect 10,963.8 acres. Approximately 428.5 acres of forest and woodland would be permanently removed due to clearing or conversion to herbaceous grassland in the ROW. The loss of trees could affect bat species that rely on trees for hibernacula. Additionally, 114.2 acres of shrubland would be permanently impacted and 1,377.4 acres would be temporarily impacted. The Project would remove 216 acres of potentially undisturbed (unbroken) grasslands in Montana and 24 acres in North Dakota leading to impacts on species that rely on this habitat. Habitat loss and degradation due to grading and vegetation removal could result in permanent or long-term impacts that would be direct and secondary, localized, and medium-term to permanent. Greater sage-grouse avoid transmission line corridors; transmission lines have an impact on habitat selection and survival due to avian predators using transmission lines near leks to perch (Lebeau et al. 2019). Impacts on nesting success have been demonstrated up to 1.6 miles from transmission lines (Kohl et al. 2019). Greater sage-grouse avoidance of maintained ROW would be a direct, permanent, and localized impact.

Resource Area/Impact	No Action Alternative	Proposed Alternative
Direct Mortalities	No change from current condition.	Grading and construction activities could lead to the mortality of ground dwelling species such as the black-tailed prairie dog and other small mammals, ground-nesting bird species, reptiles, and amphibians. Additionally, 800 workers would be mobilized across the Project during construction. The additional traffic due to commuting or direct activities could lead to vehicle strikes, resulting in severe injury or mortality of big game species. The Proposed Alternative operational phase could lead to bird species mortality, as they could collide in flight with the lines. Bird species with larger wingspans and slower maneuverability (e.g., cranes, herons, swans, pelicans, and geese) are more susceptible to power line collisions, as are smaller, heavy-bodied birds that are fast flyers (e.g., ducks). Eagles and other raptors are adept flyers, and collision incidents with overhead lines occur with much less frequency than collision incidents involving other bird species. Factors such as increased human activity may flush birds and result in collisions; inclement weather and low-light conditions during bird migration may also increase collision risk. Bat collisions are uncommon and are not listed as a current threat for the northern long-eared bat (*Myotis septentrionalis*). Increased mortalities resulting from construction and due to collisions with infrastructure during operations could cause direct, localized, and permanent impacts on fisheries and wildlife.
Fragmentation	No change from current condition.	The removal of vegetation and establishment of a maintained ROW would break up contiguous areas of habitat leading to fragmentation. Fragmentation can reduce habitat quality and affect wildlife behavior as some species avoid forest or habitat edges. The majority of Project impact areas are grassland and agricultural and would reestablish more quickly than woody vegetation; however, the permanent conversion of forest and shrubland habitat within the ROW could affect interior forest dwelling species. Habitat fragmentation resulting from construction and operations may result in direct and cumulative, regional, and permanent impacts.
Sensory Impacts from Light and Noise	No change from current condition.	Noise and light impacts would be anticipated from Project construction and operations. Construction-related noise from equipment would exceed ambient noise levels in some areas, potentially altering wildlife behavior and leading to increased stress and mortality. Helicopter use and blasting would generate the highest noise levels; however, they would only be used for brief periods. Noise impacts would be localized and expected to attenuate to ambient levels past 1,000 feet from construction. During operations, there are potentially corona noise (i.e., crackling, hissing sound) and aeolian noise (whistling sound) impacts along the proposed transmission line. Construction would potentially use artificial lighting temporarily, and the proposed converter and switchyard stations would have permanent lighting. Impacts resulting from construction-related noise from equipment, helicopters, and blasting would be direct, localized, and medium-term. Operational increases in noise and light could cause direct, localized, and permanent impacts on fisheries and wildlife.
Stream Crossings and Sedimentation	No change from current condition.	With the exception of Project access roads, Project impact areas have been designed to avoid placing permanent transmission line structures or temporary construction within waterbodies. Existing access roads would be used to the extent practicable. Where public or private roads are not available to access remote segments, the Proponent would construct new access roads, siting them to avoid impacts on waterbodies where possible. Proposed waterbody crossings could include clear span bridges, span bridges with in-water supports, culverts/flumes, vented rock fords, or low water crossings. The Proponent would comply with the design specifications required by federal and state agencies for waterbody crossings and acquire all necessary permits from federal, state, and local agencies in compliance with minimization and mitigation measures for permanent waterbody impacts. Access roads installed during construction could disturb the streambed and cause minor changes in water quality and instream habitat characteristics at the crossing location. These impacts could affect water quality and aquatic life downstream of the immediate location disturbed and thus are localized and regional. Impacts resulting from the waterbody crossings would begin with the start of construction and could be long-term and persist beyond construction throughout the life of the established crossing. If the crossing is one that is used within the streambed itself, there could be ongoing direct impacts on aquatic organisms, particularly benthic invertebrates, through injury or mortality. Secondary impacts may occur due to altered aquatic habitat and substrates, as long as the road is in use. Overall, the impacts of waterbody crossings on fisheries from construction and ongoing operations of access roads that cross waterbodies would be direct and secondary, localized and regional, and short-term to long-term.
Changes in Water Quantity	No change from current condition.	During construction, water would be withdrawn from municipal sources for dust suppression and batching of concrete during construction. If additional water is needed, it would be supplied by existing water rights holders via groundwater wells near the Proposed Alternative. There would be no water withdrawals during operations. No impacts on fisheries from water withdrawals are anticipated.
Changes in Water Quality	No change from current condition.	Unplanned spills or leaks of hazardous liquids during equipment refueling, operations, maintenance, or storage could cause localized, and medium-term impacts that could be direct, secondary, or cumulative. Access roads installed during construction could disturb the stream bed and cause minor changes in water quality and instream habitat characteristics at the crossing location. These impacts could affect water quality and aquatic life downstream of the immediate location of disturbance and are localized and regional. While no impacts on water quality during operations are anticipated, impacts on water quality from spills on fisheries during construction would be direct, localized and regional, and long-term.

< = less than; ARS = Agricultural Research Service; BLM = Bureau of Land Management; BMP = best management practice; CO_2e = carbon dioxide equivalent; DNRC = Department of Natural Resources and Conservation; EMF = electromagnetic field; ESA = Endangered Species Act; GHG = greenhouse gas; HUC = hydrologic unit code; HVDC = high-voltage direct current; MP = Milepost; NFS = National Forest System; PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub; RFSS = Regional Forester's Sensitive Species (USDA Forest Service status listing); ROW = right-of-way; RV = recreational vehicle; SCP = Species of Conservation Priority (North Dakota status listing); SOC = Species of Concern (Montana status listing); SSS = Special Status Species (BLM status listing); USDA = U.S. Department of Agriculture; USEPA = U.S. Environmental Protection Agency; VRM = Visual Resource Management

ES-7. REFERENCES

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1. PURPOSE AND NEED

1.1. INTRODUCTION

This Environmental Impact Statement (EIS) analyzes the potential impacts on the human and Montana / North Dakota environment of granting the various permits or other authorizations for the North Plains Connector Project (Project) proposed by North Plains Connector LLC (the Proponent—a Grid United LLC Company) in accordance with the National Environmental Policy Act (NEPA), the Montana Environmental Policy Act (MEPA), and the Montana Major Facility Siting Act (MFSA). MEPA and MFSA apply to the portions of the Project in Montana only, while NEPA applies to the entire Project (portions located both in Montana and North Dakota).

The Project involves construction and operations of a 525-kilovolt (kV) high-voltage direct current (HVDC) transmission line and three alternating current (AC) transmission lines spanning approximately 422 miles between Montana and North Dakota, as well as auxiliary facilities. Refer to Section 2.3.1, Proposed Alternative (Route Alternative D), for more information on Project components.

The North American electrical grid is divided into major interconnections: Western, Eastern, and Electricity Reliability Council of Texas Interconnections. The Western and Eastern Interconnections (referred to as the western and eastern electrical grids) are the two largest electrical grids in North America. The Project would connect the Western Electricity Coordinating Council in the western grid to the Midcontinent Independent System Operator (MISO) and the Southwest Power Pool (SPP) in the eastern grid. These interconnections are mostly separate but do have limited HVDC Transmission Line connections serving local utilities.

Per NEPA and MEPA, federal and state agencies are required to prepare an EIS prior to taking an action significantly affecting the quality of the human or Montana / North Dakota environment, per 42 USC § 4332(C); 42 USC § 4321 *et seq.*; and § 75-1-201(1)(b)(iv), Montana Code Annotated (MCA). This EIS relies on NEPA regulations for the U.S. Department of Agriculture (USDA), the U.S. Department of the Interior (DOI), and the U.S. Department of Energy (DOE) (7 CFR Part 1b; 43 CFR Part 46; 10 CFR Part 1021, respectively). This EIS also relies on DOE NEPA Implementing Procedures and the DOI Handbook of NEPA Implementing Procedures, both dated June 30, 2025. Although the Council on Environmental Quality (CEQ) rescinded its NEPA implementing regulations (40 CFR Parts 1500–1508), agencies may consider voluntarily using those regulations as guidance in completing ongoing NEPA reviews or defending against challenges to reviews completed while those regulations were in effect (CEQ 2025). Accordingly, this EIS may refer to CEQ regulations in effect at the time when the agencies issued the Notice of Intent (NOI) to prepare an EIS.

The DOE and the Montana Department of Environmental Quality (MTDEQ) (i.e., the Joint Lead Agencies) directed Environmental Resources Management, Inc. (ERM) in the preparation of this EIS and independently reviewed and confirmed the accuracy of the information contained herein to inform federal decision-making regarding the issuance of certain federal or state authorizations.

1.2. PURPOSE, NEED, AND BENEFITS

This section describes the purpose and need of the Project from the Proponent's perspective (Section 1.2.1) and outlines the purpose and need as well as roles and responsibilities for the

Joint Lead Agencies (Section 1.2.2) and Cooperating Agencies (Section 1.2.3). Appendix A, Agency Roles and Responsibilities, provides a list of anticipated federal, state, and local permits, licenses, consultations, or approvals required before Project construction.

1.2.1. Proponent

The terms "objectives and goals" (under federal guidance) or "purpose and need" (under State of Montana guidance) are used interchangeably to describe the intent or outcome of the Project.

The objective or purpose of the Project is to connect the western and eastern electrical grids to allow energy transfer between them. This would (1) improve the reliability, efficiency, and resiliency of both grids by increasing transfer capacity and (2) mitigate weather-driven system outages (Grid United 2024). The goals or need for the Project are driven by three primary issues: (1) changes in public policy that decrease historically reliable baseload generation capacity and lower the ability to meet growing energy demands; (2) rapid changes in the sources of energy generation that reduce the ability to balance supply and demand in real time; and (3) extreme weather events that affect grid resiliency. Energy consumption in the United States is projected to rise significantly—by 30 percent over the next 10 years (PNUCC 2024). The Project aims to develop a robust system to address this growing demand and provide stable and reliable energy transfer. For more information on the objective and purpose of the Project, refer to the Montana MFSA Application for a Certificate of Compliance (Grid United 2024).

1.2.2. Joint Lead Agencies

1.2.2.1. U.S. Department of Energy

In August 2024, the DOE announced a conditional award of $700 million through the Grid Resilience and Innovation Partnerships (GRIP) Program to the Montana Department of Commerce and its three subrecipients—the Proponent, NorthWestern Energy, and Sage Development—for the North Plains Connector Interregional Innovation Project. This award is subject to environmental review. If awarded, the Montana Department of Commerce would disburse $605 million to the Proponent to support planning, procurement, permitting, construction, and commission of the Project. The purpose of the GRIP Program is to enhance grid flexibility and improve the resilience of the power system against extreme weather; the DOE needs to decide whether to finalize the conditional $605 million award.

Pursuant to Section 216(h) of the Federal Power Act, the DOE can serve as the lead agency for purposes of coordinating and expediting required federal authorizations and environmental reviews of proposed electric transmission facilities siting. This coordination increases the efficiency and effectiveness of the federal authorization and review process. It establishes pre-application procedures designed to collect the information needed to perform efficient and timely federal authorization and environmental reviews, reduces duplication of effort by preparing a single environmental review document as the basis for all federal decisions, and sets binding schedules for the completion of all federal authorizations and environmental reviews. The DOE purpose is to reduce the time it takes to site and permit the electric transmission infrastructure, ensuring the delivery of reliable, resilient, and low-cost electricity to homes and businesses. For DOE, the Proposed Action is to grant the necessary permissions

and funding for the Proposed Alternative (discussed in Section 2.3.1, Proposed Alternative [Route Alternative D]).

1.2.2.2. Montana Department of Environmental Quality

The portion of the Project within Montana is regulated under MFSA due to the line exceeding 69 kV and more than 10 miles in length and exceeding 230 kV regardless of length (§ 75-20-104(8), MCA). On September 17, 2024, the Proponent submitted an application for a Certificate of Compliance to MTDEQ under MFSA (§ 75-20-101 *et seq*., MCA) for the Project portion within Montana. The Proponent must obtain MTDEQ approval before construction or operations of the Project in Montana. A MFSA Certificate is required only for the proposed 500-kV extra high-voltage (EHV) AC and 525-kV direct current (DC) transmission lines in Montana. MTDEQ must conduct an environmental review to satisfy MEPA (§ 75-1-101 *et seq*., MCA) and prepare a report to satisfy the requirements of MFSA. This EIS serves as that report. Under MFSA, MTDEQ must make its decision on the issuance of the Certificate based on the findings in § 75-20-301, MCA. For MTDEQ, the Proposed Action is the Proposed Alternative (discussed in Section 2.3.1, Proposed Alternative [Route Alternative D]).

1.2.3. Cooperating Agencies

The USDA Forest Service, Bureau of Land Management (BLM; as a part of the DOI), and USDA Agricultural Research Service (ARS) are cooperating agencies as they all have decisions to make on applications submitted to each agency, as required under NEPA. In Montana, approximately 10 miles of the Project's transmission lines would cross BLM-managed lands and 8 miles cross USDA ARS-managed lands. In North Dakota, approximately 10 miles of the Project's transmission lines cross USDA Forest Service-managed lands. All of these crossings require federal right-of-way (ROW) authorizations from the respective agency. Appendix A includes a summary of agencies and authorizations.

1.2.3.1. U.S. Department of Agriculture Forest Service

The Project would require USDA Forest Service review of a special use application for the crossing of about 10 miles of the Little Missouri National Grassland (LMNG) in North Dakota, which is managed by the USDA Forest Service. The USDA Forest Service is required by law to consider the Special Use Application under Title V of the Federal Land Policy and Management Act of 1973 (43 CFR Parts 1761–1771). This crossing would entail siting, construction, and operations of an up to 525-kV-rated, bi-directional HVDC transmission facility and associated support facilities within a 200-foot ROW, which would be part of a system of high-voltage AC and DC facilities over approximately 10 miles on the LMNG (3 miles Golden Valley County; 7 miles Slope County).

1.2.3.2. Bureau of Land Management

BLM's purpose is to respond to the Proponent's Standard Form SF-299 request for ROW access to construct, operate, maintain, and terminate the overhead powerline and long-term and short-term access roads on BLM lands. The BLM would decide to grant, grant with conditions, or deny the application and make any necessary plan amendments for the use of public lands managed by the BLM pursuant to 43 CFR Part 2800 *et seq*.

The need for the action is established through BLM's responsibility under the Federal Land Policy Management Act of 1976 to respond to requests for ROWs across BLM-managed lands and to determine any stipulations to the short-term and long-term ROW conditional grants.

While the Proponent does not anticipate mining federal minerals as part of this application, ROW operations may at times require removal of federal mineral materials from the ROW (e.g., blasting and disposal of mineral materials off site or reincorporation for a road base along access roads), which could require mineral materials contracts during operations. The BLM will process these potential future applications separately and in accordance with the Act of July 31, 1947 (Disposal of Materials on Public Lands), the Surface Resources Act of 1955, NEPA, and the regulations at 43 CFR Part 3600.

1.2.3.3. U.S. Department of Agriculture, Agricultural Research Service

The USDA ARS's purpose is to respond to the Proponent's request for easement access across about 8 miles of USDA ARS-managed federal land in Montana for the siting, construction, and operations of an up to 525-kV-rated, bi-directional HVDC transmission facility and associated support facilities within a 200-foot ROW. The USDA ARS will determine if permitting the use of USDA ARS lands (Fort Keogh Livestock and Range Research Laboratory in Montana) for the Project is in the public interest. The need for the action is established through 43 USC § 961, "Rights-of-way for power and communications facilities," as well as the broader framework of regulations and laws such as NEPA, the Federal Land Policy Management Act of 1976, and USDA policies and regulations.

1.2.4. Benefits, Pursuant to Montana Environmental Policy Act

In addition to the benefits discussed in Section 1.2.1, [Purpose, Need, and Benefits] Proponent, the Project has the opportunity to enhance the electrical grid's resiliency and ability to transfer power efficiently between the western and eastern electrical grids. This is particularly important due to diversified electrical generation sources and the growing need for reliability enhancements.

The Project would provide the following federal, state, and local benefits: improved reliability and responsiveness (e.g., access to electricity in peak times or during extreme weather events), greater efficiency and cost effectiveness (e.g., access to regional markets with competitive pricing), potential reduction in customer electricity costs, and national security benefits. For more information on benefits of the Project, refer to the Montana MFSA Application for a Certificate of Compliance (Grid United 2024).

1.3. PROJECT LOCATION AND BACKGROUND

The Project would span 422 miles, starting near Colstrip, Montana, and ending at two separate locations in North Dakota: one near the town of Center and the other near St. Anthony (Figure1.3-1 in Appendix B, Supplemental Information). The Project would include construction of four transmission line segments (HVDC Transmission Line, Rosebud Transmission Line, Oliver Transmission Line, and Morton Transmission Line), two converter stations (Rosebud County Converter Station and Morton County Converter Station), and one switchyard (Morton County Switchyard) (Figure 1.3-2 in Appendix B). The Project would also include construction of auxiliary components and equipment, such as repeater stations, telecommunication systems, and grounding infrastructure. Additionally, the Proponent would install various access roads (new permanent/temporary access roads, overland travel) for construction and operations. Refer to Section 2.3.1, Proposed Alternative (Route Alternative D), for additional discussion about the Proposed Alternative.

The Proponent would construct a new 500-kV EHV AC transmission line, referred to as the Rosebud Transmission Line, in Rosebud County, Montana. This line would feature two separate, parallel circuits, each approximately 3 miles long with an up to 320-foot-wide ROW where co-located. It would start at the existing Colstrip Substation, owned by NorthWestern Energy, which would serve as the interconnection point to the Western Electricity Coordinating Council power system for the western grid. The footprint of the existing Colstrip Substation would be expanded by approximately 4.2 acres to the northwest and approximately 9 acres to the south and east. The Proponent would also modify the Colstrip Substation to include two new 500-kV bays and upgrade the electrical components to accommodate a 5,000-amp rating (which increases its capacity to handle a larger electrical current).

The Rosebud Transmission Line would then extend eastward to a new AC/DC converter station in Rosebud County (the Rosebud County Converter Station). This Station would link the eastern endpoint of the Rosebud Transmission Line with the western endpoint of the new 525± kV HVDC Transmission Line.

The Proponent would install approximately 173 miles of the HVDC Transmission Line from the Rosebud County Converter Station east to the Montana / North Dakota state line in Fallon County and approximately 168 miles from the state line to a new AC/DC converter station in Morton County, North Dakota (the Morton County Converter Station). The HVDC Transmission Line would have a 200-foot-wide ROW. The Morton County Converter Station would link the eastern endpoint of the new HVDC Transmission Line to the western endpoints of two new 345-kV EHV AC transmission line segments (Oliver Transmission Line and Morton Transmission Line).

Approximately 52 miles of new 345-kV EHV AC transmission line (Oliver Transmission Line) would extend east and north from the Morton County Converter Station to a new separately planned substation in Oliver County (the Oliver County Substation). The Oliver Transmission Line would have a 200-foot-wide ROW. The Oliver County Substation is a 345-kV/230-kV facility being proposed and developed independently of the Project by Minnesota Power. The Oliver County Substation would be the interconnection point to the MISO system and the eastern grid.

Additionally, the Proponent would construct approximately 22 miles of new 345-kV EHV AC transmission line (Morton Transmission Line), extending east and southeast from the Morton County Converter Station to a new switchyard (known as the Morton County Switchyard). The Morton Transmission Line would have a 200-foot-wide ROW. The Morton County Switchyard would be the interconnection point for SPP system and the eastern grid.

1.4. Scope of the Document

In accordance with NEPA and MEPA, the Joint Lead Agencies have prepared this EIS to evaluate the potential direct, secondary (indirect), and cumulative impacts on the human and Montana / North Dakota environment that could arise from the No Action Alternative and Proposed Alternative. This document is organized into eight chapters:

- Chapter 1, Purpose and Need, provides an overview of the Project and associated statutory and regulatory framework, purpose and need for agency action, and agency roles/responsibilities.

- Chapter 2, Description of Alternatives, summarizes information provided on the Project alternatives and feedback received from agencies and the public during the scoping process, and describes the No Action Alternative and Proposed Alternative. This Chapter also describes alternatives considered but dismissed from further consideration.
- Chapter 3, Affected Environment and Environmental Consequences, describes the existing environment and the potential direct and secondary impacts from construction and operations of the Proposed Alternative and No Action Alternative on the existing environment.
- Chapter 4, Cumulative and Reasonably Foreseeable Effects, describes reasonably foreseeable projects/activities in the Project area[1]; assesses the impacts of the Project alternatives in the context of current, past, and future projects in the same area; and describes the unavoidable, irreversible, and irretrievable impacts, as well as regulatory restrictions (pursuant to MEPA).
- Chapter 5, Comparison of Alternatives, presents the Preferred Alternative in Montana identified by the MTDEQ and explains the rationale behind the preference (40 CFR § 1502.14; § 75-1-201, MCA).
- Chapter 6, Consultation and Coordination, lists other agencies and organizations who were contacted or who contributed information.
- Chapter 7, List of Preparers and Reviewers, lists the preparers of this EIS and the agency reviewers.
- Chapter 8, References, lists the source materials used in preparing this EIS.

The following appendices provide detailed information to support the analyses presented in this EIS:

- Appendix A, Agency Roles and Responsibilities
- Appendix B, Supplemental Information[2]
- Appendix C, Scoping Report
- Appendix D, Project Work Area Requirements, Typicals, and Designs
- Appendix E, Construction, Mitigation, and Reclamation Plan (CMRP)
- Appendix F, MFSA Corridor Wider or Narrower than 500 Feet
- Appendix G, Visual Simulations and Viewsheds
- Appendix H, Draft Rate Impact Study

[1] "Project area" is the permanent, operational ROW and areas with temporary/permanent impacts within and outside of the ROW.

[2] Unless otherwise stated, all tables and figures discussed in this EIS are in Appendix B.

2. DESCRIPTION OF ALTERNATIVES

The purpose of this EIS is to analyze the potential impacts on the human and Montana / North Dakota environment of the Proposed Alternative (also referred to as Project), No Action Alternative, and reasonable alternatives to the Proposed Alternative so the Joint Lead Agencies can make informed permitting decisions on the Project. This chapter describes the process of identifying and screening alternatives, including (1) how public comments were captured during the scoping process and considered in the EIS, (2) the alternatives carried forward for detailed analysis, and (3) the alternatives considered but not carried forward for detailed analysis.

2.1. DEVELOPMENT OF ALTERNATIVES

MEPA regulations and CEQ regulations adopted by the DOE for implementing NEPA require the identification and evaluation of a range of reasonable alternatives (33 CFR Part 325; 40 CFR § 230.10; § 75-1-201(1)(b)(iv)(C)(I), MCA). Alternatives are limited to those that would meet the Project objectives and goals (under NEPA) or purpose and need (under MEPA) and be technically and economically feasible. Alternatives are also informed by public comments and the agencies' internal scoping. MEPA and NEPA regulations (§ 75-1-201(1)(b)(iv)(C)(I), MCA; 40 CFR § 1502.14) require exploration of the No Action Alternatives, which provide a baseline to compare environmental impacts of the action alternatives carried forward in the EIS analysis. Alternatives were initially developed based on concerns raised by the public and input from participating government agencies. This section describes the process and outcomes of considering reasonable alternatives to the Project.

2.1.1. Public Involvement

In late 2021, the Proponent initiated coordination efforts with governmental agencies including state, federal, tribal, and local authorities responsible for the oversight of environmental regulation and land management. The Proponent developed various route designs for the transmission line interconnection between 2021 and 2024, which reflected stakeholders' input on the Project. To address public concerns and gather feedback on the routes, the Proponent hosted 12 events in Montana and 14 events in North Dakota to present the Project (including initial route variations) to nearby residents and landowners. Integration of feedback and issues of concern from the public and participating government agencies resulted in the development of route alternatives considered in early design development.

The Joint Lead Agencies subsequently conducted the NEPA/MEPA scoping process to inform the public about the Project, encourage public input, identify issues important to the community, identify human and environmental resources that may be affected by the Project, and explore possible alternatives for consideration. On October 25, 2024, as part of the NEPA/MEPA scoping process, the DOE published a "Notice of Intent To Prepare an Environmental Impact Statement for the Proposed North Plains Connector Project, Colstrip, Montana to Center/St. Anthony, North Dakota" (89 *Federal Register* 207 [October 25, 2024]),[3] which opened the 45-day scoping period for the MTDEQ and cooperating federal agencies. News agencies, newspapers, and landowners crossed by an alternative were notified of the scoping period (Section 3.1 of Appendix C, Scoping Report). Additionally, the DOE issued a press release announcing the

[3] https://www.federalregister.gov/documents/2024/10/25/2024-24879/notice-of-intent-to-prepare-an-environmental-impact-statement-for-the-proposed-north-plains

public scoping meetings; the MTDEQ issued this same press release on its website. The DOE also published a new webpage via the Office of NEPA Policy and Compliance that included a Project summary, an overview of the EIS process and the DOE's role, and information on the scoping meetings (Appendix C). The NOI and press releases disclosed the times and locations of five public scoping meetings and information about the Project. The NOI also provided information on Project alternatives: Alternatives A (Northern Route Alternative), B (Central Route Alternative), C (Southern Route Alternative), D (Proposed Route Alternative), E (Tongue River Route Alternative), the Eastern Route, and the No Action Alternative (Figure 2.1-1).[4]

One scoping meeting was held virtually, and four scoping meetings were held in-person: two in Montana and two in North Dakota (Table 2.1-1). Topics covered during the scoping meetings included the Project overview and map, purpose and need of Project, Project design, Project alternatives, agency roles and responsibilities, timeline and schedule, and how to submit comments. Public comments were collected in person, on paper, via post mail, and email during the comment scoping period (October 25 to December 9, 2024). A total of 28 public comment submittals were received, which included 85 distinct comments. For more details on the scoping process, see Section 2 of Appendix C.

2.1.2. Scoping Comments

Table 3 in Appendix C summarizes the substantive comments and sorts them by resource topic. Commentors expressed that the EIS should assess impacts on federally and state threatened and endangered species and sensitive habitats to determine if the Project would cause loss of habitat or biodiversity. Comments in support of the Project discussed the potential of the Project to improve energy independence and economic opportunities, as well as increase transmission of renewable energy. Other more general comments requested the Proponent consider routes that are collocated with major roads and interstates and avoid impacts on feedlots, visual and aesthetic resources, and commercial property value.

Specifically, Alternative A (Northern Route Alternative) in Montana received some opposition due to concerns that the development would reduce property values. Suggestions included an alternative route more closely aligned with Interstate 94 (I-94) that would reduce maintenance costs, construction in remote areas, and fire risk, as well as improve emergency response time. The commentor proposed a variation of Alternative A in Custer County, Montana, where the length and amount of turns in the line could be decreased and avoid impacts on feedlot operations, visual and aesthetic resources, and commercial property value. An anonymous comment expressed regional opposition regarding economic growth, general development, and other factors associated with development, suggesting support for the No Action Alternative.

Scoping comments did not result in direct changes to the Project alternatives; however, concerns raised during the public comment period were incorporated into the decision-making process for selection of routes to analyze in the EIS. For more information on alternative dismissal rationales, see Section 2.2, Alternatives Considered but Dismissed from Detailed Analysis.

[4] Alternatives presented in the NOI used different terminology for the alternatives than the MFSA Application, which referred to the alternatives as A through E and the Eastern Alternative.

2.1.3. Alternatives Screening Process

The Joint Lead Agencies and Cooperating Agencies reviewed the six route alternatives using a preliminary screening process to determine which to carry forward into the EIS for detailed analysis, in addition to the required No Action Alternative. This screening considered whether the alternatives met the basic criteria of reasonable alternatives described in Section 2.1, Development of Alternatives, including achieving the Project objectives and being technically and economically feasible. Technical feasibility considers whether the alternative can be accomplished with available technology and construction capabilities, while economic feasibility considers the price-competitive nature of an alternative. Cost is not a critical criterion unless the comparative cost renders an alternative economically impractical. Outside of the No Action Alternative, if an alternative did not meet these requirements they were dismissed from detailed analysis (Section 2.2).

A preliminary assessment of impacts on the human and Montana / North Dakota environment was conducted for each route alternative. This included, but was not limited to, the length of an alternative; sensitive natural resources such as protected species habitat or aquatic resources; open land, range land, and pasture land use; topography; and vicinity to residential and recreational areas and cultural resources. Route Alternatives A, B, C, E, and the Eastern Alternative had relevant routing constraints (i.e., existing land easements), engineering constraints (challenging terrain), and greater impacts on the human and Montana / North Dakota environment and were dismissed from detailed analysis (Section 2.2).

The following alternatives were considered to potentially achieve the Project objectives: energy efficiency and conservation, alternative energy resources, design alternatives, and route alternatives.

Based on this screening process, the alternatives carried forward for detailed analysis are the required No Action Alternative and one transmission line route variation: Alternative D (the Proposed Alternative). The general Project description and the alternatives considered but dismissed from detailed analysis are described in detail in the sections below. The impacts of the alternatives being carried forward are evaluated in Chapter 3, Affected Environment and Environmental Consequences.

2.2. Alternatives Considered but Dismissed from Detailed Analysis

This section describes alternatives that were considered but dismissed from detailed analysis using the screening process described in Section 2.1.3, Alternatives Screening Process.

2.2.1. Energy Efficiency and Conservation

Energy efficiency and conservation (such as replacing existing lines with more efficient transmission line materials or reducing energy use) are often raised as alternatives to energy projects. Although energy efficiency and conservation efforts help reduce energy demand, primary energy consumption in the United States is expected to increase by 16 to 57 percent by 2050 compared to 2022 (EIA 2023). Energy conservation efforts are long-term goals that require large-scale public education efforts, significant incentives, and government intervention, which extend beyond the scope and timeframe of the Project. Energy efficiency efforts, such as replacing and optimizing existing lines, still do not address the Project purpose, which is to connect the eastern and western electrical grids. Because improvement of energy

efficiency and conservation would not meet the Project purpose and need, it was dismissed from detailed analysis.

2.2.2. Alternative Energy Development

Alternative energy resources could be a potential alternative to the Project, such as implementation of renewable energy sources; however, projected energy growth would need a combination of increased energy generation and increased transmission capacity. The Project is not proposing to provide new or alternative energy resources; rather, it is intended to connect the western and eastern electrical grids, which would increase energy resource access and the capacity to transport energy for both electrical grids. Therefore, this was not a viable alternative and dismissed from detailed analysis.

2.2.3. Design Alternatives

The Proponent reviewed design alternatives that would achieve the Project purpose and need while remaining technically and economically feasible. The use of AC transmission rather than DC transmission and underground instead of aboveground transmission lines were both considered, as described below.

2.2.3.1. Alternating Current Transmission Line

Most electricity in the United States is generated, transmitted, and distributed as AC power, making it easier to integrate into existing infrastructure and future connections; however, DC power is more advantageous for long-haul transmission, as it is simpler in design, requires fewer materials, has lower amounts of power loss, and can provide bi-directional flow of energy. A DC line requires high-cost converter stations to connect to an AC grid, but the additional costs are typically outweighed when the line is a few hundred miles long, which is achieved by the proposed approximately 422-mile interconnection. Construction of an AC line is possible but would require additional infrastructure such as extra conductors and more robust structures, which would require more space to allow bi-directional transmission. Overall, the additional materials and construction costs for the AC line weigh against AC technology for the Project. Due to the economic and technical challenges, AC transmission was dismissed from detailed analysis.

2.2.3.2. Underground Transmission

Electric transmission lines are typically constructed aboveground because they are easier and cheaper to build, inspect, maintain, and repair. In addition to easier access, aboveground transmission line conductors have lower resistance, resulting in lower energy loss during transmission, which provides more efficient and higher system performance and lower operational costs.

While underground transmission lines are protected from severe weather, they can be damaged by ground movement, groundwater, and insulation degradation over time. The damage to underground transmission lines is difficult to pinpoint and can result in wider outages and longer repair times. The lifespan of an underground transmission line is estimated to be approximately 50 years as compared to 80 for aboveground (Xcel Energy 2025).

Aboveground transmission lines typically require less expensive and complex materials and less specialized equipment and labor than underground transmission lines. Underground cable, insulated conductors, and protective sheaths are more expensive, and more cables are needed

to match the capacity of an aboveground circuit. Underground installation would also require a continuous trench of at least 3 feet wide and 5 feet deep, resulting in a substantial increase in ground disturbance compared to overhead lines, where ground disturbance would be limited to the structure placement (Xcel Energy 2025). Underground transmission lines are estimated to cost 10 and 15 times more than aboveground transmission lines (Xcel Energy 2025).

Although an underground transmission line could meet the Project purpose and need and may be technically feasible, this alternative is not economically feasible due to its substantial additional construction cost, reduced transmission efficiency and system performance, more challenging inspection and ability to repair or upgrade the lines, additional ground disturbance that would result from trenching over 400 miles of transmission line, and overall shorter lifespan.

2.2.4. Route Alternatives

As discussed in Section 2.1.3, Alternatives Screening Process, the Joint Lead Agencies reviewed several route alternatives against the screening criteria and conducted a preliminary assessment of impacts on human and environmental resources to determine which route alternatives to carry forward for detailed analysis. The following route alternatives were considered in the screening process but were ultimately dismissed from detailed analysis.

2.2.4.1. Route Alternative A (Northern Route Alternative)

The Northern Route Alternative (Alternative A) would encompass approximately 9,420.2 acres of maintained ROW (including approximately 380.3 permanent acres of auxiliary facilities) and have an approximate 389.6-mile centerline (Figure 2.1-1).

Alternative A was developed based on a BLM recommendation to prioritize colocation with existing linear utilities near I-94 and to minimize routing through the Greater Sage Grouse General Habitat Management Area. The Proponent presented this alternative to the community during pre-scoping engagement and landowners expressed concerns about structure placement in agricultural fields within the Yellowstone River Valley, especially fields with irrigation and prime farmland. Of the route variations developed, this route crossed the second most residences within 1,000 feet of the Project (28).

A review of state records showed a large number of tribal and cultural resources (244) within 1 mile of Alternative A, as well as the Yellowstone River and Tongue River corridors, which are areas of increased tribal and cultural concerns (Montana SHPO 2023; State Historical Society of North Dakota 2020). In addition, these river corridors contain sensitive species, including bats, fish, and eagles, as well as sensitive riparian habitats, which would require surveying, monitoring, and mitigation.

As Alternative A extends north out of Colstrip, the route crosses an area of land between Colstrip and Forsyth, Montana, with multiple parcels that are under easements with an energy company. These easements allow the company to use some or all of the parcels for the construction, replacement, relocation, and maintenance of transmission facilities, including structures, wires, cables, foundations, and ingress and egress to these facilities (Clearwater Energy Resources LLC 2016, 2019; Clearwater Wind Land Holdings, LLC 2021). These existing easement agreements would conflict with the placement of the Project transmission facilities. Acquiring easements that would not conflict with the existing ones would be difficult. The existing energy easements in this area limit the technical feasibility of Alternative A.

As discussed in Section 2.1.2, Scoping Comments, a landowner suggested a variation of Alternative A in Custer County, Montana, to avoid feedlot operations, visual and aesthetic resources, and commercial property value. Given the complications of the energy easements, landowner feedback, and tribal and cultural resource and natural resource concerns, Route Alternative A was dismissed from detailed analysis.

2.2.4.2. Route Alternative B (Central Route Alternative)

The Central Route Alternative (Alternative B) would encompass approximately 9,074.4 acres of maintained ROW (including approximately 380.3 permanent acres of auxiliary facilities) and have an approximate 375.3-mile centerline (Figure 2.1-1).

The Proponent developed Alternative B to avoid the Yellowstone River Valley and development along highway corridors and Miles City. This route generally crosses open country with limited opportunities to collocate with existing linear infrastructure. To avoid energy easements north of Colstrip, as discussed in Section 2.2.4.1, Alternative A (Northern Route Alternative), the route would cross approximately 3 miles of the Hoodoo Land Holdings LLC conservation easements managed by the Montana Fish, Wildlife & Parks (FWP) between Butte Creek Road and Sweeney Creek Road in Rosebud County, Montana. This conservation easement is intended to "conserve, protect, and enhance wildlife habitat," and prohibits the removal, destruction, control, or manipulation of native vegetation (Hoodoo Land Holdings, LLC 2021). The terms on these easements are incompatible with the construction of a transmission line in the areas north of Butte Creek Road and west of Sweeney Creek Road. This route also crosses the Tongue River approximately 0.6 mile south of Twelve Mile Dam, a state fishing access site and campground that could be visually affected by this route.

In addition to the easement land use conflict, Alternative B did not offer significant environmental advantages over other routes. Therefore, Route Alternative B was dismissed from detailed analysis.

2.2.4.3. Route Alternative C (Southern Route Alternative)

The Southern Route Alternative (Alternative C) would encompass approximately 8,909.2 acres of maintained ROW (including approximately 380.3 permanent acres of auxiliary facilities) and have an approximate 368.5-mile centerline (Figure 2.1-1).

This alternative would take advantage of the gentler topography east of Colstrip compared to the other alternatives that routed northeast past Rosebud Creek. However, east of the Powder River crossing, the route traverses rugged topography with several abrupt elevation changes of up to 800 feet. The route also crosses predominantly open country with limited existing roads.

Alternative C crosses approximately 2.5 miles of the Bice Ranch LLC Conservation Easement approximately 0.7 mile west of its intersection with Moon Creek Road and Road 611 in Custer County, Montana. The purpose of the conservation easement, managed by the Montana FWP, is to "preserve and protect in perpetuity the conservation values of the Land, particularly the habitat the Land provides for a variety of wildlife species" (Bice Ranch, LLC 2002). The easement prohibits the "removal of trees… the control, removal, or manipulations of any riparian vegetation… and any commercial or industrial use or activity." Although the installation of a utility line is not expressly prohibited, it may be considered a commercial or industrial activity, and the Montana FWP recommends avoidance of these and similar easements to the extent practicable.

During community engagement, landowners expressed land use conflicts where Alternatives C and D diverge (approximately mileposts [MPs] 20 to 80), indicating the route would negatively affect ongoing ranching and farming operations. Additionally, this route crosses approximately 4.3 miles of subdivided residential properties along Cherry Creek Road approximately 3.5 miles east of Rosebud Creek Road in Rosebud County, Montana, which would require easements across more than 14 private properties and come within close proximity (0.5 mile) of several houses.

While Alternative C was slightly shorter (approximately 1 mile shorter with a 45-acre smaller footprint) and crossed less miles of greater sage-grouse habitat (4.7 miles less) and leks (10.3 miles less) within a 2-mile buffer compared to the Proposed Alternative (Alternative D), there are also 55 more tribal/cultural resources within 1 mile and six more homes within 1,000 feet (Montana SHPO 2023; State Historical Society of North Dakota 2020).

Based on stakeholder engagement, the Proponent revised Alternative C to address landowner concerns and avoid easements and challenging terrain, which resulted in the development of Alternative D. Alternative C would, therefore, be similar enough to Alternative D in design that its inclusion would not better inform decision making (DOE 2025). Community feedback also indicated a preference for Alternative D over Alternative C. Therefore, Route Alternative C was dismissed from detailed analysis.

2.2.4.4. Route Alternative E (Tongue River Route Alternative)

The Tongue River Route Alternative (Alternative E) is a variation of Alternative C that runs along the Tongue River Valley. Alternative E would encompass approximately 8,715.9 acres of maintained ROW (including approximately 380.3 permanent acres of auxiliary facilities) and have an approximate 359.7-mile centerline (Figure 2.1-1).

Alternative E was created to avoid developed areas around highways and the natural environment of the Yellowstone River. It deviates north of Alternative C near Tongue River Road in Custer County, where it runs parallel to the road and river northeast. The Alternative C route segment that deviates from Alternative E is approximately 30 miles long. Although Alternative E is the second shortest route alternative, it would cross the most miles of BLM Visual Resource Management (VRM) Class II lands (5.9 miles), which have an objective of retaining the existing character of the landscape. It would also have the third most residences (25) within 1,000 feet of the route alternatives.

During the Proponent's discussions with various agencies, concerns arose regarding tribal resources, protected species, and prairie dog towns (colonies of prairie dogs) along the Tongue River, which had been identified during siting surveys for a different project. Collaborating agency staff were concerned about the route not avoiding these sensitive areas. To address these concerns, the Proponent adjusted Alternative C to follow another route heading north along Montana Highway 59 near Pumpkin Creek in Custer County. Alternative E would be similar to Alternative C in design and environmental impacts. As a result, its inclusion would not better inform decision making. Therefore, Route Alternative E was dismissed from detailed analysis.

2.2.4.5. Eastern Route Alternative

The Eastern Alternative is an alternative route within North Dakota only. It was developed to collocate with existing linear utilities and I-94 upon the recommendation of the North Dakota

Game and Fish Department to avoid designated greater sage-grouse primary range and by the USDA Forest Service to cross the Little Missouri River on private lands. The Eastern Alternative would encompass approximately 7,830.2 acres of maintained ROW (including approximately 380.3 permanent acres of auxiliary facilities) and have an approximate 323-mile centerline (Figure 2.1-1).

The Eastern Alternative would have the most residences (34) within 1,000 feet of the route alternatives. The Eastern Alternative was developed prior to the addition of the Morton Transmission Line to the Project and was not designed to accommodate the designated SPP interconnection near St. Anthony. To serve both the Oliver County Substation and Morton County Switchyard, the proposed Rosebud County Converter Station would need to be moved to a point on the alternative route and would need to adopt the portion of Alternative D serving the switchyard. Because the route does not serve the purpose and need of the Project, the Eastern Alternative was dismissed from detailed analysis.

2.3. ALTERNATIVES ANALYZED

2.3.1. Proposed Alternative (Route Alternative D)

The Proposed Alternative (Alternative D) would encompass approximately 10,125.1 acres of maintained ROW (a 200- to 320-foot-wide corridor crossing easements for public and private lands; Grid United 2025a), with a centerline of approximately 422 miles (Figure 2.3-1). The Proposed Alternative begins at the existing Colstrip Substation, routes east and south to the proposed Rosebud County Converter Station, then heads north and east to the Montana / North Dakota state line. Appendix D, Project Work Area Requirements, Typicals, and Designs, includes more details about the Proposed Alternative and Project area.[5] In certain areas along the Project, MTDEQ and the Proponent consulted with each other to identify areas where the approved corridor should be more or less than 500 feet wide (75-20-303(5)(a)(ii), MCA). These locations are identified in Appendix F, MFSA Corridor Wider or Narrower than 500 Feet.

The route generally traverses open, undeveloped lands and passes through predominately private lands in Montana and North Dakota. The route also crosses Montana State Trust, BLM, and USDA ARS lands within Montana; and North Dakota State Trust and National Forest System (NFS) lands within North Dakota. For details on miles of land, land types, and land ownership crossed, see Appendix D and Section 3.8, Land Use and Recreation.

Where it crosses the Montana / North Dakota state line, the Proposed Alternative generally routes east to the proposed Morton County Converter Station. From there, the route splits, with an approximate 52-mile section heading north to the Oliver County Substation near Center, North Dakota, and an approximate 22-mile section heading east/southeast to the proposed Morton County Switchyard near St. Anthony, North Dakota.

Overall, the Proponent selected Alternative D as their preferred route alternative to submit to the agencies based on the stakeholder response. It largely avoids several land use conflicts (including ongoing ranching/farming, subdivided property, and conservation easements), crosses the Powder River in an area without broader constructability challenges, and minimizes impacts on several resources and land use while considering stakeholder input.

[5] "Project area" is the permanent, operational ROW and areas with temporary/permanent impacts within and outside of the ROW.

2.3.1.1. Construction

The Proponent anticipates starting construction in 2028 (after all the required permits and authorizations have been issued) and estimates that it would take approximately 3 to 4 years to complete with concurrent construction on the transmission line, converter stations, and switchyard. Construction would likely occur year-round (weather permitting) on a 6-day work week, except for areas with construction timing restrictions (e.g., to protect sensitive species and habitat).

Transmission line construction generally follows a sequence, including survey and staking, access road construction, work area clearing, foundation installation, structure assembly and erection, conductor and optical power ground wire installation, and site cleanup and restoration. Construction crews (peak temporary workforce of approximately 800 workers) would operate simultaneously at different locations. Crews could assemble and erect structures at an average pace of around 1 to 2 miles per day. Conductor and optical power ground wire installation could be completed at an estimated average pace of about 2 miles per day.

The Project would generally require a typical 200-foot-wide maintained ROW.[6] Within the maintained ROW, each structure would require a 200-foot by 200-foot construction work area, but larger structures (exceeding 170 feet in height) would require a 250-foot by 200-foot work area. Appendix D provides the typical work areas required for the Project.

Construction crews would prepare work areas by removing trees, shrubs, brush, and large rocks from the work area using mechanical equipment such as mechanized mowers, sky trips, process harvesters, feller bunchers, or brush cutters. In areas where clearing with large equipment is not feasible, the Proponent would use hand tools such as chain saws. Crews would generally cut vegetation at or slightly above the surface of the ground, leaving rootstock in place where possible. Brush and other cleared material would be burned, chipped, or mulched onsite within the ROW or hauled to an appropriate disposal location. In some cases, crews may need to grade and level the ground within Project work areas to allow for the safe operation of construction equipment. Where grading extends below the topsoil layer, the Proponent would separate topsoil and store it separately from subsoil in accordance with the CMRP (Appendix E, Construction, Mitigation, and Reclamation Plan). During restoration, the Proponent would return subsoil to its original horizon, followed by topsoil prior to reseeding.

Transmission structure height would range from approximately 110 to 195 feet tall. The exact heights would depend on various aspects such as engineering, topographic constraints, terrain, river crossings, or crossing other transmission lines. Structures would typically be spaced approximately 900 and 1,600 feet apart and with an average span of 1,200 feet, resulting in three to six structures per mile.

Steel monopole structures and lattice towers (collectively, “structures”) would generally be supported by cast-in-place, concrete pier foundations. Excavated holes for monopole structures would typically be 7 to 14 feet in diameter and extend 20 to 60 feet into the ground to accommodate 5- to 12-foot diameter foundations. Lattice towers would have a concrete pad

[6] The maintained ROW would be permanently maintained throughout the life of the Project. The Rosebud Transmission Line would have a typical ROW of 320 feet (due to colocation of parallel lines), while the HVDC Transmission Line, Oliver Transmission Line, and Morton Transmission Line would have a typical ROW of 200 feet.

measuring 25 to 55 feet wide and long, and each of the four legs would have an excavation hole approximately 5 to 8 feet in diameter, extending 20 to 60 feet into the ground. Foundation construction would require making a vertical hole using power drilling equipment or limited blasting in rocky areas. Construction crews would install reinforced-steel anchor bolt cages into the holes to increase the structural integrity of the concrete foundation and then pour concrete into the holes. Due to the remote areas along the route, the Proponent would likely need to provide concrete from portable batch plants located at construction yards approximately every 30 miles along the route. The Proponent's typical transmission line structures are provided in Appendix D. The Proponent would dispose of remaining subsoil from excavations at an approved offsite location, as needed.

To assemble and erect monopole structures, crews would transport the entire structure or sections by truck or helicopter to each work area. At the structure site, crews would use a large crane[7] to hoist the bottom section onto the structure foundation and mount the anchor bolts. Next, crews would lift the middle section(s) into place. Crews would then climb the assembly to ensure proper alignment and secure the fitting, then guide and secure the top section into place to complete the structure. The Proponent would install a grounding system at the base of each transmission structure.

To assemble and erect lattice towers, crews would transport bundles of steel members, associated hardware, and wood to each structure site by truck. Next, crews would open and place the structure steel bundles on the wood blocking for assembly. Typically, the crews would assemble the leg extensions for the structures first and erect the leg extensions with a small crane. Subsections would then be assembled and hoisted into place with a large crane, followed by fastening them together to complete the structure.

The Proponent may use helicopters to erect structures in areas that are difficult to access due to rough terrain or lack of roads. Before deciding to use helicopters, the Proponent would consider access to structure locations, sensitive resources, permitting restrictions, landowner needs and preferences, construction schedule, weight of structural components, time of year, elevation, availability of heavy lift helicopters, and construction economics.

After structures are erected, insulator strings (a series of insulator discs used to isolate the electrical current) and stringing sheaves (pulleys used to string the line) would be attached at each conductor. Pilot lines would first be pulled or strung from each structure using a helicopter or land-operated equipment, followed by larger-diameter line until the conductor and optical power ground wire are pulled through the sheaves. Powered pulling and tensioning equipment would be used to maintain tension on the wires until they are properly fastened to the structures. The string sheaves would then be removed and the conductors permanently attached to the insulators. Temporary guard structures would be erected at road and railroad crossings, as necessary, to protect the public during the stringing activities.

Access Roads

The Project would be accessed by existing roads, overland travel, and new temporary and permanent access roads. The Proponent has identified Project access roads that would

[7] BLM may require decompaction as part of their approval for any location on BLM-managed lands where equipment weighing over 10 tons is used.

minimize travel through sensitive resources at site-specific locations, avoid large waterway crossings, provide safe pathways, and allow access across agricultural areas as preferred by landowners. Gates and cattle guards would be installed and maintained on access roads where required by landowners. New temporary and permanent access roads would be designed in accordance with federal, state, and local requirements. Permits and authorizations for temporary and permanent access roads would be obtained prior to construction.

Existing roads would be maintained or improved for use using cut-fill material or gravel sourced from commercial operations, and new roads would be built as needed. Gravel fill or dirt used to develop or maintain access roads on NFS lands would be certified weed free, as stipulated in the Special Use Permit. Maintenance activities such as tree trimming, repair of washed-out areas, grading down washboards, filling depressions and blow-outs, repaving potholes and damaged surfaces, and back-blading may occur where needed and as agreed upon with the road authority. Additionally, improvements such as blading, widening/straightening curves, re-establishing drainage features, tree removal, boulder and rock removal, bridge and culvert construction/repair, installation of roads to cross washes (i.e., ephemeral streams), and other improvements may be required to provide an adequate surface to support construction and maintenance vehicles. For more details on existing access road maintenance, see Section 5.3 of Appendix E.

New permanent access roads may be up to approximately 25 feet wide and consist of dirt, gravel, asphalt, concrete, or another hard surface. The Proponent would maintain the permanent access roads. The type of hard surface for an access road would be dependent on BLM and USDA Forest Service jurisdictional guidelines. New permanent access road construction may include vegetation, rock, and debris clearing; cut and fill and grading; establishing drainage features; bridge and culvert construction; laying of aggregate; paving; and other improvements to provide an adequate surface to support construction and maintenance vehicles. For more details on new access road construction and maintenance, see Section 5.3 of Appendix E.

Temporary access roads developed for use during construction would be up to approximately 25 feet wide. The construction of temporary access roads may involve many of the same steps as permanent access roads, but they would not be paved with asphalt or concrete. After construction is completed, temporary access roads and overland travel lanes would be returned to their pre-construction conditions, unless the road authority, landowner, or land-managing agency asks the Proponent to leave the improvements in place. For more details on the restoration of temporary access roads and overland travel lanes, see Section 6.0 of Appendix E. Following construction, all associated temporary infrastructure and materials in wetlands or waterbodies would be removed as required by applicable permits and authorizations.

Overland travel would consist of using the Project ROW as the primary access where there are no existing roads, no road construction or improvements are necessary, and it is safe for the use of construction vehicles and equipment. Overland travel lanes would consist of a 25-foot-wide path within the ROW where there are no pre-existing roads. There would be no construction of temporary access roads and no clearing of vegetation or grading for overland travel. However, vegetation would be driven over and potentially damaged. The Proponent

would restore any areas where soil becomes rutted or vegetation is disturbed. On BLM-managed lands, no overland travel would occur outside of an approved ROW.

Additional temporary space along some access roads could be required for vehicle turnarounds or bi-directional travel.

Fill material for construction and maintenance of access roads may include gravel, sand, and clay. Materials would be purchased as needed from local commercial operations. Matting may be used to provide support for construction equipment where wetlands or hydric soils are present. The appropriate best management practices (BMPs) for waterbody crossings, pipeline protection, and sediment and erosion control would be installed before construction of temporary and permanent access roads. For more details on access road construction stormwater BMPs, see Sections 5.3 and 5.7 of the CMRP (Appendix E).

Permanent access roads would be required for up to six fiber repeater stations associated with the HVDC Transmission Line, although these roads have not yet been designed.

Length and land requirements for the Proposed Alternative, including access roads, temporary work areas, and the maintained ROW, are assessed in Chapter 3, Affected Environment and Environmental Consequences. The Proponent would use BMPs during the construction process described above, which are detailed in the CMRP (Appendix E).

Power and Auxiliary Facilities

The Project would require new permanent facilities that would remain in place for the life of the Project (Grid United 2025a, 2025b):

- The existing 22.2-acre Colstrip Substation would be expanded by approximately 4.2 acres to the northwest and approximately 9.0 acres to the south and east. The Colstrip Substation would be modified to include two new 500-kV bays and upgrades of the electrical components to accommodate a 5,000-amp rating. No additional temporary work areas or access roads would be required for this work.
- The Morton County and Rosebud County Converter Stations would include a DC line entry, DC hall, AC yard, valve hall, control building, cooling equipment, converter transformers, generators, cooling equipment, spare parts buildings, and temporary work areas. The Rosebud County Converter Station permanent footprint would be 22.7 acres, with 0.4 mile of permanent access roads, 0.4 mile of improvements on existing access roads, and 17.7 acres of temporary work areas. The Morton County Converter Station permanent footprint would be 24.1 acres with no permanent access roads and 40.6 acres of temporary work areas. The Rosebud Converter Station would be on Montana State Trust lands, and the Morton County Converter Station would be on privately owned land. The converter stations would be used for converting power currents, stepping up voltages, and housing protection and control systems. At the eastern end of the line, the Morton County Converter Station would connect the Morton Transmission Line to the new Morton County Switchyard, in addition to connecting the Oliver Transmission Line to the Oliver County Substation. The Rosebud County Converter Station would be constructed east of the existing Colstrip Substation and would be connected to the existing Colstrip Substation by the Rosebud Transmission Line.

- The Morton County Switchyard would consist of a DC switchyard and equipment, control, maintenance, and administrative buildings. The Morton County Switchyard would be built on privately owned land and include a control enclosure, ground grid, finish gravel, foundations, structural steel bus work, conduit, switches, breakers, security fence, a gravel surfaced access road, and a backup power system. The switchyard permanent footprint would be 4.3 acres with 0.3 mile of permanent access roads and 91.1 acres of temporary work areas.
- The Project would include up to six fiber repeater stations. The stations would consist of 12-by-12-foot buildings to house signal regeneration equipment every 50 to 60 miles along the transmission line. These stations would collectively occupy a permanent footprint of approximately 0.4 acre. The construction of the repeater stations would require a total of 1.4 acres of temporary work area on privately owned lands and include a permanent access road and power supply via a distribution line, as well as emergency backup generators, a liquefied petroleum gas storage tank, and a battery bank.

These facilities would collectively have a permanent footprint of approximately 64.7 acres and 152.4 acres of temporary construction footprint (Grid United 2025b). Full details of the required facilities, as well as designs, are provided in Appendix D.

2.3.1.2. Operational Conditions, Resiliency, and Public Safety

Procedures under Normal and Emergency Conditions

Transmission line design would account for regional weather and load cases and clearance requirements so that they are structurally resilient and to minimize structure failure and outages due to ice, wind, and extreme weather (North American Electric Reliability Corporation [NERC] TPL-001-5.1). Transmission lines must be regularly inspected for safe, efficient, and economical operation (NERC FAC-003-4). Ground and aerial inspections of the transmission line and Project facilities would be performed regularly, in accordance with good utility practices for transmission line inspection and maintenance (National Electrical Safety Code [NESC] Rule 214A2). The Proponent would conduct routine and preventative maintenance activities as described in Section 8.0 of the CMRP (Appendix E) to identify and repair any deficiencies recorded during routine monitoring and inspections. The Proponent would respond promptly to outages from line failure and would use emergency ingress/egress rights to make necessary repairs and contact the required agencies. The Proponent would investigate any complaints of line-generated radio and/or television interference and implement appropriate mitigation measures (47 CFR Part 15; FCC 2022). Section 3.4, Public Health and Safety, discusses many of the design and safety considerations for the Project.

Right-of-Way Control and Management

The typical 200-foot-wide transmission line ROW design and construction would meet or exceed NESC requirements, which provide for the safety and protection of landowners and their property, the public, and operator employees (NERC PRC-005-6). Land uses within the maintained ROW would be determined in accordance with the terms and conditions of easements for the Project (NDCC § 49-22-09; Administrative Rules of Montana [ARM] 17.20.1512(3)). Ranching, farming, gardening, recreational activities, and other uses are generally permitted; however, structures may be restricted (Section 3.8, Land Use and Recreation). Where vegetation would be cleared for construction, the Proponent would

establish permanent vegetation where exposed soils remain within Project work areas and along temporary access roads that would be restored to pre-construction conditions (§ 75-20-101 *et seq.*, MCA; NDCC § 49-22-09). ROWs in actively cultivated areas would be reseeded in accordance with landowner preference; inundated wetlands would be allowed to naturally revegetate. For more details on restoration of the temporary ROW, see Appendix E.

The Proponent would conduct regular transmission line inspections in compliance with state and federal regulations and Project commitments. These inspections would check for transmission line or vegetation maintenance needs and unauthorized encroachments such as trash dumping.

The operational life of the Project infrastructure is assumed to be approximately 80 years. Beyond this timeframe, effects cannot be reasonably foreseen or measured and are, therefore, not included in this analysis.

2.3.2. No Action Alternative

The No Action Alternative provides the baseline against which the impacts of the Proposed Action or Proposed Alternative can be compared. Under the No Action Alternative, the DOE would not finalize the conditional $605 million award to Montana Department of Commerce to support planning, procurement, permitting, construction, and commission of the Project; the agency permits and authorizations listed in Appendix A would not be granted; and the agencies would assume for purposes of the EIS analysis that the Project would not be constructed. The objective for the Project to enhance grid reliability and resilience between service areas and provide cross-grid market access for electricity generators between the western and eastern electrical grids would not be met. The No Action Alternative would assume the electrical grids and connections between them remain unchanged from their current status. Any beneficial or adverse impacts associated with the Project would not occur (Chapter 3, Affected Environment and Environmental Consequences).

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1. INTRODUCTION

This chapter details the affected environment and environmental consequences of the No Action Alternative and the Proposed Alternative. The affected environment is the human and environmental resources that could be affected by the Project. Environmental consequences refer to the potential impacts (herein referred to as impacts), defined in Section 3.1.1, Impact Assessment Methodology, that the Project components would have on the human and Montana / North Dakota environment.

The following resource topics were identified prior to and during scoping:

- Air Quality (Section 3.2)
- Cultural/Tribal/Historic Resources (Section 3.3)
- Public Health and Safety (Section 3.4)
- Groundwater Hydrology (Section 3.5)
- Surface Water Hydrology (Section 3.6)
- Minerals and Geology (Section 3.7)
- Land Use and Recreation (Section 3.8)
- Visual and Aesthetics (Section 3.9)
- Socioeconomics (Section 3.10)
- Soils (Section 3.11)
- Noise (Section 3.12)
- Vegetation (Section 3.13)
- Fisheries and Wildlife (Section 3.14)

3.1.1. Impact Assessment Methodology

A combination of desktop studies, field surveys, and professional expertise was used to identify and evaluate the Project impacts on each resource analysis area under each alternative. The impact assessment methodology has been applied consistently as part of the analysis to compare and characterize impacts, which helps develop measures that could minimize, mitigate, or avoid impacts.

Impacts on each resource analysis area are considered during construction and operational phases. Impact types may be direct, indirect[8] or secondary[9] (referred to in this EIS as secondary), or cumulative and are classified as either beneficial or adverse. Direct impacts are immediate and tangible impacts caused by a Project activity and are discussed for each resource analysis area. Secondary impacts are those that may be stimulated, induced by, or otherwise caused by a direct Project impact and are discussed where they exist. Impacts that mitigation[10] cannot eliminate are referred to as residual impacts.

[8] "Indirect impacts" defined under previous DOE NEPA procedures "means changes to the human environment from the proposed alternative or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed alternative or alternatives" (10 CFR Part 1021).

[9] MEPA implementing rules define "secondary impacts" as "a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action" (ARM 17.4.603 (18)).

[10] Means, measures, or practices to reduce Project impacts

Cumulative impacts include "collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures" (ARM 17.4.603 (7)).

Impacts are characterized by type (beneficial, adverse; direct, secondary, or cumulative), duration (short-, medium-, long-term, or permanent), and extent (localized or regional). Impacts are adverse unless stated as beneficial. Short-term impacts would occur at the start of construction through the first year, medium-term impacts would occur through the end of the 3- to 4-year construction window, long-term impacts would persist past construction, and permanent impacts would be permanent.

Environmental consequences (i.e., impacts) resulting from Project alternatives are determined through a series of steps:

1. Characterize the baseline conditions before the Project begins (the affected environment sections of the EIS).
2. Describe the Project components and activities conducted throughout the Project lifespan (i.e., pre-construction, construction, and operations).
3. Identify and screen Project alternatives to determine which are carried forward for detailed analysis in the EIS.
4. Based on the description of the Project alternatives, identify and describe the beneficial or adverse impacts for each resource analysis area using the impact assessment types (direct, secondary, and cumulative).
5. Identify appropriate impact mitigation.
6. Describe the duration and extent of the impact after mitigation (the residual impact).

The analysis methods used for each resource are detailed in Appendix B.

3.2. AIR QUALITY

This section describes the analysis methods, affected environment, and impacts on air quality from the Project.

3.2.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on air quality.

3.2.2. Affected Environment

This section describes baseline conditions for air quality.

3.2.2.1. Regional Climate

Daily summaries from the National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information were used to evaluate the regional climate for the Project. Both Montana and North Dakota have mild-to-hot summers with potential for severe thunderstorms and tornadoes, and harsh, cold winters with snow and potential for blizzards. Annual average temperatures and precipitation in the Project area are shown in Table 3.2-3; the average represents the 10-year data set from four stations from 2014 to 2023.

3.2.2.2. Background Ambient Air Quality

Pollutant concentration data used to characterize background air quality for the Project were obtained from the USEPA Air Data website (USEPA 2025c). Ambient levels of criteria pollutants are measured at a number of air quality monitoring stations throughout the United States. Two monitoring stations were chosen to best represent background air quality in the Project area. For the Montana portion of the Project, a station approximately 11 miles north of the HVDC Transmission Line in Miles City, Montana, was selected. Two years (2022 and 2023) of certified monitoring data for Miles City are shown in Table 3.2-4. For the North Dakota portion of the Project, a station approximately 10 miles east of the Oliver Transmission Line in Bismarck, North Dakota, was selected. Three years (2020, 2021, and 2022) of certified monitoring data for Bismarck is shown in Table 3.2-5. Both tables indicate that the monitoring concentrations at Miles City and Bismarck stations do not exceed the NAAQS for any pollutants.

3.2.2.3. Attainment Status Designations

The Project would be located in counties designated as in attainment or in attainment/unclassifiable for all criteria pollutants. An exception is Rosebud County, Montana, which is partially in nonattainment for 24-hour particulate matter (PM) with an aerodynamic diameter less than or equal to 10 microns (PM_{10}). This area is located about 13.7 miles (22 kilometers) south of the Rosebud Transmission Line. However, the Project would not be located in that portion of Rosebud County and therefore, the entire Project area is considered in attainment/unclassifiable.

3.2.2.4. Atmospheric Deposition and Visibility

Regional haze is impaired visibility across the landscape. In general, it is caused by multiple sources and activities that emit fine particles and chemical precursors of haze that are distributed across a broad geographic area. Fine PM and condensed aerosols including sulfates, nitrates, organic carbon, elemental carbon, and soil dust impair visibility by scattering and absorbing sunlight. Regional haze reduces "visual range," which is a measure of atmospheric clarity. Visibility or lack thereof can be measured as a haze index or deciview, with higher deciview values meaning more haze.

Atmospheric deposition refers to the transfer of air pollutants such as toxic organic compounds, toxic metals, and inorganic acids from the air to the ground, vegetation, and into waterbodies. This deposition can lead to ecosystem acidification in water and on land, which can cause major distress and damage to both aquatic and non-aquatic organisms.

Air quality data collected by the National Park Service (NPS) were used to evaluate deposition and visibility in a Class I area near the Project (NPS 2025a). Data from Theodore Roosevelt National Park showed a 10.1 deciview haze index and an ambient level of 59 parts per billion (ppb) ozone (O_3). These values are considered fair, and data showed a relatively unchanging condition. Nitrogen and sulfur deposition levels were fair to good with an unchanging condition.

The Interagency Monitoring of Protected Visual Environment Program (IMPROVE) collects and identifies visibility and composition trends throughout the nation. Detailed plots provide a graphical representation of annual visibility trends for the closest IMPROVE monitoring sites to the Project area (Grid United 2024). The data show that the visibility trends have not changed significantly since the early 2000s; however, it reveals an improving trend for the clearest and most impaired days at the monitoring sites.

3.2.2.5. Climate Impacts

The lifetime of greenhouse gases (GHGs) in the atmosphere ranges from about a decade to thousands of years. Therefore, GHGs are circulated and well-mixed throughout the atmosphere and contribute to climate change irrespective of the location of the emissions. Because of this, impacts of GHG emissions on climate change should be viewed on a global rather than regional scale. However, climate change impacts and levels of GHG emissions can be evaluated at a more local level.

The "2023 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends" provides details about the impact of GHG emissions (particularly carbon dioxide [CO_2], methane [CH_4], and nitrous oxide [N_2O]) and estimates for coal, oil, and gas development, which includes current operations and predicted future operations on the lands and mineral estate managed by the BLM (BLM 2024). The report also assesses climate change impacts for individual states with BLM-owned lands. The NOAA's National Center for Environmental Information also provides state-specific climate summary reports (NOAA 2022a, 2022b). Average temperatures in Montana and North Dakota have increased at a rate higher than the average warming for the contiguous United States, and extreme precipitation events such as floods or droughts have increased in frequency since the start of the 20th century. Wildfires and flooding are major threats to infrastructure, which could affect any area of the Project, and increased droughts have led to concern about future water availability in the area.

3.2.3. Environmental Consequences

The impacts on air quality are discussed in the following sections.

3.2.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on air quality or climate change, as the Project would not be built.

3.2.3.2. Proposed Alternative

Emissions Impact Analysis and Mitigation

During the construction phase, there would be emissions from construction equipment and ground-disturbing activities. Construction activities on the transmission lines would occur at different times across the length of the Project. Emissions of criteria pollutants, GHGs, and HAPs would primarily come from the construction equipment's gasoline, diesel, or jet-fueled engines. Vehicle traffic on paved and unpaved roads, land clearing, grading, and excavation would cause fugitive dust emissions. The amount of resulting fugitive dust depends on many factors, including type of vehicles or machinery and amount of activity, weather, and surface characteristics including soil type. For example, dry and windy days with a lot of construction activity occurring over fine-textured soil would lead to higher amounts of fugitive dust.

Transmission line construction activities would not be continuous throughout the entire Project area. Typically, construction would occur in one area before moving to another. The activities would be temporary, and any impact on air quality would be direct and secondary, short-term, and localized. Construction emissions are estimated for each Proposed Alternative component separately and shown in Table 3.2-6 and Table 3.2-7. Estimated GHG emissions for CO_2, CH_4, and N_2O are shown in Table 3.2-7 and represent the maximum emissions that could occur in a year of construction. For comparison, total reported criteria pollutant emissions for Montana and North Dakota from the latest available National Emissions Inventory Data are shown in Table 3.2-8 (USEPA 2023). The data show that the total Project emissions from construction is equivalent to 1 percent or less of the total criteria pollutant emissions reported in Montana and North Dakota in 2020. Equipment types and construction duration can vary for each Proposed Alternative segment, but estimates are based on typical construction equipment, equipment operating schedule, and distances traveled. Emission factors from USEPA's Motor Vehicle Emission Simulator model were used to calculate estimated construction emissions (USEPA 2025b), and the assessment presents the most conservative emission estimates that would occur in a single year.

Construction vehicle fleets typically contain a mixture of newer and older equipment. The USEPA has phased in tiers for emission standards of newly manufactured engines. The current highest tier (Tier 4) contains the most stringent emission standards, typically met only by newer equipment. For this assessment, the Proponent has assumed that, in general, the construction equipment engines will meet Tier 2 standards or higher. Table 3.2-6 and Table 3.2-7 show the estimated criteria and GHG emissions for each segment of the Proposed Alternative. See Grid United 2024, 2025a, and 2025b for detailed emissions calculations.

Construction emissions are expected to be direct and secondary, medium-term, and localized. If dust levels become problematic, the Proponent would implement the measures outlined in Section 5.6 of the CMRP (Appendix E) to reduce potential fugitive dust levels. Construction emissions at the Rosebud County Converter Station in Montana, Morton County Converter Station in North Dakota, Morton County Switchyard in North Dakota, and expansion of the existing Colstrip Substation could result in higher emission levels from construction due to the extended period of time that work is required at each site. The Proponent would apply dust mitigation measures at these sites and notify nearby landowners of construction activities as outlined in the CMRP (Appendix E). Construction emissions would cease when

construction is complete, and it is not expected that the construction emissions would lead to an NAAQS violation.

The Proposed Alternative would have limited operational emissions. Some emissions could occur after the construction period for inspections and general infrastructure maintenance and repair, but any emission impacts would be direct and secondary, short-term, and negligible. Therefore, the Project is not expected to have a significant impact on overall air quality in the region during the operational phase.

Climate Impact Analysis and Mitigation

Incremental impacts of global GHGs from a single Proposed Alternative cannot be accurately translated into effects on global climate change or any localized impacts. Currently, global climate models cannot forecast local or regional impacts on resources resulting from a specific subset of emissions. However, there are general projections regarding impacts on natural resources and plant and animal species that may be attributed to climate change resulting from the accumulation of GHG emissions over time.

Overall, the maximum annual emissions of GHGs measured as carbon dioxide equivalent (CO_2e) for the Project impact areas would be 155,080 metric tons, as shown in Table 3.2-7. For comparison, that is approximately equivalent to 36,173 gasoline-powered passenger vehicles driven for 1 year or the amount of energy usage of 20,827 homes for 1 year (USEPA 2025a). That total is less than 0.5 percent of total GHGs emitted in 2022 in the energy sector for Montana or North Dakota, and less than 0.003 percent of the national emissions data for 2022 (USEPA 2024a). The energy sector accounts for the majority of human-caused GHG emissions and accounted for 82 percent of all CO_2e emissions in 2022 (USEPA 2024b). The main GHG emission sources during the construction phase would come from the burning of fuel by construction equipment, helicopters, and on-road commuter vehicles. The Project would emit GHGs temporarily during the construction phase, which would add to the current global levels of GHGs. After construction, negligible amounts of GHG emissions could result from workers commuting to sites for inspections, maintenance, and repair of infrastructure; there would be no stationary permanent sources of operational GHG emissions that would contribute to global climate change.

3.3. CULTURAL/TRIBAL/HISTORIC RESOURCES

This section describes the analysis methods, affected environment, and impacts on cultural resources from the Project.

3.3.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on cultural resources.

3.3.2. Affected Environment

This section describes baseline conditions for cultural resources. Preliminary information reported from research and field surveys is pending.

The Project is located within the Northwestern Plains prehistoric cultural subarea. This area encompasses 300,000 square miles and reaches from Canada to the central plains of Colorado, Nebraska, Kansas, and Oklahoma, as well as the Rocky Mountains to the Red River (DOD and USACE 1996). Prehistoric site types common to the region included campsites, rock shelters, lithic quarries, stone rings, stone cairns, sheep traps, medicine wheels, rock art, bison processing areas, and lithic reduction areas. Typical historic cultural resources in the area include homesteads, ranches, mines, farms, and refuse dumps (Frison 1996).

This analysis considers the Project area and a 1-mile buffer surrounding the Project and includes archaeological and architectural resources and prior surveys recorded in State Historic Preservation Office (SHPO) records. Literature review for the 3-mile non-physical Area of Potential Effects (APE) is pending but will be reported in the Final EIS. For the purposes of this records review, the National Register of Historic Places (NRHP) eligibility status recorded in SHPO records will be categorized as eligible (recommended eligible by consultants and/or listed as eligible in SHPO's database), listed (formally listed on the NRHP), not eligible (recorded as such in SHPO's database and/or consultant recorded opinion), unevaluated (includes record entries of undetermined and no recommendation), and determination of eligibility (NPS has formally determined resource to be NRHP eligible, but it is not listed, and the SHPO has not officially concurred with the resource's eligibility).

3.3.2.1. Montana

A total of 144 precontact, historic, and multicomponent archaeological sites are recorded within 1 mile of Project impact areas, according to research originally conducted in 2022 (Grid United 2024) and most recently updated as of June 2025 (Grid United 2025). Of the 101 precontact archaeological sites within 1 mile of Project impact areas, 6 lithic material concentrations are eligible for inclusion on the NRHP, and 15 precontact sites are not eligible. The remaining precontact sites are unevaluated for NRHP eligibility (Grid United 2025).

Previously recorded historic archaeological sites within 1 mile of Project impact areas include multiple site types. Two railroad sites, one irrigation system, and one vehicular / foot bridge are eligible. Fourteen previously recorded historic cultural resources are not eligible for NRHP listing, and the remainder are unevaluated. One multicomponent archaeological site, which includes precontact and historic components, is not eligible for NRHP listing (Grid United 2025).

A total of 27 previously recorded cultural resources that cross Project impact areas were identified during research, including 16 precontact archaeological sites and 11 historic sites. Of the precontact sites, one site (a lithic material concentration) is eligible (determination of

eligibility), eight are not eligible, and seven are unevaluated. Of the historic sites, three are recommended as eligible, four are not eligible, and four are unevaluated (Table 3.3-1; Grid United 2025).

During the 2022 and 2023 physical APE field surveys, archaeologists identified 371 cultural resources, including 130 archaeological sites (of which 22 were previously recorded), 186 isolated finds, and 55 Tribal Cultural Specialist-identified sites. Archaeologists recommended that isolated finds consisting of single artifacts without identifiable context are not eligible, and no further action was recommended. Of the 371 total resources, 138 are considered unevaluated for listing on the NRHP, and the archaeologists recommend that 233 are not eligible for NRHP listing (Grid United 2025). Reporting of 2024 and 2025 physical APE field survey results is in progress, and additional cultural resources will likely be identified.

For the non-physical APE, preliminary research of the Montana Cultural Records Database for cultural resources within 3 miles of the Project is also in progress.

3.3.2.2. North Dakota

A desktop review found a total of 209 precontact, historic, and multicomponent archaeological sites, site leads, architectural sites, isolated finds, and tribally identified sites are recorded within 1 mile of Project impact areas, according to research conducted in 2022 and recently updated as of March 2025. Ninety resources are not eligible, and 109 are unevaluated. Nine resources are eligible: three precontact stone features, two precontact lithic scatters, one historic wrought iron cross cemetery, two churches, and one sod structure (remnants). One church is NRHP-listed.

Six previously recorded cultural resources cross Project impact areas, of which three are precontact and three are historic. Two of the precontact sites (rock art and artifact scatter) are unevaluated, and one (an isolated chipped stone find) is not eligible. Two historic sites (a military camp and a coal mine) are unevaluated, and one (a railroad segment) is not eligible (Table 3.3-2).

A physical APE field survey conducted for the Project in 2022 and 2023 identified 287 newly recorded archaeological sites. The newly recorded archaeological resources include 122 verified sites, 83 site leads (including two site lead revisits), and 82 isolated resources. Pending consultation, the preliminary field evaluation of the 287 newly recorded archaeological resources recommends 160 sites be treated with further evaluation or avoidance and the remaining 127 be considered not eligible.

The Tribal Cultural Specialists identified 340 tribally identified sites during the 2022 and 2023 field seasons, all considered unevaluated for eligibility for NRHP listing, with avoidance by a minimum of 150 feet recommended.

Additional surveys conducted by archaeologists and Tribal Cultural Specialists in 2024 and 2025 will likely identify additional resources (reporting pending).

For the non-physical APE, preliminary research of the files stored at the Archaeology and Historic Preservation section of the State Historical Society of North Dakota within 3 miles of the Project is in progress.

3.3.2.3. Indian Tribes

The DOE is conducting Section 106 consultation with federally recognized Indian tribes interested in the Project and will continue to engage with identified Indian tribes. The Proponent and federal and state agencies have engaged with Indian tribes throughout the Project planning process, and tribal input has informed how cultural resources are identified and managed. The Project would not cross any Indian tribal-owned lands. The Proponent has engaged with federally recognized Indian tribes in planning and determining how to identify and evaluate significant cultural resources that may be affected by the Project.

3.3.3. Environmental Consequences

The impacts on cultural resources are discussed in the following sections.

3.3.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on cultural resources, as the Project would not be built.

3.3.3.2. Proposed Alternative

For historic properties, impacts would be considered significant if the undertaking may alter, directly or indirectly, any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Significant impacts on historic properties include visual impacts, acoustic impacts, and physical impacts. Visual impacts could occur during construction and operations and would be direct, with potential for secondary impacts, long-term to permanent, and localized. Acoustic impacts could occur during construction and operations and would be direct, short- to medium-term, and localized. Physical impacts would primarily occur during construction and would be direct, permanent, and localized. Whether an impact would be considered significant would be evaluated on a case-by-case basis.

Visual impacts on aboveground historic properties could be managed through measures such as planting trees or moving structure locations to the base of hills or behind a vegetative screen to reduce viewshed impacts, selecting structure types that better blend with the viewshed, and/or painting permanent facilities appropriate colors to blend with the landscape. This would reduce the significance of the visual impact in such a way that it would not affect the property's NRHP eligibility. If the Proposed Alternative would be visible from historic properties or tribal resources, the impact could be direct, permanent, and localized. The importance of the visual setting in the significance of a cultural resource would be evaluated by the DOE. Acoustic impacts would be likely only during construction and would be direct, short- to medium-term, and localized, not requiring management.

Physical impacts on archaeological sites within Project impact areas (physical APE) where construction would occur would be direct, permanent, and localized. Whether an impact would alter the archaeological site so as to alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association, would require Section 106 consultation with consulting parties. Impacts would be considered relative to the NRHP criteria (NPS 1995). Impacts on archaeological sites

could result directly from earth-moving activities or indirectly from vibrations caused by nearby earth-moving and heavy equipment traffic, which could be direct, medium-term to permanent, and localized.

For any resources of cultural or religious significance to Indian tribes identified as significant, the Proponent would avoid any physical disturbance on those resources, plus a buffer up to 150 feet. Where avoidance is not feasible for tribal resources, appropriate mitigation according to Section 106 of the National Historic Preservation Act (NHPA) would be determined through tribal and agency consultation.

The Proponent plans to avoid the physical disturbance of unevaluated, eligible, or listed cultural resources to the extent feasible. To facilitate avoidance of identified cultural resources, the Proponent would prepare detailed mapping prior to construction that would identify buffer zones for sensitive features, including cultural and tribal sites. The mapping would include notations to direct personnel to the correct environmental plans or permit conditions that stipulate the activities, restrictions, and/or BMPs to be employed at each demarcated resource.

Unevaluated archaeological sites that cannot be avoided will be evaluated for NRHP eligibility or remain unevaluated but be presumed eligible for the purposes of assessing impacts from the Project. For eligible archaeological sites that cannot be avoided, site-specific measures would minimize or mitigate impacts, such as fencing and monitoring by a Secretary of the Interior-qualified archaeologist and/or Tribal Cultural Specialist during construction; installing construction mats for driving heavy equipment; implementing site-specific treatment plans; or recovering data for archaeological sites. Standard construction methods and erosion and sediment control BMPs would manage the potential for erosion that may affect cultural and tribal resources. The Proponent, the DOE, federal and state land-managing agencies, SHPOs, Indian tribes, and consulting parties would develop the treatment plans, including the type of mitigation or management measures appropriate for eligible sites, as outlined in the Programmatic Agreement.

A Post-Review Discovery Plan for Cultural Resources and Human Remains that would be reviewed and subsequently implemented during construction and operations will be developed in consultation with the DOE. The plan outlines how construction crews would be trained to respond to discoveries, including cessation of any work that may create further affect or limit opportunities to avoid further impact; who to notify of discoveries; how agencies, Indian tribes, and other parties would evaluate and manage discoveries; and how Native American Graves Protection and Repatriation Act responsibilities of federal agencies would be addressed, when applicable. The plan also addresses how to manage post-review discovery of any historic property that may be affected by the Proposed Alternative and unanticipated impacts on historic properties.

Through avoidance; implementation of the Programmatic Agreement, BMPs, and mitigation measures; and implementation of the Post-Review Discovery Plan for Cultural Resources and Human Remains, no significant permanent impacts on cultural resources are anticipated from the Proposed Alternative.

3.4. PUBLIC HEALTH AND SAFETY

This section describes the analysis methods, affected environment, and impacts on public health and safety from the Project.

3.4.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on public health and safety.

3.4.2. Affected Environment

This section describes baseline conditions for public health and safety. The Project spans across nine counties (mostly rural areas), crosses no major metro areas (populations greater than 50,000), and crosses no minor metro areas (populations between 5,000 and 50,000). Urban areas pose the highest risk for health and safety due to increased potential for equipment contact with pedestrians if best practices are not upheld.

3.4.2.1. Electromagnetic Fields

EMFs are a byproduct of electrical transmission and present within and around the transmission line ROW. A 200-foot ROW for the DC transmission line and a 320-foot ROW for the AC transmission line have been proposed, which would ensure safe operational clearance. Within this ROW, the affected environment primarily includes areas immediately adjacent to transmission lines where EMF intensity is highest, gradually diminishing with distance. Although scientific studies have not conclusively linked EMF exposure at typical transmission line levels to adverse health impacts, the ROW serves as a precautionary measure to limit prolonged public exposure, protect human health, and reduce interactions with sensitive land uses such as residences, schools, and healthcare facilities.

Implantable Medical Devices

Impacts on implantable medical devices would be a result of EMF activity; therefore, impacts were analyzed using the same area discussed above.

Radio and Television Interference

The Institute of Electrical and Electronics Engineers (IEEE) guidelines specify that the radio interference at 50 feet from the outermost conductor should not exceed 56 decibel-microvolts per meter and should be below 42 decibel-microvolts per meter at 100 feet, using an American National Standards Institute (ANSI) quasi-peak detector. Compliance with these standards supports that radio interference remains within tolerable levels. The resource report (Grid United 2024d) also presents radio interference levels based on conductor type and location within the ROW, providing benchmarks for acceptable interference in both typical weather conditions and in specific areas where signal strength is low.

3.4.2.2. Stray Voltage

Stray voltage due to unintended electrical potential differences that occur between conductive surfaces could have an impact on humans, livestock, and sensitive equipment. For humans, it may cause perceptible electric shocks upon contact with grounded or metallic objects. Sensitive equipment and automated systems could experience erratic operation, malfunctions, or data corruption due to these unintended voltages. In agricultural and industrial settings, persistent stray voltage can compromise safety, animal welfare, and operational reliability.

3.4.2.3. Public Services

Generally, the Project crosses rural terrain with relatively minimal utilities within the ROW (Grid United 2024c). The Project crosses approximately 50 utilities and other infrastructure, including existing transmission lines, gas transmission pipelines, hazardous liquid pipelines, railroads, and hydrocarbon liquid pipelines (Grid United 2024d).

Airspace

There are no major or regional airports within 1 mile of the Project and proposed HVDC Transmission Line. One private airstrip, located approximately 4 miles north of Baker, Montana, would be within 1 mile of the Project (Grid United 2024c).

Traffic

Some portions of the proposed transmission route cross major public roadways, including interstate highways and urban areas. Construction activities can pose a threat to human health when they cross vehicle traffic. Navigation of construction equipment on roads, road closures, traffic pattern adjustments, and land disturbances near road ROWs can disrupt the typical flow of traffic and could increase the risk of vehicle accidents. Transportation, including roads, rail, and airports, is discussed in Section 3.10, Socioeconomics.

Utilities

The Project crosses existing linear utilities, including fiber optics, crude oil pipelines, natural gas pipelines, other petroleum pipelines, electric power transmission lines, and rural water lines.

When AC transmission lines are near conductive infrastructure(e.g., underground pipelines, railways, or nearby power lines), they can induce electrical currents in those structures. The magnetic field generated by AC flow in the transmission lines creates an electromotive force in nearby conductive materials, even if they are not physically connected to the line. However, HVDC lines generally do not cause such induction, except briefly during current fluctuations; therefore, induced currents primarily apply to EHV AC lines.

The Proponent identified and documented all instances where the proposed transmission line crosses existing infrastructure, which includes 31 existing transmission lines, 10 gas transmission lines, 7 hazardous liquid pipelines, and 2 railroads (Grid United 2024d). While HVDC crossings were mapped, they are not considered a risk in terms of current induction. In addition to induced currents, direct conductive interference can happen during fault conditions in AC lines, especially near pipelines with damaged coatings. In such cases, AC power could enter the pipeline, potentially creating hazardous voltage levels. This can lead to shock risks for individuals coming into contact with exposed conductive parts. Similarly, railways can experience false signaling from AC interference, which poses concerns for train operations and public safety.

Despite these risks, safe colocation of transmission lines with pipelines and railways is achievable through planning and mitigation, which the Proponent has done.

3.4.2.4. Corona Effect

Baseline conditions for air quality and noise in the Project area are discussed in depth in Sections 3.2, Air Quality, and 3.12, Noise, respectively.

3.4.2.5. Other Resources Considered

Erionite Features

The proposed line crosses areas within erionite test radii and known erionite regions in Slope and Hettinger counties, North Dakota, where gravel mining is regulated. Section 3.7.2.5, Geologic Hazards, provides details on the affected environment for erionite features along the proposed line.

Agricultural Operations

The Project crosses lands used for ranching and farming, including livestock grazing and irrigation areas, and would cross approximately 2,958.2 acres total of agricultural land, including 548.3 acres in Montana and 2,409.9 acres in North Dakota (Grid United 2024c).

Floodplains

The Project crosses multiple 100-year floodplains in Montana and North Dakota (Table 3.6-3). Section 3.6.2.2, Floodplains, provides details on the floodplains crossed.

Extreme Weather Interactions

The entire scope of the Project may be affected by severe weather events. Transmission lines are vulnerable to a range of hazards, many of which can lead to significant consequences for both the infrastructure and the reliable delivery of electricity. Some of the primary hazards and their impacts are as follows:

- Electrical faults: Extreme weather events are a major cause of electrical faults in transmission lines. These faults can lead to significant operational disruptions and typically manifest as equipment damage, momentary outages, or outages, which hinder the reliable flow of electricity and require costly repairs (NERC 2023).
- High winds: High winds, especially those from tornadoes or severe storms, can place substantial mechanical stress on transmission lines and induce dynamic loads that may result in conductor blowouts or breakage, compromising the integrity of the transmission infrastructure and potentially causing widespread power outages (NERC 2023).
- Ice accumulation: During winter storms, ice accumulation on transmission lines can significantly increase their weight, leading to sagging, which puts additional strain on the transmission infrastructure, heightening the risk of structural failure and long-term power outages (NERC 2023). This issue is particularly pronounced in regions prone to severe winter weather (e.g., Montana and North Dakota).
- Heavy precipitation: Excessive rainfall or snowmelt can lead to compromised insulation properties of transmission line components, resulting in electrical faults and short circuits. These conditions, highlighted in various transmission event reports from 2017 to 2022, can damage components and disrupt the stable delivery of electricity (NERC 2023).
- Galloping: Galloping occurs when a combination of ice accumulation and steady winds induces excessive swaying of transmission wires. This motion can decrease the electrical clearance between wires, potentially resulting in flashovers, which pose fire hazards and create significant safety risks to both the public and maintenance personnel (NERC 2023).

3.4.3. Environmental Consequences

The impacts on public health and safety are discussed in the following sections.

3.4.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on public health and safety, as the Project would not be built.

3.4.3.2. Proposed Alternative

The Proposed Alternative would result in both temporary and permanent impacts on public health and safety within the analysis area. Discussion of these impacts is grouped by the safety concerns described in Section 3.4.2, [Public Health and Safety] Affected Environment. The Proponent would implement mitigation measures as relevant to reduce impacts.

The majority of the health and safety impacts resulting from the Proposed Alternative would be associated with construction and direct and secondary, short- to medium-term, and localized.

Electromagnetic Fields

The modeling results are compliant with the established guidelines for electric fields, including the International Commission on Non-Ionizing Radiation Protection, International Committee for Electromagnetic Safety, IEEE, Alstom, and MTDEQ safety standards (Grid United 2024d). The Project has been designed to meet the specific EMF limits for public safety and occupational exposure. The design also adheres to regulations regarding the electric field at the edges of the transmission line ROW, particularly in residential or subdivided areas.

For AC transmission lines, the IEEE C95.6-2002 standard sets a public exposure limit for electric fields at 10 kV/meter within the ROW during normal operating conditions. At the boundary of the ROW, the allowable limit is reduced to 5 kV/meter; however, these guidelines do not apply to HVDC systems. For HVDC lines, recommendations from the Electric Power Research Institute and Alstom indicate that electric field strengths should generally remain below 25 kV/meter within the ROW and under 10 kV/meter at its edge during typical fair-weather conditions, with allowances up to 45 kV/meter in severe weather. Such field-strength criteria are commonly observed in HVDC transmission systems worldwide.

While there are no specific standards for magnetic fields at the ROW's edge, they were found to be less or similar in magnitude to Earth's natural magnetic field (approximately 504 milligauss [mG]), posing minimal risk based on current research.

The EMF from the Project would be strongest directly beneath the transmission line and would decrease as the distance from the line increases toward the ROW's edge. Table 3.4-1 summarizes the calculated EMF strength in and at the ROW's edge for the conductors selected for the HVDC, Oliver, Morton, and Rosebud Transmission Lines.

Typical EMF levels associated with common household electrical appliances and electronic devices are summarized in Table 3.4-2. The electric field strength from most everyday items is approximately 0.2 kV/meter, while the magnetic field levels from most everyday items typically range from 0.1 to 500 mG. The electric fields at the proposed ROW edges range from 0.1 kV/meter to 7.8 kV/meter. The magnetic fields at the proposed ROW edges (ranging from 23.3 to 503.0 mG) are expected to be approximately within the range of those generated by these items (Table 3.4-2). The conductors selected for the transmission routes support compliance with safety limits for EMFs and minimize potential risks to the public and personnel. No significant EMF impacts are expected from construction or operations of the Proposed Alternative.

With the selection of appropriate conductors across various routes, impacts due to radio interference would be direct and secondary, permanent, and localized.

Implantable Medical Devices

EMFs generated by high-voltage transmission lines can raise potential concerns for individuals with implantable medical devices (e.g., pacemakers and implantable cardioverter defibrillators). While these devices are generally designed to comply with electromagnetic compatibility standards (e.g., ISO 14117, IEC 60601-1-2), they may still be susceptible to strong EMFs. According to a report by the Electric Power Research Institute (EPRI 2008), implantable medical devices are more sensitive to electric fields than to magnetic fields, with some studies identifying temporary device interference at electric field strengths between 1.2 and 1.7 kV/meter (Toivonen et al. 1991). Additionally, device manufacturer guidance (e.g., Medtronic, Boston Scientific) suggests that magnetic field exposures below 1,000 mG are unlikely to cause functional issues. Within the typical 200-foot ROW for the proposed transmission line, consistent magnetic field exposures (ranges between 23 and 503 mG) at the ROW's edge are expected to be below established thresholds for interference. However, electric field strengths that vary in the range of 0.1 to 7.8 kV/meter at the ROW's edge may pose functional issues based on Electric Power Research Institute study (EPRI 2008). Such impacts are typically temporary and resolve immediately upon removal from the source.

Radio and Television Interference

The AM radio interference from the 3-2156 Bluebird conductor is well above the maximum recommended level of 42 decibels (dB) per meter recommendation at 100 feet from the outermost conductor.

Several strategies that can be implemented to mitigate radio interference include:

- Increasing transmitter power to overcome interference.
- Relocating the transmission line or increasing the distance between the line and affected properties.
- Using specialized antennas for affected receivers, raising them above the interference zone.
- Adjusting span lengths in areas of concern to prevent reradiation.
- Working with converter equipment manufacturers to install filters to reduce interference from electronic switching.

In cases where interference with non-directional navigation beacons or AM radio reception occurs, mitigation could involve adjusting the line design, enhancing transmitter power, or implementing filters at the converter stations.

With these mitigation measures, impacts due to radio interference would be direct and secondary, permanent, and localized.

Stray Voltage

The Proponent would follow industry standards to ensure safe and reliable construction and operations of the Proposed Alternative. The design, operations, and maintenance would comply with regulations from the Federal Energy Regulatory Commission, NERC, WECC, Midwest Reliability Organization, MISO, SPP, MFSA, North Dakota Public Service Commission, IEEE 80, IEEE 142, NESC, and Occupational Safety and Health Administration to protect against stray voltage hazards.

To minimize the impacts of electric fields, metal buildings, fences, or other large permanent conductive objects near the AC portions of the proposed transmission line should be grounded to prevent excessive discharge. Vehicles parked under or near transmission lines are typically grounded through their tires. However, in cases where vehicles with old tires or those parked on insulating surfaces such as dry rocks or plastic may not naturally discharge to the ground, members of the public should be made aware of the potential for static buildup. For Project-related vehicles operating within or near the ROW, the Proponent would ensure all vehicles are properly grounded, such as by using grounding straps, particularly when operating in areas where natural grounding may be impaired.

Public Services

Public services within the proposed ROW are primarily located within municipal boundaries, with some utilities (water, fiber optic, transmission, and distribution lines) located in rural areas. Urban areas host medical centers, hospitals, fire stations, police stations, and schools. The Proposed Alternative is not expected to have any direct or secondary impact on these public services. Signage, stakeholder communication, and construction planning would prevent public contact with the Proposed Alternative. The Proponent would develop a stakeholder engagement standard to detail communication schedules and procedures in case of impacts on services.

Impacts on public services, particularly emergency services, could arise from construction activities that may temporarily disrupt roadways and access. However, construction would be staged to ensure that public roads are not closed for extended periods. In the event emergency services are needed, construction would be paused, and equipment would be relocated to allow emergency vehicles to reach residences. During operations, there would be no further disruption to emergency services.

By following these steps, impacts on public services would be direct, short-term, and localized.

Airspace

The Proposed Alternative would be constructed outside of the regulated airspace of all private and public airports (14 CFR Part 77), as the structures would all be shorter than 200 feet in height (14 CFR § 77.9) and not within the runway's airspace buffer (14 CFR § 77.19). There would be no Project personnel or equipment within the ground-level runway safety area (i.e., the buffer 500 feet around the runway centerline and 1,000 feet beyond each end) at any time during construction or operations. All proposed transmission line structures are sufficiently distant from private and public airports.

Traffic

During construction, traffic disturbances could arise due to road closures, equipment navigation, and temporary modifications to traffic patterns. To minimize these impacts and enhance safety, the Proponent has developed a detailed Traffic and Transportation Management Plan. Section 3.10, Socioeconomics, provides details on traffic-related mitigation measures and the impact analysis. By implementing these measures, the Proposed Alternative would improve the safety of construction personnel and the public while minimizing disruptions to transportation networks.

With these mitigation measures, impacts on traffic disturbances would be direct, short-term, and localized.

Utilities

During construction, the Proponent would employ public or private utility location services prior to any subsurface activity to ensure any underground lines are marked. With accurate utility location procedures in place, there are no anticipated impacts on on-site personnel and utility services (e.g., water, cable, transmission) in nearby areas.

Planned outages may be required in the case of necessary construction activities crossing underground lines, and the Proponent would notify the appropriate local authorities and modify construction schedules accordingly to prevent or minimize service interruptions.

With these mitigation measures, impacts on utilities would be direct and secondary, permanent, and localized.

Corona Effect

The Proponent evaluated the conductor surface gradient along the proposed line to determine the likelihood of corona onset. The corona analysis found that the maximum surface gradient of all conductors remained below 95 percent of the corona onset threshold, indicating that corona discharges are not expected to result in ionization.

With the selection of appropriate conductors, impacts due to corona would be direct and secondary, permanent, and localized.

Other Resources Considered

Erionite Features

The Proponent does not anticipate any ground-disturbing activities in locations that cross erionite testing radii; therefore, erionite testing is not planned. If imported gravel is required for construction, the Proponent would require that suppliers source the material from outside of the North Dakota Department of Environmental Quality (NDDEQ) exclusion zones. No erionite gravel sources are permitted on USDA Forest Service lands. If gravel or ground-disturbing work in these exclusion zones is required, the Proponent would adhere to the sampling procedures dictated in the North Dakota Department of Transportation (NDDOT) Standard Specifications (NDDOT 2025). Dust suppression and proper personal protective equipment would prevent inhalation of erionite by on-site personnel. The public having access to an active work area or being immediately downwind of work within erionite testing radii could increase the potential for exposure to erionite during construction activities.

With these mitigation measures, impacts due to erionite would be direct and secondary, short-term, and localized.

Agricultural Operations

The Proposed Alternative would temporarily affect 2,958.2 acres of grasslands, shrublands, and agricultural lands, including 1,548.3 acres in Montana and 2,409.9 acres in North Dakota (Grid United 2024c). It would permanently affect 405.1 acres of agricultural land, including 170.1 acres in Montana and 235.0 acres in North Dakota (Grid United 2024c). Since irrigation systems are grounded and electrically neutral when in use, there is no increased hazard for irrigating under transmission lines. The primary safety concern is the loading and unloading of

irrigation pipes in proximity to the proposed transmission lines. The increased moisture and potential for contact with transmission line structures (not the conductors themselves) in these circumstances can generate minor or major shocks; however, the proposed transmission line structures are designed to prevent unexpected contact with livestock or agricultural equipment, so risk of electrical shock or equipment damage is minimal, even in agricultural areas. Refraining from loading/unloading and conducting repairs within the ROW would prevent this hazard. Under normal conditions, the lowest point of conductor sag (at mid-span and maximum design temperature) typically maintains a minimum clearance of 33 to 40 feet above ground level based on NESC requirements. Modern large agricultural machinery, such as combine harvesters, tractors with raised implements, and grain augers, can reach heights of 13 to 20 feet when fully extended. A sag clearance of 33 to 40 feet offers a safe vertical buffer of at least 13 feet, which is generally sufficient for safe operation beneath the lines, even in worst-case sag scenarios.

With these mitigation measures, temporary impacts on irrigation would be direct, short-term, and localized. Permanent impacts on irrigation would be direct, permanent, and localized.

Floodplains

The Project would have a total of 15.0 acres of direct, permanent, and localized impacts on FEMA-mapped 100-year floodplains and 16.9 acres of direct, medium- to long-term temporary, and localized impacts on 100-year floodplains (Table 3.6-3). Regulations in Montana and North Dakota (§ 76-5-402, MCA; NDCC § 61-16.2) mandate obtaining necessary permits (e.g., floodplain development permit) for any development within floodplains. Construction and operations in floodplains would follow applicable local floodplain regulations, which would ensure there are no impacts on public health and safety. Where work or structures occur in floodplains, designed stormwater controls (Grid United 2024e) would minimize impacts on property outside of the ROW.

With adherence to the CMRP (Appendix E) and local floodplain regulations, impacts on floodplains would be direct, permanent, and localized.

Extreme Weather Interactions

- Each county that includes a portion of the Project was analyzed using the FEMA National Risk Index. The FEMA National Risk Index database indicates the Project scope falls under the Relatively Low or Very Low risk designation for cumulative natural hazards (FEMA 2025). The risk designation is determined by the percentile average risk across all U.S. counties. Natural hazards affecting the Project area at significant designations (Moderate, Relatively High, or Very High Risk) are as follows, with accompanying range of Risk Index Scores out of 100:
- Cold wave: 60.6 to 95.2
- Hail: 87.2 to 92.0
- Heat wave: 72.0
- Ice storm: 67.2 to 97.5
- Riverine flooding: 86.8
- High winds: 73.6 to 81.2
- Winter weather: 63.6 to 99.0

These hazards underscore the critical need for enhanced design, operational measures, and proactive planning to mitigate risks and ensure the resilience of transmission infrastructure against extreme weather and other environmental factors. The Proponent would implement industry-recognized standards, including NESC and applicable ANSI guidelines, during construction and operations. These standards support structural integrity, operational reliability, and public safety, even under adverse environmental conditions, and the Proposed Alternative is designed to comply with such standards. The Proposed Alternative would be designed for a maximum design wind speed of 117 miles per hour, which is based on an F1 tornado according to the guidance outlined in the American Society of Civil Engineers Guidelines for Electrical Transmission Line Structural Loading, Manual of Practice 74, Fourth Edition. This wind speed exceeds the NESC Rule 250C regulated code wind speed of 96 miles per hour (Grid United 2024e).

Furthermore, the Proponent would implement comprehensive mitigation strategies, including emergency response protocols, contingency planning, and adaptive maintenance practices, to minimize impacts associated with extreme events. These measures would help ensure that any adverse impacts remain localized, manageable, and within acceptable risk thresholds, consistent with regulatory expectations and industry BMPs.

With these mitigation measures, impacts on operations and resiliency of the transmission system would be direct, short-term, and localized.

3.5. GROUNDWATER HYDROLOGY

This section describes the analysis methods, affected environment, and impacts on groundwater hydrology from the Project.

3.5.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on groundwater hydrology.

3.5.2. Affected Environment

This section describes baseline conditions for groundwater hydrology, including aquifers and wells.

3.5.2.1. Principal Aquifers

The Project is located within Segment 8 of the U.S. Geological Survey (USGS) Ground Water Atlas of the United States (Whitehead 1996). Segment 8 covers portions of Montana, North Dakota, South Dakota, and Wyoming and is part of the Northern Great Plains Regional Aquifer System. This system includes multiple aquifers, ranging from shallow, unconsolidated alluvium and glacial till aquifers (Quaternary age) with high yields (up to 3,500 gallons per minute) to deeper, consolidated bedrock aquifers with lower yields (up to 100 gallons per minute) (Figure 3.5-1). Groundwater is primarily recharged by precipitation (rain and snow), and flow generally moves southwest to northeast (USGS 2021).

3.5.2.2. Sole Source Aquifers

Sole source aquifers are aquifers that supply at least 50 percent of drinking water in their service area with no alternative water sources if the aquifer is contaminated (USEPA 2024). The Project area would not cross any sole source aquifers; therefore, there are no special regulatory considerations related to sole source aquifers for the Project.

3.5.2.3. Public Wells and Wellhead Protection Areas

Amendments to the Safe Drinking Water Act established the Wellhead Protection Program in 1986. The program safeguards underground drinking water sources by designating and managing Wellhead Protection Areas (WHPAs). A WHPA surrounds a well or wellfield and is defined by the potential movement of contaminants toward the well. The size of a WHPA depends on the well's capacity and the local geology and hydraulics. The MTDEQ and NDDEQ manage Source Water Protection Programs to prevent contamination of public water supplies (MTDEQ 2024; NDDEQ 2012, 2024). See Section 3.6.2.5, Public Surface Water Sources and Source Water Protection Areas, for additional details.

No public water wells were found within 150 feet of Project impact areas. However, the HVDC Transmission Line would cross a source water protection area near Plevna, Montana, which is associated with three public wells (MTDEQ 2003, Undated). The nearest public well is located approximately 0.5 mile north of the Project area. The Project would not affect this source water protection area. The powerlines are constructed overhead, and the support structure foundations (approximately 60 feet deep; Appendix D) are not anticipated to affect groundwater. Therefore, they would not pose a threat to the source water protection area.

3.5.2.4. Water Supply Wells and Springs

The Proponent identified 58 private wells within 150 feet of Project impact areas (Table 3.5-1) by reviewing publicly available data from the North Dakota Department of Water Resources and the Montana Bureau of Mines and Geology (MBMG) (Grid United 2024; NDDWR 2024). One spring and six groundwater seeps were identified within a 300-foot-wide transmission line survey corridor, 50-foot-wide access road corridors (100 feet on USDA Forest Service lands), pulling and tensioning sites, laydown yards, facility footprints, and additional construction areas based on field surveys (WEST 2025). The spring is located in Slope County, North Dakota, approximately 150 feet from the Project centerline and outside of impact areas and the ROW. The six groundwater seeps are located in both North Dakota and Montana:

- One seep within Project impact areas along a temporary access road in Morton County, North Dakota;
- Two seeps within the Project ROW but outside of the impact area in Fallon and Custer counties, Montana;
- One seep within the survey area but outside the impact areas or ROW in Hettinger County, North Dakota;
- One seep within the survey area but outside the impact areas or ROW in Oliver County, North Dakota; and
- One additional seep within the survey area but outside the impact areas or ROW in Custer County, Montana.

3.5.2.5. Potential Sources of Groundwater Contamination

The Proponent reviewed federal and state databases to identify contaminated sites that could affect groundwater in Project impact areas. A Phase I Environmental Site Assessment was conducted on one parcel in Rosebud County, Montana, and two parcels in Morton County, North Dakota. No contaminants were identified. The Proponent also conducted a Phase I Environmental Site Assessment at the end of the Morton Transmission Line for Morton County Switchyard siting.

The following U.S. Environmental Protection Agency (USEPA) databases were reviewed: Superfund Enterprise Management Systems; Toxic Release Inventory; Resource Conservation and Recovery Act; Assessment, Cleanup, and Redevelopment Exchanged System; and Toxic Substances Control Act (Grid United 2024). The Proponent identified ten contaminated sites within 1 mile of Project impact areas (Table 3.5-2). The closest site would be approximately 0.1 mile from the Rosebud Transmission Line near Colstrip, Montana.

Additionally, data from the USEPA's underground storage tank (UST) finder identified 16 USTs within 0.5 mile of Project impact areas (USEPA 2025). However, 15 of these USTs are located hydraulically downgradient, and none are within 1,000 feet of Project impact areas.

3.5.3. Environmental Consequences

The impacts on groundwater hydrology are discussed in the following sections.

3.5.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on groundwater hydrology, as the Project would not be built.

3.5.3.2. Proposed Alternative

The following activities could potentially affect pre-existing groundwater quantity and quality:

- Vegetation clearing for overland travel and ROW maintenance;
- Ground disturbance from construction (road construction, surface grading, excavation, and ground rod or counterpoise installation);
- Leaks or spills of petroleum-based fluids from equipment operation;
- Groundwater use; and
- Groundwater dewatering where excavation of transmission structure foundations and permanent facilities may be necessary.

Clearing of Vegetation

The Proponent would manage vegetation clearing and maintenance within the ROW following the NERC FAC-003-4 guidelines. While vegetation management could affect surface water flow and groundwater infiltration, direct and secondary impacts would be minimal, short-term, and localized, except in areas where permanent facilities like converter stations, switchyards, access roads, or transmission structures would be built. While these direct impacts would be permanent, they are unlikely to cause a noticeable change in groundwater conditions.

Disturbance of Ground from Construction

Construction activities such as access road creation, surface grading, and excavation for foundation installation could temporarily affect groundwater by altering stormwater flow and precipitation infiltration, resulting in direct and secondary, medium- to long-term, and localized impacts. However, these temporary impacts would be minor. The Proponent may decompact soils in actively cultivated areas and where requested by landowners and land-managing agencies (BLM may require decompaction on BLM lands as part of its approval). The Proponent would consult with the Natural Resource Conservation Service (NRCS) for proper decompaction techniques, where applicable.

Additionally, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with MTDEQ and NDDEQ regulations. Adherence to construction stormwater permits and implementing erosion and sediment control BMPs would minimize impacts on shallow groundwater aquifers from runoff and turbidity. The localized disturbances and mitigation efforts would further reduce impacts on groundwater during construction. Any impacts from construction would be direct and secondary, medium- to long-term, and localized.

Leaking or Spilling of Petroleum-Based Fluids

It is unlikely that construction or operations would be affected by USTs or affect soil and groundwater quality in Project impact areas. None of the 16 identified USTs are located within 1,000 feet of Project impact areas. Additionally, 15 of the USTs are located downgradient of Project impact areas. If contaminated materials (soils and/or groundwater) are encountered during construction, the Proponent would follow the procedures outlined in its Plan for the Unanticipated Discovery of Contaminated Materials (Appendix E). The Proponent would manage all contaminated soil and groundwater in accordance with the applicable federal, state, and local laws and regulations.

Unintended leaks or spills of petroleum-based fluids during construction could directly affect groundwater quality to varying degrees. To prevent and respond to such incidents, the Project's

Spill Prevention and Response Plan (SPRP) outlines methods for controlling and managing hazardous substance spills (Appendix E). This plan, alongside the Project's Hazardous Materials and Waste Management Plan (Appendix E), details proper storage, handling, and disposal of hazardous materials. The objective of this plan is to minimize the potential for a spill of fuel or other hazardous materials and contain and mitigate any hazardous materials spill.

Hazardous materials would not be stored in surface water conveyances or within a 100-year floodplain. The Proponent would prohibit storage of hazardous materials within 100 feet of surface waters and the use and storage of hazardous materials, chemicals, fuels, lubricating oils, and other petroleum products within 200 feet of active private water wells and identified public or municipal water wells. The Proponent would also avoid overnight parking, servicing, and/or refueling of equipment and vehicles within 100 feet of surface waters.

Pollution prevention measures in Appendix E include protecting chemicals, liquids, and materials with cover and containment; using spill prevention and control measures during vehicle maintenance and fueling; maintaining spill kits and cleaning up spills immediately; designating areas for equipment wash and clean-out activities away from water sources; applying fertilizers and herbicides according to manufacturer instructions; and preventing concrete product discharges.

These measures would prevent groundwater or stormwater contamination from construction activities. Implementation of these plans would avoid or mitigate direct impacts due to a petroleum or other hazardous material spill; therefore, no impacts on groundwater are anticipated.

Use of Groundwater

The acquisition of water for dust control and concrete batching during construction could affect local water use. The Proponent estimates approximately 2.4 million gallons of water would be needed for concrete batching and approximately 272,000 gallons of water per mile for access road dust control based on the anticipated construction duration. The Proponent would calculate water requirements before construction and plan to obtain water from municipal sources. If water from nearby groundwater wells is needed, it would be sourced from existing water rights holders with whom the Proponent has reached an agreement. Impacts on groundwater use would be mitigated by sourcing water using municipal water sources outside of the Project area. If existing groundwater wells are used within the Project area, they would be from existing water rights holders, and use would be within their existing individual allocation. Sourcing water from municipal sources or, if necessary, from existing water rights holders would mitigate impacts on groundwater quantity in the Project area. Any impacts from groundwater use would be direct, short-term, and localized.

No public water wells are located within 150 feet of Project impact areas, and the Project does not cross a sole source aquifer. However, it crosses a source water protection area near Plevna, Montana, requiring careful consideration of water quality impacts in the region. Source water protection areas are land areas that contribute water to the drinking water supply. In these areas, pollution from human activities or natural sources poses the greatest threat to source water quality.

The SPRP (Appendix E) discusses methods to prevent, control, and respond to spills that could affect groundwater or source water protection areas. The plan includes guidelines for the

proper storage and handling of hazardous substances. Implementation of the SPRP would avoid or mitigate direct impacts due to spill of fuels or hazardous materials; therefore, no impacts on groundwater are anticipated.

There are 58 private wells identified within 150 feet of Project impact areas. Construction could damage these wells, leading to temporary water availability issues for local users. The Proponent would consult with landowners to confirm the presence and location of these wells before construction. To minimize impacts, the Proponent would monitor surface disturbance near wells, maintaining a minimum 10-foot setback from each well. In the event of damage, the Proponent would provide a temporary water source, repair or replace the well, or compensate the well owner. These measures would avoid or mitigate direct impacts on existing wells. Any impacts would be direct, short-term, and localized.

Additionally, one spring and six groundwater seeps are located along the Project area. Project construction and/or operational impacts on the spring and seeps are not anticipated. The Proponent would avoid direct impacts on springs and seeps by establishing a 100-foot setback for hazardous materials storage and refueling activities, though BLM may require a larger setback distance, as needed. Erosion and sediment control measures would be implemented to minimize disturbance upslope of the spring and seeps. Implementation of erosion and sediment control measures would mitigate direct impacts on springs and seeps.

Dewatering of Groundwater

In areas with a high-water table, dewatering may be necessary during excavation, which could cause direct, temporary, and localized fluctuations in groundwater. Once dewatering is complete, groundwater would return to its pre-existing state.

Portable pumps would be used, with the number and size depending on the water volume. Before starting, the Proponent would review and approve a water discharge plan. The plan would contain erosion and sediment control measures to prevent sediment-laden water from reaching sensitive areas like wetlands. Dewatering discharge would typically be directed to well-vegetated upland areas using a geotextile filter bag. If upland areas are unsuitable, discharge would be directed to a straw bale dewatering structure for additional sediment filtration.

All dewatering activities would comply with necessary permits, including the MTDEQ General Permit for Construction Dewatering (Permit No. MTG070000; MTDEQ 2025) and NDDEQ Temporary Discharge Permit (Permit No. NDG0700000; NDDEQ 2020). Water quality standards would be maintained through required sampling. Per the General Permit NDG0700000, turbidity effluent limitations would be maintained at 100 Nephelometric Turbidity Units, and no oil and grease with a visible film would be present or in excess of 10 milligrams per liter. As such, direct and secondary impacts on groundwater due to construction dewatering would be short-term, localized, and minimal.

3.6. SURFACE WATER HYDROLOGY

This section describes the analysis methods, affected environment, and impacts on surface water hydrology from the Project.

3.6.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on surface water hydrology.

3.6.2. Affected Environment

This section describes baseline conditions for surface water hydrology. The Project crosses landscapes in Montana and North Dakota that are mostly unglaciated, semi-arid rolling plains. These areas have both intermittent (seasonally flowing) streams and perennial (flowing all year) rivers. Land cover varies from areas with little vegetation, to heavily vegetated grassland/rangeland, to sagebrush and Rocky Mountain Juniper (Woods et al. 2002). Precipitation along the Project route ranges from 15 to 17 inches per year in North Dakota and 10 to 19 inches per year in Montana (Woods et al. 2002; Bryce et al. 1996). The following sections summarize watersheds, floodplains, waterbodies, wetlands, public surface water supply sources and source water protection (SWP) areas within the Project area.

3.6.2.1. Watersheds

Watersheds are areas defined by drainage divides that channel precipitation to streams, rivers, and other waterbodies. The USGS classifies watersheds by hydrologic unit codes (HUCs) in four levels—regions, subregions, accounting units, and cataloging units—which may contain an entire or part of a watershed (Grid United 2024). Each unit is identified by a unique HUC consisting of two to eight digits based on its classification. The first level of the code (the 2-digit region) is a major geographic area or region containing several rivers or the drainage area of a major river. Subsequent levels are progressively smaller areas based on the drainage divides of smaller waterbodies.

The Project area is within the HUC 2 Missouri region (10), which drains the Missouri River basin, the Saskatchewan River Basin, and several smaller closed basins, such as ponds, that do not drain to other waterbodies. The Project area crosses HUC 4 subregions—Lower Yellowstone (1010), Powder-Tongue (1009), Missouri-Little Missouri (1011), and the Missouri-Oahe (1013)—containing Little Yellowstone River, Tongue River, Powder River, Little Missouri River, and Missouri River. The HUCs crossed by the Project area are further divided into 14 smaller HUC 8 subbasins (herein referred to as watersheds) (Figure 3.6-1). HUC 8 is the scale commonly used by permitting agencies to review landscape-level surface water impacts and was used here as the level of analysis for watershed impacts. Details on the HUC 8 watersheds crossed by the Project area are provided in Tables 3.6-1 and 3.6-2.

3.6.2.2. Floodplains

Not all areas crossed by the Project are mapped by FEMA. However, where FEMA data on 100-year floodplains were available (Grid United 2024), floodplains with temporary or permanent impacts, including permanent structures, tree clearing, construction areas, and access road impacts, were identified. These include approximately 32.6 acres of 100-year floodplains (Table 3.6-3).

In Montana, 27.6 acres of FEMA-mapped 100-year floodplains are in planned temporary or permanent impact areas (6.0 acres associated with Spring Creek, 9.7 acres associated with Rosebud Creek, 1.6 acre associated with Sprague Creek, 5.1 acres associated with Udee Creek, and 5.2 acres associated with Goodman Creek).

In North Dakota, 5.0 acres of FEMA-mapped 100-year floodplains are in planned temporary or permanent impact areas (4.0 acres of 100-year associated with Heart River, 0.7 acre associated with Antelope Creek, 0.2 acre associated with Pump Coulee, less than 0.1 acre associated with Unnamed Tributary to Otter Creek, and less than 0.1 acre associated with Cow Creek). Floodplain impacts are discussed in Section 3.6.3.2.

3.6.2.3. Waterbodies

Waterbodies in the Project area include flowing waterbodies such as streams and rivers, as well as open waterbodies such as reservoirs, lakes, ponds, and stormwater features. These were identified using the USGS National Hydrography Dataset (NHD) and field surveys (Grid United 2024; WEST 2025). The Proponent completed wetland delineations (i.e., identification, classification, and mapping of wetlands) from 2022 to 2024 and will continue fieldwork to document aquatic resources during the 2025 field season to support Project permitting.

Flowing waterbodies are characterized by their flow regime as perennial, intermittent, or ephemeral. Perennial flow regimes are characterized by year-round flow driven by rainfall, snowmelt, and groundwater. Intermittent streams do not flow the entire year and are generally seasonal, flowing in direct response to rainfall or snowmelt. Ephemeral streams typically only have water flow in short durations due to rainfall (USEPA 2024b).

An aquatic resource inventory (ARI) for the Project was conducted on a 300-foot-wide transmission line survey corridor, 50-foot-wide access road corridors (100 feet on USDA Forest Service lands), pulling and tensioning sites, laydown yards, facility footprints, and additional construction areas (WEST 2025). Waterbodies identified in the survey are presented in Table 3.6-4.[11] Waterbodies crossed by the Project on public lands are provided in Table 3.6-5; most public land crossings take place on USDA ARS lands. Based on the ARI survey, the Project areas would cross 465 waterbodies, of which 70 are perennial streams, 146 are intermittent streams, 167 are ephemeral streams, and 82 are open waterbodies (WEST 2025). Of the 465 total waterbodies surveyed, 201 waterbodies (20 perennial, 82 intermittent, 92 ephemeral, and 7 lakes/ponds) could be affected (Table 3.6-6).

Of the 201 potentially affected waterbodies, 172 are in Montana (9 perennial, 73 intermittent, 84 ephemeral, and 6 lakes/ponds) and 29 are in North Dakota (11 perennial, 9 intermittent, 8 ephemeral, and 1 lake/pond). Waterbody locations within Project impact areas are shown on Figure 3.6-2.[12]

In Montana, the MTDEQ classifies surface waters according to the present and future beneficial use under ideal conditions using a letter and number to indicate water quality and temperature (Grid United 2024) (Table 3.6-7). In North Dakota, the NDDEQ classifies flowing surface waters

[11] Field surveys were conducted between 2022 and 2024; due to reroutes along the Project, some surveyed areas are no longer located along the Project route as it is proposed in this EIS (WEST 2025). Field surveys are ongoing, and the Proponent will complete final aquatic resource surveys prior to construction.

[12] Due to the scale of the maps, only NHD-mapped waterbodies are visible.

according to water quality, flow regime, and beneficial uses, and non-flowing waterbodies by their ability to sustain fishery resources (North Dakota Administrative Code [NDAC] § 33.1-16-02.1) (Table 3.6-8).

Waterbodies are also categorized based on their impairment status under the Clean Water Act (USEPA 2025). There are direct and indirect temporary or permanent impacts proposed on seven waterbodies listed as 303(d) impaired under the Clean Water Act (four in Montana, three in North Dakota) (Table 3.6-9, Table 3.6-10, and Table 3.6-11) (Grid United 2024). The NPS catalogs rivers as eligible or potentially eligible for the National Wild and Scenic Rivers System. While no rivers within the Project area are classified as Wild and Scenic, the Little Missouri River (crossed by the Project between MPs 187 and 188) is listed on the Nationwide Rivers Inventory (NRI) with Outstandingly Remarkable Values related to historic, cultural, and scenic values (Grid United 2024).

3.6.2.4. Wetlands

Wetlands[13] were identified in the Project area using the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) desktop data, Montana Wetland and Riparian Framework (MWRF), and field surveys (Grid United 2024; WEST 2025). Wetlands are classified based on the Cowardin classification system described below (Cowardin et al. 1979):

- Palustrine emergent (PEM) wetlands—characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants) and woody species less than 3 feet in height, excluding mosses and lichens;
- Palustrine scrub-shrub (PSS) wetlands—characterized by woody vegetation, excluding woody vines, approximately 3 to 20 feet in height;
- Palustrine forested (PFO) wetlands—characterized by woody vegetation, excluding woody vines, approximately 20 feet or more in height and 3 inches or larger diameter at breast height;
- Palustrine unconsolidated bottom open waters—characterized by bottom substrate particles smaller than stones (less than 10 inches) covering more than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine streams—channels containing periodically or continuously moving water (FGDC 2013).

Wetlands identified in the Project area surveyed are presented in Table 3.6-12. The Project area would cross 528 wetlands, of which 520 are PEM, 6 are PFO, and 2 are PSS (WEST 2025). The majority of wetlands within Project impact areas are PEM wetlands, with a small amount of riverine wetlands.

Project impact areas cross total of 13.3 acres of wetlands (12.9 acres PEM, less than 0.1 acre PFO, 0.3 acre PSS, and 0.1 acre riverine). This includes 6.1 acres in Montana and 7.2 acres in North Dakota. Of these, 13.0 acres are within proposed areas of ground disturbance, and 0.3 acre are within the Project-maintained ROW. Acres of wetlands that would be affected by the Project and wetlands on federal land crossed by the Project are summarized in

[13] Wetlands as defined by the USEPA (2024a) are, "…areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions…including swamps, marshes, bogs, and similar areas."

Tables 3.6-13 and 3.6-14. Wetlands within Project impact areas on public lands are provided in Table 3.6-5; most are on Montana State Trust Lands.

3.6.2.5. Public Surface Water Sources and Source Water Protection Areas

In Montana, the MTDEQ regulates public water sources in compliance with the USEPA's SWP program (MTDEQ Undated_b). Based on the Montana SWP Viewer, the Project crosses two SWP areas. SWP area MT0003470 is located approximately 0.3 mile northeast of the Project area near MP 0.0 (in Colstrip, Montana). This SWP area is associated with a transient, non-community public water supply well located approximately 0.9 mile southeast of the Project area near Montana Highway 39 (MT 39) (MTDEQ Undated_a, 2004). The Project does not cross any surface waters within or near the SWP area. SWP area MT0000307 is located between MPs 138 and 140 and is associated with three public (community water supply) wells located within the Town of Plevna on the north and south sides of Montana Highway 12 (MT 12). The nearest well is approximately 0.5 mile north of the Project area (MTDEQ Undated_a, 2003). Within the SWP area, the Project crosses Sandstone Creek.

Two surface water intakes were identified in the vicinity of the Project using the Montana SWP Viewer (MTDEQ Undated_a). One intake (MT000180) is located 0.5 mile west of the Rosebud Transmission Line terminus and is classified by the MTDEQ as a small site (serving approximately 2,350 citizens year-round site). A second surface water intake (MT004033) is located 0.8 mile west from the Rosebud Transmission Line terminus (MTDEQ Undated_b) and is classified by the MTDEQ as a very small site (serving approximately 25 people for part of the year).

In North Dakota, the North Dakota Department of Water Resource's Sovereign Lands, Water Appropriation Programs, and NDDEQ's SWP Program regulates water intakes and the surrounding water protection areas (NDDWR 2021a, 2021b; NDDEQ 2025). USEPA Region 8 regulates tribal water intakes. Based on NDDEQ's SWP mapping tool, there are no SWP areas or surface water intakes within the Project area (NDDEQ 2023). SWP areas are shown on Figure 3.6-2.

3.6.3. Environmental Consequences

The impacts on surface water hydrology are discussed in the following sections.

3.6.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on surface water hydrology, as the Project would not be built.

3.6.3.2. Proposed Alternative

Construction and operations of the Proposed Alternative could have direct impacts on surface water hydrology resulting from water withdrawals, stream crossings and ground disturbance (leading to increased turbidity), or the construction of permanent structures such as transmission structures or the associated facilities. In addition, fuel storage, equipment refueling, and equipment maintenance could lead to potential spills of hazardous materials such as fuel or lubricants. As detailed in the Hazardous Materials and Waste Management Plan, hazardous materials would not be stored in surface water conveyances or 100-year floodplains, and the Proponent would also prohibit use and storage of these materials within 100 feet of surface waters (Appendix E).

The Project could result in secondary impacts on surface water as a result of changes to watershed characteristics such as increased impervious surface from facilities, soil compaction, and vegetation clearing, which could alter the timing and magnitude of stream flow in the watersheds crossed by the Project. These secondary impacts could be either permanent or temporary. Temporary secondary impacts may result from ground-disturbing activities in construction areas (e.g., structure pads, wire pulling and tensioning areas, temporary access roads, and overland travel paths). Permanent secondary impacts may result from new facility structure footprints, permanent access roads, and vegetation clearing within the ROW.

The Proponent has designed the route so that the transmission line infrastructure spans or avoids direct impacts on surface waters and floodplains and uses existing access roads where possible. Water withdrawals required for construction activities would be from municipal sources or from surface water supplied by water rights holders, resulting in no net impact on water use.

The proposed transmission line structures would be set back from waterbodies by a minimum of 10 feet from the ordinary high water mark[14]. The Proponent would design new access roads to minimize impacts on waterbodies. Culverts and bridges would be installed to maintain flows in accordance with federal, state, and local permitting requirements and federal and state land-managing agency specifications. Trees and tall vegetation would be cleared from the ROW with mechanical equipment such as mowers, sky trips, process harvesters, feller bunchers, and brush cutters, as well as hand tools where mechanized equipment is not feasible. Where vegetation clearing is required, it would be cut at or slightly above ground level, allowing root systems to remain in place for soil stability. The Proponent would not dispose of chips, mulch, or mechanically cut woody debris in waterbodies or wetlands. The Proponent has prepared an SPRP that describes the methods used to prevent, control, and respond to spills of hazardous substances (Appendix E). BMPs, construction methods, and mitigation measures are described in more detail in the CMRP (Appendix E).

Watersheds

Changes in land cover can result in changes to the overall watersheds. The degree of impact depends on the scale of alteration compared to watershed size. The greater the percent change in land cover, the greater the potential impact on hydrology. The threshold of watershed alteration that would have a detectable effect on hydrology would vary based on watershed sensitivity, vegetative cover type, and type of disturbance or alteration.

Table 3.6-2 provides a summary of potentially affected areas for watersheds crossed by the Project. Project impacts (such as vegetation clearing, grading, and construction of associated Project facilities and access roads) were evaluated as a percentage of the overall HUC 8 watersheds within Project impact areas that would be subject to land cover change. Total estimated tree clearing within the Project area would be approximately 478.6 acres. The combined tree clearing in all HUCs crossed would be less than 0.1 percent (Table 3.6-2). The combined acreage of impact areas within all HUCs crossed would be 0.4 percent (Table 3.6-2). A review of the impact of land clearing on hydrology in the United States suggests that the overall impact on watersheds from land use changes by the Project would likely not be detectable

[14] A line on the shore/bank of a waterbody that indicates the average high water level

unless the cleared area is greater than 15 to 20 percent of the watershed area, depending on the hydrologic region (Stednick 1996). Impacts on the HUC 8 watersheds from tree clearing and ground disturbance would result in direct and secondary impacts on the watersheds crossed by the Project that would range from temporary (short-, medium, or long-term) to permanent (Table 3.6-2). Impacts are anticipated to be localized and not at a detectable scale within the watershed.

Floodplains

The Proponent has designed the Project to span or avoid floodplains where possible. Floodplain impacts would be limited to vegetation clearing and compaction within temporary construction areas, permanent and temporary access roads and overland travel, and permanent structure placement. The Project would have a total of 19.2 acres of direct, permanent, localized impacts on FEMA-mapped 100-year floodplains and 13.4 acres of direct, short- to medium-term temporary, localized impacts on 100-year floodplains (Table 3.6-3).

In Montana, there would be 18.4 acres of permanent impacts from structure footprints and access roads and 9.2 acres of direct, short- to medium-term temporary, localized impacts associated with structure pads, guard structures, and overland travel (Table 3.6-3).

In North Dakota, there would be 0.8 acres of permanent, direct, localized impacts on floodplains from tree clearing and three structures placed within the Heart River 100-year floodplain (Table 3.6-3). An additional 4.2 acres of direct, short- to medium-term temporary, localized impacts on floodplains would be associated with structure pads, guard structures, and overland travel (Table 3.6-3).

Based on 100-year FEMA floodplains, the Proponent anticipates floodplain permits would be necessary in Morton County, North Dakota, and Rosebud County, Montana, and would acquire the permits according to local floodplain regulations. Where impacts occur, Project infrastructure and construction BMPs would be designed to adhere to local ordinances and permitting requirements to minimize impacts and reviewed by appropriate county floodplain administrator(s). By following local floodplain ordinances and implementing required BMPs, structures installed in floodplains would not substantially affect surface water hydrology.

Waterbodies

During construction and operations of the transmission line, waterbodies would be spanned to avoid direct impacts. Medium- to long-term temporary impacts on waterbodies would result from required stream crossings during construction, including access roads. Secondary impacts could result from ground disturbance, vegetation clearing, and spills. Tree removal near waterbodies would reduce riparian buffer functions. This includes stream bank stabilization and erosion control, nutrient and sediment filtration, floodwater storage and peak flow reduction, and water temperature changes due to the loss of shade. Based on aerial imagery, 62 waterbody crossings within Project impact areas could result in the clearing of riparian forest (Table 3.6-9; Grid United 2025c). The Proponent would use BMPs discussed in the CMRP (Appendix E) to minimize impacts due to vegetation clearing and erosion/turbidity, as well as potential spills or hazardous materials.

Table 3.6-9 provides the waterbody impacts by type (overland travel, access roads, and work areas) within planned Project impact areas. The Project would have permanent, direct impacts on 0.4 acre of waterbodies: 0.4 acre in Montana and less than 0.1 acre in North Dakota

(Table 3.6-9). The Project would have short- to long-term temporary, direct impacts on 0.8 acre of waterbodies: 0.6 acre in Montana and 0.3 acre in North Dakota.[15] Both permanent and temporary impacts would be short-term and localized.

Construction within or near waterbodies would follow local, state, and federal permit requirements.

Wetlands

Short- to long-term, direct impacts on wetlands would result from temporary construction activities such as timber matting or culverts for construction areas or access roads. The Proponent would return short- to long-term wetland impact areas to pre-construction conditions (baseline) as near as practical following construction work. Permanent, direct impacts would be limited to placement of structures within wetlands, if unavoidable. Secondary impacts would be similar to those described for waterbodies. Table 3.6-13 provides wetland impacts by type (access road or work area and permanent or temporary) within the planned Project impact areas. Table 3.6-14 and Table 3.6-15 show the wetland impact acreages on federal land and on each unique wetland, respectively.

The Project would result in a total of 3.3 acres of permanent and 10.1 acres of short- to long-term wetland impacts. Permanent wetland impacts would include 3.0 acres of PEM wetlands (2.9 acres in Montana and 0.1 acre in North Dakota) and the conversion of less than 0.1 acre of PFO and 0.3 acre of PSS wetland to PEM/PSS wetlands in North Dakota through tree removal within the maintained Project ROW. Short- to long-term wetland impacts would include 10.0 acres on PEM wetlands (3.2 acres in Montana and 6.8 acres in North Dakota) and 0.1 acre of riverine wetlands (less than 0.1 acre in Montana and 0.1 acre in North Dakota).

Construction within or near wetlands would follow state and federal permit requirements, and mitigation required for wetland impacts would be determined by regulating authorities.

Public Surface Water Sources and Source Water Protection Areas

The Project is not anticipated to result in any impacts on SWP areas. The Project does not cross surface waters within or associated with SWP area MT0003470. Impacts on Sandstone Creek, crossed within SWP area MT0000307, including any vegetation clearing or grading and installation of Project infrastructure, would be avoided or minimized through use of BMPs. The Project's SPRP is included as an attachment to the CMRP and describes the methods used to prevent, control, and respond to spills of hazardous substances that may affect surface waters. The SPRP would be implemented to mitigate impacts on SWP areas and public surface water sources. Surface water intake impacts are not anticipated due to their locations relative to the Project impact area; neither of the identified sites draws water from waterbodies crossed by the Project (MTDEQ Undated_a).

[15] Totals may not sum due to rounding.

3.7. MINERALS AND GEOLOGY

This section describes the analysis methods, affected environment, and impacts on minerals and geology from the Project.

3.7.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on minerals and geology.

3.7.2. Affected Environment

This section describes baseline conditions for minerals and geology.

3.7.2.1. Physiography

The Project area is within the Great Plains Physiographic Province, which contains relatively flat terrain with features like mountains and lowlands. The features described in the following two subregions define the Project area's geology and topography (Grid United 2024; Bluemle and Biek 1996; NDGS 1999):

- **Missouri Plateau**: Located south and west of the Missouri River, this landform consists of rolling plains and elevated terrain. It is mostly unglaciated, resulting in fewer visible glacial impacts, characterized by flat plains and rolling hills.
- **Little Missouri Badlands**: The Little Missouri Badlands is west of the Missouri River extending into eastern Montana, and the unglaciated Missouri Plateau or "High Plains" subregion extends west to Colstrip. Made primarily of sedimentary rocks from the Tertiary to Cretaceous periods, the erosive action of the river has created steep, craggy hills and valleys, resulting in the "badlands" terrain.

3.7.2.2. Bedrock Geology

The Project area is underlain by Quaternary alluvium and terrace deposits and by Tertiary and upper Cretaceous bedrock, with shallow bedrock (less than 5 feet below ground surface). Bedrock units underlying the Project area consist of Tertiary and upper Cretaceous rocks (Table 3.7-1) (MBMG 2023a; NDGS 2001, 2009; Grid United 2024). Project components and temporary and permanent Project impacts on shallow bedrock (less than 5 feet below ground surface) are shown in Table 3.7-2 and Table 3.7-3, respectively. Approximately 61 percent of the temporary impact areas and 48 percent of the permanent Project components; including ROW, structure footprint, and access roads; are situated on shallow bedrock. This includes construction of new access roads and road improvements totaling approximately 175 acres of shallow bedrock areas.

3.7.2.3. Mineral Resources

Oil and Gas Production

The HVDC Transmission Line would be within 200 feet of seven oil and gas wells on the Cedar Creek anticline, a major oil-producing feature in the Williston Basin crossed by the Project between MP 149.9 and 153.0. The Project also crosses oil-producing areas in Slope County, North Dakota, operated by Chesapeake Operating, Inc. (BLM 2021). Oil and gas leases affected by the Project are summarized in Table 3.7-4.

Coal Mining

Montana holds the largest recoverable coal resources in the United States, with an estimated 74 billion tons. In 2023, it ranked sixth nationally in coal production, contributing about 30 million tons annually from six operating mines. Most of the coal deposits consist of significant reserves of lignite and economically minable coal (MBMG 2023b).

Minable coal deposits are found throughout the western half of North Dakota (NDGS 2009; Oihus 1983), with an estimated 351 billion tons of lignite and 25 billion tons of economically minable coal (NDDMR 2002; Pollard et al. 1972). As of 2023, there were four active coal mines in North Dakota (U.S. Energy Administration 2023).

The Rosebud County Converter Station, Rosebud Transmission Line, and HVDC Transmission Line cross a reclaimed area of the Rosebud Coal Mine (Area D) near Colstrip, Montana, which has been restored for other uses after coal mining (MTDEQ Undated).

Mineral Materials Mining

The BLM retains subsurface mineral rights under the 1916 Stock-Raising Homestead Act and the Taylor Grazing Act of 1943. Per 43 CFR Part 3600, mineral materials on public lands may not be extracted, severed, or removed unless the BLM (or another federal agency with appropriate jurisdiction) authorizes the removal by sale or permit. On split estate lands, the surface rights are privately owned, but the subsurface mineral rights are federally owned. Though none of the facilities (converter stations, switchyards, etc.) occur on split estate lands, the HVDC Transmission Line and Morton Transmission Line cross approximately 96 acres of split estate lands where subsurface mineral use may occur.

The Project area could cross available mineral resources such as sand, gravel, scoria, or aggregate for future mining. Sand and gravel deposits are typically sourced from glacial, alluvial, and floodplain or terrace deposits found throughout the Project area. Scoria comes from baked sediments naturally overlying coal seam fires found throughout the Little Missouri Badlands and high plains.

Locatable Minerals

The Project area does not cross any active mining claims. Western North Dakota has various uranium-bearing formations, rare earth element (REE) deposits, and volcanic ash deposits, which have the potential to be locatable minerals subject to claims (BLM 2016; USGS 2023). The Rhame bed is a 10- to 30-foot-thick sequence of kaolinized sediment that was weathered during an extended period of little to no deposition when the climate was much warmer, roughly 61 million years ago. Lignites below this thick bed of kaolinite can be significantly enriched in antimony, arsenic, barium, beryllium, germanium, lithium, molybdenum, uranium, and total REE, including the highest dry coal basis concentration (2,792 ppm REE) and dry ash basis concentration (5,642 ppm REE) (NDGS 2023b). The Proponent reviewed available data from the North Dakota Geological Survey (NDGS) and did not identify volcanic ash or REE deposits crossing Project impact areas (NDGS 2023c, 2001). However, REEs and uranium have been identified in lignite beds near the ROW (NDGS 2023b; USGS 2021a, 2021b). While uranium-bearing formations exist in Slope County, North Dakota, along the HVDC Transmission Line, their presence is limited (Table 3.7-5). While mining activities could be allowed within the maintained ROW after construction, the Project is not expected to significantly affect future mining of locatable minerals such as uranium, REEs, or volcanic ash, as these resources are

either small in scale or not currently commercially viable for extraction in the area. There are no mining claims or operations in the Project area. Likewise, there is no pending or foreseeable development for these minerals currently.

3.7.2.4. Paleontological Resources

The Project area in Montana and North Dakota overlay fossil-bearing bedrock formations that date back to the Cretaceous and Tertiary periods. These formations contain a variety of important fossilized remains, especially vertebrates.

Within the Project area, the Cretaceous Hell Creek Formation contains a wealth of dinosaur fossils, including species such as Triceratops and Tyrannosaurus Rex. It is one of the most well-known and productive fossil beds in North America, providing important insight into late Cretaceous ecosystems.

These fossil-rich formations make the Project area one of paleontological interest. While this increases the potential for finding important fossils during construction, it also underscores the importance of implementing proper protocols for monitoring and preserving these resources in accordance with environmental and regulatory guidelines.

The BLM developed the Potential Fossil Yield Classification (PFYC) System for assessments of paleontological resources. The PFYC system is also used by the USDA Forest Service and consists of the following classes applied to different geologic units: Class 1 (Very low), Class 2 (Low), Class 3 (Moderate), Class 4 (High), Class 5 (Very High), Class U (Unknown Potential), Class W (Water), and Class I (Ice). All the geologic units underlying the Project area except for the Quaternary deposits are classified as having a High to Very High fossil potential and preserve diverse vertebrate, invertebrate, and plant taxa. Additionally, the Proponent conducted paleontological surveys within federal and state lands during 2023 and 2024.

3.7.2.5. Geologic Hazards

Seismicity, Earthquakes, Faults, and Soil Liquefaction

The Project area has a low seismic risk based on historical data and geological stability. Earthquakes in this region have been infrequent and of low magnitude, with the strongest recorded earthquake in North Dakota occurring 8 miles northeast of the Project area in 1968, with a magnitude of 4.4 (NDGS 2022). In Montana, seismic activity has primarily been associated with blasting at the Rosebud Coal Mine, with three recorded earthquakes, with magnitudes of 3.35 or less. The USGS seismic hazard maps indicate that the peak horizontal ground acceleration in the area is low, ranging from 0.02 gravity (g) to 0.06 g, with a 2 percent probability of exceedance in 50 years (Grid United 2024). A lower percentage of gravity generally indicates slower ground acceleration, which typically means a lower seismic risk and minimal ground shaking.

Induced Seismicity

In the Williston Basin (eastern Montana and western North Dakota), seismicity caused by human activity (i.e., induced seismicity) is rare. The lack of earthquake swarms, common in induced seismic events, supports these findings. Key factors for low seismicity include the hydraulic fracturing depth of oil and gas formations (0.9 to 1.2 miles above Precambrian bedrock) and the distance to brine disposal zones completed in the Dakota Formation (1.6 miles above basement rock). Additionally, Petersen et al. (2018) estimated the combined hazard of

natural and induced seismicity of less than a 1 percent chance of experiencing earthquakes that produce minor damage annually in the region, indicating a low seismic risk.

Soil Liquefaction

Most Project impact areas are classified with no risk of soils losing strength and behaving like a liquid (i.e., soil liquefaction). However, the Project area has some regions with Very Low to Moderate risk, particularly along streams in the western part of the Project area between MPs 125 to 126 and 141 to 142, where saturated soil conditions exist (MBMG 2023a). However, due to the low seismic risk in the region, the likelihood of strong enough ground shaking to trigger soil liquefaction is minimal. Therefore, while the Project may encounter areas with a higher susceptibility to liquefaction due to saturated soils, the overall risk is low due to the low probability of significant seismic activity.

Faults

The USGS developed its Quaternary Fault and Fold Database to locate and characterize fault sources across the United States. The Project does not cross any active fault zones (Grid United 2024). The nearest fault zone is the Brockton-Froid Fault Zone, located approximately 115 miles north of the Project in Roosevelt County, Montana. Some faults in Montana and North Dakota are classified as Holocene faults, meaning they have experienced movement within the last 10,000 years, suggesting they could become active in the future. Many older, inactive faults are also present throughout eastern Montana, particularly within the Cedar Creek anticline, and in western North Dakota. These older faults are not expected to cause significant seismic activity due to their inactive nature. Despite the presence of faults in the region, the overall seismic risk remains low.

Landslides

Landslides are movements of soil, rock, or debris down a slope. While the USGS landslide inventory shows no recorded landslides within 50 miles of the Project area, the NDGS identified historical landslide deposits within the Project area, particularly along steep slopes (greater than 30 percent) near rivers and streams (NDGS 2023a). These areas are more susceptible to landslides due to the erosive impact of water on slopes, increasing their instability.

In contrast, landslide mapping in Montana is more limited, and the areas of concern are primarily in the western part of the state, outside the Project area. However, landslides in Montana are more common near steep slopes (greater than 30 percent) close to rivers and streams, similar to the patterns observed in North Dakota.

Although landslide risk is low based on USGS data (USGS 2022), steep topography in parts of the ROW in North Dakota indicates that some areas may be more prone to landslides. Table 3.7-6 includes a summary of slope percentages along the ROW.

Erionite

Erionite, a fibrous mineral found in North Dakota's Arikaree, Brule, and Chadron formations, poses health risks like lung cancer and mesothelioma when inhaled. The HVDC Transmission Line crosses areas within erionite test radii (Table 3.7-7), and where gravel mining is regulated by the NDDOT. It also crosses three areas with known occurrences of erionite in Slope and Hettinger counties, North Dakota (NDDOT 2025) (Figure 3.7-1). Proper testing and mitigation measures must be implemented in accordance with NDDOT guidelines to avoid health risks

when gravel mining is planned. The Proponent does not anticipate opening a new gravel mine to support the Project. If imported gravel is required for construction, the Proponent would require suppliers to source the material from outside the NDDOT exclusion zones. Any material sourced from within the testing radii would comply with the North Dakota Department of Health sampling protocol (NDDOH 2007; NDDOT 2025) before being used. The Proponent would also notify all grading and excavation contractors of segments that cross erionite testing radii zones established by the NDDOT and require dust suppression BMPs for areas that cross testing zones.

3.7.3. Environmental Consequences

The impacts on minerals and geology are discussed in the following sections.

3.7.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on minerals and geology, as the Project would not be built.

3.7.3.2. Proposed Alternative

The Proposed Alternative involves activities that could affect geological and mineral resources, particularly in areas with shallow bedrock, significant paleontological resources, and mineral deposits. Additionally, the Project area could be affected by geologic hazards, including earthquakes, soil liquefaction, landslides, and erionite deposits. The Proponent has developed mitigation measures to address impacts on geologic resources and manage risks associated with geologic hazards during construction and operations.

Geologic, Mineral, and Paleontological Resources

Shallow Bedrock

The primary method for removing shallow bedrock would involve truck-mounted auger drill rigs, with blasting as a backup option if necessary. The Project's Blasting Plan can be found in Appendix E. Blasting activities could occur where there is shallow bedrock that crosses structure foundations, facility foundations (i.e., permanent footprint associated with a converter station or switchyard), or access roads. Blasting would not be conducted along overland travel areas. Blasting due to shallow bedrock could permanently affect 563.6 acres along the HVDC Transmission Line, 0.2 acre along the Rosebud Transmission Line, 71.5 acres along the Oliver Transmission Line, 17.6 acres along the Morton Transmission Line, 24.1 acres at the Morton County Converter Station, 4.3 acres at the Morton County Switchyard, and 21.7 acres at the Rosebud County Converter Station (Grid United 2024) (Table 3.7-8). Across the Project, there could be up to 708 acres of shallow bedrock blasting; however, blasting would only occur as needed. Clearing of blast sites and cut-fill operations in areas of federal minerals would be coordinated with the BLM to determine the need for mineral materials contracts to authorize the activities, as needed.

Permanent access roads would be constructed and maintained to provide ongoing access to facilities for transmission line maintenance. These roads would likely include improvements such as clearing trees, grading, and importing additional fill, with durable surfaces such as dirt, gravel, asphalt, or concrete. These roads would remain in place after construction. Since the Proposed Alternative is an aboveground transmission system with limited excavation and minimal grading, it would not significantly alter the area's geological or

topographical conditions. Details of access road construction can be found in Section 5.3 of the CMRP (Appendix E).

Fill materials, such as gravel and sand, would be used for construction and maintenance of various Project components, sourced from local commercial operations. These materials would meet standards to verify they do not contain unsuitable substances or toxic pollutants. Topsoil would not be used as fill.

Mineral Deposits

The Proposed Alternative does not cross any active locatable mining claims. While there are uranium-bearing formations within Project impact areas, most of the affected areas are associated with temporary impacts associated with construction activities (84.1 acres) as opposed to permanent impacts (1.8 acres) (Table 3.7-5). Thus, the Proposed Alternative would not affect future locatable minerals development.

The Proposed Alternative crosses some oil and gas production areas in Montana and North Dakota, but impacts would be minimal and limited to temporary work areas and access road development. Most of the permanent impacts are associated with ROW clearing, as the Proponent would continue to periodically clear trees to maintain the transmission line; however, this activity would not interfere with oil and gas development. The remaining permanent impacts crossing oil and gas leases include structure footprints (less than 0.5 acre) and development of new permanent access roads (approximately 49.6 acres) (Table 3.7-4). While future oil and gas extraction equipment would be precluded from certain Proposed Alternative elements along the permanently maintained ROW, such as structure locations, advancements in oil and gas extraction technology have enabled flexibility in the location of surface drilling equipment. In addition, the Proponent has completed micro-siting along the oil fields and worked with leaseholders and oil and gas producers to ensure construction and operations of the Proposed Alternative would not interfere with existing mineral rights agreements or oil and gas well development. The Proponent would continue to coordinate with the BLM, Montana Department of Natural Resources and Conservation (DNRC), and current and potentially future lease holders on leases crossed or adjacent to Project impact areas.

Additionally, the Project crosses a reclaimed area (Area D) of Rosebud Coal Mine area near Colstrip, Montana. Since no active coal mining sites are crossed by the Project, impacts on existing and future coal mining operations are not anticipated. While mining activities could be allowed within the maintained ROW after construction, and coal mining activities would be limited within 35 feet of the transmission infrastructure (30 CFR § 77.807-2), the Project would not block or significantly interfere with future mining activities.

To assess mineral material mines along Project impact areas, numerous sources were used, including the MTDEQ opencut, hard rock, and abandoned mine lands databases (Grid United 2024; MTDEQ 2024), the USGS Mineral Deposit Database (USGS 2023), the North Dakota abandoned mine lands database (North Dakota Public Service Commission 2021), and North Dakota State Soil Conservation Committee annual reports (North Dakota State Soil Conservation Committee 2023). The Proposed Alternative is not expected to have long-term impacts on the availability of construction materials. ROW operations would not have an impact on the overall availability of these materials, as they are abundant throughout surrounding areas (C. Shilling, Pers. Comm., July 2025).

The HVDC Transmission Line and Morton Transmission Line segments both cross split estate lands where BLM retains subsurface rights to aggregate minerals. The Proponent may conduct activities that use mineral materials, such as disposal of mineral materials off site or reincorporation for a road base along temporary or permanent access roads and access roads that require improvements. Conservatively, the Project would permanently affect approximately 39.3 acres and temporarily affect approximately 56.7 acres of split estate lands (total of 95.9 acres; Table 3.7-9), though it is likely that mineral use would not occur in all cases.

Paleontological Resources

The Proponent developed a Paleontological Resources Management and Mitigation Plan (Appendix E) to minimize impacts on fossils during construction and operations. The plan requires all paleontological activities to be approved by specialists from the BLM, USDA ARS, USDA Forest Service, MBMG, and NDGS prior to construction.

A paleontological principal investigator (paleontological PI) would oversee all paleontological work during construction. All construction personnel would be briefed on fossils they could encounter and the steps to take if fossils are uncovered during construction. The Paleontological Resources Management and Mitigation Plan (Appendix E) also states that prior to conducting paleontological activities, the paleontological PI must obtain the appropriate work permits from the BLM, USDA ARS, USDA Forest Service, and Montana and North Dakota state officials. The paleontological PI would monitor all ground-disturbance activities on federal- and state-managed lands with a PFYC classification of Unknown, High, and Very High fossil potential. If the contractor discovers a fossil during monitoring, the contractor would stop construction in the immediate area of the discovery and immediately notify the environmental inspector and paleontological PI. The paleontological PI would establish a protective buffer or flagging to demarcate the location and protect the fossil(s). A 100-foot initial buffer surrounding the fossils would be established while construction activities resume outside the buffer. Direct impacts on paleontological resources would be avoided or mitigated through implementation of the Paleontological Resources Management and Mitigation Plan (Appendix E).

Geologic Hazards

Quaternary Faults

Project impact areas cross the Cedar Creek anticline, which contains several inactive, pre-Quaternary faults. However, as Project impact areas do not cross any active Quaternary faults, construction and operations are not expected to be affected by surface faults.

Seismicity

The Project would be designed to withstand seismic events. Given the absence of Quaternary faults and low peak horizontal ground acceleration, it is not anticipated that seismic activity, soil liquefaction, or surface faulting would affect the Project, nor would the Project have an impact on area seismicity.

Soil Liquefaction

Due to the low seismic risk, liquefaction is unlikely, and geotechnical surveys would be conducted prior to construction to assess subsurface suitability.

Landslides and Unstable Slopes

Approximately 350.7 acres of Project impact areas cross terrain with a slope percentage of 30 percent or higher (Table 3.7-6). Potential landslide hazards exist at locations with steep slopes, particularly in areas along streams and with slopes greater than 30 percent (NDGS 2023a). To mitigate these risks, the Proponent would avoid building structures in areas with slopes greater than 30 percent and areas along streams and drainages to the greatest extent practicable. Additionally, the Proponent would conduct geotechnical surveys to assess subsurface suitability. The Proponent would design structures to withstand and not exacerbate landslide activity.

Erionite

While the HVDC Transmission Line crosses erionite testing radii, and erionite is known to occur in the geologic formations crossed in Slope and Hettinger counties, North Dakota, mineral material mining is not anticipated, and erionite testing is not planned. If gravel from these zones is required, the Proposed Alternative would follow the sampling procedures outlined in the *Standard Specifications for Road and Bridge Construction* (NDDOT 2025). As discussed, dust suppression BMPs for ROW locations that cross erionite zones would be required.

3.8. LAND USE AND RECREATION

This section describes the analysis methods, affected environment, and impacts on land use and recreation from the Project.

3.8.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on land use and recreation.

3.8.1.1. Land Use

The land use analysis area includes temporary (construction) and permanent (operations) Project impact areas. Changes in land use were calculated based on the Project area acreage. In terms of predominant land uses and patterns, lands within 0.25 mile (1,320 feet) of Project components are discussed to provide context for impacts. County and regional planning documents and federal and state land management documents were reviewed to determine the relationship between Project components and local or regional land use policies.

3.8.1.2. Recreation

Recreation resources include natural resources and facilities that offer opportunities for leisure activities. The recreation analysis area includes the temporary and permanent Project impact areas and a 0.25-mile (1,320-foot) radius surrounding the permanent Project components. Project activities and components were reviewed for the following impacts on recreation resources: permanent or temporary access restrictions and construction-related or operational-related noise, lighting, traffic, and land disturbance. Visual resources are addressed in Section 3.9, Visual and Aesthetics.

3.8.2. Affected Environment

This section describes baseline conditions for land use and recreation.

3.8.2.1. Land Ownership and Management

The Project crosses lands owned and managed by private owners, Montana and North Dakota state trust lands, and various federal agencies. Federal lands crossed by the Project include lands managed by the BLM, USDA Forest Service, and the USDA ARS. Table 3.8-1 lists the length of permanent public and private land crossed by the transmission line in each county.

In addition to the permanent transmission line crossings, Project components include the Rosebud County Converter Station, Morton County Converter Station, and Morton County Switchyard permanent facility footprints, which total 51.5 acres and would be located on privately or state-owned land. Additionally, the Colstrip Substation would be expanded by approximately 13.2 acres of permanent footprint. Temporary work areas and temporary and permanent access roads would cross both private and public lands in the vicinity of the transmission line and components.

The state and federal lands crossed by the Project are managed for different goals by the managing agencies. The following subsections provide a summary of the intended land uses, policies, and requirements applicable to the public lands crossed by the Project.

Montana Department of Natural Resources and Conservation Trust Lands

The Montana DNRC Trust Lands Management Division manages over 5 million surface acres and over 6 million subsurface acres of trust lands throughout Montana. Trust lands are managed to produce revenues for established beneficiaries such as state public schools, universities and

technical colleges, and other educational and health institutions. State trust lands are managed primarily for agricultural, energy, and recreational uses (Montana DNRC Undated_b).

The Montana DNRC has six land offices across the state, subdividing management of state trust lands between them. The Project would be located within the Eastern Land Office, which manages all state trust lands in Rosebud, Custer, and Fallon counties. As state trust lands are managed for various purposes, only specific tracts are available for public access. Generally, tracts open to public access are those that have a public road located within the tract.

North Dakota Trust Lands

The North Dakota Department of Trust Lands is responsible for the management of state trust lands throughout North Dakota. Trust land assets in North Dakota include over 700,000 acres of surface lands and nearly 2.6 million acres of subsurface resources. Trust lands are managed for the purpose of generating revenue for state public schools, universities, and other institutions (North Dakota Department of Trust Lands 2025a, 2025b, 2025c).

On trust surface lands, the major source of income is from agricultural leases, which are primarily used for grazing. Other sources of significant revenue on surface lands include ROWs, saltwater disposal, and gravel/scoria mining (North Dakota Department of Trust Lands 2025c). Trust Lands in North Dakota are predominantly open to non-vehicular public access for recreation.

Bureau of Land Management Lands

The BLM Montana/Dakotas State Office manages approximately 8.3 million acres of federal lands and nearly 47.2 million acres of federal subsurface estate across Montana, North Dakota, and South Dakota. BLM-managed lands across these states provide wildlife habitat, agricultural uses, and recreational opportunities.

The Project would cross BLM lands in Montana managed by the Miles City Field Office and their 2015 approved Resource Management Plan (RMP). The 2015 RMP provides land management policy for the approximately 2.8 million surface acres under the jurisdiction of the Miles City Field Office (BLM 2015). In addition to managing land development activities for oil, gas, and coal deposit resources in the area, the RMP also establishes goals and objectives for wildlife habitat, rangelands for grazing, and recreational activities. The RMP provides comprehensive management direction for all resources and uses, identifying lands available for the development of certain resources, along with restrictions (BLM 2015, Undated_c).

The 2015 RMP identifies goals, objectives, and management decisions (MDs) for lands, realty, and recreational resources on BLM-administered lands within the Miles City Field Office jurisdiction; those relevant to the Project are provided below (BLM 2015):

- Lands and Realty (LR)
  - Goal LR 1: Provide public lands, interests in land, and authorization for public and private uses while maintaining and improving resource values.
  - Goal LR 4: Strive to increase and diversify the nation’s sources of both traditional and alternative energy resources, improve the energy transportation network, and ensure sound environmental management.

  - Goal LR 5: Effects of infrastructure projects, including siting, will be minimized using the best available science, updated as monitoring information on current infrastructure projects becomes available.
  - MD LR 2: Major ROWs are avoided on 2,222,701 surface acres (81 percent) and Minor ROWs and other realty-related land use authorizations are avoided on 858,073 surface acres (31 percent). On the remaining surface acres in the planning area, major ROWs are allowed on 445,170 surface acres (16 percent) and Minor ROWs are allowed on 1,809,798 surface acres (66 percent).
- Recreation (REC)
  - Goal REC 1: Provide a diverse array of quality resource-based recreation opportunities while protecting and interpreting the resource values, providing educational opportunities, minimizing recreational use conflicts, and promoting public safety.
  - Goal REC 2: Establish, manage, and maintain quality recreation sites and facilities to balance public demand and protection of public land resources.
  - Goal REC 3: Manage recreation opportunities and experiences to provide a sustained flow of local economic benefits and protect non-market economic values.
  - MD REC 1: Surface-disturbing and disruptive activities are allowed adjacent to designated sport-fish reservoirs with BLM-approved design features (170 acres). Oil and gas leasing is open and surface occupancy and use in and within 0.25 mile of designated sport fishing reservoirs is allowed subject to specialized design features to minimize impacts (controlled surface use, 2,600 acres).
  - MD REC 2: The BLM will issue Special Recreation Permits as appropriate for commercial, competitive, special events and/or organized group activities, subject to guidelines in BLM Handbook 2930 (BLM 2014), resource capabilities, social conflict concerns, professional qualifications, public safety, and public needs. Changes in demand for permits and resulting impacts will be monitored and future thresholds identified that could lead to limits in the number of permits to minimize impacts on the resource, public safety, and overall visitor satisfaction. All special recreation permit applications and renewals will be reviewed on a case-by-case basis and issued as tools to achieve area specific planning goals, objectives and decisions.

National Forest System Lands

The Project's HVDC Transmission Line would cross the LMNG in western North Dakota. The LMNG is part of the Dakota Prairie Grasslands (DPG), an NFS Unit consisting entirely of National Grasslands that is comprised of 1,033,271 acres and the largest grassland in the country (USDA Forest Service Undated). The Theodore Roosevelt National Park is located within the LMNG's borders in Billings County, North Dakota, approximately 26 miles from the HVDC Transmission Line. USDA NFS-administered lands include areas available for recreational activities (camping, hiking, outfitting and similar uses), areas leased for cattle grazing, and areas for mineral leasing and development.

In addition to the USDA NFS-administered lands, significant portions of state-owned and privately owned lands are also within the LMNG. Many of the state-owned and privately owned lands are leased for cattle grazing.

The 2001 DPG Land and Resource Management Plan (LRMP) provides management direction including goals, objectives, standards, and guidelines for lands within the DPG. The goals, objectives, standards, and guidelines described in the 2001 LRMP reflect the USDA Forest Service's overall commitment to a sustainable natural resource base for the country (USDA Forest Service 2001). Standards and guidelines relevant to transmission line development and applicable to all lands within the DPG are provided in Appendix A.

The DPG also include several Management Areas (MAs). The HVDC Transmission Line would cross MA 3.65, Rangelands with Diverse Natural-Appearing Landscapes, and MA 6.1, Rangeland with Broad Resource Emphasis (USDA Forest Service 2001). Appendix A discusses compliance with the DPG LRMP.

Rangelands with Diverse Natural-Appearing Landscapes

The HVDC Transmission Line crosses 3.2 miles of lands within the Rangelands with Diverse Natural-Appearing Landscapes MA. This MA focuses on maintaining or restoring a diverse landscape of biodiversity and ecological processes and functions. It also provides additional rangeland values and uses with limits on facilities to maintain a natural-appearing landscape. A guideline for special uses in this MA includes locating new utilities along road corridors or within other areas already disturbed (USDA Forest Service 2001).

Rangeland with Broad Resource Emphasis

The HVDC Transmission Line crosses 7 miles of lands within the Rangeland with Broad Resource Emphasis MA. This MA is predominantly a rangeland ecosystem managed to meet a variety of ecological conditions and human needs. Lands within this MA are often highly developed with users expecting to witness human activities, including motorized transportation (USDA Forest Service 2001). The DPG LRMP, Chapter 1 (Grassland-wide Direction), Section P, provides additional special uses. Where possible, the HVDC Transmission Line would be located adjacent to existing roads to minimize visual impacts and conform to approved corridors.

U.S. Department of Agriculture, Agricultural Research Service Lands

Fort Keogh is a 55,000-acre rangeland facility managed by the USDA ARS in conjunction with the Montana Agricultural Experiment Station that would be crossed by the HVDC Transmission Line in Custer County, Montana, for approximately 7.9 miles. Fort Keogh is 1 of 20 research facilities that comprise the 10-state plains area of the USDA ARS. The mission of this facility is to research and develop ecologically and economically sustainable range animal management systems to meet consumer needs (USDA ARS 2020).

3.8.2.2. Land Cover

Land cover types are derived from the USGS National Land Cover Database (NLCD) and grouped to form categories of land cover (Grid United 2025b). Section 3.13, Vegetation, uses a combination of USGS NLCD and Montana Natural Heritage Program Land Cover Framework; therefore, vegetation acreages differ from this section. Land cover types within the Project footprint include the following NLCD categories (MRLC Undated):

- Grassland and Shrubland (Rangeland): This category includes NLCD land cover types of herbaceous grassland and scrub/shrub, as well as areas classified as barren land. Apart from the Grassland and Shrubland group description for these NLCD types, much of the land crossed by the Project can also be characterized as rangeland. As described in Section 3.3,

Cultural/Tribal/Historic Resources, rangeland is land in which ground cover and vegetation is dominated by grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing of wildlife and livestock. As such, most of the land within the Project area and this land cover category can be considered rangeland. Herbaceous grasslands are dominated by graminoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not subject to intensive management such as tilling but can be used for grazing. Shrub/scrub areas are dominated by shrubs less than 5 meters tall, including true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions. Barren land areas are rock, sand, or clay, with vegetation generally less than 15 percent of total ground cover.

- Agricultural: This category includes NLCD land cover types of cultivated crops and hay/pasture. Cultivated crops include land areas used for production of annual crops and land being actively tilled. Hay/pasture is areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle.
- Forested: This category includes NLCD land cover types of evergreen, deciduous, and mixed forest.
- Wetland: This category includes NLCD land cover types of emergent herbaceous wetlands and woody wetlands. Wetland classification in Section 3.6, Surface Water Hydrology, is based on field and state data and, therefore, differs from NLCD data.
- Open Water: This category refers to the single NLCD land cover type of open water.
- Developed: This category includes NLCD land cover types of Low and Medium Intensity Development and Developed Open Space. Low and Medium Intensity Developed areas have a mixture of constructed materials and vegetation, with impervious surfaces accounting for up to 49 percent (Low Intensity) or 79 percent (Medium Intensity) of total cover. Developed Open Space is mostly mowed grass or landscaped areas with up to 20 percent impervious surface coverage.

Table 3.8-2 lists the length of permanent transmission line crossings by land cover category. The Project's transmission lines (including the Rosebud, HVDC, Oliver, and Morton Transmission Lines) cross 302.5 miles of Grassland and Shrubland; 102.6 miles of Agricultural; 8.8 miles of Forested; 3.4 miles of Wetland; 0.2 mile of Open Water; and 5.0 miles of Developed (Table 3.8-2).

The land areas categorized as Developed within the Project footprint are associated with public or private roads or utilities. Roadway areas in the Developed land category include paved, gravel, or dirt road surfaces and the mowed ROWs associated with the roads. Only I-94 has sufficient impervious area to be classified as Medium Intensity Developed; all other Developed land crossed by the Project is Low Intensity or Open Space Developed.

The largest land cover category crossed by the Project transmission lines in both Montana and North Dakota is Grassland and Shrubland, followed by Agricultural. In North Dakota, Agricultural lands (both cultivated crops and hay/pasture) crossed by the transmission lines account for over 36 percent of total lands crossed, primarily in eastern Slope County, Hettinger County, and western Grant County. Land cover impacts are discussed in Section 3.8.3, [Land Use and Recreation] Environmental Consequences.

3.8.2.3. Existing and Planned Residential and Commercial Development

Existing Development

Table 3.8-3 lists all existing structures within 200 feet of the edge of Project construction impact areas. A total of nine structures (two grain bins and seven sheds) range in distance from 32.5 to 177.5 feet from the Project construction impact areas (Grid United 2024).

Table 3.8-4 lists the number of houses within 0.25 mile (1,320 feet) of the Project transmission centerline. No existing residences are less than 600 feet from the Project centerline. Fifteen residences are between 600 and 1,000 feet from a centerline, and ten residences are between 1,000 feet and 0.25 mile (1,320 feet) from a centerline. The Oliver Transmission Line has the highest number of dwellings near Project components, with 18 homes within 0.25 mile of the centerline. Most of these residences are within a cluster of homes between I-94 and County Road 139A, where the Oliver Transmission Line would be located parallel to an existing transmission line.

The only commercial or industrial improvements within 0.25 mile of a Project component are in the vicinity of the Rosebud Transmission Line's starting point at the existing Colstrip Substation. Within the first 0.3 mile of the Rosebud Transmission Line, it is within 0.25 mile of structures or improvements associated with the existing substation, the Colstrip Power Plant, and a City of Colstrip utility shop. A recreational vehicle park operated by Talen Energy (the power plant operator) is located adjacent to the existing Colstrip Substation, approximately 800 feet west of the Rosebud Transmission Line.

A total of 211 barns, grain bins, and sheds are within 0.25 mile of a Project transmission line centerline. These include 32 structures less than 500 feet from the centerline and 179 structures that are 501 to 1,320 feet (0.25 mile) from the centerline (Grid United 2025b).

Planned Development

Planned future development within 0.25 mile of the Project is described below, based on publicly available county documents. Local planning policies and land use regulations establish the types of future land uses appropriate within the Project area.

Montana Jurisdictions

Planning policies and regulations are described below for the three counties and one city in Montana with land within 0.25 mile of the Project.

- Rosebud County: The Rosebud County Growth Policy recommends no changes to land use patterns in the county and notes that a majority of the county is open grassland or shrubland, with coal mining and electrical generation around Colstrip, cropland in the Yellowstone River valley, and timber in the southern half of the county (Great West Engineering 2025). The county does not have a zoning map or zoning regulations.
- Colstrip: The Colstrip Substation and a portion of the Rosebud Transmission Line are within the City of Colstrip. A parcel of land crossed by the city's municipal boundary and north of the existing Colstrip Substation is identified by the Colstrip Growth Policy as a "high value development location" for commercial or industrial use (City of Colstrip 2019). The Project's Rosebud Transmission Line crosses this 240-acre parcel. Most of the 240-acre parcel is in Rosebud County (outside the municipal limits of Colstrip) and not zoned. The existing

Colstrip Substation (and expansion area for the Project) and the Talen Energy Power Plant near the Rosebud Transmission Line are within the City of Colstrip's "Power Generation" zoning district (KLJ 2019).

- Custer County: The Custer County Growth Policy identifies most land in the county as Grassland and Shrubland, Agricultural, or public lands (Custer County Board of Commissioners 2023). The policy notes the existence of available subdivision lots near Miles City and the possibility of future new residential development within and near Miles City, approximately 8 miles north of the Project.
- Fallon County: Fallon County's 2023 Growth Policy calls for future commercial development along Montana Highway 7 (MT 7) and MT 12 to make use of the existing transportation corridors; continued industrial development in the vicinity of existing industrial uses along MT 7 north of Baker (to the extent that can be served by water/sewer capacity); and infill residential development within Baker and Plevna (Fallon County 2024). Plevna is approximately 0.5 mile north of the HVDC Transmission Line, and the industrial uses north of Baker are about 1.5 miles south of the HVDC Transmission Line. The county does not have a zoning map or zoning regulations.

North Dakota Jurisdictions

Planning policies and regulations are described below for the six counties in North Dakota with land within 0.25 mile of the Project.

- Golden Valley County: The Project would be located within the Agricultural District in Golden Valley County according to the county zoning map (Golden Valley County North Dakota Undated). The Golden Valley County Comprehensive Plan establishes land use policies that include support for farming practices and guiding new development to areas where services are available (Golden Valley County 2012). The plan supports directing new commercial and industrial land uses to areas near the incorporated municipalities (Beach, Golva, and Sentinel Butte). No major development proposals are currently under review in southern Golden Valley County (J. Huff, Pers. Comm., February 3, 2025).
- Slope County: The Project would be located within the Agricultural District in Slope County according to the county's zoning resolution. The county does not have a policy or document establishing future land use policies.
- Hettinger and Grant counties: The Project would be primarily located within the Agricultural Districts of Hettinger and Grant counties. These two counties have zoning maps that assign most land to the Agricultural zoning district (Grant County North Dakota Undated; Hettinger County 2012). Recreational, Residential, Commercial, and Industrial zoning are assigned to parcels based on existing land uses. The counties do not have a policy or document establishing future land use policies.
- Morton County: The Project transmission lines, Morton County Converter Station, and Morton County Switchyard are on land designated for Agricultural use per the Morton County 2045 Comprehensive Plan, adopted in 2018 (Morton County 2018). The Morton County Department of Planning and Zoning website does not identify any major development projects or planning initiatives within 4 miles of the Project (Morton County 2024).

  - Between I-94 and County Road 139A (parallel to and north of I-94), the 345-kV Oliver Transmission Line is on land designated for Agriculture that contains an existing transmission line. An existing residential neighborhood to the west (along 28 ½ Avenue) is in the county's Developed land use category. Undeveloped land to the east is designated for future Industrial use.
- Oliver County: The Project would be located on land designated for agricultural use. The Oliver County Comprehensive Plan, adopted in 1976, establishes land use and growth policies for the county (Oliver County 1976). The plan calls for new development to be focused on the incorporated municipality of Center and the unincorporated communities of Hensler and Hannover; the plan also calls for promoting agricultural activities, protecting soils, and steering development to areas where public and private services are available (Oliver County 1976). The zoning ordinance supports existing patterns of development, with most of the county in the Agricultural zoning district and Residential, Commercial, and Industrial districts established where development exists (Oliver County 2016). No major development proposals are under review.

3.8.2.4. Other Land Uses

Mines and Mineral Resources

Information on mines and mineral resources near the Project is included in Section 3.7, Minerals and Geology.

Colstrip Landfill

The Rosebud Transmission Line would cross a closed Rosebud County landfill near the existing Colstrip Substation at approximately MP 0.1.

Electronic Installations

Radio transmitters, microwave relay stations, and other electronic installations are located along the Project in Montana and North Dakota. Table 3.8-5 lists the electronic installations within 2,000 feet of the Project. No electronic installations in North Dakota are located within 2,000 feet of the Project.

Airports

Information on airports near the Project is included in Sections 3.10, Socioeconomics, and 3.4, Public Health and Safety.

3.8.2.5. Recreational Resources

Private Preservation Lands

The Project is located in the vicinity of one conservation easement identified through the National Conservation Easement Database (NCED 2025). The conservation easement is held by the Montana Land Reliance, an organization partnering with landowners to permanently protect agricultural lands, fish and wildlife habitat, and Open Space (Montana Land Reliance 2025). The HVDC Transmission Line would not cross this conservation easement; the nearest point would be approximately 0.2 mile near MP 57. One Project access road (P500-MT-1223) crosses the conservation easement south of MP 53 for approximately 865 feet. The existing access road would be permanent for the Project but needs improvements; therefore, it would require temporary and permanent impact areas.

Parkland (Federal, State, County)

The south unit of the Theodore Roosevelt National Park is located approximately 26 miles from the HVDC Transmission Line near MP 157. No Project-related infrastructure would be located closer to the national park.

Montana Department of Natural Resources and Conservation Trust Lands

Certain Montana DNRC lands are open to the public for recreational purposes that include camping, facility rentals, hunting and fishing, motorized recreation, snowmobiles, outfitting, and guiding. A conservation license must be obtained from the Montana DNRC to allow access to the lands for an individual person. A "special recreation use license" can be obtained for commercial, organized, or coordinated recreational use of the lands (Montana DNRC Undated_c).

Montana DNRC lands are found throughout the state of Montana, and the HVDC Transmission Line would be adjacent to or cross Montana DNRC lands. Table 3.8-6 includes crossings of the transmission line with DNRC lands by MP. The Rosebud Transmission Line would cross DNRC lands for approximately 2.2 miles. The Rosebud County Converter Station would be located on the same tract of DNRC land as the Rosebud Transmission Line and require approximately 22.7 acres of land. That DNRC tract is classified as having no public access by the Montana DNRC. Table 3.8-6 notes the MPs where the transmission lines cross DNRC tracts that are open for public access (Montana DNRC Undated_a).

North Dakota Trust Lands

Most North Dakota trust lands are open to the public for non-vehicular access only for hiking, hunting, and fishing. Less than 1 percent of the trust lands are closed to public access or have restricted access. Motor vehicles, camping, fee hunting, target shooting, and trapping are not permitted on these lands (North Dakota Department of Trust Lands 2025b).

North Dakota trust lands are located throughout the state and along the entirety of the HVDC, Morton, and Oliver Transmission Line routes. The HVDC and Oliver Transmission Lines would cross trust lands (Table 3.8-6); however, the Morton Transmission Line, Morton County Converter Station, and Morton County Switchyard would not cross any North Dakota trust lands. In North Dakota, the HVDC Transmission Line would cross through approximately 4.1 miles of trust lands and the Oliver Transmission Line would cross through approximately 0.1 mile of trust lands.

North Dakota Game and Fish Department Wildlife Management Areas

North Dakota Wildlife Management Areas (WMAs) allow recreational uses that include hunting, fishing, and trapping. Camping is permitted in some WMAs. The Otter Creek WMA, located in Grant County, is comprised of approximately 318 acres (North Dakota Game and Fish 2024). The Project in Grant County would be within 1 mile of the Otter Creek WMA. Temporary impact areas for the HVDC Transmission Line would be less than approximately 0.2 mile south of the Otter Creek WMA at MP 337.3 (centerline would be approximately 0.3 mile south of the Otter Creek WMA).

The Wilbur Boldt WMA is in Oliver County and comprised of approximately 161 acres (North Dakota Game and Fish 2024). Temporary impact areas and the centerline of the Oliver Transmission Line at MP 51.8 would be located approximately 0.3 mile east of the Wilbur Boldt WMA.

Bureau of Land Management

The majority of the BLM-administered land within the Project area would be considered "public lands not designated," managed to meet basic recreation activities, visitor services, and resource stewardship needs. Recreational activities on BLM-administered land within the Miles City Field Office management area include hunting, fishing, hiking, rafting, bird watching, rock collecting, mountain biking, off-highway vehicle use, and visiting frontier-era historical sites (BLM Undated_b). Outfitting businesses, organizations, and individuals can obtain Special Recreation Permits from the BLM, which authorizes the use of specific public land and related waters for commercial, competitive, and organized group use (BLM Undated_d). No improved BLM recreation facilities are located within approximately 0.25 mile of the Project. The Rest Reservoir site on the north side of U.S. Route 12 (US 12) in Custer County, 0.5 mile north of the HVDC Transmission Line, is identified as a camping area on BLM mapping but is an undeveloped recreation area. The Rest Reservoir is used for sport fishing, and camping is permitted, but no amenities are provided (BLM Undated_a).

National Forest System Lands

The HVDC Transmission Line crosses USDA NFS-administered land within LMNG in Golden Valley and Slope counties, North Dakota, for 10.2 miles. The areas administered by the USDA Forest Service are open to the public and include trails and access roads authorized for use by motorized vehicles. Recreational activities include biking, camping, fishing, hiking, horseback riding, outfitting, hunting, geocaching, target shooting, picnicking, and off-highway vehicle use where permitted (USDA Forest Service Undated). Recreational sites and facilities within LMNG in Golden Valley and Slope counties are located generally north (greater than 6 miles) of the HVDC Transmission Line.

Scenic Rivers

The HVDC Transmission Line crosses the Little Missouri River in Slope County, North Dakota, at approximately MP 187.5. This is North Dakota's only designated State Scenic River; it offers recreational opportunities such as canoeing, kayaking, and fishing.

The Little Missouri River State Scenic River Act (NDCC § 61-29-01) establishes the intent of preserving the river in a free-flowing natural condition and establishes the Little Missouri River Commission, which may advise local or other government units to afford the protection adequate to maintain the scenic, historic, and recreational qualities of the Little Missouri River and its tributary streams. The Little Missouri River Commission also has the power and duties of promulgating management policies to coordinate all activities within the confines of the Little Missouri River when such action is deemed necessary.

The Little Missouri River is listed on the NRI managed by the NPS. NRI river segments are potential candidates for inclusion in the National Wild and Scenic River System; however, the Little Missouri River is not designated as a Wild and Scenic River. NPS notes that the Little Missouri River's remarkable values include cultural, historic, and scenic characteristics (NPS 2024).

3.8.3. Environmental Consequences

The impacts on land use and recreation are discussed in the following sections.

3.8.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on land use and recreation, as the Project would not be built.

3.8.3.2. Proposed Alternative

Land Ownership and Land Use

The Proposed Alternative transmission lines would cross land owned by state and federal agencies for 49.6 miles, including the following landowners: State of Montana (17.0 miles); State of North Dakota (4.7 miles); BLM (9.8 miles); USDA Forest Service (10.2 miles); and USDA ARS (7.9 miles) (Table 3.8-1). The remaining 371.9 miles of transmission lines would cross privately owned lands and public or private roads.

Lands crossed by the Proposed Alternative transmission lines would be subject to temporary easements for construction impact areas (including temporary access roads) and permanent easements for the transmission line ROW and permanent access roads. Ownership of the land would not change but would remain with the current owner. The Rosebud County Converter Station is on Montana state trust lands, and the Morton County Converter Station, Morton County Switchyard, and Colstrip Substation expansion are proposed for privately owned land (Morton County Undated). The permanent acreage associated with these sites is 21.7 acres for the Rosebud County Converter Station, with 0.4 mile of permanent access road; 24.1 acres for the Morton County Converter Station; 4.3 acres for the Morton County Switchyard, with 0.3 mile of permanent access road; and 13.2 additional acres for the Colstrip Substation expansion.

Table 3.8-7 details land cover categories affected by the Rosebud County Converter Station, Morton County Converter Station, and Morton County Switchyard.

Construction of the proposed converter stations and switchyard would result in both temporary and permanent conversion of land from Grassland and Shrubland or Agricultural land, as summarized below. The land used temporarily during construction for storage, staging, access, and other construction-related activities would be restored to its current condition (i.e., Grassland and Shrubland or Agricultural) after construction is done.

- Rosebud County Converter Station
  - Permanent conversion of 21.7 acres from Grassland and Shrubland to Developed land cover; and
  - Temporary use of 17.7 acres of Grassland and Shrubland.
- Morton County Converter Station
  - Permanent conversion of 24.1 acres from Agricultural to Developed land cover; and
  - Temporary use of 40.6 acres of Agricultural land.
- Morton County Switchyard
  - Permanent conversion of 4.3 acres from Agricultural to Developed land cover; and
  - Temporary use of 6.6 acres of Grassland and Shrubland, 83.8 acres of Agricultural land, and 0.7 acre of Developed land.

Table 3.8-8 provides land cover categories affected by access roads for the Proposed Alternative. The table identifies temporary and permanent impacts for existing access roads that need to be improved, newly constructed temporary access roads, newly constructed permanent access roads, turnaround areas allowing vehicle turnarounds and bi-directional travel, and roads for overland travel.

As indicated in Table 3.8-9, construction and operations of the transmission lines would affect the following acreages within the Project area:

- Rosebud Transmission Line (Montana)
  - 63.6 acres of temporary impacts, including approximately 59.6 acres of Grassland and Shrubland, 3.3 acres of Forested land, and 0.6 acre of Developed land; and
  - Permanent use of 0.2 acre for structure footprints, including approximately 0.1 acre of Grassland and Shrubland, less than 0.1 acre of Forested land, and less than 0.1 acre of Developed land.
- HVDC Transmission Line (Montana)
  - 1,698.1 acres of temporary impacts, including approximately 1,464.5 acres of Grassland and Shrubland, 159.2 acres of Agricultural land, 47.3 acres of Forested land, 12.9 acres of Wetland, and 14.2 acres of Developed land; and
  - Permanent use of 269.9 acres for structure footprints and access roads, including approximately 256.0 acres of Grassland and Shrubland, 7.1 acres of Forested land, 3.8 acres of Wetland, 1.7 acres of Agricultural land, and 1.4 acres of Developed land.
- HVDC Transmission Line (North Dakota)
  - 1,574.5 acres of temporary impacts, including approximately 866.0 acres of Grassland and Shrubland, 682.9 acres of Agricultural land, 21.4 acres of Developed land, 2.5 acres of Wetland, 1.7 acres of Forested land, and less than 0.1 acre of Open Water; and
  - Permanent use of 16.5 acres for structure footprints and access roads, including approximately 11.9 acres of Grassland and Shrubland, 2.5 acres of Agricultural land, and 2.1 acres of Developed land.
- Morton Transmission Line (North Dakota)
  - 170.7 acres of temporary impacts, including 113.1 acres of Grassland and Shrubland, 56.3 acres of Agricultural land, 1.1 acres of Developed land, and 0.2 acre of Forested land; and
  - Permanent use of 17.6 acres for structure footprints and access roads, including approximately 7.6 acres of Grassland and Shrubland, 6.5 acres of Developed land, 3.5 acres of Agricultural land, and less than 0.1 acre of Wetland.
- Oliver Transmission Line (North Dakota)
  - 583.9 acres of temporary impacts, including 410.1 acres of Grassland and Shrubland, 158.0 acres of Agricultural land, 10.8 acres of Forested, 4.5 acres of Developed land, and 0.7 acre of Wetland; and
  - Permanent use of 7.2 acres for structure footprints and access roads, including approximately 3.9 acres of Developed land, 2.5 acres of Grassland and Shrubland, 0.9 acre of Agricultural land, and less than 0.1 acre of Forested land.

In addition to the permanent structure footprints and access roads noted above, vegetative cover would be permanently altered within the operational ROW where tall woody shrubs, trees, and forested areas need to be cleared and converted to grasslands. These impacts are discussed in Section 3.13.

Within the temporary impact areas, property access could be restricted due to the presence of construction work areas and equipment, and the land would not be available for grazing, crops, recreation, or other uses. The disruption of land uses would occur during the 3- to 4-year construction period, but because construction of transmission line segments would occur sequentially along the ROW, the disruption may not last for the full construction timeframe at all locations along the route.

Developed land crossed by Proposed Alternative components is primarily utility uses and public or private roads and associated mowed or cleared areas within the road ROWs. Construction-related disruptions to road traffic are discussed in Section 3.10, Socioeconomics. Generally, disruptions to Developed land during construction would include construction noise and dust, the presence of equipment, limited access, and potential damage to landscaping, fences, sheds, and other improvements.

Following construction, the Proponent would restore temporary construction areas, temporary access roads, and overland travel lanes as near as practicable to pre-construction conditions. Restoration would include de-compacting soils and revegetating disturbed areas in accordance with Section 6 of the CMRP (Appendix E); landowner agreements; and applicable permit requirements. The Proponent would restore temporary access roads unless a landowner requests that the access road be left in place.

The Proponent has developed an Agricultural Impact and Mitigation Plan (AIMP) (Appendix E). The AIMP includes mitigation measures to address construction impacts (e.g., addressing damage to drain/tile lines, preventing interference with irrigation systems, topsoil segregation, decompaction, fence repairs, livestock management, stone removal, mitigation for specialty practices such as organic farms or apiaries).

The following mitigation measures are planned for temporary impacts in specific land cover categories:

- Grassland and Shrubland—Minimal vegetation clearing would be needed. Upon completion of construction, the Proponent would restore disturbed areas in accordance with the CMRP (Appendix E). The AIMP would also address specific construction impacts.
- Agricultural land—The Proponent would compensate landowners for any crop loss resulting from construction. The AIMP would address specific construction impacts.
- Developed land—The areas within Project impact areas categorized as Developed land generally consist of roadways (public or private) and adjacent shoulders or mowed ROWs. The Proponent would notify the road authorities or landowners prior to construction, limit the hours during which high-decibel noise levels would be permitted, and minimize exposure to fugitive dust using techniques outlined in Section 5.6 of the CMRP (Appendix E). The Proponent would evaluate that safe conditions are maintained, avoid unnecessary removal of trees and landscaping, restore areas following construction, coordinate with the road authorities / landowners to avoid or minimize impacts, repair damage to roads, and implement a landowner complaint procedure.

- Forest—Forested areas within temporary construction areas would naturally regenerate following construction, as the Proponent would leave roots and stumps in place following clearing in most cases, except to facilitate the movement of construction equipment where excavation would occur, or when reasonably requested by the landowner.

Permanent alterations to land use resulting from the transmission lines include the following:

- Permanent structure footprints for the transmission line support structures;
- Permanent new access roads; and
- Conversion of existing forest and woody shrubs within the maintained ROW to grasslands.

In addition to the temporary work areas and permanent land use for structure footprints and access roads, the entirety of the permanent Proposed Alternative ROW would be subject to easements limiting certain land uses and providing necessary access for the transmission line operator. The permanent ROW would occupy the following acreages (Grid United 2025a):

- Rosebud Transmission Line (Montana)—134 acres
- HVDC Transmission Line (Montana)—4,182 acres
- HVDC Transmission Line (North Dakota)—4,071 acres
- Oliver Transmission Line (North Dakota)—1,227 acres
- Morton Transmission Line (North Dakota)—511 acres

Although the permanent easements for the transmission line ROWs would not convert the underlying land use to a different land use, the easements could affect human use of land by preventing the placement of new buildings and other structures that could interfere with operations or maintenance of the transmission line. The easement could also result in periodic disruptions to agricultural or recreational activities within the ROW by the transmission line operator allowing access for inspections, vegetation maintenance, or repair activities.

Human activities expected to continue within the permanent ROW include agricultural uses such as crops and grazing; recreational access for hiking, hunting, fishing and similar uses; and continued use of driveways or roads crossed by the ROW. Although agricultural land uses would continue in the ROW, the presence of transmission structures may make it more difficult for some farm equipment to navigate and could also affect the ability of private aircraft, including those used for agricultural purposes, to travel near the ROW. This might require aircraft to alter their travel patterns and require farmers to find alternate methods for applying pesticides to crops. The Proponent sited transmission line segments in Agricultural land use areas to generally follow agricultural field edges and existing roads or utility lines.

Proposed Alternative impacts would vary by land cover category. The impacts of the Proposed Alternative on Forested land are evaluated in Section 3.13, and impacts on Wetlands and Open Water are evaluated in Section 3.6. Proposed Alternative construction would have a medium-term, direct impact on human uses of land within Grassland and Shrubland, Agricultural, and Developed land cover categories, while operations would have a permanent, direct impact. The degree of impact would vary depending upon the particular land cover category and would be mitigated as described above and in the AIMP and CMRP (Appendix E).

Existing Residential and Commercial Industrial Development

No existing structures (e.g., grain bins, sheds, barns) within 500 feet of the centerline would need to be removed for construction or operations of the Proposed Alternative. Construction and operations would not hinder continued use of these structures, although structures near

proposed impact areas may also be close to Agricultural land areas that would experience temporary disruption during construction, as discussed in Section 3.8.3.2, [Land Use and Recreation, Environmental Consequences, Proposed Alternative] Land Ownership and Land Use. Although the Proposed Alternative has been routed to avoid impacts on existing structures, if it is necessary to remove an outbuilding, the Proponent would compensate landowners for relocation or removal.

No commercial or industrial facilities are within 0.25 mile of Proposed Alternative facilities, except the Colstrip Substation (the expansion of which is included with the Proposed Alternative) and Colstrip Power Plant, which would not be disrupted by construction and operations.

As noted in Table 3.8-4, 25 residences are within 0.25 mile of the Proposed Alternative transmission lines. These residences may be subject to noise, dust, visual impacts, and road traffic during construction. Proposed Alternative operations would not disrupt or constrain continued residential land uses. Mitigations to address construction impacts include limiting the hours during which high-decibel noise levels would be permitted and minimizing exposure to fugitive dust using techniques, outlined in Section 5.6 of the CMRP (Appendix E). Visual impacts are addressed in Section 3.9, and impacts on property values are addressed in Section 3.10.

Construction and operations would have no impact on existing commercial or industrial development. Construction would have a medium-term, direct impact, and operations would have a direct, permanent, and localized impact on existing residential development.

Planned Residential and Commercial Development

County planning documents do not establish plans or policies calling for changes to existing land use patterns within the Proposed Alternative impact areas or ROW. Similarly, county plans do not call for changes to land uses adjacent to Proposed Alternative facilities. Where the Proposed Alternative ROW crosses I-94 in Morton County, North Dakota, it is adjacent to land planned for new industrial land use according to the Morton County 2045 Comprehensive Plan (Morton County 2018).

Construction and operations would have no impact on planned development.

Other Land Uses

The Proposed Alternative would not cross any active coal mining sites or active locatable mineral mining claims. Section 3.7 discusses impacts on mines and mineral resources. The Proposed Alternative could affect the closed Rosebud County landfill.

The Proposed Alternative is not anticipated to affect the Gold Creek Cellular of Montana Limited Partnership/Verizon cell tower due to its distance from Proposed Alternative impact areas. Impacts on air transportation are addressed in Section 3.10.

Recreational and Managed Lands

Private Preservation Lands

The only Proposed Alternative feature with anticipated impacts on the conservation easement held by the Montana Land Reliance is an access road near MP 53. The Proposed Alternative access road would cross the conservation easement for approximately 865 feet and be located on an existing road requiring improvements for Proposed Alternative use. Construction would have a medium-term direct impact on the conservation easement, and operations would have

a direct, permanent, and localized impact. The Proponent would collaborate with the landowner and the Montana Land Reliance to maintain use of the road and its compatibility with the easement.

Parkland (Federal, State, County)

The Proposed Alternative would not have any impact on the Theodore Roosevelt National Park in North Dakota due to the distance from the nearest proposed impact area. The Proposed Alternative would not affect other parkland.

Montana Department of Natural Resources and Conservation and North Dakota Trust Lands

There would be approximately 210.1 acres of direct and short- to medium-term impacts and 46.7 acres of direct, permanent, and localized impacts on Montana DNRC trust lands. There would be approximately 43.6 acres of direct, short- to medium-term, and localized impacts and 2 acres of direct, permanent, and localized impacts on North Dakota trust lands.
Table 3.8-10 details trust land impacts by Proposed Alternative component in both Montana and North Dakota.

Montana DNRC and North Dakota trust lands would be directly affected by construction and operations of the Proposed Alternative, including certain areas open to the public for recreation. Construction activities would result in direct, short-term, and localized impacts on users of trust lands; however, the degree of impact would vary depending on the location of the users relative to construction activities. Construction activities of the Proposed Alternative components may require users to avoid areas due to safety or site restrictions. Once these activities are completed and temporary work areas are restored, recreational activities would be allowed to resume to the degree permitted prior to construction. Additionally, recreational activities on nearby trust lands unaffected by the Proposed Alternative would remain available for users.

Operations of the Proposed Alternative would result in direct, permanent, and localized impacts on trust lands in both Montana and North Dakota; however, most recreation activities on trust lands would be able to continue. Visual resource impacts on trust lands are discussed in Section 3.9.

North Dakota Game and Fish Department Wildlife Management Areas

Project impact areas do not cross any game MAs. Similarly, the Proposed Alternative is not anticipated to directly affect the two WMAs in North Dakota discussed in Section 3.8.2.5, Recreational Resources, due to the distance from Project impact areas. Visual impacts from the Proposed Alternative on users of the WMAs are discussed in Section 3.9.

Bureau of Land Management

In Montana, the HVDC Transmission Line would cross 9.8 miles of BLM land in Rosebud, Custer, and Fallon counties, resulting in approximately 124.9 acres of direct, short- to medium-term, and localized impacts and 19.8 acres of direct, permanent, and localized impacts within the proposed impact areas (Table 3.8-11).

Where possible, the Proponent has routed the transmission lines adjacent to or near roads and other existing linear features. While the HVDC Transmission Line would avoid designated recreational resources on BLM lands, some direct impacts on users on BLM lands generally open to recreation would be expected. Construction would have short-term, localized

disruptions on recreational users and may restrict specific areas while construction activities are occurring. Once these activities are completed and work areas are restored, recreational activities would be allowed to resume to the degree permitted prior to construction. Additionally, recreational activities on nearby BLM lands unaffected by the Proposed Alternative would remain available for users.

The disruption of grazing would occur during the 3- to 4-year construction period, but because construction of transmission line segments would occur sequentially along the ROW, the disruption may not last for the full construction timeframe within BLM grazing lands along the route. Minimal vegetation clearing would be needed within rangeland areas. Upon completion of construction, the Proponent would restore disturbed areas. Restoration would include de-compacting soils and revegetating disturbed areas in accordance with Appendix E and applicable permit requirements.

Operations of the Proposed Alternative would result in direct, permanent, localized impacts on BLM lands in Montana. While most recreation activities on BLM lands would be able to continue during operations, some areas would be affected where land uses are modified for Proposed Alternative infrastructure. Visual resource impacts on BLM lands are discussed in Section 3.9.

National Forest System Lands

The HVDC Transmission Line would cross approximately 10.2 miles of NFS lands (i.e., the LMNG) in Golden Valley and Slope counties, North Dakota, resulting in approximately 107.1 acres of direct, short- to medium-term, and localized impacts and 3.8 acres of direct, permanent, and localized impacts within the Proposed Alternative (Table 3.8-12).

Where possible, the Proponent sited the HVDC Transmission Line on NFS lands to follow existing linear structures. Areas of the LMNG crossed by the HVDC Transmission Line that are within the Rangeland with Diverse Natural-Appearing Landscapes are generally previously disturbed or contain existing roads and trails. Disturbances within these areas are generally consistent with the management area standards for special uses. There are no special standards or guidelines related to utilities crossing lands within the Rangeland with Broad Resource Emphasis management area of the LMNG. Impacts due to grazing and recreation on NFS lands would be mitigated in a manner similar to those on BLM lands.

Construction activities would result in direct, short-term, and localized impacts on USDA Forest Service land users. Once these activities are completed and work areas are restored, recreational activities would be allowed to resume to the degree permitted prior to construction. Additionally, recreational activities on nearby NFS lands unaffected by the Proposed Alternative would remain available for users.

Operations of the Proposed Alternative would result in direct, permanent, and localized impacts on NFS lands in North Dakota. While most recreation activities on NFS lands would be able to continue during operations, some areas would be affected where land uses are modified for Proposed Alternative infrastructure. Visual resource impacts on NFS lands are discussed in Section 3.9.

U.S. Department of Agriculture, Agricultural Research Service Lands

The HVDC Transmission Line would cross 7.9 miles of USDA ARS land in Custer County, Montana, resulting in approximately 71.3 acres of direct, short- to medium-term, and localized

impacts and 17.9 acres of direct, permanent, and localized impacts within the Project impact areas (Table 3.8-13).

Construction of the HVDC Transmission Line would result in direct, short-term, and localized impacts on lands in Fort Keogh. Areas within Fort Keogh where construction activities would occur would be temporarily unavailable for rangeland management or other desired activities. The Proponent has coordinated with the USDA ARS to site Project components in areas where impacts on research activities would be limited. Impacts from operations would be direct, permanent, and localized to areas where Project components would alter existing land uses within Fort Keogh. While some areas would have permanent restrictions on use, general research activities occurring on USDA ARS lands and other grazing activities would be permitted to continue.

Scenic Rivers

The HVDC Transmission Line crosses the Little Missouri River in Slope County, North Dakota, at approximately MP 187.5. Primary impacts from construction and operations on scenic rivers would be related to visual, which are discussed in Section 3.9. There may be direct, short-term, and localized impacts on the recreational activities on the Little Missouri River from temporary construction activities, which would resume as normal during operations.

3.9. VISUAL AND AESTHETICS

This section describes the analysis methods, affected environment, and impacts on visual and aesthetics from the Project.

3.9.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on visual and aesthetics.

3.9.2. Affected Environment

This section describes baseline conditions for visual and aesthetics.

Visual resources encompass all visible physical features within a landscape that shape its aesthetic character and scenic value. These elements form a visual display that includes both natural and human-made components. The interplay of colors, textures, and forms from natural and built elements contributes to the viewers' experience.

The Project traverses the Eastern Plains physiographic region, which encompasses vast expanses of relatively flat to rolling terrain with elevations ranging from 3,000 to 5,500 feet above sea level. The visual and aesthetics analysis area exhibits the characteristic features of the Eastern Plains, including broad valleys carved by major river systems, badlands formations with striated buttes and plateaus, and areas of dense vegetation along watercourses. The topography exhibits a subtle but consistent eastward slope, descending gradually from the mountain foothills toward the Mississippi River basin. Table 3.8-1 in Section 3.8, Land Use and Recreation, lists the length of land crossed by the transmission line by county.

3.9.2.1. Regulatory Framework

VRM requirements vary by land ownership and managing agency across the Project area. The following sections describe the applicable regulations for visual resources.

Bureau of Land Management

The BLM manages visual resources through its VRM system, which classifies lands into four categories based on scenic quality, viewer sensitivity, and viewing distance (BLM 1986) (Appendix A details BLM VRM classes and objectives). The HVDC Transmission Line crosses a total of 9.7 miles of BLM land: 1.0 mile on BLM VRM Class II lands, 2.3 miles on BLM VRM Class III lands, and 6.8 miles on VRM Class IV BLM land. Other Project features (e.g., temporary and permanent access roads, access turnaround areas, guard structure pads, pulling/tensioning sites, structure footprints, and structure pads) total 164.9 acres on BLM land: 31.7 acres on BLM VRM Class II land, 27.2 acres on BLM VRM Class III land, and 106.0 acres on BLM VRM Class IV land (Table 3.9-1). The Miles City Field Office 2015 RMP (as discussed in Section 3.8.2.1, [Land Use and Recreation] Land Ownership and Management) provides specific guidance for visual resource protection on BLM-administered lands, emphasizing that major ROWs should be sited in areas where land use authorizations are allowed. BLM VRM classes for lands crossed by the Project are shown on Figure 3.9-1 and in Table 3.9-1 using the VRM Class data provided by the BLM Miles City Field Office (BLM 2025).

U.S. Department of Agriculture Forest Service

The LMNG manages scenic resources through the Scenery Management System as outlined in the LRMP (USDA Forest Service 2001). Management activities must align with scenic integrity objectives per the LRMP standards and guidelines, which vary by MA (Appendix A includes

more information about compliance with the LRMP). For the Rangelands with Diverse Natural-Appearing Landscapes (MA 3.65), which encompass 3.1 miles of the Project, scenery management standards and guidelines require managing the area to encompass the scenery integrity objectives. For the Rangelands with Broad Resource Emphasis (MA 6.1), which encompass 7.1 miles of the Project, the guideline is to manage the area to meet scenic integrity objectives of Moderate and Low.

Chapter 1 (Section P) of the LRMP provides standards and guidelines applicable to transmission lines, requiring that new overhead power lines be routed to minimize visual impacts and conform to approved corridors. When facilities leave corridors, they should be subordinate to the landscape. Night facility lighting must be designed to minimize light pollution, with continuous or dusk-to-dawn lighting limited, except facilities for flight safety or with staffed operations.

State and Private Lands

Montana and North Dakota have no formal guidelines for managing visual resources on private or state-owned lands. Therefore, the analysis applies BLM and USDA Forest Service VRM guidance methodologies to the Project (regardless of land ownership or management) to provide consistent assessment across the Project area.

3.9.2.2. Inventory Methods

Visual resource inventory methods involved comprehensive approaches to document baseline conditions throughout the Project area. The inventory process began with desktop analysis of existing reports, management plans, and geospatial data to understand the regulatory context and identify sensitive visual resources. Satellite imagery was reviewed to identify landscape patterns, visual characteristics, and potential viewing locations across the visual and aesthetics analysis area.

Field surveys were conducted between August 5 and 8, 2024, and March 25 and 27, 2025, to capture seasonal variations and document visual conditions. During these surveys, field teams photographed baseline conditions from selected key observation points (KOPs) representing sensitive viewing locations. The field documentation focused on capturing the characteristic landscape elements, existing visual modifications, and viewing conditions that would influence the impact assessment.

Viewing distances were categorized to reflect the open landscape character of the geographic region. Foreground views encompass areas from 0 to 0.5 mile, where details of individual landscape elements are clearly visible. Middleground views extend from 0.5 to 4 miles, where landscape patterns and general forms are distinguishable. Background views include areas beyond 4 miles to the horizon, where only broad landscape masses and skyline features are perceptible.

The KOP selection process prioritized comprehensive representation of sensitive visual resources. All BLM VRM Class II areas received KOP coverage due to their high scenic value. USDA Forest Service Scenery Management System Moderate areas were similarly prioritized for representation. State-designated scenic resources, including the Little Missouri State Scenic River and scenic highways, were documented from representative viewpoints. High-use recreational areas and locations with concentrated viewer populations were included in the

analysis. This selection process resulted in 14 KOPs distributed throughout the Project area to capture the range of viewing conditions and landscape contexts.

3.9.2.3. Analysis Area Landscape Characteristics

The visual and aesthetics analysis area encompasses diverse landscape characteristics that reflect the transition from badlands to prairie environments across the Eastern Plains physiographic region.

Montana Segment

The Montana portion of the Project area is characterized by dramatic badlands formations typical of the region. Generally, lands within the badlands geographic area feature intricately dissected drainages and draws dropping from grassy ridgelines or butte-like hills and color-banded mounds typical of a badlands landscape. Large slumps and earth flows typical of a highly erodible landscape can also be identified throughout the area. Small inclusions of rolling prairie are also typical of this geographic area.

Vegetation patterns reflect the arid climate and varied topography. Open areas support grassland communities dominated by buffalo grass, blue grama, and western wheatgrass. Shrub communities include sagebrush, yucca, and prickly pear cactus. Woody vegetation is largely confined to protected locations, with cedars and other conifers growing on north-facing slopes and in sheltered draws. Major watercourses, particularly the Powder River and its tributaries, support dense riparian corridors of cottonwoods that create visual contrast with the surrounding uplands.

North Dakota Segment

East of the Little Missouri River, the landscape transitions to the gentler topography characteristic of the rolling prairie geographic area. Lands within this area are described as nearly level to rolling hills with some inclusions of scattered buttes and badlands landscapes. The transition from rugged badlands to rolling prairie occurs gradually, with isolated badlands features becoming less frequent eastward.

Agricultural land use increasingly dominates the landscape in North Dakota, with cultivated fields replacing native rangeland. Row crops and pastures create geometric patterns that contrast with the organic forms of remaining native landscapes. Shelterbelts and farmsteads introduce vertical elements into the predominantly horizontal landscape. The continuous band of cottonwoods along the Little Missouri River remains a defining landscape feature, creating a green corridor through the otherwise open terrain.

Existing Visual Modifications

Human modifications have altered the natural landscape character throughout the Project area. Existing electrical transmission and distribution lines create linear features with vertical structures like those proposed by the Project. Transportation infrastructure, including I-94, US 12, and numerous state and county roads, introduces linear corridors across the landscape. Agricultural operations have converted native landscapes to geometric field patterns. Oil and gas infrastructure, including wells, storage facilities, and access roads, create localized industrial intrusions. Rural residences and small communities introduce built elements into the natural landscape. These existing features have established a modified visual context in many areas, particularly near major transportation corridors and in agricultural regions.

3.9.3. Environmental Consequences

The impacts on visual and aesthetics are discussed in the following sections.

3.9.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on visual and aesthetics, as the Project would not be built.

3.9.3.2. Proposed Alternative

Short-term and medium-term visual and aesthetics impacts during construction would persist across the approximately 3- to 4-year construction period. Construction activities would create direct, localized, medium-term visual disturbances as work progresses along the transmission line ROW. Heavy equipment operations, including cranes, excavators, and specialized conductor stringing equipment, would introduce industrial elements into the rural and natural landscapes. These machines would be prominent when working on elevated terrain or when viewed from elevated observation points.

Vegetation-clearing activities would create immediate visual changes, particularly in forested areas and along river corridors. The removal of mature cottonwoods and other trees would open views previously screened by vegetation, potentially exposing viewers to construction activities over greater distances. Temporary impact areas extending beyond the permanent ROW would expand the zone of visual disturbance during construction.

Access road construction and improvement would create a network of visual disturbances extending from the main ROW. New temporary roads would require grading and vegetation removal, creating linear features across previously undisturbed landscapes. The improvement of existing roads may involve widening, surface treatments, and drainage modifications that alter their visual character. Dust generation from earth-moving activities and vehicle traffic would create atmospheric impacts visible over considerable distances, particularly during dry conditions. This dust would temporarily reduce visibility and alter the color and clarity of views. Temporary access roads would result in direct, short-term or medium-term impacts on visual and aesthetics.

Material storage areas and equipment staging zones would create concentrated areas of industrial activity. These facilities would typically occupy 20-acre sites for contractor laydown yards and 5-acre sites for helicopter landing pads. The accumulation of materials, vehicles, and structures at these locations would create visual contrast with surrounding landscapes, and this impact would be short-term and direct.

Permanent visual and aesthetics impacts during operations would persist throughout the Project's operational life. These permanent changes would fundamentally alter the visual character along the 422-mile ROW.

The transmission line structures would introduce prominent vertical elements into predominantly horizontal landscapes. The monopole steel structures would be the dominant structure used. They range from 110 to 195 feet in height and would be placed at average intervals of 1,200 feet. This regular spacing would create a rhythmic pattern extending across viewsheds, drawing the eye along the corridor. The self-weathering steel finish would initially appear dark and industrial but would develop a rust-brown color over time that may blend with earth tones in the landscape. Lattice structures would generally be used in topographically

challenging areas with limited access, where the turning angle is between 2 and 8 degrees and/or the structure height is greater than 165 feet for the Rosebud Transmission Line, 180 feet for Morton and Oliver Transmission Lines, or 175 feet for the HVDC Transmission Line. The dulled, galvanized steel finish would typically be used on the lattice structures.

Conductor lines strung between structures would create horizontal lines at multiple levels, forming a geometric pattern against the sky. These lines would be most visible when backlit by bright skies or when viewed as perpendicular to their alignment. The regular sag patterns between structures would create a distinctive pattern across the landscape. The transmission lines would result in permanent impacts on visual and aesthetics.

Within the ROW, vegetation management would maintain a permanently altered landscape condition. Tall-growing vegetation would be removed and prevented from regrowth, creating linear corridors through altered forested areas. These isolated forested areas would be prominent at river crossings, where breaks in cottonwood groves would disrupt the continuous riparian corridors that currently comprise these landscapes. The maintained ROW would support only low-growing herbaceous and shrub communities, creating textural and color contrasts with adjacent undisturbed vegetation. Vegetation clearing and conversion would result in permanent impacts on visual and aesthetics.

Permanent access roads would create a network of linear features extending from existing road systems to structure locations. These 25-foot-wide roads would require ongoing maintenance, allowing for their continued visibility. In previously roadless areas, these access roads would introduce new patterns of human activity and associated visual disturbances from maintenance vehicles. Permanent access roads would result in direct, permanent impacts on visual and aesthetics.

The converter stations and switchyard would create concentrated areas of industrial development within rural landscapes. The Rosebud County Converter Station would occupy 39.4 acres, including 32.4 acres of existing open land and 7.0 acres of forested land. The Morton County Converter Station would encompass 24.2 acres of agricultural land, while the Morton County Switchyard would occupy 4.3 acres of agricultural land. These facilities would include large electrical equipment, control buildings, security fencing, lighting systems, and gravel-surfaced operational areas. The vertical elements and geometric forms of these installations would create contrast with surrounding natural and agricultural landscapes. Fiber repeater stations distributed along the ROW would create smaller but distinguishable visual intrusions. Each station's 12-foot by 12-foot building; along with associated access roads, power supply lines, backup generators, and fuel storage tanks; would introduce clusters of built elements into otherwise undeveloped areas. The various facilities would result in permanent impacts on visual and aesthetics.

The footprint of the existing approximately 22.2-acre Colstrip Substation would be expanded by approximately 4.2 acres to the northwest and approximately 9.0 acres to the south and east, for an approximate total footprint of 35.4 acres. The substation would be modified to include two new 500-kV bays and upgrades of the electrical components on site to accommodate a 5,000-amp rating. The expansion of the facility would include additional switching equipment, protection and control elements, support infrastructure, and auxiliary systems. Vertical elements and geometric forms of these installations would expand the amount of area that

contrasts the rural landscape surrounding the town of Colstrip. The expansion of the Colstrip Substation would have a direct, permanent visual impact on the area, which would likely be minimal, as it is an expansion of the existing station and not a new feature on the landscape.

Viewshed analysis was conducted within 20 miles of the structures on a bare-earth model, assuming a structure height of 195 feet and a 6-foot-tall viewer (Figure G-1 in Appendix G). While there are portions of the Project that could be seen up to 20 miles away under ideal conditions, most of the visual and aesthetics impacts would be within 3 miles of the Project (Appendix G). This would mostly correspond with the foreground and middleground viewpoints.

Within Montana, the undulating landscape of buttes and badlands limits full views of multiple structures to a narrow area close to the Project ROW. North Dakota has less topographic variability compared to the Montana Project area, allowing for more of the Project structures to be visible and from a farther distance. Elevated views from buttes, hillsides, and ridgelines are possible across the 20-mile visual and aesthetics analysis area, allowing for partial views of the Project.

Figure G-2 in Appendix G shows the degree of change in Project visibility, with dark red along the Project ROW depicting high visibility. The light orange depicts lower visibility of the Project as terrain screens full and direct views of the structures. The Project would be highly visible on the east side of Colstrip, Montana, due to the surrounding hills, and it would quickly become less visible to viewers and residents to the north along Highway 39. The Project would be clearly visible within the immediate vicinity of the Powder River crossing in Montana and the slopes to either side of the floodplain, but structures would become less visible as the terrain screens views. The Little Missouri River crossing in North Dakota is surrounded by steep slopes and a meandering floodplain, which limit views to the immediate vicinity. Conversely, east of U.S. Route 85 (US 85) and near North Dakota Highway 21 (ND 21), the distance of direct visual and aesthetics impacts increases, as the landscape is flat and open with several buttes to the south, providing additional elevated views of the Project. Direct views include a wider area near the Morton County Converter Station southwest of Bismarck, North Dakota (Figure G-2 in Appendix G).

Visual and aesthetics impacts were assessed at 14 KOPs distributed along the Project ROW. Table 3.9-2 summarizes each KOP location and indicates if visual contrast rating worksheets (Appendix G) were completed for each KOP. The simulations (Appendix G) provided at each KOP show direct, permanent impacts both locally and regionally across the views.
Figure 3.9-1 shows the KOPs within Montana that are near the Project where it crosses BLM parcels and if that BLM parcel is a BLM VRM II, VRM III, or VRM IV Class.

The simulations show that viewing distances, topographic screening, or the presence of similar existing infrastructure reduce the visual prominence of Project features. When the Project is in the middleground with partial screening, visual contrast decreases. Where the Project crosses scenic resources (the Enchanted Highway), is within foreground viewing distances without screening (locations where the transmission line would parallel US 12 at close distances), and introduces industrial elements into high-quality natural landscapes (multiple viewpoints at BLM VRM Class II lands), the Project would have a high visual contrast to the existing landscape.

The Project incorporates comprehensive mitigation measures to reduce visual and aesthetics impacts where feasible. Vegetation clearing would be minimized by limiting activities to the necessary ROW width for safe construction and operations. Structure placement strategies include maximizing spans to reduce the total number of structures, setting structures back from road crossings and sensitive viewpoints where topography allows, and using perpendicular alignments at road and river crossings to minimize the duration of views.

Route selection has prioritized paralleling existing linear infrastructure to avoid creating new visual corridors. Where the Project must cross undisturbed landscapes, routes follow natural topographic features to reduce prominence. The use of self-weathering steel or other appropriate finishes helps structures blend with earth tones over time.

Where feasible, operational practices would maintain existing vegetation outside of the required clearance zones and schedule maintenance activities to avoid peak recreation seasons. Coordination with land management agencies would continue throughout the design process to refine structure placement, identify site-specific mitigation opportunities, and ensure compliance with visual resource objectives.

3.10. SOCIOECONOMICS

This section describes the analysis methods, affected environment, and impacts on socioeconomics from the Project.

3.10.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on socioeconomics.

3.10.2. Affected Environment

This section describes baseline conditions for socioeconomics.

3.10.2.1. Population

Table 3.10-2 provides a summary of the U.S. Census Bureau 2010 and 2020 population statistics for each county in the socioeconomic analysis area.

The Project facilities in Montana are in Rosebud, Custer, and Fallon counties, which are rural counties with population densities of 3.1 people per square mile or lower, substantially less than the statewide population density. Rosebud County's population declined by almost 10 percent between 2010 and 2020; the population of Custer and Fallon counties increased at a lower rate than the statewide population. There are two incorporated municipalities in each of the three counties; the largest is Miles City in Custer County (2020 population of 8,354), which accounted for most of the county's residents (U.S. Census Bureau 2024; Montana State Library 2025). Rosebud County, which contains the Rosebud County Converter Station and Colstrip Substation, has two towns (Colstrip and Forsyth) that are centers of population and public services.

The larger socioeconomic analysis area in Montana is rural; most of the counties (Carter, McCone, Powder River, Prairie, and Treasure) have populations of less than 2,000, with population density less than 1 person per square mile. Dawson County has a higher population density due to the city of Glendive and the adjacent unincorporated community of West Glendive, which together provided about three-fourths of Dawson County's 2020 population (8,940). Much of Big Horn County, the sixth largest county in Montana, is within the Crow Reservation and part of the Northern Cheyenne Reservation. Big Horn County's population is distributed among towns that include Hardin, Dunmore, Crow Agency, and Lodge Grass.

Population in the North Dakota socioeconomic analysis area is concentrated in the cities of Bismarck, Mandan, and Dickinson. The Project facilities in North Dakota are in six counties (Golden Valley, Grant, Hettinger, Morton, Oliver, and Slope) that include 19 incorporated municipalities (North Dakota GIS 2025). With the exception of Morton County, the counties are rural with population densities substantially lower than the statewide average. These counties experienced small population increases or decreases between 2010 and 2020. Morton County (population of 33,291) has a population density greater than the North Dakota average and experienced 17.5 percent growth between 2010 and 2020. The city of Mandan accounts for most of Morton County's population and 2010 to 2020 population increase. Mandan's population increased from 18,331 in 2010 to 24,206 in 2020 (U.S. Census Bureau 2024).

The socioeconomic analysis area includes five North Dakota counties without Project facilities. Two rural counties, Adams and Bowman, decreased in population from 2010 to 2020; Dunn County, also primarily rural, had moderate population growth. Burleigh and Stark counties

experienced significant population growth. Burleigh County contains the city of Bismarck, the state capital and the state's second most populous city. It had 21 percent population growth from 2010 to 2020. Most of the population of Stark County is in the city of Dickinson, which had a 2020 population of 25,679; the county's population grew by 39 percent from 2010 to 2020.

The socioeconomic analysis area also includes three counties south of Project facilities in Wyoming and South Dakota. Parts of these counties are within the potential commuting distance for Project workers. Harding and Perkins counties in South Dakota have population levels and density similar to the rural Montana and North Dakota counties. Sheridan County in Wyoming is more densely populated, with most of the county population in and near the town of Sheridan.

3.10.2.2. Economy, Employment, and Income

Employment statistics by industry are from the U.S. Census Bureau's 2019–2023 American Community Survey 5-year estimates (U.S. Census Bureau 2025a). Unemployment statistics detailed are from the U.S. Bureau of Labor Statistics. These statistics are the most recent data available.

Table 3.10-3 provides 2023 average labor statistics for the counties in the socioeconomic analysis area, including civilian labor force, employed, unemployed, and the unemployment rate.

The greatest civilian labor force in the socioeconomic analysis area is in Burleigh, Morton, and Stark counties, North Dakota, concentrated in and around the cities of Bismarck, Mandan, and Dickinson. In Montana, the labor force is dispersed throughout the rural socioeconomic analysis area, with modest concentrations in towns in Big Horn, Custer, Dawson, and Rosebud counties. The 2023 unemployment rates were generally low (1.6 to 4.1 percent) and did not vary substantially between socioeconomic analysis area counties or between those counties and the statewide unemployment rate. The unemployment rates were highest for Big Horn County, Montana (4.1 percent), and Oliver County, North Dakota (3.4 percent); 21 of the 24 counties in the socioeconomic analysis area were under 3 percent.

Table 3.10-4 provides data on employment by industry. The sector that includes agriculture, forestry, and mining employs the greatest percentage of the employed labor force in much of the rural socioeconomic analysis area: Carter, Custer, McCone, Powder River, Prairie, and Treasure counties, Montana; Bowman, Dunn, Hettinger, and Slope counties, North Dakota; and Harding and Perkins counties, South Dakota. The oil and gas industry is a major source of employment in this sector. The job sector that includes educational services, health care, and social assistance employs the second highest percentage of workers in these counties, the highest percentage of workers in the other counties in the socioeconomic analysis area, and the highest number of workers overall in the counties that contain Project facilities. Construction workers make up 5 to 12 percent of the employed workforce in socioeconomic analysis area counties.

Major employers in the socioeconomic analysis area include the oil and gas industry, mining companies, utilities and energy providers, and healthcare providers (Montana Department of Labor and Industry 2021; Job Service North Dakota 2021). The eastern portion of the socioeconomic analysis area in North Dakota (including Burleigh, Grant, Morton, and Oliver

counties) has a larger share of jobs in health care and social assistance, retail trade, public administration, and educational services.

3.10.2.3. Housing

The counties in the socioeconomic analysis area had an estimated total of 126,228 housing units in 2023, of which 16,490 units were vacant (Table 3.10-5; U.S. Census Bureau 2025b). The rental vacancy rates in North Dakota range from a low of 0 percent in Slope County to a high of 25.7 percent in Bowman County. Rental vacancy rates in Montana range from a low of 0 percent in Treasure County to a high of 17 percent in Fallon County.[16]

Regional centers of housing in southwestern North Dakota are the cities of Bismarck, Mandan, and Dickinson in Burleigh, Morton, and Stark counties, respectively. These counties have rental vacancy rates of 6.4 to 8.9 percent. The housing supply is smaller in the Montana portion of the socioeconomic analysis area. Most of the available housing units are in towns in Big Horn, Custer, Dawson, and Rosebud counties, with rental vacancy rates from 0.2 percent in Dawson County to 7.9 percent in Rosebud County. Sheridan County, Wyoming, has housing in the town of Sheridan, approximately 100 miles south of the Project facilities in Colstrip.

The southwestern North Dakota counties in the socioeconomic analysis area are in the 19 oil- and gas-producing counties where industry growth was anticipated to produce population- and housing-growth pressures (KLJ, Inc. 2014). The Roosevelt Custer Regional Council identified housing shortages, housing affordability, workforce availability, and a shortage of construction contractors as interrelated challenges facing the area that includes Adams, Billings, Bowman, Dunn, Golden Valley, Hettinger, Slope, and Stark counties (Roosevelt Custer Regional Council 2024). The North Dakota Rural Housing Development Task Force is seeking to facilitate new housing investment to address North Dakota's rural housing shortage (North Dakota Rural Housing Development Task Force 2022).

Since 2022, the Montana Governor's Housing Task Force has worked to address statewide constraints on housing availability and affordability. Task force reports detail issues such as lack of construction labor, falling rental vacancy rates, and increasing rents (Montana Budget and Policy Center 2024).

Table 3.10-6 provides conservative estimates of transient housing supply in the socioeconomic analysis area (hotels, motels, and recreational vehicle [RV] campgrounds). Clusters of hotels and motels within commuting distance of Project facilities in Montana are located in and around Miles City and West Miles City (Custer County) and Glendive (Dawson County), as well as small clusters in Baker (Fallon County) and Forsyth (Rosebud County). In North Dakota, clusters of hotels and motels are found in Bismarck (Burleigh County), Mandan (Morton County), Dickinson (Stark County), and Bowman (Bowman County). RV campgrounds provide additional transient housing options in rural areas, especially in Big Horn County, Montana, and Oliver County, North Dakota.

In total, the socioeconomic analysis area has at least 1,300 hotel/motel rooms in Montana, at least 1,000 in North Dakota outside of Burleigh County, and at least 2,900 in Burleigh County,

[16] The number of vacant units is higher than indicated by the vacancy rate primarily because some vacant units are used for only part of the year, so they may be unoccupied but not available for rent. It also can result from units that are under renovation or are newly built and not yet listed for sale or rent.

North Dakota. Sheridan County in Wyoming has approximately 300 rooms. Perkins County in South Dakota has approximately 40 rooms. In addition, over 1,000 RV campsites are located within the entire socioeconomic analysis area.

3.10.2.4. Public Services and Facilities

Table 3.10-7 summarizes public services in the socioeconomic analysis area.

Medical Services

As listed in Table 3.10-7, an inpatient hospital is available in five of the counties that contain Project facilities, providing a total of 191 beds in Montana and 76 beds in North Dakota. An additional 11 hospitals are available in other socioeconomic analysis area counties. Most of the hospitals are rural, critical access facilities providing 25 to 35 beds. Larger facilities are in Bismarck and Mandan, North Dakota, and Miles City and Rosebud, Montana. All of the hospitals provide outpatient medical services and clinics, and some provide services such as home-based care and long-term care.

The following descriptions of services are provided by the medical networks with a hospital in counties that would contain Project facilities. Patients who require types of care not available at these hospitals are transferred to larger medical facilities. The nearest facilities that patients are likely to be transferred to are in Billings, Montana; Bismarck, North Dakota; or Rapid City, South Dakota (FMC 2025):

- The Fallon Medical Complex, based in Baker, Montana, provides a 25-bed hospital and primary care, long-term care, dental services, home-based skilled and personal care, and physical or occupational therapy. It serves Fallon, Carter, Wibaux, and part of Custer counties, Montana; and Slope, Golden Valley, and part of Bowman counties, North Dakota (FMC 2025).
- Holy Rosary Healthcare in Miles City, Montana, provides a 109-bed hospital and primary, walk-in, and ob-gyn services. It is part of the Intermountain Health network (Intermountain Health 2025; AHD 2024b).
- Rosebud Health Care Center in Forsyth, Montana, provides a 57-bed hospital, an emergency room staffed by a registered nurse, a rural health clinic, and a long-term nursing care facility (Rosebud Health Care Center 2022; AHD 2024c).
- Jacobsen Memorial Hospital Care Center in Elgin, North Dakota, has a 35-bed hospital, outpatient services, and primary care services.
- Vibra Hospital of the Central Dakotas in Mandan, North Dakota, has a 41-bed hospital, outpatient services, and rehabilitation and support services (Vibra Hospital of the Central Dakotas Undated; AHD 2024d).
- CHI St. Alexius Health Hospital in Dickinson, North Dakota, is a 25-bed hospital providing emergency care with a Level IV Trauma Center, acute care services, and other services (AHD 2024a).

Fire Departments

Fire protection in the socioeconomic analysis area is provided primarily by volunteer fire departments. Montana and North Dakota fire protection districts cross county and municipal lines. Table 3.10-7 provides the approximate number of fire stations located in each county. Counties may also be served by fire companies associated with fire protection districts that partly cross the county but have their fire station located in a neighboring county. Fire stations

include those serving cities or larger towns (such as Mandan in Morton County, Dickinson in Stark County, and Colstrip in Rosebud County), as well as rural fire departments with fire stations serving a large area.

Law Enforcement Agencies

Montana and North Dakota have State Highway Patrols that enforce traffic, vehicle, and driver regulations on state highways; investigate traffic crashes; assist other law enforcement agencies; and help motorists in need (Montana Department of Justice Undated; North Dakota Highway Patrol 2025). The primary law enforcement agencies in the socioeconomic analysis area are sheriff's offices for each county and municipal police departments in some municipalities.

In Montana, as of 2022, there were 6 full-time and 14 part-time or reserve officers in the Custer County Sheriff's Office. The Fallon County Sheriff's Office had 4 full-time officers, and Rosebud County Sheriff's offices had 14 full-time law enforcement officers (Montana Board of Crime Control 2023). Municipal police departments exist in Colstrip (Rosebud County) with 6 officers; Miles City (Custer County) with 17 officers, Baker (Fallon County) with 4 officers, and Glendive (Dawson County) with 5 officers.

In addition to the county sheriff's offices, most of the North Dakota counties in the socioeconomic analysis area (including Bowman, Burleigh, Dunn, Grant, Morton, Oliver, and Stark) have one or two municipal police departments (North Dakota Government Undated).

Schools

Table 3.10-7 lists the number of public schools in each county in the socioeconomic analysis area. School districts in North Dakota cross county lines, while school districts in Montana are located within a single county.

Montana counties in the socioeconomic analysis area have between 3 and 15 public schools per county (Montana Office of Public Instruction 2025a, 2025b, 2025c). Custer County has ten public schools, including six schools in Miles City and four in other areas of the county. Fallon County's seven schools include three in Plevna and four in Baker, divided by grade. Rosebud County's 15 public schools include 3 schools in Colstrip, 3 in Forsythe, 3 in Rosebud, and 6 in other parts of the county.

North Dakota has between one and four public schools in most of the counties containing Project facilities; Burleigh, Morton, and Stark have greater numbers of schools due to the higher populations in and around Dickinson, Mandan, and Bismarck (North Dakota Department of Public Instruction 2024). The public schools in Slope, Hettinger, Grant, and Oliver counties provide pre-kindergarten through 12th grade. Golden Valley County has one high school (grades 7 through 12) and two schools for younger students. Several counties have schools serving the elementary, middle, or high school grades in the more densely populated areas and schools for a wider range of grades in the rural areas. Many of the school districts in North Dakota provide both virtual and in-person schools. As school districts in North Dakota cross county lines, portions of the North Dakota socioeconomic analysis area may be served by schools in neighboring counties.

3.10.2.5. Taxes and Revenues

Property taxes and federal or state shared revenues are the largest contributors to county revenues. The primary funding sources for state and local services in Montana include transfer funds from the federal government, property taxes, income taxes, fees/licenses, and selective goods and services taxes (on items that include tobacco, alcohol, lodging, and fuel). Property taxes make up approximately 40 percent of state and local tax revenues (Montana Budget and Policy Center 2023). Approximately 82 percent of property tax revenues are directed toward local governments and school districts. The State of Montana receives the remaining 18 percent of property taxes through statewide mills.

North Dakota is similar to Montana in funding sources. There are two types of property taxes in North Dakota: real property and centrally assessed property. For real property—land and permanent assets such as buildings—the counties assess the value of the property, collect the property taxes, and distribute it to taxing authorities. Centrally assessed property includes railroads, investor-owned public utilities, pipelines, and airlines. The North Dakota State Board of Equalization determines the value of these assets and certifies the value to each county. The counties determine the tax due based on the various mill levies, collect, and distribute the taxes.

The property of rural electric cooperatives is subject to generation, distribution, and transmission taxes (NDCC § 57-33.2). The taxes are in lieu of property taxes on all property other than land owned and used by a company in the operation and conduct of the business of generation or delivery of electricity through distribution or transmission lines. Other companies engaged in electric generation, distribution, and transmission may file an irrevocable election to be taxed under NDCC § 57-33.2 and exempt from ad valorem taxation under NDCC § 57-06 (North Dakota Office of State Tax Commissioner 2024).

Table 3.10-8 lists revenue sources for the most recent available year for the counties containing Project facilities. The table does not include revenue sources for counties in the socioeconomic analysis area not containing Project facilities because they are not anticipated to receive revenue from Project construction or operations.

3.10.2.6. Transportation

Roads

The Project facilities are located south of I-94, which is a four-lane, median divided, limited access highway. The 525-kV HVDC Transmission Line is roughly parallel to and 10 to 50 miles south of I-94. The 345-kV Oliver Transmission Line from the Morton County Converter Station to the Oliver County Substation would cross I-94. The next closest interstate is Interstate 90 (I-90), which connects with I-94 in Billings, Montana, approximately 100 miles west of the Project. U.S. Route 212 (US 212) and US 12 are major east-to-west routes south of the Project. US 212 and US 12 are two-lane, paved roads with paved shoulders and at-grade intersections with local roads.

State highways in Montana providing access to the Project area include MT 39, Montana Highway 59 (MT 59), and MT 7. These are north-to-south routes connecting municipalities and communities between US 212 and I-94 and crossing the Project's HVDC Transmission Line.

In North Dakota, north-to-south road connections from US 12 to I-94 that cross the HVDC Transmission Line include US 85 and five North Dakota highways, listed from west to east:

North Dakota Highway 22 (ND 22), North Dakota Highway 8 (ND 8), North Dakota Highway 49 (ND 49), North Dakota Highway 31 (ND 31), and North Dakota Highway 6 (ND 6).

The state routes in Montana and North Dakota are two-lane, paved roads with narrow or no shoulders. County roads provide additional transportation routes between the state highways. The county roads include both paved and unpaved roads with varied surface conditions.

The number of roadway crashes reported in Montana from 2011 through 2020 varied from year to year but generally increased through 2019 then decreased in 2020. The number of crashes appears to be correlated to the measures of vehicle miles traveled (VMT); over 62 percent of crashes were in rural areas.

In 2020, Montana had a relatively high traffic accident fatality rate, with 1.76 fatalities per 100 million VMT as compared to the national average of 1.34 fatalities per 100 million VMT. Fatal crashes were far more likely to occur in rural areas, with 198 of 212 fatalities occurring in rural areas in 2020 (MDT 2022).

In North Dakota, roadway crashes have decreased most years between 2014 and 2023. In 2023, North Dakota had 10,475 recorded crashes and 106 fatalities. Additionally in 2023, North Dakota had 1.07 fatalities per 100 million VMT, a rate lower than the 2023 national average of 1.26 (NDDOT 2024).

Rail

In Montana, the Project's HVDC Transmission Line would cross a rail line identified by the Montana Department of Transportation as an unused BNSF Railway line. An operating rail line is located north of the Project, parallel to I-94 (MDT 2024).

In North Dakota, the operating BNSF rail line is parallel to I-94. The 345-kV Oliver Transmission Line from the proposed Morton County Converter Station to the proposed Oliver County Substation would cross this line near I-94 (NDDOT 2021).

Airports

The following airports and airstrips identified by the Federal Aviation Administration and the Proponent are located within approximately 5 miles of Project facilities (FAA 2019):

- Private airstrip (Johny Creek Airstrip) in Fallon County, approximately 0.4 mile north of the 525-kV HVDC Transmission Line northeast of Baker (cleared grass area with no paved runway)
- Colstrip Airport in Rosebud County on Airport Road, approximately 3 miles southwest of Colstrip and about 4.2 miles east of the Colstrip Substation
- Baker Municipal Airport in Fallon County on Airport Road south of Baker, 1 mile south of US 12 and about 3.6 miles south of the HVDC Transmission Line
- Private airstrip in Hettinger County, approximately 1.2 miles south of the 525-kV HVDC Transmission Line (cleared grass area with no paved runway)
- Z P Field Airstrip in Morton County, approximately 1.6 miles west of the Oliver Transmission Line west of Mandan (cleared grass area with no paved runway; C. Jones, Pers. Comm., July 2025)
- Landeis Airstrip, north of I-94 near interchange with North Dakota Highway 25 (ND 25), west of Mandan and about 2.5 miles east of the Oliver Transmission Line (cleared grass area with no paved runway)

3.10.3. Environmental Consequences

The impacts on socioeconomics are discussed in the following sections.

3.10.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on socioeconomics, as the Project would not be built.

3.10.3.2. Proposed Alternative

Population

The Proponent estimates a construction period of 3 to 4 years with a peak temporary workforce of 800 workers. The construction workforce would consist of an estimated 150 workers at the Rosebud County Converter Station, 150 workers at the Morton County Converter Station, 75 workers at the Morton County Switchyard, and the remaining 425 workers along the transmission line segments. The workforce would include some local workers and an influx of temporary workers from outside the socioeconomic analysis area. Workers residing temporarily in the socioeconomic analysis area may produce a medium-term increase in population within many socioeconomic analysis area towns and cities during construction. Smaller towns may experience a more significant increase in temporary workers when compared to their existing populations. As construction of the HVDC Transmission Line progresses through these areas, workers would relocate, and the population levels of these smaller towns would drop to their existing levels.

Workers assigned to the Rosebud County Converter Station, Morton County Converter Station, Morton County Switchyard, and the Colstrip Substation expansion are anticipated to work at these sites for the full construction period, resulting in a medium-term population increase within commuting distance of these facilities. Given the current population of Rosebud County and neighboring Custer County, especially in the towns of Colstrip, Forsyth, and Miles City, the 150 workers for the Rosebud County Converter Station would result in minimal impacts on population levels. In Morton County, with the greater population of Mandan and surrounding areas, the workers needed for the Morton County Converter Station and Switchyard construction would not result in a perceptible population increase.

The remaining workers would be distributed along the proposed transmission lines, with a peak of 425 workers divided between worksites in Rosebud, Custer, Fallon, Golden Valley, Slope, Hettinger, Grant, Morton, and Oliver counties. Based on the mileage of the line within each county, the Proponent estimates the peak workforce would range from 11 workers in Oliver County to 82 workers in Custer County. Even considering that the division of workers by county is an estimate and the number in a given county could be higher, a significant population change in any one location is not anticipated due to the likely distribution of temporary workers among multiple towns and cities and the movement of workers along the proposed lines.

The permanent workforce for operations would be two to four new full-time equivalent jobs (Grid United 2024a).

Based on the above analysis, construction would have a direct, medium-term, regional impact on socioeconomic analysis area population, and operations would have a negligible but direct, long-term, regional impact on socioeconomic analysis area population. Population change

would have both beneficial and adverse impacts, resulting in beneficial economic activity and labor force resources within the socioeconomic analysis area, as well as adverse impacts due to demand for public services and potential competition for strained housing resources. These impacts are discussed in the sections below.

Economy, Employment, and Income

As indicated in Table 3.10-4, approximately 5 to 10 percent of the workforce in most socioeconomic analysis area counties worked in the construction industry in 2023, indicating an available construction workforce living within the socioeconomic analysis area. Construction jobs have frequent turnover, as jobs are finished and workers find new projects. The presence of a local construction workforce indicates that the socioeconomic analysis area likely contains qualified workers. The Proponent has stated that it would endeavor to hire local workers, dependent upon the availability of skilled labor, union agreements, and the hiring methods used by the selected construction contractors (Grid United 2024a).

Direct economic benefits within the socioeconomic analysis area would include wages paid to workers and purchase of supplies and services from socioeconomic analysis area businesses. The Proponent anticipates local purchase and lease of construction equipment and machinery (cranes, lifts, pump trucks, flatbed trucks, dump trucks, excavators, and front-end loaders), locally procured services (engineering, waste disposal, sanitary services, food services, and security), and fuel purchases from local distributors.

Direct economic activity would lead to secondary economic activity, as the businesses that support construction would, in turn, purchase materials and services from other local businesses. Induced economic activity would also result from construction, as workers living permanently or temporarily in the socioeconomic analysis area purchase goods and services, supporting local businesses and jobs.

The Proponent's Economic Impact Analysis estimates the Proposed Alternative would generate an average of 2,055 jobs annually in Montana and North Dakota during a 3-year construction period (Bureau of Business and Economics Research, University of Montana 2025). Construction may occur for an additional year with the total economic impacts distributed over the longer time period. In addition to the Proponent's estimated 800 jobs directly resulting from construction, additional job creation could result from direct, secondary, and induced economic activity. Household income would increase by an average of $144 million for each year of construction, of which $126 million would be after-tax income available for spending. Economic output, defined as gross receipts to business and non-business organizations, would increase by $343.6 million annually. The analysis concludes that most of the economic impacts would occur in the nine counties containing Proposed Alternative facilities. Table 3.10-9 provides additional details on construction-related economic impacts.

Operations would result in two to four full-time equivalent jobs within the socioeconomic analysis area, as well as periodic contracts or hiring of line crews for transmission line maintenance (Grid United 2024a). The Proponent has engaged with local colleges in Montana and North Dakota to develop workforce development partnerships with their line-worker programs.

The Proponent, through its Community Investment Program, is partnering with the Montana Community Foundation and North Dakota Community Foundation to help address community

needs in the counties the Proposed Alternative would cross by providing grants to nonprofit or governmental entities (NPC 2025). Since its inception in 2022, the program has awarded grants to organizations that include fire protection districts, ambulance services, hospitals, schools, city governments, historical societies, libraries, food banks, park districts, and recreation organizations. As of August 2024, the Proponent had approved grants of $1.88 million of a total $3.85 million commitment (Grid United 2024a).

Based on the above, construction would result in direct and secondary, medium-term, regional, beneficial impacts on economics, employment, and income in the socioeconomic analysis area. Operations would result in negligible beneficial impacts.

Housing

The Proponent anticipates a mix of workers who already live in the socioeconomic analysis area and workers from outside the area who would temporarily relocate to the area. The Proponent does not intend to provide a construction camp or housing for temporary construction employees. Non-local workers would be expected to seek housing options in populated areas within a maximum 90-minute commute of the Proposed Alternative components, with workers likely seeking shorter commutes. Non-local workers for the Rosebud County Converter Station, Colstrip Substation, Morton County Converter Station, and Morton County Switchyard would likely seek rental housing or purchase a home given the anticipated 3-year construction period. Workers who decide to permanently relocate to the area (and seek other employment once construction is complete) could seek to rent or purchase affordable single-family homes. Transmission line installation workers are more likely to use transient housing (hotels/motels or campgrounds) given the shorter duration of the work at any one location and the need to move to the next construction location.

Housing impacts would result from increased demand for rental or for-sale housing due to the influx of workers. Given the shortage of housing reported by state and local agencies, housing needs during construction could strain an already limited supply of affordable rental housing. Impacts include increased rental housing costs, increased strain on the existing housing supply, and affordability challenges within the socioeconomic analysis area during construction.

The supply of hotel and motel rooms within the socioeconomic analysis area (supplemented by RV campgrounds) is sufficient to support the Proposed Alternative workforce that chooses this option. The transient housing is adequately distributed along most of the HVDC Transmission Line route based on the clusters of hotels/motels in and near Forsyth, Miles City, Glendive, Bowman, Dickinson, and Mandan, and the cluster of smaller motels in Baker. However, some areas near the Montana/North Dakota border may require long commutes from available housing.

Operations would require only two to four full-time equivalent jobs plus periodic line maintenance workers and, therefore, would not affect regional demand for permanent or short-term housing.

The use of rental housing by the construction workforce could worsen the shortage of low- or moderate-cost rental housing in the socioeconomic analysis area. The impact on hotels, motels, and campgrounds is likely to be beneficial by providing demand for the existing businesses. Little to no long-term impact on housing supply would result during operations. Accordingly, construction would have a direct, medium-term, regional impact on housing supply and a could

have a beneficial, direct, medium-term, regional impact on businesses providing transient lodging in the socioeconomic analysis area. Operations would have a negligible, direct, long-term impact on housing that would be neither adverse nor beneficial.

Public Services and Facilities

Construction would result in increased demand for public services in socioeconomic analysis area counties due to the influx of workers that would live in the socioeconomic analysis area. These impacts would be reduced by the short- to medium-term duration of construction and the large area over which the workforce would be dispersed. The incremental increase in public service demands from an influx of temporary construction workers would be small given the socioeconomic analysis area population of 51,997 in Montana and 151,132 in North Dakota, as compared to a peak construction workforce of 800 workers.

Construction could result in incidents that require police, fire, or emergency medical responders and hospital-based medical services. At times, construction could require law enforcement personnel to assist with traffic control, site security, and emergency calls. The Colstrip Substation, Rosebud County Converter Station, Morton County Converter Station, and Morton County Switchyard sites would be accessible to emergency service responders via public roads. Most transmission line construction areas would be available from public roads via temporary construction access roads.

Prior to construction, the Proponent would coordinate with local responders such as fire departments, emergency medical services, and local law enforcement to develop an Emergency Response Plan that outlines communication protocols and coordinate access for emergency response (Appendix E; Grid United 2024a). The Emergency Response Plan would include emergency contacts (in addition to 911), identify the local first responders along the transmission line route, and describe the notification process to be implemented, depending on the nature of the emergency (Grid United 2024b). The Proponent has prepared a Fire Prevention and Suppression Plan for construction that includes emergency procedures including notifications (Appendix E). The planning process would require an investment of time on the part of local emergency management officials, and emergencies that occur during construction would require time and resources from first responders. Given the limited number of law enforcement officers and emergency responders serving large rural areas within socioeconomic analysis area counties, an increased need for services could have a noticeable impact on providers.

School systems in the socioeconomic analysis area in Rosebud County, Mandan (Morton County), and neighboring counties would be most likely to have families relocate to work on the converter station and switchyard facilities. These school systems have or could develop capacity to accommodate the limited number of construction workers that choose to relocate with families including children. Rosebud County school districts have adequate capacity for moderate enrollment increases (J. Huff, Pers. Comm., May 8, 2025). To accommodate growing enrollment, the Mandan Public School District in Morton County expanded its middle school in 2018, opened a new elementary school in 2023, and opened a new, larger high school (replacing the existing high school) in 2024 (AP 2018; KXNET 2023; Bismarck Mandan Chamber EDC 2024). The new high school has capacity for 1,200 students with plans to expand to 1,500 students. Enrollment in 2024 was 1,175 students (North Dakota Department of Public

Instruction 2025). Impacts on schools would be small, as construction workers would most likely be residents of the socioeconomic analysis area or only relocate to the area for short periods; thus, most would be unlikely to temporarily relocate with their families.

Due to potential demands on emergency responders, medical services, and law enforcement resources, construction would have a secondary, medium-term, regional impact on public services and facilities. Operations would generate an imperceptible incremental demand for public services and facilities and, therefore, would have a secondary, long-term, regional impact that would be neither beneficial nor adverse.

Taxes and Revenues

Taxes and revenues resulting from construction would include income taxes, goods and services taxes on certain items, and fees. Benefits would accrue to socioeconomic analysis area counties through revenue sharing by Montana or North Dakota or through the state facilities and services funded within the socioeconomic analysis area. Income taxes would be paid within the state where the worker permanently resides.

During operations, the Proposed Alternative components would be assessed for payment of property taxes in Montana and for payment of either property taxes or utility generation, distribution, and transmission taxes in North Dakota. In Montana, approximately 82 percent of property tax revenues are directed toward local governments and school districts. In North Dakota, property taxes are paid to counties and cities, school districts, water districts, fire/ambulance districts, and similar local taxing authorities. Property taxes compose more than 50 percent of county revenues in the three Montana counties containing Proposed Alternative components and average 42 percent of county revenues in the six North Dakota counties containing Proposed Alternative components (Table 3.10-8).

The Proponent has stated the future valuation of the Proposed Alternative components and resulting tax income would depend on information about the Project that is not yet available. However, the Proponent expects tax revenues to be in the tens of millions in the first 30 years of operations (Grid United 2024a).

Based on the above, construction would have a direct and secondary, medium-term, regional, beneficial impact on taxes and revenues, while operations would have a secondary, long-term, regional, beneficial impact.

Transportation

Transportation impacts would include road and air transportation. No Proposed Alternative-related rail transport within the socioeconomic analysis area is proposed. Where railroad tracks would be crossed by Proposed Alternative transmission lines, the Proponent would coordinate with the railroad owner for necessary approvals and precautions.

Agency Coordination

Agencies with jurisdiction over Proposed Alternative transportation include the Federal Highway Administration, Montana Department of Transportation, NDDOT, local county and township road authorities, and local law enforcement. The Proposed Alternative would use roads under the jurisdiction of BLM, USDA Forest Service, and USDA ARS (at Fort Keogh). The Proponent would coordinate with these agencies to secure required permits for construction-related transportation. Permits and approvals would include oversize/overweight

load permits, access or driveway permits where new or improved access roads cross public roads, encroachment permits for work within the road ROW, and utility permits (Appendix E). The Proponent would also coordinate with road authorities on improvements to public roads to allow passage of heavy construction vehicles.

Road Access to Project Impact Areas

During construction, the Proponent would use existing public roads and new or existing private access roads to access Proposed Alternative work areas. The Proponent would maintain permanent access roads during operations; temporary access roads (i.e., roads created only for construction) would be returned to their pre-construction condition unless the road authority, landowner, or land-managing agency requests that the improvements remain. Where existing public roads are inadequate for construction vehicles, the Proponent would provide improvements as required by the road authority (Appendix E). Necessary road improvements for narrow or unpaved local roads could include providing an adequate road surface, as well as road width and intersection dimensions to accommodate large vehicle movements.

Generally, bridges and culverts associated with public roads would be sufficient to allow the passage of construction equipment and vehicles. Where necessary, and with approval of appropriate agencies, the Proponent may install temporary bridges or culverts that provide passage. The Proponent may also install new, permanent bridges and culverts depending on site-specific conditions (Appendix E).

Construction Road Traffic

Proposed Alternative road traffic would result primarily from worker commutes and truck deliveries of equipment, components, and materials. The Proponent plans to establish contractor yards near the ROW, approximately every 30 miles, to provide field offices, reporting locations for workers, parking for vehicles and equipment, material storage areas, fabrication and assembly, portable concrete batch plants, and equipment maintenance. This impact assessment assumes that traffic, including worker commutes and deliveries, would be to travel to a contractor yard or to one of the converter stations or switchyard sites.

Construction would result in estimated commuter traffic on roads within the socioeconomic analysis area as high as 550 vehicles per day traveling to Montana sites plus 950 vehicles per day traveling to North Dakota sites. The commuter traffic destinations would be dispersed between the converter station/switchyard sites and contractor yards along the transmission lines. In addition to the commuter traffic, truck deliveries would generate trips to Proposed Alternative sites and contractor yards.

Traffic volumes on I-94 near the socioeconomic analysis area range from 4,000 average annual daily trips (AADT) in rural areas to 11,000 AADT west of Mandan, North Dakota. US 212 carries about 2,000 to 2,600 AADT, and US 12 carries about 500 AADT. State highway traffic varies from about 500 to 3,500 AADT on ND 22 south of Dickinson and 2,600 AADT on ND 6 south of Mandan.

Given current traffic volumes on the interstate, U.S., and state highways serving the socioeconomic analysis area and the dispersed nature of Proposed Alternative components, the construction-generated traffic would not result in significantly increased congestion on the highways serving the region. Area highways and roads have capacity to carry increased traffic volumes without congestion. Generally, two-lane, paved roads can carry more than

1,000 passenger cars per lane each hour (Transportation Research Board 2008). Capacity is lower for trucks and unpaved road segments. The construction traffic would be dispersed among the regional highways and even more dispersed on local roads to reach the worksites or contractor yards.

Although Proposed Alternative traffic would not generally result in road traffic congestion, short-term delays would result from movement of construction equipment and delivery trucks, especially those with heavy or oversized loads. The Proponent would mitigate delays through traffic management measures, including road improvements where required by road authorities, mapping authorized transportation routes, marking authorized transportation routes through signs or flagging, and training for field personnel to only use approved roads and observe speed limits (Appendix E).

Construction-Related Road Delay or Closures

Where the transmission lines cross public roads, traffic delays on public roads would occur when construction equipment is moved in or out of Project impact areas. The Proponent would use human flaggers and signage to slow and direct road traffic (Appendix E). Temporary public road or lane closures would be required for construction, mostly during conductor stringing across public roads or during blasting.

The Proponent would install temporary guard structures at transmission line road crossing locations to protect the public during Project construction activities by preventing ground wires, conductors, or equipment from falling and disrupting road traffic. Guard structures would be installed just outside of the road ROW or within the road ROW depending on land availability and topography. Where the Proposed Alternative crosses an interstate highway, guard structures would be placed in the highway median. Guard structure installation and removal may require short-term lane or road closures and traffic congestion.

For road or lane closures or work within the road ROW, the Proponent would coordinate with regulatory agencies, emergency service providers, and affected parties and use warning signs, lights, barriers, and human flaggers to direct traffic and ensure safety (Appendix E).

Construction-Related Road Damage

The Proponent would limit damage to road surfaces by placing temporary surfaces (e.g., tires, equipment mats, plywood sheets) prior to crossings by tracked equipment, installing sediment barriers, and removing excess soil tracked onto public roads. If needed, road maintenance activities during construction could include blading or filling to maintain the surface of unpaved public roads, with road authority approval.

Upon completion of construction, the Proponent would repair any road damage that occurred due to construction. If this requires temporary closure of the road to traffic, the Proponent would coordinate with the road administrator to determine lane closures, detours, and safety and communication measures such as posting signs at road crossings. The Proponent would notify landowners, land-managing agencies, law enforcement agencies, and local businesses that could be affected by the closure (Appendix E).

Construction-Related Road Traffic Risks

Construction would increase the volume of traffic within the socioeconomic analysis area. As noted in Section 3.10.2.6, Transportation, Montana experienced a generally increasing number

of traffic crashes annually between 2011 and 2019, while traffic crashes in North Dakota generally decreased. Increased VMT within the socioeconomic analysis area could result in a proportional, incremental increase in risk of road crashes; however, the increase in overall traffic volumes and VMT within the socioeconomic analysis area would be small in proportion to existing traffic. Construction could result in specific road safety risks resulting from the presence of drivers not familiar with area roads, large/heavily loaded trucks on roads with limited width and no shoulders, slow-moving vehicles, and road or lane closures. The mitigations described in this section, including route planning, road improvements, driver training, coordination with local authorities, and use of barriers, signage and flaggers, are necessary to address the potential traffic safety risks.

In summary, construction has impacts that include short-term traffic delays, increased traffic safety risks, and increased wear and deterioration of road surfaces. To mitigate these impacts, the Proponent's Traffic and Transportation Management Plan includes the following measures (Appendix E):

- Providing road improvements where existing public roads are inadequate for construction vehicles.
- Providing advance planning of routes in coordination with local authorities; using multi-lane highways where available; mapping routes and clearly marking access routes in the field with signs or flagging.
- Using public and private roads to access the Proposed Alternative impact areas, but once within the impact area, moving construction equipment along the ROW as work progresses to reduce travel on local roads.
- Providing a training program for field personnel. Ensuring that workers and contractors only use approved roads and comply with speed limits.
- Coordinating with regulatory agencies and emergency service providers if temporary road or lane closures are needed.
- Using signage and flaggers along roads when needed due to slow-moving vehicles or construction activities across roadways.
- Installing guard structures at road and railroad crossing locations to protect the public during construction activities.
- Scheduling wire stringing and tensioning activities across roads and railroad crossings during periods of minimal use.
- Using tires, equipment mats, or plywood sheets to minimize the potential for damage from tracked equipment crossing paved roads.
- Installing sediment barriers at the base of slopes adjacent to roads to prevent sediment from the construction ROW from being washed onto roads during rain events; removing soil or mud tracked onto paved roadways.
- Maintaining road surfaces, including blading or filling activities, to ensure road safety and proper functioning. Upon completion of construction, repairing any road damage.

Traffic During Operations

Operations would generate only periodic maintenance-related road traffic.

Road Transportation Impact Assessment

Based on the above, construction would have a direct, medium-term, regional impact on road traffic, while operations would not have a perceptible impact on road traffic. Road traffic impacts during construction would be reduced with implementation of the Traffic and Transportation Management Plan to address route planning in coordination with local authorities, driver policies, and compliance with regulations.

Air Transportation

The Proponent may use helicopters to facilitate structure setting, wire pulling, and line tensioning in areas that are difficult to access due to remoteness and steep topography. Approximately three helicopter fly yards would be needed in Montana (none in North Dakota). Although locations have not yet been identified, the Proponent estimates that one helicopter fly yard would be needed in Rosebud, Custer, and Fallon counties. Proposed Alternative-related helicopter traffic would operate in compliance with air traffic standards to avoid air traffic conflicts with local and regional airfields.

Based on Federal Aviation Administration requirements, no transmission structure or runway slope analyses are required for the Proposed Alternative due to its distance from airports. The closest air facility to the Proposed Alternative facility is the Johny Creek Airstrip approximately 0.4 mile north of the HVDC Transmission Line, northeast of Baker in Fallon County. The Project would not have an impact on the landing strip, and the Proponent is coordinating with the landowner on additional measures. Other nearby air facilities would continue to operate without change if the Proposed Alternative is built. Accordingly, construction would have direct, medium-term, regional impacts on air traffic due to the use of helicopter transport. Operations would have no impact on air traffic.

Public Health, Welfare, and Safety

Montana Major Facility Siting requires that projects in Montana assess the "effects of the proposed facility on the public health, welfare, and safety" (§ 75-30-3, MCA). In addition to the discussion below, this requirement is addressed in Section 3.4, Public Health and Safety.

An influx of workers to an area, particularly to a remote or small town, can lead to adverse human impacts on local communities, primarily through increased demand for utilities, housing, local services (restaurants, laundromats, groceries), or public services. At its peak, no more than 82 workers, and as few as 11 workers, would be working at any one segment along the transmission line. The Proponent would establish contractor laydown yards, the locations of which would be established after a contractor is brought on. Construction of the converter stations in Rosebud County, Montana, and Morton County, North Dakota, would require more workers who would stay longer compared to the transient workforce of the transmission lines.

Based on the relatively small influx of workers necessary for construction and the Proponent's management plans, construction would have a secondary, medium-term, regional, impact on public health, welfare, and safety due to the introduction of transient workers from outside the area to small towns and rural areas. Operations would have a beneficial, permanent, regional, secondary impact on public health, welfare, and safety due to the generation of tax revenues that would accrue to county governments, fire districts, schools, and other public service authorities.

Property Value

Property value concerns are closely related to land use (addressed in Section 3.8, Land Use and Recreation) and visual and aesthetics (addressed in Section 3.9, Visual and Aesthetics). This section addresses the impacts on property values as a result of land use and visual and aesthetic impacts.

A 2012 study of property sales along the Colstrip Bonneville Power Administration (BPA) 500-kV Transmission Line in Montana reviewed impacts of a long-existing transmission line on rural Montana properties (Haggerty 2013). The study found that the impact of transmission lines on property value was a function of land use, parcel size, and availability of substitutes. Little to no price impacts were found for production agriculture land, but interview data noted the need to locate structures at minimally intrusive locations within existing agricultural operations, especially irrigated, plowed, or otherwise mechanically managed fields, as the structures can represent a nuisance factor for agricultural operators. Recorded sales of agricultural lands with recreational influences or with high amenity recreation and natural features showed no price impact, but interviewees indicated that sales may have taken longer (Haggerty 2013).

The impact of transmission lines on property values in various locations in the United States and Canada have varied greatly based on study locations and approaches. Adverse property value impacts, as measured in market transactions, tend to be smaller than expected, and impacts generally dissipated, not only with distance from the transmission line but with the length of time the lines were in place. Where impacts on property values were found, they ranged from approximately 2 to 9 percent. Researchers noted that the effect on values were often less than anticipated by landowners because numerous factors affect buyer decisions (Haggerty 2013).

The Proposed Alternative was routed to avoid proximity to residences. As described in Section 3.8, Land Use and Recreation, the privately owned land that would be crossed by the transmission lines is primarily characterized by grassland and shrubland land cover or agricultural production. Transmission line centerlines would be at least 600 feet from all residences and collocated with an existing transmission line where they are closest (600 to 1,000 feet) from existing residences. Visibility is addressed in Section 3.9, Visual and Aesthetics, and depends upon factors that include topography, intervening structures or vegetation, and proximity.

Based on the above, construction and operations are generally not anticipated to affect property values for land use types crossed by the Proposed Alternative transmission lines. Transmission lines could have limited secondary, long-term, regional impact on property values for residential properties. The impact on residential properties, if adverse, would vary depending upon proximity, topography, intervening uses, and vegetation, and the impact may dissipate with the length of time that the lines are in place. In locations where structures are on private property, the Proponent may reimburse landowners as a mitigation measure.

3.11. SOILS

This section describes the analysis methods, affected environment, and impacts on soils from the Project.

3.11.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on soils.

3.11.2. Affected Environment

This section describes baseline conditions for soils.

3.11.2.1. Regional Soil Description

The USDA NRCS identified 20 land resource regions within the contiguous United States by grouping areas with similar soils, climate, and vegetation or crop types. The Project is located within two land resource regions: the Northern Great Plains Spring Wheat Region (which covers most of North Dakota) and the Western Great Plains Range and Irrigated Region (which covers most of southeastern Montana) (USDA NRCS 2022).

The Northern Great Plains Spring Wheat Region is one of the major cropland regions of the United States. This region mostly consists of soft, unconsolidated geologic deposits from the Cretaceous Western Interior Seaway. The region has a dry continental climate with short, warm summers and long, cold winters. About 30 percent of the annual precipitation falls as snow in winter with the remainder occurring during the growing season. The region is dominated by Mollisols soil types (USDA NRCS 2022).

The Western Great Plains Range and Irrigated Region features mainly grasslands and shrublands on an elevated piedmont plain of Paleogene and Neogene sediments associated with the uplift of the Rocky Mountains. Many rivers, which generally flow east, dissect the plain. Most of the precipitation in the region's semiarid climate occurs during spring thunderstorms and winter snowfalls. The soil temperature regime in the northern part of the region in Montana and North Dakota is mainly frigid. This region consists mostly of Entisols, Inceptisols, and Vertisols (USDA NRCS 2022). In eastern Montana, Inseptisols soil types are dominant, and many soils in the northern part of region feature restrictive zones, mainly as paralithic bedrock (USDA NRCS 2022).

3.11.2.2. Soil Characteristics

Soil characteristics help determine the suitability of a soil for uses such as agriculture or construction; determine its susceptibility to erosion, compaction, or saturation; or describe specific features such as depth to bedrock and depth of topsoil. The selected soil characteristics described in the following sections were evaluated to determine Project impacts.

3.11.2.3. Prime Farmland and Farmland of Statewide Importance

The USDA NRCS defines prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses" (USDA NRCS 2024). Designation of prime farmland is independent of current land use but excludes urban and built-up areas. Typically, prime farmland contains few or no rocks, has acceptable levels of salt content and pH, and is permeable to air and water. Prime farmland does not flood frequently during the growing season, is not saturated with water for long periods, and is not excessively eroded. Land with soils that does not meet the

prime farmland criteria may be considered prime farmland if the limiting factor is mitigated by methods such as drainage or irrigation (USDA NRCS 2024).

The USDA NRCS also recognizes farmlands of statewide importance, which are lands other than prime farmland used for production of specific high-value food and fiber crops such as citrus, tree nuts, olives, fruits, and vegetables. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate state agencies. In Montana, the Montana DNRC and the Montana Department of Agriculture (MDA) designate farmland of statewide importance. In North Dakota, the North Dakota Natural Resources Conservation Service is the agency responsible for determining and mapping farmland of statewide importance. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by state law (USDA NRCS 2024).

3.11.2.4. Hydric Soils

Defined as soils that develop anaerobic conditions (i.e., no oxygen) resulting from prolonged conditions of saturation, flooding, or ponding, these soils can include those that are saturated due to artificial measures and those whose hydrology has been artificially modified but were hydric in their unmodified condition. They can be permanently or seasonally saturated and support the growth and regeneration of hydrophytic vegetation. Hydric soils, along with hydrophytic vegetation and wetland hydrology, are used to define wetlands (USDA NRCS 2024).

3.11.2.5. Compaction-Prone Soils

Soil compaction develops from heavy construction equipment traveling over wet soils, particularly those that are fine-textured and/or poorly drained. Compaction can modify or disrupt the structure of soils, reduce porosity and pore space, increase run-off potential, and cause rutting, though the degree of this depends on moisture content and soil texture (USDA NRCS 2024).

3.11.2.6. Erodible Soils

Erosion is the process by which surface soils are worn away by forces such as running water, waves, moving ice and wind, or corrosion. Erodible soils are those that are susceptible to erosion. Erosion can be accelerated by human disturbance and is generally referred to as "accelerated erosion," where naturally occurring levels are exceeded as a direct result of human activities. Soil texture, structure, slope characteristics, topography, land management practices, vegetation cover, and rainfall can influence the degree of erosion. Soils are more prone to erosion when they are fine-textured, bare or sparsely vegetated, or situated on slopes. Vegetation, structure, high percolation rates, and level terrain can increase a soil's resistance to erosion. Sediment from erosion can result in impacts on the wider environment, such as changes to aquatic habitats that can affect flora and fauna, or structural changes to drainage ditches, stream channels, and reservoirs (USDA NRCS 2024).

Highly Water Erodible Soils

These soils are highly susceptible to erosion by water and typically present with bare or sparse vegetative cover, non-cohesive soil particles, low infiltration rates, and/or moderate to steep

slopes. Those that occupy low relief areas, are well vegetated, and/or have high infiltration capacity and internal permeability are typically more resistant to water erosion.

Soils can be classified as highly water erodible using the Revised Universal Loss Soil Equation, a model that predicts soil erosion rates. The K-factor within the equation represents a relative quantitative index of the susceptibility of bare soil to water erosion and is used alongside slope percentage to determine if a soil is highly water erodible (USDA NRCS 2024).

Highly Wind Erodible Soils

These soils are highly susceptible to erosion by wind and influenced by physical soil factors and landform or landscape conditions. Moisture (rainfall, humidity, mulching, or residue), temperature, organic matter, calcium carbonate, and texture are physical soil factors that can influence susceptibility to wind erosion. Landscape or landform conditions include soil roughness factors, unsheltered distance, and vegetative cover. Additionally, there are other factors that can affect the vulnerability of soils to wind erosion, including wind speed and duration and land management practices and disturbance.

Soils can be placed into Wind Erodibility Groups (WEG) based on the properties of the soil surface layer. This categorization indicates a soil's inherent susceptibility to wind erosion. WEGs range from 1 to 8, with WEG 1 soils being the most susceptible to wind erosion and WEG 8 being the least susceptible (USDA NRCS 2024).

3.11.2.7. Soils with Low Revegetation Potential

These soils typically do not provide conditions that are suitable to support vegetation growth. This can be due to a number of characteristics, including topsoil thickness; soil texture; water and nutrient holding capacity; susceptibility to flooding; slope; and whether the soils are natural, human transported, or disturbed. Some of these characteristics can cause a soil to have high seed mortality, preventing revegetation. Construction activities (e.g., grading and clearing soils with poor revegetation potential) could affect or reduce future vegetation, restoration of disturbed areas, and wildlife habitat, as well as potentially increase erosion and create adverse visual impacts.

Soils can be grouped based on their capability to produce common cultivated crops and pasture plants without deteriorating over time, using the land capability classification system. Similarly to WEG, the groups range from 1 to 8, depending on limitations that restrict soil use for crops and pasture plants. Soils with a land capability classification of 1 have the fewest limitations, and those with 8 have severe limitations. Those with a non-irrigated land capability classification of 3 or greater have poor revegetation potential (USDA NRCS 2024).

3.11.2.8. Rocky Soils

These soils have a large proportion of rocks or gravel. They are classified as having a cobbly, stony, bouldery, shaly, very gravelly, or extremely gravelly modifier to the textural class of the surface layer and/or have a surface layer that contains a certain percentage of rock fragments that are larger than 3 inches. Stones and rock fragments in surface soil layers can reduce moisture-holding capacity of the soil, resulting in reduced soil productivity and vegetative cover. Large rocks and stones may damage agricultural equipment and can be difficult to work with during construction activities such as grading, trenching, and backfilling (USDA NRCS 2024).

3.11.2.9. Shallow Bedrock Soils

These soils have bedrock, the solid rock that lies under loose surface material, at a depth of approximately 20 inches or less from the ground surface (USDA 2017). Shallow soils can be susceptible to erosion and are unsuitable for agricultural uses. Construction through these soils could result in incorporation of bedrock fragments into surface soils (USDA NRCS 2024). Shallow bedrock soils are listed in Table 3.7-2, and surface bedrock areas are listed in Table 3.7-3.

3.11.2.10. Topsoil

Topsoil is the uppermost soil layer of the earth's surface and generally consists of sand, silt, clay, rock fragments, and organic matter. It typically has greater biological productivity than deeper soils due to high concentrations of organic materials. It is capable of growing and supporting vegetation due to the nutrients that come from microorganisms and macroorganisms, inorganic soil components, and other biological material and is where most plant roots and seeds are found. It is valuable for growing crops and pasture plants, and its preservation is important for vegetation restoration. Its depth can vary depending on wetness, topography, climate, and vegetation (USDA NRCS 2024).

3.11.2.11. Slope Gradient

Slope gradient is the measure of how steep a slope is. It is measured by calculating the difference in elevation between two points and expressed as a percentage. It is an important factor in evaluating soils for construction purposes, as it can affect the magnitude of water erosion, revegetation capabilities, constructability, water retention and movement, engineering uses of the soil, soil slippage, machinery usage, and other properties (USDA NRCS 2024). A summary of slope gradients in the Project area is listed in Table 3.7-6.

3.11.3. Environmental Consequences

The impacts on soils are discussed in the following sections.

3.11.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on soils, as the Project would not be built.

3.11.3.2. Proposed Alternative

Common construction activities, such as clearing, grading, foundation excavation, and movement of construction equipment, have the potential to affect soils. These impacts include loss of soil caused by water or wind erosion, compaction of soil caused by heavy construction equipment, reduction of favorable soil properties due to mixing of topsoil and subsoil or introduction of excess rock to the surface, alteration of vegetation community type (e.g., forested to herbaceous) and increase in invasive plant species in areas of soils with low revegetation potential, reduction of productive agricultural land from addition of impervious areas, and disruption of surface or subsurface irrigation or drainage systems.

The Proposed Alternative would result in both temporary and permanent impacts on soils within the analysis area. Discussion of these impacts in the following sections are grouped by the soil characteristics described in Section 3.11.2, [Soils] Affected Environment. The mitigations proposed by the Proponent to reduce impacts on these soil characteristics are identified and discussed in the sections below. Permanent and temporary impacts are listed in acres and as a percentage of the total Project impact areas.

Most soil impacts resulting from the Proposed Alternative would be direct, short-term, localized, and occur within temporary construction impact areas for structure pads, wire pulling and tensioning areas, temporary access roads, overland travel paths, and facility sites. Ground disturbance activities would generally be limited to structure sites, facility sites, and grading that may be necessary along sections of some temporary access roads. However, most activities within temporary impact areas would consist of clearing trees and tall vegetation where necessary, vehicle travel, and equipment and material staging. The Proponent has identified specific areas within the ROW where vegetation clearing would be required.

Some soil impacts (e.g., structure foundations, permanent access roads, facilities) would be direct, permanent, and localized, but would be largely mitigated using the mitigation measures and BMPs discussed below.

Table 3.11-1 provides a summary of permanent and temporary impacts (by state) on the soil characteristics discussed below.

Prime Farmland and Farmland of Statewide Importance

Prime farmland and farmland of statewide importance are designated based on intrinsic soil properties rather than current land use. Activities required to build the Proposed Alternative, including clearing, grading, structure and facility foundation excavations, and movement of construction equipment and materials within the Project impact areas have the potential to affect agricultural lands and soils designated as prime farmland or farmland of statewide importance. Construction activities could temporarily disrupt agricultural operations, introduce invasive weed species, damage crops and irrigation or drainage equipment, and change soil properties, resulting in a loss of soil productivity. These changes to soil properties could result from soil compaction by heavy equipment, mixing of topsoil and subsoil during excavations, soil erosion, and introduction of rocks to the soil surface.

As listed in Table 3.11-1, the Proposed Alternative would temporarily affect approximately 128.9 acres (2.8 percent) and permanently affect approximately 18.0 acres (0.4 percent) of soils designated as prime farmland or prime farmland if the limiting factor is mitigated. The Proposed Alternative would temporarily affect approximately 1,484.9 acres (32.2 percent) and permanently affect approximately 91.2 acres (2.0 percent) of soils designated as farmland of statewide importance[17].

The Proponent would separate topsoil and subsoil storage during excavation activities to minimize mixing, as described in Section 5.8.1 of the CMRP (Appendix E). Upon completion of construction activities, rough grading and decompaction would occur where requested by landowners and land-managing agencies (BLM may require decompaction on BLM lands as part of their approval) and according to procedures in the CMRP. Rocks exposed or brought to the surface would be removed, topsoil would be replaced, and the area would be restored according to the CMRP.

Operation of heavy equipment, particularly in wet soils, may risk damage to irrigation systems, drain tiles, and ditches, including soil mixing and soil compaction and rutting. If these systems are present within the Project impact areas, the Proponent would work with landowners to

[17] Within the BLM-managed lands, 0.3 acre of prime farmland and 3.1 acres of farmland of statewide importance would be permanently affected by the Proposed Action.

avoid or resolve impacts on these systems and de-compact the affected soils if required. The Proponent would incorporate known locations of these features into the design of the Proposed Alternative to avoid and minimize impacts on irrigation and drainage infrastructure and wet soils. The Proponent would repair any damage caused by Proposed Alternative construction using materials of the same or better quality as those that were damaged.

As described in Section 2 of the CMRP (Appendix E), the Proponent has developed an AIMP in coordination with the USDA ARS and the BLM[18] and applicable state and local agencies. The AIMP includes, but is not limited to, the following mitigation measures: potential drain tiles or lines damage, irrigation systems interference, topsoil segregation, soil decompaction, fence repairs, livestock management, and stone removal. Special mitigation measures would also be included where the Proposed Alternative crosses or is adjacent to practices such as organic farms or apiaries. Impacts on farmland soils from temporary construction activities would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.

Hydric Soils

During periods of saturation, hydric soils are at greater risk of rutting and compaction from movement of heavy equipment. As listed in Table 3.11-1, the Proposed Alternative would temporarily affect approximately 23.6 acres (0.5 percent) and permanently affect approximately 3.0 acres (0.1 percent) of hydric soils.

Section 5.3.2 of the CMRP (Appendix E) describes wetland crossing procedures the Proponent would implement, which may include the use of low ground pressure equipment or temporary installation of construction mats to minimize rutting, compaction, and mixing of hydric soils. The CMRP also details erosion control measures that would be used in wet soil conditions and methods for site restoration and permanent revegetation. Soil impacts on hydric soils due to construction would be direct, short-term, and localized, and impacts due to operations would be direct, localized, and short-term or permanent.

Compaction-Prone Soils

The Proposed Alternative would temporarily affect approximately 14.2 acres (0.3 percent) and permanently affect approximately 3.1 acres (0.1 percent) of compaction-prone soils (Table 3.11-1).

The Proponent would implement erosion control mitigation measures described in Section 6 of the CMRP (Appendix E) and may install construction mats or use low ground pressure equipment, where needed, to minimize impacts on compaction-prone soils. Where soil compaction may occur, decompaction procedures described in the CMRP would be applied. Soil impacts on compaction-prone soils due to construction would be direct, short-term, and localized, and impacts due to operations would be direct, localized, and short-term or permanent.

[18] Within the BLM-managed lands, construction work would cease when soils are wet/moist enough for ruts greater than 4 inches occur.

Highly Water Erodible and Wind Erodible Soils

The Proposed Alternative would temporarily affect approximately 1,162.6 acres (25.2 percent) and permanently affect approximately 119.2 acres (2.6 percent) of highly water erodible soils, as noted in Table 3.11-1. The Proposed Alternative would temporarily affect approximately 158.7 acres (3.4 percent) and permanently affect approximately 1.6 acres (less than 0.1 percent) of highly wind erodible soils, as noted in Table 3.11-1. Impacts on erodible soils would be direct, short-term to permanent and localized.

To avoid and minimize soil impacts resulting from erosion and sedimentation, the Proponent would implement erosion and sediment control BMPs prior to ground-disturbing activities in accordance with Section 6 of the CMRP (Appendix E). The Proponent would maintain temporary erosion and sediment control BMPs for the duration of construction until final stabilization or permanent cover is achieved in accordance with storm water construction general permits administered by the MTDEQ and the NDDEQ. Exposed soils would be revegetated, as described in the CMRP.

The Proponent would use BMPs to minimize impacts on highly erodible soils, such as topsoil segregation and storage, rough grading and soil decompaction, replacement of topsoil, and restoration of vegetation, as detailed in the CMRP.

The Proponent would construct temporary access roads, as described in Section 5.3 of the CMRP (Appendix E), and integrate surface cross drains (e.g., drivable dips, water bars, rolls in profile, open slotted culverts, metal bars, and rubber water diverters) into the design of access roads where necessary and appropriate based on site-specific conditions. As described in the CMRP, the Proponent would install and maintain additional erosion and sediment control BMPs along access roads, where needed, during their construction and use.

Soils with Low Revegetation Potential

Following ground-disturbing activities, successful restoration and revegetation efforts are essential in maintaining soil productivity by avoiding and minimizing impacts on soils, particularly erosion. As noted in Table 3.11-1, the Proposed Alternative would temporarily affect approximately 2,233.3 acres (48.5 percent) and permanently affect approximately 194.2 acres (4.2 percent) of soils identified as having a low revegetation potential.

As noted above, most impacts on soils with low revegetation potential would be temporary, and grading would generally be limited to structure sites and sections of some access roads. Should grading along access roads require cut and fill, the Proponent would conduct these activities, as described in the CMRP.

The Proponent would implement temporary erosion and sediment control BMPs prior to ground disturbance activities in accordance with Section 5.8 of the CMRP (Appendix E). These BMPs would be maintained for the duration of construction until final stabilization or permanent cover is achieved in accordance with storm water construction general permits administered by the MTDEQ and the NDDEQ. The Proponent would revegetate exposed soils, as described in the CMRP.

The Proponent would permanently clear approximately 302.8 acres of trees within the ROW. Vegetation within these areas would be permanently maintained at a suitable height throughout operations of the Proposed Alternative. The Proponent would establish permanent vegetation on exposed soils within the Project impact areas including graded areas and along

temporary access road alignments after they are restored to pre-construction conditions. Exceptions would include actively cultivated areas and wetlands with standing water.

In areas that require reseeding, the Proponent would use seed mixes that resemble the native seed stock present in soils and enhance natural recruitment of these native species. Selection of seed mixes is intended to not alter the composition of native species.

The Proponent would develop permanent seed mixes in coordination with the USDA NRCS (in both states) and other federal and state land-managing agencies. The Proponent would consult the landowner regarding desired seed mixes to be used on their property. As referenced in the CMRP, the Proponent would use the preferred seed mixes specified by the BLM, USDA Forest Service, and USDA ARS for the portions of the Proposed Alternative that cross federally managed lands. Additional discussion of permanent revegetation can be found in Section 6.6 of the CMRP (Appendix E). Impacts from temporary construction activities on soils with low revegetation potential would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.

Rocky Soils

During grading and excavation activities, construction crews could encounter rocks on the surface or within the surface soil horizon. The Proposed Alternative would temporarily affect approximately 175.5 acres (3.8 percent) and permanently affect approximately 9.7 acres (0.2 percent) of soils identified as rocky (Table 3.11-1).

As noted above, most impacts on rocky soils would be temporary, and most ground-disturbing activities would generally be limited to grading and cut and fill along sections of some access roads and grading and excavation at permanent facility sites. Although considered a permanent impact, clearing of trees and tall vegetation within the ROW would result in minimal ground disturbance. Consequently, it is anticipated that impacts on rocky soils with these clearing areas would be short-term.

To minimize the introduction of subsoil rocks into the surface horizon, the Proponent would segregate topsoil and subsoil during ground-disturbing activities and replace the topsoil during restoration, as described in Section 5.8.1 of the CMRP (Appendix E). As needed, the Proponent would remove rocks exposed on the surface due to construction activity from the Project impact areas prior to and after the replacement of topsoil, as described in the CMRP. Impacts on rocky soils would be direct, short-term to permanent, and localized.

Shallow Bedrock Soils

Ground-disturbing activities in soils with a shallow depth to bedrock could result in the introduction of bedrock fragments into the surface soil horizon. The Proposed Alternative would temporarily affect approximately 2,565.7 acres (55.7 percent) and permanently affect approximately 174.9 acres (3.8 percent) of soils with a shallow depth to bedrock (Table 3.11-1). Shallow bedrock is further discussed in Section 3.7, Minerals and Geology.

The Proponent may need to conduct blasting of shallow bedrock for foundation excavations associated with transmission structures or facility site infrastructure. As described in Section 5.8.3 of the CMRP (Appendix E), the Proponent has developed a Blasting Plan, which identifies the standard procedures that would be implemented where blasting would occur

(Appendix E). However, most areas with temporary impacts on soils with shallow bedrock would not require blasting. While the soil itself may have shallow bedrock, the primary Proposed Alternative construction activity within the 2,565.7 acres (Table 3.11-1) of soils with shallow bedrock would be overland travel. Additionally, to minimize the impacts on soils in areas with shallow bedrock, the construction contractor would remove rocks exposed due to construction activity from the Project impact area prior to and after construction. This effort would result in an equivalent quantity, size, and distribution of rocks to those found on adjacent lands, as determined by the Proponent's construction contractor. The construction contractor would haul rocks removed from the construction area to a licensed disposal facility or dispose of the rocks on the landowner's premises away from environmentally sensitive features with prior approval from the landowner or land-managing agency. Impacts on shallow bedrock soils would be direct, short-term to permanent, and localized.

The Blasting Plan (Appendix E) includes safety precautions, notifications, and outlines of site-specific blasting plans that would be developed by the Proponent's selected construction contractor.

Topsoil

Construction of the Proposed Alternative would disturb topsoil and subsoil where grading or excavation are required and where heavy equipment travels along access roads. These activities have the potential to cause mixing of topsoil and subsoil, which would result in a loss of soil productivity.

To minimize impacts on topsoil and help preserve soil productivity, the Proponent would segregate topsoil and subsoil where grading and excavation activities would occur, as described in Section 5.8.1 of the CMRP (Appendix E). Upon completion of construction, the Proponent would rough-grade the area and conduct decompaction of soils, where needed, in accordance with procedures in the CMRP. Where necessary, the Proponent would then remove rocks introduced to the soil surface due to construction activity prior to and after topsoil replacement, as described in the CMRP. The Proponent would also use the AIMP (Appendix E). With implementation of mitigation measures and BMPs, impacts on topsoil would be direct and secondary, short- to medium-term, and localized.

Slope Gradient

Steep slopes can affect constructability, water erosion potential, revegetation efforts, soil compaction, and rutting potential, in addition to other soil properties. The Proposed Alternative would temporarily affect approximately 3,449.0 acres (74.8 percent) of soils with a 0 to 15 percent slope, 453.8 acres (9.9 percent) of soils with a 15 to 30 percent slope, and 319.4 acres (6.9 percent) of soils with 30 percent or greater slope (Table 3.11-1). Approximately 18.3 acres (0.4 percent) of soils that would be temporarily affected by construction of the Proposed Alternative were not rated for slope gradient (USDA NRCS 2019).

The Proposed Alternative would permanently affect approximately 260.6 acres (5.7 percent) of soils with a 0 to 15 percent slope, 62.9 acres (1.4 percent) of soils with a 15 to 30 percent slope, and 31.2 acres (0.7 percent) of soils with 30 percent or greater slope (Table 3.11-1). Approximately 11.7 acres (0.3 percent) of soils that would be permanently affected by operations of the Proposed Alternative were not rated for slope gradient (USDA NRCS 2019).

A discussion of slope gradient in the context of geologic hazards is presented in Section 3.7, Minerals and Geology.

To minimize soil impacts resulting from erosion, the Proponent would install temporary erosion and sediment control BMPs prior to ground-disturbing activities, as described in Section 5.7 of the CMRP (Appendix E). In areas of steeper slopes, these BMPs could include temporary or permanent slope breakers in addition to other stabilization measures. The Proponent would maintain temporary erosion and sediment control BMPs for the duration of construction and until final stabilization or permanent cover is achieved and would revegetate soils exposed due to construction activities in accordance with the CMRP (Appendix E). With implementation of mitigation measures and BMPs, impacts on soils with steep slope gradients from temporary construction activities would be direct, short- to medium-term, and localized. Where impacts are proposed for permanent structures, access roads, improvements, facilities, and vegetation clearing within the permanently maintained ROW, impacts would be direct, permanent, and localized.

3.12. NOISE

This section describes the analysis methods, affected environment, and impacts on noise from the Project.

3.12.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on noise.

3.12.2. Affected Environment

This section describes baseline conditions for noise.

3.12.2.1. Existing Noise Environment

Regional ambient sound level is defined by the total noise generated within the specific environment and is usually comprised of sound produced by natural and artificial sources. At any location, both the magnitude and frequency of noise may vary over the course of the day, throughout the week, and over the course of the year. This variation is caused in part by changing weather conditions and seasonal vegetative cover. Existing noise sources in the Project area likely include transportation infrastructure, agricultural activities, and natural sounds such as wind and wildlife.

Transmission Line Route

The Project area comprises rural and semi-rural land uses. ANSI S12.9-2013/Part 3 estimates existing ambient noise levels based on land use categories and population densities. Based on review of the Project area, ambient noise levels were estimated to be 43 A-weighted decibels (dBA) L_d (daytime sound level), 37 dBA L_n (nighttime sound level), and 45 dBA day-night sound level (L_{dn}); the federal agencies concur with these estimates. Existing noise sources likely include agricultural machinery, vehicular traffic on local roads, and natural sounds.

Converter Stations

The Rosebud County Converter Station and Morton County Converter Station would be in rural and semi-rural areas. For the Morton County Converter Station, ambient noise levels were estimated to be 40 dBA L_d, 34 dBA L_n, and 45 dBA L_{dn}. For the Rosebud Converter Station, where the residential areas are in a more densely populated area, ambient noise levels were estimated to be 45 dBA L_d, 39 dBA L_n, and 47 dBA L_{dn}. The federal agencies concur with these estimates.

Colstrip Substation Expansion

The Colstrip Substation is in an industrial area, with the Colstrip power plant located immediately south of the substation. Noise modeling has not been conducted for the Colstrip Substation expansion, but ambient noise levels were estimated to be 55 dBA L_d, 49 dBA L_n, and 57 dBA L_{dn}. The federal agencies concur with these estimates.

3.12.2.2. Noise-Sensitive Areas

The transmission line typical ROW would extend 100 feet on either side of the transmission line centerline (total ROW of 200 feet), although it would be wider on some of the transmission line segments. No existing residences are less than 600 feet from the Project centerline, which would be outside the widest ROW. As a result, the Project does not directly cross any residential or subdivided area.

Table 3.12-1 summarizes the identified nearest noise-sensitive areas (NSAs) to the Morton County Converter Station and Rosebud County Converter Station (Grid United 2024). The nearest NSA (a residence) is 4,170 feet east-southeast of the Morton County Converter Station. A second NSA (a residence) is 10,430 feet west of the Rosebud County Converter Station.

The Wilbur Bolt WMA is also 1,920 feet east of the Oliver County Substation; however, that substation is being developed separately from the Project and is not included in Table 3.12-1.

3.12.3. Environmental Consequences

The impacts on noise are discussed in the following sections.

3.12.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on noise, as the Project would not be built.

3.12.3.2. Proposed Alternative

Transmission Line Route

Proposed Alternative construction would require the temporary use of various types of noise-generating equipment, including excavators, bulldozers, and trucks. Wire stringing operations would require pullers, tensioners, and cable reel trailers. Blasting activities would occur along the route where shallow bedrock crosses structure foundations, facilities, and access roads. The Proponent may also use mechanical means or implosive sleeves to fuse conductor wires during the splicing process. The specific timing, quantity, and locations of these practices would be developed further during construction. Helicopters would also be used to assist with the conductor stringing process.

The construction equipment would be similar to that used during typical public works projects. Table 3.12-2 provides typical maximum noise levels at a reference distance of 50 feet associated with the equipment expected to be used during construction (Reherman et al. 2006). The equipment list provided may not be comprehensive of all the equipment that would be used but provides a reasonable estimate. The noise levels are presented as a reference distance of 50 feet, 600 feet (the closest any NSA would be to the Project centerline), 1,000 feet, and 2,000 feet. The extrapolated noise levels were developed using the standard 6 dBA reduction with doubling of distance from a point source of sound. The equipment presented could potentially be used at any location along the corridor.

Equipment would not generally be operated continuously or at full throttle, nor would the equipment always operate simultaneously. In addition, there would be times when no equipment is operating, and noise would be at ambient levels. Blasting would generate the highest noise level of any typical construction equipment, with a maximum level of 72 dBA at 600 feet (Table 3.12-2). Implosive sleeves to fuse conductors are expected to generate a lower noise level than bedrock blasting.

Helicopter usage would also occur for line stringing; depending on the location of any NSAs along the line, helicopters could occur as close as 600 feet from an NSA. Table 3.12-3 provides noise levels associated with several types of helicopters at various distances from the Project centerline.

Construction would typically occur 6 days per week over a period of 3 to 4 years, generally limited to 7:00 a.m. to 7:00 p.m.; Sunday and nighttime construction would be avoided to the

extent possible. Construction-related noise would exceed the existing ambient noise levels depending on the equipment in use and distance from the site (Table 3.12-2 and Table 3.12-3). Construction at each structure would be short-term and temporary, with no single NSA exposed to activities that exceed the existing ambient noise levels for an extended period. Helicopter use would generate the highest noise levels. While a helicopter would be used along the entire line, noise associated with its use would only occur for brief periods in the vicinity of any single NSA as wire stringing progresses along the line. Like helicopter use, blasting, whether for bedrock or conductor fusing, would be a short-term and temporary activity in the vicinity of any NSA. Therefore, construction noise impacts would be direct, short-term, and localized.

Operational noise from the proposed 500 kV and 525 kV transmission lines would originate from corona noise effects, which can produce a faint crackling or hissing sound, especially in wet weather conditions. Corona noise occurs when the insulating air around the conductors breaks down partially due to high electric fields, typically during foul weather (e.g., rain, fog, or snow). Corona noise is most relevant for high-voltage lines (345 kV or higher) and may include a 120 Hertz hum under certain conditions.

Corona noise for a 550 kV line (slightly larger than the proposed 500 to 525 kV lines and, thus, more conservative) has been calculated to be 40.3 dBA at 150 feet (K&R Consulting 2009). Expected corona noise levels at various distances were developed by using the 150-foot noise level as a reference and accounting for a 3 dBA reduction in noise from a line source with every doubling of distance. Table 3.12-4 provides the expected Project corona sound levels (dBA) at various distances.

The calculated corona noise levels are those that may occur during rainy or wet conditions. Corona noise levels are shown to be below the estimated existing ambient noise levels for both daytime and nighttime hours. Natural sounds such as wind and rain help mask corona noise. Further, during fair weather, corona noise levels would be much lower. Therefore, corona noise is not anticipated to result in any impacts.

During windy conditions, there is also the potential for aeolian noise to occur at times. Aeolian noise is characterized by a whistling-type sound generated by the wind blowing across the lines. However, this sound can be masked by the sound of the wind. At the ROW's edge, this impact would be direct, permanent, and localized but intermittent depending on wind speeds.

Converter Stations

Equipment and noise emissions data, as provided for the transmission line route construction analysis, were evaluated for the converter stations. Construction is expected to take 3 to 4 years. Table 3.12-5 provides the maximum noise levels for each piece of equipment at the nearest NSAs.

Construction would typically occur 6 days per week over a period of 3 to 4 years, limited to 7:00 a.m. to 7:00 p.m.; Sunday and nighttime construction would be avoided to the extent possible. Construction-related noise for some of the equipment could exceed the existing ambient noise levels depending on the equipment in use and distance from the site (Table 3.12-5). However, as discussed previously, equipment would not generally be operated continuously or at full throttle, nor would the equipment always operate simultaneously. In addition, there would be times when no equipment is operating and noise would be at ambient levels. Thus, impacts during construction would be direct, short-term, and localized.

The Rosebud County Converter Station and Morton County Converter Station would also produce noise during operations. Both converter stations would contain the same type and quantity of noise-generating sources.

The Proponent conducted noise modeling of each converter station using the commercially available CadnaA modeling software. The model included noise emissions from each major outdoor source, existing topography, and reflections off the converter station structures. Modeling included all sources in operation simultaneously.

The Proponent used the International Organization for Standardization 9613 standard for air absorption and other noise propagation calculations. Noise emissions for indoor sources were not included in the noise models due to the attenuating impacts of the converter station valve halls. Table 3.12-6 provides the sources, quantities, and sound power levels associated with each converter station included in the noise model.

Morton County Converter Station Noise Model Results

In lieu of applicable noise standards, modeling results were presented as L_{dn} levels to provide a comparison to the USEPA recommended L_{dn} level of 55 dBA for NSAs. Table 3.12-7 provides the noise modeling results for the nearest identified NSA, the USEPA recommended guideline level, the future cumulative level (estimated existing level plus the converter station), and potential increase above the existing level.

Both converter station noise levels and the combined future noise levels are projected to remain below the USEPA recommended noise levels for NSAs. Therefore, impacts from operations of the Morton County Converter Station would be direct, short-term, and localized.

Rosebud County Converter Station Noise Model Results

Montana (ARM 17.20.1607(2)(a)(i)) regulation limiting sound levels in residential and subdivided areas would not be applicable to the Project, as the Rosebud County Converter Station is not located in a residential area. The nearest residence is located 10,430 feet from the converter station.

In lieu of applicable noise standards, modeling results were presented as L_{dn} levels to provide a comparison to the USEPA recommended L_{dn} level of 55 dBA for NSAs. Table 3.12-8 provides the noise modeling results for the nearest identified NSA, the USEPA recommended guideline level, the future cumulative level (estimated existing level plus the converter station), and potential increase above the existing level.

Both converter station noise levels and the combined future noise levels are projected to remain below the USEPA recommended noise levels for NSAs (Table 3.12-8). No increases to noise levels at the NSA locations are projected to occur. Therefore, impacts from operations of the Rosebud County Converter Station would be direct, short-term, and localized.

Colstrip Substation Expansion

The nearest permanent NSAs are located on Olive Drive approximately 2,600 feet east of the nearest proposed substation expansion area. Additional NSAs are located approximately 3,100 feet north on Piedmont Drive. The highest noise level associated with any piece of equipment is 85 dBA at 50 feet (Table 3.12-5). This noise level would be reduced to 44 dBA at 2,600 feet (the nearest NSA), which is below the estimated L_{dn}. Thus, no impacts would occur during construction.

Noise from the Colstrip Substation expansion would be similar to noise from the existing substation. Typically, the loudest noise at a substation is generated by transformers. The proposed expansion to facilitate the Project's interconnection does not require the addition of new transformers. Therefore, the sound emissions would be largely similar to the existing operating conditions of the Colstrip Substation.

3.13. VEGETATION

This section describes the analysis methods, affected environment, and impacts on vegetation from the Project.

3.13.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on vegetation.

3.13.2. Affected Environment

This section describes baseline conditions for vegetation.

3.13.2.1. Vegetation and Plant Communities

The Project area is entirely within the Northwestern Great Plains Level III Ecoregion (USEPA 2025) and characterized by rolling hills, grasslands, ephemeral streams, and perennial rivers. Within this ecoregion, there are six Level IV ecoregions that occur in the Project area (USEPA 2025). Figure 3.13-1 shows all USEPA Level IV Ecoregions crossed by the Project area.

Level IV Ecoregions

Montana Central Grasslands

The Montana Central Grasslands are prairies located centrally in Montana. They are characterized by open landscapes comprised of grasses, shrubs, and forbs with rolling hills to flat plains. These grasslands are primarily used for ranching, cattle and sheep grazing, and agricultural activities.

Pine Scoria Hills

The Pine Scoria Hills are an ecoregion in Montana characterized by the combination of ponderosa pine (*Pinus ponderosa*) forests and unique geological features due to the presence of scoria, a reddish-brown volcanic rock. This ecoregion is primarily used for logging, grazing, and coal mining.

River Breaks

The River Breaks are a landscape found in Montana and North Dakota defined by deeply eroded terrain along rivers. This resulted in the formation of narrow canyons, buttes, mesas, and ravines. This rugged, isolated terrain makes the area challenging for human settlement and agricultural use and is instead primarily managed for conservation given its geological features and biodiversity.

Sagebrush Steppe

The Sagebrush Steppe is a dry, shrubland ecosystem in the western United States, including parts of Montana. It is dominated by sagebrush (*Artemisia* sp.) mixed with grasses and other shrubs. The landscape is typically flat to rolling with a semi-arid climate. It is primarily used for ranching and agriculture.

Little Missouri Badlands

The Little Missouri Badlands are a rugged landscape found in western North Dakota and eastern Montana. This ecoregion is characterized by eroded terrain, deep ravines, and sharp ridges, all formed by wind and water erosion. Vegetation includes grasses, sagebrush, and cacti. It is primarily used for cattle grazing and managed for conservation and recreation.

Missouri Plateau

The Missouri Plateau is a geologically diverse region in eastern Montana, North Dakota, and South Dakota. It consists of flat to gently rolling terrain but also has buttes, ridges, and valleys made up of sedimentary rock shaped by erosion. Its vegetation includes a mix of grasslands, sagebrush, and scattered forests. It is primarily used for farming, grazing, and conservation.

Plant Communities and Vegetation Cover

Within the Project area, there are several vegetation cover types: herbaceous grasslands, shrubland, forest and woodland, and agricultural land, classified using the Montana Land Cover Framework (MLCF) and USGS NLCD (Grid United 2025b). This section discusses their potential presence within the Project area. Figure 3.13-2A shows vegetative land cover types throughout the Project area, and Table 3.13-3 lists a summary of acreages.

Herbaceous Grassland

Herbaceous grassland is the most abundant vegetation type within the Project area and occupies 6,686.3 acres of the Project area (2,697.0 acres in Montana and 3,989.2 in North Dakota) (Grid United 2025b). It supports several graminoids, shrubs, and some forbs. In dry upland areas, blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) are dominant. Taller grasses such as big bluestem (*Andropogon gerardii*) and western wheatgrass (*Pascopyrum smithii*) are present at the bases of slopes, ravines, and valleys where moisture can better accumulate. Forb species include field pussytoes (*Antennaria neglecta*), purple coneflower (*Echinacea angustifolia*), yarrow (*Achillea millefolium*), Indian breadroot (*Pediomelum* spp.), sagewort (*Artemisia* spp.), and goldenrods (*Solidago* spp.) (Grid United 2024).

The MLCF identifies most grasslands within the Project area in Montana as Great Plains Mixed-Grass Prairie or Great Plains Sand Prairie (Grid United 2024). These habitat types are typically associated with each other and can support communities of silver sagebrush (*Artemisia cana*). These prairie types typically occur within the Missouri Plateau Level IV Ecoregion.

The North Dakota Game and Fish Department (NDGFD) defines most of the grasslands within the Project area as mixed-grass prairie and divides North Dakota into six geological regions (Missouri Slope, Badlands, Missouri Coteau, Turtle Mountains, Drift Prairie, and Red River Valley) (NDGFD 2025). The Project area lies within the western portion of the Missouri Slope region, which is characterized by mixed- and short-grass prairie, and the Badlands region, which is characterized by sparse vegetation, dry shrubs, and thickets of woodlands.

A historical record of a Western Little Bluestem Prairie, a subtype of herbaceous grassland, occurrence is documented by the North Dakota Natural Heritage Inventory (managed under the North Dakota Parks and Recreation), south of an existing road outside Project impact areas (Grid United 2024). Therefore, no direct impacts on this prairie are anticipated from the Project. Western Little Bluestem Prairies are classified as an S2 community (i.e., grassland type is imperiled and highly vulnerable to extirpation and only has 6 to 20 known occurrences remaining in the state) (Grid United 2024). However, there is limited information regarding the historical extent or status of the Western Little Bluestem Prairie occurrence. Aerial imagery from recent surveys indicates that the area is significantly disturbed, with the presence of a

road and possible cattle paths or off-road vehicle tracks (Grid United 2024); these disturbances may affect the prairie's integrity.

The Prairie Pothole Joint Venture has mapped native prairie remnants and other grasslands across North America, categorizing those areas as potentially undisturbed or unbroken grasslands (landscapes that have not been disturbed by agricultural row crop activities or urban development; Fields and Barnes 2019). These grasslands have a higher potential to retain grasses and forbs characteristic of native prairies and provide valuable habitats for native plants and animals. However, the floristic quality of these potentially unbroken grasslands (which may include land uses such as cattle grazing, haying, and controlled burning) is not always high (Fields and Barnes 2019).

Within Project impact areas, approximately 2,026 acres of potentially undisturbed grassland have been identified (Fields and Barnes 2019). The remaining grasslands in Project impact areas are considered disturbed or altered, and they may be dominated wholly or in part by exotic and nonnative grass and forage species.

Shrubland

Shrublands comprise 1,491.6 acres (1,197.7 acres in Montana and 293.9 acres in North Dakota) of the Project area (Grid United 2025b) and are divided into two types in Montana: Big Sagebrush Steppe and Great Plains Badlands. Big Sagebrush Steppe is dominated by forbs, perennial grasses, and big sagebrush (*Artemisia tridentata*). The Great Plains Badlands is characterized by dryland shrubs, namely broom snakeweed (*Gutierrezia sarothrae*), greasewood (*Sarcobatus vermiculatus*), and Gardner's saltbush (*Atriplex gardneri*; Grid United 2024).

In North Dakota, shrublands are not as common or defined. Common shrub and small tree species include dwarf juniper (*Juniperus communis*), creeping juniper (*Juniperus horizontalis*), spiny saltbush (*Chenopodium spinescens*), greasewood, eastern cottonwood (*Populus deltoides*), and green ash (*Fraxinus pennsylvanica*).

Wetlands

Wetlands in the Project area occupy 13.3 acres, most of which are classified as PEM wetlands and the remainder classified as riverine or lakes/ponds. There are 6.1 acres within Montana and 7.2 acres within North Dakota. See Section 3.6.2.4, [Surface Water Hydrology, Affected Environment] Wetlands, for more information about wetlands.

Forest and Woodland

Forested lands in the Project area occupy 474.1 acres (450.3 acres in Montana and 23.9 acres in North Dakota) (Grid United 2025b).

In Montana, the most common forest types in the Project area are the Great Plains Ponderosa Pine Woodland and Savanna and Great Plains Riparian. Dominant overstory species include ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*). Understory is typically made up of shrubs, including western snowberry (*Symphoricarpos occidentalis*) and skunkbush sumac (*Rhus trilobata*), as well as mixed grasses.

In North Dakota, forests are uncommon and typically deciduous; 27.5 acres of forest and woodland occur within the Project impact areas (Grid United 2025b). Common overstory species include bur oak (*Quercus macrocarpa*), green ash, cottonwood, juniper, ponderosa

pine, and quaking aspen (*Populus tremuloides*). Common understory shrub species include American hazelnut (*Corylus americana*), black currant (*Ribes nigrum*), and Missouri gooseberry (*Ribes missouriense*). Common forbs include false lily-of-the-valley (*Maianthemum dilatatum*) and early meadowrue (*Thalictrum dioicum*).

Agricultural Lands

Agricultural lands within the Project area occupy 2,654.2 acres (457.4 acres in Montana and 2,196.8 acres in North Dakota) and include crop fields and pasture (Grid United 2025b). Common crops include spring wheat, alfalfa, corn, soybeans, and sunflowers.

Rangeland

Rangeland includes land in which ground cover and vegetation is dominated by grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing of wildlife and livestock. These cover types include diverse vegetation such as grasslands, shrublands, forest, and woodlands. Most of the land within the Project area is considered rangeland, except for agricultural land that is tilled for crop production. The majority of land within the Project area that crosses BLM, USDA Forest Service, or USDA ARS lands are rangelands. Section 3.9, Visual and Aesthetics, addresses rangeland on federal lands.

3.13.2.2. Threatened and Endangered Species and Species of Concern

Threatened and endangered (T&E) species are defined under the Endangered Species Act (ESA) of 1973, with threatened meaning "any species which is likely to become an endangered species within the foreseeable future" and endangered meaning "any species which is in danger of extinction throughout all or a significant portion of its range" (16 USC § 1532). No federal or state-listed T&E plant species have been known to occur within the Project area or were identified during the 2022 to 2024 botanical surveys on NFS lands in North Dakota (WEST 2022, 2023, 2024). Additionally, no ESA-listed (T&E) species were identified in the Information for Planning and Consultation (IPaC) tool or during USFWS coordination.

Based on the current USDA Forest Service Regional Forester's Sensitive Species (RFSS) list, 13 USDA Forest Service-designated sensitive plant species have the potential to occur within the LMNG. The Hooker's Townsend-daisy (*Townsendia hookeri*) was the only RFSS plant (also a North Dakota Species of Conservation Priority [SCP]) found and documented in several locations, all within the LMNG in Slope County, North Dakota (WEST 2024). In 2022, 3 occurrences of 15 individual Hooker's Townsend-daisies were recorded (WEST 2022). In 2023, 20 occurrences of 117 individual Hooker's Townsend-daisies were recorded (WEST 2023). In 2024, 29 occurrences of 204 individual Hooker's Townsend-daisies were recorded (WEST 2024). All observations of Hooker's Townsend-daisy were in areas with flat to gently sloping gravel with bare, eroded soils. The populations occupied the shoulder slopes, transitioning uphill into native grassland benches and downhill into steeper, more eroded slopes. Surrounding plant species typically included needleleaf sedge (*Carex duriuscula*), blue grama, little bluestem (*Schizachyrium scoparium*), purple coneflower (*Echinacea purpurea*), and creeping juniper (*Juniperus horizontalis*). Nonnative grasses such as crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*) were also widespread in the surrounding area (WEST 2022, 2023, 2024). Additionally, grazing activity was observed nearby.

Based on the Montana Natural Heritage Program (MTNHP) species occurrences (MTNHP 2025b), four Species of Concern (SOC) plant species are known to occur in Project impact areas in Montana. Bractless blazingstar (*Mentzelia nuda*) is a forb that occurs in sandy or gravelly soil of open hills and roadsides on the plains in Rosebud and Custer counties, Montana. Heavy sedge (*Carex gravida*) is a graminoid that occurs in moist woodlands and prairies, such as ravines and wooded draws in Custer and Fallon counties, Montana. Lead plant (*Amorpha canescens*) is a forb that occurs in mixed-grass and tallgrass prairies, woodlands, and along stream banks, typically in sandy, gravely, or rocky soils in Rosebud County, Montana. Raceme milkvetch (*Astragalus racemosus*) is a forb that grows in grasslands and is highly dependent on clay or chalky, alkaline soils rich in selenium and is known to occur in Fallon County. Heavy sedge and raceme milkvetch have both been documented in Fallon County in 2005 and 2006, respectively (MTNHP 2025a).

There are another 48 special status plant species known to occur in the counties crossed by the Project (Table 3.13-1); 32 of these are Montana SOC, 19 are North Dakota SCP, 5 are both, 13 are USDA Forest Service RFSS, and 2 are BLM Special Status Species (SSS) (Grid United 2024). None of these plants, however, have been documented in the Project area.

3.13.2.3. Noxious Weeds

A noxious weed is defined as "any plant designated by a federal, state, or county government as harmful to public health, agriculture, recreation, wildlife, or property" (BLM 2024). Noxious weeds often include nonnative, invasive terrestrial and aquatic plant species that possess certain traits or lack natural constraints, allowing them to outcompete native or desirable plant species.

Federal Executive Order 13751, “Safeguarding the Nation from the Impacts of Invasive Species” (2016), aims to prevent the introduction, establishment, and spread of invasive species. The order also mandates the eradication and control of invasive species populations that result from federal government actions or authorized activities. Additionally, the Noxious Weed Control and Eradication Act of 2004 requires federal agencies to manage weeds on federal lands in compliance with state and local weed control regulations.

The Montana Aquatic Invasive Species (AIS) Act of 2009 establishes a statewide invasive species management area, requiring inspection of vessels and equipment entering the state. It also mandates inspection and cleaning protocols for vehicles and equipment moving between waterbodies. Of the 31 AIS in Montana, no plant species occur in the Project area (FWP 2024).

In North Dakota, regulations require construction equipment to be free of state-listed Aquatic Nuisance Species (ANS), with mandatory inspections for equipment entering the state. The NDGFD certifies equipment from Class I ANS-infested waterbodies as ANS-free before it can enter another waterbody. Of the 46 ANS in North Dakota, 1 plant species occurs in western North Dakota—the curly leaf pondweed (*Potamogeton crispus*)—which has not been documented in any of the waterbodies found in the Project area (NDGFD 2019).

In Montana, noxious weeds are regulated under the Montana County Weed Control Act of 1939, enforced by the County Weed Districts. These plants are assigned a priority level based on their known presence in the state. There are currently 47 designated statewide noxious weeds listed within the Project area. Cheatgrass (*Bromus tectorum*) was observed in the

Project area but is not considered a noxious weed in Montana; however, it is a statewide regulated plant.

In North Dakota, noxious weeds are regulated under the North Dakota Century Code Noxious Weed Control, enforced by the North Dakota Department of Agriculture (NDDA). The NDDA also maintains a list of noxious weeds currently totaling 13 species. Seven additional plants are listed by one or more counties (NDDA 2023). Cicer milkvetch (*Astragalus cicer*), crested wheatgrass, field brome (*Bromus arvensis*), intermediate wheatgrass (*Thinopyrum intermedium*), Kentucky bluegrass, and smooth brome were all observed in the Project area and are not considered statewide noxious weeds in North Dakota but are recognized by the USDA Forest Service as being nonnative or invasive plant species.

The Proponent conducted surveys for noxious weeds within the Project area between 2022 and 2024. Documented species in the Project area during these surveys can be found in Table 3.13-2.

3.13.3. Environmental Consequences

The impacts on vegetation are discussed in the following sections.

3.13.3.1. No Action Alternative

Under the No Action Alternative, there would be no impacts on vegetation, as the Project would not be built.

3.13.3.2. Proposed Alternative

The Proposed Alternative involves construction and operations of the transmission line segments, converter stations, switchyard, expansion of the Colstrip Substation, and access roads across eastern Montana and western North Dakota. Construction would occur year-round over 3 to 4 years. Actions taken to avoid or mitigate vegetation impacts are considered in the discussions below.

Direct impacts on vegetation communities and special status species occur through clearing, filling, and other construction activities. A direct impact on a special status species occurs when the action results in the removal or loss of an individual plant or entire plant population.

Secondary impacts occur when a vegetative land cover type, plant community, or ecological habitat type experiences a change in vegetative composition, either over years or immediately after an action. Secondary impacts on vegetation may include changes in hydrology, deposition of PM (dust), changes in successional stage, a decline in species structure, and/or invasion of noxious weeds.

Site Preparation and Construction Activities

The Proposed Alternative would temporarily disturb approximately 10,556.1 acres and permanently disturb 750.3 acres of vegetation within the Project area (Grid United 2025b). These disturbances would directly affect existing vegetation in the Project area during construction. The following impact acreages are listed in Table 3.13-3.

Construction in the Project area would primarily affect 6,686.3 acres of herbaceous grasslands: 6,517.7 temporarily (2,553.5 acres in Montana and 3,964.2 acres in North Dakota) and 168.6 permanently (143.5 acres in Montana and 25.0 acres in North Dakota) (Grid United 2025b). The Hooker's Townsend-daisy, a USDA Forest Service RFSS plant species, was observed during Project surveys at multiple locations within the LMNG; however, Project impact areas

have been adjusted to avoid all 52 occurrences documented during Project surveys. The closest occurrence is approximately 68 feet from a temporary structure impact area. Project impact areas have also been adjusted to avoid suitable and occupied suitable habitat for Hooker's Townsend-daisy, where possible. Timber matting would be applied to minimize ground disturbance in occupied suitable habitat where avoidance is not possible. Five occurrences remain within the Project ROW, but impacts are not anticipated. The USDA Forest Service Biological Evaluation will contain further information on RFSS within the Project area. No North Dakota SCP plants would be affected, as none were documented in Project impact areas. Montana SOCs are more likely to be affected, as there are four that have been known to occur in the Project area: bractless blazingstar, heavy sedge, lead plant, and raceme milkvetch. There have been historic observations of lead plant and bractless blazingstar, but both are assumed absent from the Project area, as they have not been documented within the Project area since 1941 and 1983, respectively (MTNHP 2025a). Specifically, heavy sedge and raceme milkvetch may be affected in Fallon County, as they have both been observed there.

During construction, the Proponent would remove trees, shrubs, and brush as necessary within Project impact areas. Vegetation would be cut at or above the ground surface to leave the rootstock intact, which would help maintain soil stability and erosion control. Additionally, trees and tall shrubs would be permanently removed from the ROW for Proposed Alternative construction and operations. Approximately 428.5 acres of forest and woodland areas (405.0 acres in Montana and 23.6 acres in North Dakota) would be permanently cleared or converted into herbaceous grassland within the ROW due to restricting tall vegetation in that area and maintaining it in an open herbaceous state (Grid United 2025b). Approximately 114.2 acres of shrubland (112.5 acres in Montana and 1.7 acres in North Dakota) would be permanently cleared or converted into herbaceous grassland within the ROW by restricting tall vegetation in that area and maintaining it in an open herbaceous state (Grid United 2025b).

The Proponent would restore impact areas as near as practicable to pre-construction conditions in accordance with Section 6 of the CMRP (Appendix E). The Proponent would revegetate impact areas using methods and regionally sourced seed mixes appropriate to existing land uses and cover types.

Forested and shrubland areas take longer to re-establish when compared to other land cover types, whereas cultivated lands can be restored to pre-construction conditions within the next growing season. Herbaceous grasslands may take 3 to 5 years to re-establish. With these measures, construction would generally have direct, short-term, localized impacts on agricultural lands; direct, medium-term, localized impacts on herbaceous grasslands; and direct, long-term, localized impacts on shrubland and forest and woodlands.

The Proponent would clear vegetation within the ROW, in compliance with NERC Facilities Design, Connections, and Maintenance standards FAC-003-4 (Transmission Vegetation Management) guidelines. Vegetation management may temporarily affect surface water flow and groundwater infiltration. These secondary impacts are expected to be short-term and localized where they are associated with temporary construction areas. Construction and expansion of permanent facilities, such as converter stations, switchyards, access roads, and transmission structures, would have secondary impacts that would be permanent and localized.

Additionally, construction would temporarily increase fugitive dust emissions, particularly in areas with erosion-prone soils where vegetation clearing and heavy equipment operations occur. Precipitation, wind, and soil disturbance from activities like vehicle movement, excavation, grading, and blasting would contribute to dust generation. As a result, construction activities would have secondary, localized, and temporary impacts on plants due to dust deposition. To mitigate these impacts, the Proponent would use water for dust control on unpaved roads, minimize sediment tracking, and promptly remove soil from paved roadways. In erosion-prone areas, the Proponent would minimize surface disturbances, use soil stabilization practices, and cover material stockpiles to minimize the potential of dust, implementing reclamation efforts to reduce erosion after construction activities. For additional details about the dust mitigation measures, see Section 5.6 of the CMRP (Appendix E).

Spill Prevention

Potential spills and leaks of hazardous materials including petroleum, antifreeze, and herbicides could harm existing vegetation during construction. The Proponent has developed an SPRP, which would help avoid or minimize these impacts (Appendix E). Any impacts on vegetation from spills would be direct and secondary, short-term, and localized.

Invasive Species Management

The Proponent has developed the Invasive and Noxious Species Management Plans (Appendix E), which includes both the Montana Noxious Weed and Aquatic Invasive Species Management Plan and the North Dakota Noxious Weed Management Plan. Both plans describe relevant laws and management requirements, as specified by federal and state agencies, and the methods the Proponent would implement during construction to manage the spread of noxious weeds.

Most impacts would occur as a result of ground-disturbing activities, namely if activities introduce or spread noxious and invasive weeds. The Proponent would establish permanent vegetation in areas of exposed soils, such as graded areas and along temporary access roads that are to be restored to pre-construction conditions (except in actively cultivated areas and inundated wetlands). The Proponent would purchase seed mixes that follow specifications set by the MDA and NDDA. Both require that seed mixes be analyzed to manage the introduction of noxious weeds and contain certified or registered commercial seed. The Proponent would apply seed using various methods (broadcasting, hydroseeding, or drill seeding) and equipment that would allow for even distribution and avoid rutting the soil surface. See Section 6 of the CMRP (Appendix E) for more details about the revegetation and seeding efforts.

Prior to construction, noxious weeds would be marked to limit the infestation to the construction area. Noxious weeds would be treated with herbicide or mowed as needed. BMPs would be installed to prevent any herbicide used from affecting other plants or wildlife species. Impact duration on vegetation communities would be influenced by the type of vegetation, the presence of noxious weeds, and growing conditions.

To reduce the risk of transferring AIS, the Proponent would coordinate with the NDGFD and comply with the AIS Act of Montana to develop measures to avoid or minimize in-water work to the extent practicable. The Proponent would also obtain an NDGFD ANS-free certification prior to starting work in another waterbody in North Dakota. Both states recommend using BMPs including cleaning and decontamination procedures to prevent the spread of invasive plant species. With this mitigation, impacts due to invasive or noxious species would generally be direct, short-term, and localized.

3.14. FISHERIES AND WILDLIFE

This section describes the analysis methods, affected environment, and impacts on fisheries and wildlife from the Project.

3.14.1. Analysis Methods

Appendix B describes methods and/or data sources used to analyze the impacts on fisheries and wildlife.

3.14.2. Affected Environment

This section describes baseline conditions for fisheries and wildlife.

3.14.2.1. Fisheries

Existing Fisheries Resources

The Project area includes portions of the Missouri River watershed in North Dakota and Montana. All waterbodies within the Project area are freshwater and do not support catadromous or anadromous populations. There is no designated essential fish habitat in the Project area (NDGFD 2015a; MTNHP 2023a). Locations of waterbodies within Project impact areas are shown on Figure 3.6-2.

An ARI for the Project was conducted on a 300-foot-wide transmission line survey corridor, 50-foot-wide access road corridors, pulling and tensioning sites, laydown yards, facility footprints, and additional construction areas during the summer and fall between 2022 and 2024 (WEST 2025a). Based on the ARI, the Project area crosses 465 waterbodies, of which 70 are perennial streams, 146 are intermittent streams, 167 are ephemeral streams, and 82 are open waterbodies (WEST 2025a). State surface water classifications are described in Section 3.6, Surface Water Hydrology. All waterbodies within Project impact areas in Montana and North Dakota are considered warmwater fisheries (Grid United 2024b).

Montana Freshwater Fisheries

In Montana, the Project would cross 321 waterbodies, which would include 31 perennial streams, 115 intermittent streams, 143 ephemeral streams, and 32 open waterbodies (WEST 2025a). Most of the waterbodies within Project impact areas in Montana have a C-3 classification, which designates beneficial uses for aquatic life and recreation (MTDEQ 2020, 2021). One of the largest rivers within the Project area, the Tongue River, has a B-3 classification, which includes the same aquatic life and recreation uses as C-3 but also identifies the waterbody for drinking, agricultural, and industrial water supply uses (MTDEQ 2020, 2021). The centerline would span the Tongue and Powder rivers, and existing roads would be used for access across the rivers (no other Project feature crosses either river).

Recreational fishing occurs throughout waterbodies crossed by the Project in Montana (FWP 2023a). The Proponent did not conduct aquatic species surveys along the Project. Thirty fish species are known to occur or have potential to occur in Montana Project impact areas (Table 3.14-1). There are no known commercial fisheries within any Project impact areas; these are not discussed further.

In Montana, the Tongue, Little Missouri, and Powder rivers and their tributaries are managed as general/conservation fisheries with active management of the rivers focusing primarily on improving fish passage, particularly for migrating species (e.g., pallid sturgeon [*Scaphirhynchus albus*; federally endangered], shovelnose sturgeon [*Scaphirhynchus platorynchus*], paddlefish

[*Polyodon spathula*], sauger [*Sander canadensis*; SOC], and blue sucker [*Cycleptus elongatus*]), whose passage is limited by culverts or other impediments. Within the Little Missouri River drainage, walleye (*Sander vitreus*) are stocked to supplement recreational opportunities in Beaver Creek. In the Tongue River below the Tongue River Reservoir, catchable-size trout are stocked. Throughout the Tongue River drainage, wild fish transfers are done to stock species of northern pike (*Esox lucius*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), yellow perch (*Perca flavescens*), channel catfish (*Ictalurus punctatus*), and bluegill (*Lepomis macrochirus*). No other waterways in these drainages are stocked (FWP 2023c).

Since 2019, annual sampling of larval pallid sturgeon, shovelnose sturgeon, and paddlefish has been conducted in the Tongue River upstream of Intake Dam by the Bureau of Reclamation. Additional game species within the Tongue River include sauger, trout, channel catfish, and northern pike (FWP 2023c). Historically, fish sampling in the drainages of the Little Missouri and Powder rivers has been limited and sporadic and mainly for specific educational activities for school programs. However, since 2014, the Bureau of Reclamation performs targeted monitoring of pallid sturgeon and paddlefish populations of the Powder River. Fish assemblages of both drainages support primarily native species. Game species found in the Little Missouri River drainage include channel catfish, northern pike, walleye, and sauger. In the Powder River drainage, game species include channel catfish, sauger, walleye, and shovelnose sturgeon (FWP 2023c).

The primary management objective for the lower Yellowstone River and its large tributaries; including Rosebud Creek, O'Fallon Creek, and Sandstone Creek; is monitoring and maintaining the native species' populations. The only legally stocked fish species in these drainages is the pallid sturgeon. The lower Yellowstone River and its tributaries support 61 species of fish, of which 41 are native. The species found are primarily warmwater and coolwater species and a few coldwater species. Game species found in the Yellowstone River drainage include sauger, channel catfish, shovelnose sturgeon, pallid sturgeon, paddlefish, brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*). Game species that have been stocked or illegally introduced include northern pike, walleye, mountain whitefish (*Prosopium williamsoni*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), white crappie, black crappie, yellow perch, bluegill, and pumpkinseed (*Lepomis gibbosus*). Within the drainage, fishing pressure is highest on the Yellowstone River and ponds and reservoirs close to population centers (FWP 2023c).

The Management Plan for Montana and North Dakota Paddlefish Stocks and Fisheries by the FWP and NDGFD proposes uniform data collection, stock assessment, and management approaches within the Yellowstone-Sakakawea, Fort Peck, and Oahe management units (Scarnecchia et al. 2021). The plan outlines management goals, including providing a sustainable recreational harvest and maintaining and enhancing existing habitat in waterbodies. The Yellowstone-Sakakawea population, which is in the largest management unit, spawn in the Yellowstone and Powder rivers, as well as in the Missouri and Milk rivers below the Fort Peck Dam in Montana. Young are commonly reared in Lake Sakakawea in North Dakota. The life cycle of the Fort Peck population is completed entirely in Montana, as this population rears in the Fort Peck Reservoir and spawns upriver in the Missouri River. The Oahe

population is found in the Oahe Reservoir. This population may be sustained from the other two stocks that entered the Oahe Reservoir from above Garrison Dam, as there is no evidence of successful spawning (Scarnecchia et al. 2021). FWP and NDGFD regulations limit harvesting of paddlefish in the rivers. Fishing season and regulations for the Yellowstone-Sakakawea and Fort Peck populations vary by river section with snag fishing permitted along most reaches except at the Fort Pack dredge cuts, where only bow and arrow harvest is permitted (FWP 2025a). In Montana, the intake on the Yellowstone River is the most important fishing site for paddlefish. The Oahe population does not support a legal fishery (Scarnecchia et al. 2021).

Fishing activity on waterbodies within the Project area is relatively low due to lack of public access to the rivers. On the Tongue River, the Twelve Mile Fishing Access Site is publicly accessible and a popular destination for anglers (FWP 2023c).

North Dakota Freshwater Fisheries

In North Dakota, the Project area would cross 144 waterbodies, which would include 39 perennial streams, 31 intermittent streams, 24 ephemeral streams, and 50 open waterbodies (WEST 2025a). The NDDEQ classifies flowing waterbodies by water quality, flow regime, and beneficial uses. The classifications range from waters with higher water quality that are suitable for a range of uses, aquatic organisms, and recreational use (i.e., Class I) to waters with progressively lower water quality and less water availability for use (i.e., Class III). The Project area in North Dakota crosses two Class IA waterbodies (Heart River and Square Butte Creek) and one Class II waterbody (Cannonball River). The Square Butte Creek and Cannonball River would both be crossed by Project access roads. The remaining flowing waterbodies are designated as Class III in the North Dakota Administrative Code Chapter 33.1-16-02.1 (NDAC § 33.1-16-02.1). The Project centerline would cross one Class II waterbody (Little Missouri River). No other Project areas (e.g., access roads) are proposed to cross these waterbodies.

Recreational fishing occurs throughout waterbodies crossed by the Project in North Dakota with fishing activity higher on lakes and near dams (NDGFD 2025a). Fishing activity along streams and rivers within the Project area is likely low due to a lack of public access. The Proponent did not conduct aquatic species surveys along the Project. However, 32 fish species are known to occur or have potential to occur in the North Dakota portion of the Project area (Table 3.14-1). There are no known commercial fisheries crossed by the Project in North Dakota.

The NDGFD considers the following species game fish: bluegill, burbot (*Lota lota*), channel catfish, chinook salmon (*Oncorhynchus tshawytscha*), white crappie, black crappie, largemouth bass, muskellunge (pure and hybrid; *Esox masquinongy*), northern pike, paddlefish, sauger, saugeye (*Sander canadensis* × *vitreus*), smallmouth bass, pallid sturgeon, shovelnose sturgeon, lake sturgeon (*Acipenser fulvescens*), brown trout, lake trout (*Salvelinus namaycush*), rainbow trout (*Oncorhynchus mykiss*), tiger trout (*Salmo trutta* × *Salvelinus fontinalis*), cutthroat trout (*Oncorhynchus* spp.), walleye, white bass (*Morone chrysops*), yellow perch, and zander (*Sander lucioperca*) (NDGFD 2024). The NDGFD considers several factors (e.g., waterbody size, depth, and habitat) and public demand for a species for fisheries management. Walleye are the most demanded species by North Dakota anglers (NDGFD 2025e).

Golden Valley, Slope, Hettinger, Grant, and Morton counties are in the Southwest Fisheries District of North Dakota. Within this district, the Project area crosses the Cannonball, Heart, and Little Missouri rivers. Walleye, northern pike, and catfish species are found in these three rivers. In the Heart River, smallmouth bass are also abundant, while sauger is found in the Little Missouri River during spring spawning (NDGFD 2025a).

The eastern half of Morton County is within North Dakota's South Central Fisheries District, and Oliver County is in the North Central Fisheries District. Fisheries species are not described for the waterways crossed by the Project area in these districts (NDGFD 2025a).

Freshwater Mussels

There are no known or expected occurrences of federally listed, Montana SOC, or North Dakota SCP freshwater mussels in the waterbodies crossed by the Project (MTNHP 2023b; Grid United 2024b), and no freshwater mussel surveys were conducted by the Proponent along the Project area. Common freshwater mussel species in Montana include the fatmucket (*Lampsilis siliquoidea*), giant floater (*Pyganodon grandis*), and grooved fingernail clam (*Sphaerium simile*) (MTNHP and FWP 2025b). In North Dakota, freshwater mussel species, such as the pink heelsplitter (*Potamilus alatus*) and threeridge (*Amblema plicata*), are locally common in select waters (NDGFD 2025g).

Aquatic Invasive Species and Aquatic Nuisance Species

AIS in Montana and ANS in North Dakota are nonnative species known to cause the displacement of native species and cause adverse impacts on ecosystems and/or public health (NDGFD 2025c; FWP 2023b). The CMRP includes the AIS list. Of the 31 listed AIS in Montana, only the American bullfrog (*Lithobates catebeianus*) is confirmed to occur in the Project area. Bullfrogs typically occur within wetlands and riparian areas, and observations are uncommon but have occurred in Rosebud and Custer counties, including the Powder River (FWP 2025b; MTNHP and FWP 2025b; Grid United 2024b). Forty-six ANS are known in North Dakota, of which only the common carp (*Cyprinus carpio*) is reported to occur in Project area waterbodies, including the Cannonball River (NDGFD 2024, 2025c, 2025f).

Fisheries of Special Concern

Fisheries of special concern include waterbodies that support fisheries of exceptional recreational value and commercial fishing or that provide habitat for aquatic species listed for protection at the federal, state, or local level. Listed aquatic species that potentially occur in the Project area are listed in Table 3.14-2.

Montana Community Types of Greatest Conservation Need and Species of Concern

All rivers and streams in Montana are designated by Montana's State Wildlife Action Plan (SWAP) as Community Types of Greatest Conservation Need (CTGCN) (FWP 2015). Within the Project impact areas, there are two types of CTGCN: Prairie Rivers and Prairie Streams. Prairie Rivers receive conservation priority because the lower reaches of the rivers contain large woody debris, deep pools, and undercut banks, which provide spawning and nursery habitat for warmwater fishes during the spring and early summer. Prairie Streams have water either intermittently or permanently flowing through them in an otherwise dry region and receive conservation priority, as they provide important fish rearing habitat and habitat and resources for amphibians, reptiles, and terrestrial wildlife (FWP 2015).

Community types are classified by conservation priority into three tiers. Within Project impact areas, there are five waterbodies that are either classified as Tier I or Tier II. Tier I communities include waterbodies and wetlands in community type and any community type that has at least 66.7 percent of all Species of Greatest Conservation Need (SGCN) within the ecoregion. Tier II communities have at least 10 percent but less than 66.7 percent of all SGCN within an ecoregion. The following CTGCN aquatic communities are crossed by Project impact areas in Montana (FWP 2023a):

- Two Tier I large Prairie Rivers (Tongue and Powder rivers);
- One Tier II medium Prairie River (Rosebud Creek); and
- Two Tier II Great Plains Prairie Streams (O'Fallon and Sandstone creeks).

Aquatic SGCN associated with Prairie Streams include Iowa darter (*Etheostoma exile*), northern redbelly dace (*Chrosomus* (*Phoxinus*) *eos*), northern redbelly dace x finescale dace hybrid (*Chrosomus* (*Phoxinus*) *eos x Chrosomus neogaeus*), sauger, and sturgeon chub (*Macrhybopsis gelida*). SGCN associated with Prairie Rivers include the same Montana SOC listed for Prairie Streams, as well as blue sucker, paddlefish, pallid sturgeon, shortnose gar (*Lepisosteus platostomus*), and sicklefin chub (*Macrhybopsis meeki*) (FWP 2015).

Montana Species of Concern

The MTNHP and the FWP produce the Montana SOC (MTNHP 2024). SOC are native species that are at-risk due to population decline, habitat threats, and/or restricted distributions. Within the Project ROW, there are ten potentially occurring SOC aquatic species, each of which are fish, including blue sucker, Iowa darter, northern redbelly dace, northern redbelly dace x finescale dace hybrid, paddlefish, pallid sturgeon, sauger, shortnose gar, sicklefin chub, and sturgeon chub. Of these, the blue sucker, paddlefish, pallid sturgeon, sauger, and sturgeon chub have been documented to occur in the Project area (Grid United 2024b) (Table 3.14-2).

Federally Listed Species

The pallid sturgeon is a federally listed endangered species that is listed as an SOC in Montana and an SCP in North Dakota. This species is known to spawn within the Tongue and Powder rivers in Montana, which are crossed by Project impact areas.

North Dakota Aquatic Communities and Species of Conservation Priority

The North Dakota SWAP designates habitats or community types of conservation priority as focus areas. Aquatic focus areas crossed by impact areas in North Dakota include the Cannonball, Heart, and Little Missouri rivers (Dyke et al. 2015).

In the North Dakota SWAP, SCP are categorized into three levels: Level I species are species in decline that have a high level of conservation priority, Level II are species that have a moderate level of conservation priority, and Level III are species that have moderate conservation priority but are nonbreeding in North Dakota (NDGFD 2025b). Within the Project ROW, there are eight fish and one mollusk SCP with the potential to occur: blue sucker, burbot, flathead chub (*Platygobio gracilis*), northern redbelly dace, paddlefish, sicklefin chub, sturgeon chub, and pink papershell (*Potamilus ohiensis*). None of these species have been documented in Project impact areas (Grid United 2024b) (Table 3.14-1 and Table 3.14-2).

Other Special Status Species

Project impact areas cross BLM lands in the Montana portion of the route. The BLM classifies native species that are either federally listed or that require special management to avoid federal listing as SSS. Five aquatic species listed as SSS have the potential to occur in the Project ROW: Iowa darter, paddlefish, pallid sturgeon, sauger, and sturgeon chub (Table 3.14-2).

3.14.2.2. Wildlife

Habitat

Habitat analysis for the Project was conducted under the assumption that vegetative communities are often dominated or preferred by a particular set of species. A vegetative community's biotic and abiotic features and their spatial arrangement can be used to estimate potential abundance of wildlife in the given area; however, certain terrestrial species may require different habitats to provide food, shelter, and young-rearing habitat, and this habitat use may vary of the course of their life history. Two landcover datasets were used for habitat analysis: the NLCD in North Dakota and the MLCF in Montana (Grid United 2025b).

Project impact areas cross five distinct land cover types (herbaceous grassland, shrubland, forest and woodland, agriculture, and other). Table 3.13-3 provides details of the habitats discussed below.

Herbaceous Grassland

The herbaceous grassland cover types include prairies, upland vegetation, herbaceous, and herbaceous wetlands. This is the largest cover type within the Project impact areas. Approximately 6,686.3 acres of the Project impact area are considered herbaceous grassland.

Shrubland

Shrublands within the Project impact area are sagebrush, sagebrush steppe, badlands, and shrub/scrub. Approximately 1,491.6 acres of the Project impact area are considered shrubland.

Forest and Woodland

Forested lands in Project impact areas include deciduous, coniferous, mixed, riparian, and floodplain forest types, ponderosa pine woodlands and savannas, limber pine-juniper woodlands, wooded draws and ravines, and recently burned forests. Approximately 474.1 acres of Project impact areas are considered forest and woodland.

Agriculture

Agricultural land cover types included cultivated crops, hayfields, and pasture. Crops most used include spring wheat, alfalfa, corn, soybeans, and sunflowers. Agricultural lands are the second most common vegetation class in Project impact areas. Approximately 2,654.2 acres of Project impact areas are considered agricultural lands.

Other (Non-Vegetated or Developed Areas)

Other lands within Project impact areas are non-vegetated or developed. Developed lands within Project impact areas consist of roads, utility corridors, residential areas, gravel pits, railroads, and open water. Approximately 438.0 acres of the Project impact area are considered other land cover types.

Federal, State, and Other Special Status Species

Species with a federal, state, BLM, and USDA Forest Service special status with the potential to occur in Project impact areas are provided in Table 3.14-3 and discussed below. The potential habitat in Table 3.14-3 is based on desktop reviews of Project impact areas, and documented occurrences are based on a combination of publicly available data, natural heritage inventory data, surveys, and incidental observations. A total of 100 species have the potential to occur in the Project area and of those, 98 species have potential habitat in Project impact areas. Terrestrial species considered federally listed, proposed, or under review for federal listing under the ESA are discussed below. Additional information on documented occurrences, habitat, and conservation measures will be in the Project's Biological Assessment. USDA Forest Service RFSS occurrences, habitat, and conservation measures applicable on NFS lands within the Little Missouri National Grassland (LMNG) will be described in the Project's USDA Forest Service Biological Evaluation. Based on MTNHP data, one aquatic species (pallid sturgeon) was documented to occur in the Project ROW and is discussed in Section 3.14.2.1, [Fisheries and Wildlife, Affected Environment] Fisheries.

Federally Endangered, Threatened, or Proposed Species

Fifteen terrestrial federally listed, proposed, or under review species were observed to potentially occur within 1 mile of Project impact areas based on field surveys and/or natural heritage inventory data. Of the 15 species, 5 were identified in or adjacent to Project impact areas during the field surveys. These species include little brown bat (*Myotis lucifugus*), northern long-eared bat (*Myotis septentrionalis*), Dakota skipper, monarch butterfly (*Danaus plexippus*), and western regal fritillary (*Argynnis idalia occidentalis)*.

The little brown bat is currently under review for federal listing under the ESA, listed as an SOC in Montana and listed as an SCP: Level I in North Dakota. Little brown bats were identified at 109 acoustic survey sites in 2023 and 75 acoustic survey sites in 2024 (WEST 2024a, 2025a). One little brown bat was captured in Montana and three were captured in North Dakota in 2023 (WEST 2024a). The species is currently declining due to a fungal infection called white-nose syndrome. These bats hibernate in caves and abandoned mines (referred to collectively as hibernacula) in the winter and spend the summer months roosting in forested habitat and human-made structures. Individuals migrate between these habitats in the spring and fall (WEST 2025b). These structures, known as hibernacula, provide habitat for rearing and support bat populations. Maternity colonies consisting of up to hundreds of individuals are typically found in warm and undisturbed locations (e.g., attics, barns, or tree cavities), where females give birth to one young between June and July. Most Project impact areas are grassland habitat and are, therefore, not considered bat habitat. Field teams identified caves that could be used as hibernacula approximately 140 feet from the closest impact areas in Custer County, Montana, and approximately 190 feet from the closest impact areas in Grant County, North Dakota; however, there are no confirmed hibernacula within Project impact areas (WEST 2025b).

Similar to the little brown bat, the northern long-eared bat has experienced population declines due to white-nose syndrome. The northern long-eared bat is listed as endangered under the ESA, an SOC in Montana, and an SCP: Level I in North Dakota. The bats overwinter in caves or abandoned mines and roost in forested habitat. In areas with few suitable roost trees, the

species has been reported to use buildings, barns, utility structures, and other human-made structures (WEST 2025b). The same caves that were identified as potential roosting habitat for the little brown bat could be used as hibernacula by the northern long-eared bat. Project acoustic surveys identified northern long-eared bats at five survey locations in North Dakota in 2023 and no locations in 2024. Additionally, no northern long-eared bats were captured during mist netting (WEST 2024a, 2025b).

The Dakota skipper is a small butterfly that is listed as threatened under the ESA and is an SCP: Level II in North Dakota. It is a prairie obligate species associated with "Type A" and "Type B" habitat. These habitats are described as low, wet, high-quality tall-grass prairie habitat and upland mixed grass prairie that is relatively dry and includes ridges and hillsides, respectively (WEST 2024b). There is designated critical habitat within north central North Dakota and near the Missouri River corridor in North Dakota. The species was documented within approximately 10 miles of Project impact areas in Oliver County, North Dakota (WEST 2024b). Surveys of Fallon County, Montana, and all counties in North Dakota in 2023 and 2024 documented approximately 717 acres of reproductive habitat and 65 acres of foraging habitat within the Project's survey corridors (WEST 2024b). One Dakota skipper was identified during habitat surveys in Morton County, North Dakota. No Dakota skipper were documented during presence/probable absence surveys conducted in 2024 or 2025.

The monarch butterfly is a proposed threatened species for federal listing under the ESA, an SOC in Montana, and an SCP: Level I in North Dakota. The species is currently threatened by habitat loss and degradation. The milkweed is an obligate host plant for monarch eggs and larvae. Adults require a diversity of flowering plants. Monarchs are commonly observed in Montana and North Dakota during the summer months, and the states are at the western edge of the migration flyway for the eastern North America population. In Montana, there are documented occurrences of monarch butterflies in Custer and Rosebud counties (WEST 2024b). Surveyors observed milkweed patches in all Project counties, and monarchs were observed in four counties in North Dakota (Golden Valley, Morton, Oliver, and Slope counties; Grid United 2024b).

The western regal fritillary is a proposed threatened species under the ESA and an SCP: Level I in North Dakota. The species is threatened by habitat loss, degradation, and fragmentation; invasive plant species; and land management regimes (e.g., broadcast herbicide application). They are found in tall-grass prairies and wet prairie habitats and currently restricted to prairies in scattered areas of the Great Plains and small, isolated areas of the Midwest. Larvae feed exclusively on native violets. Patches of native violets were observed during field surveys in Oliver, Morton, and Slope counties, North Dakota (WEST 2024b). Regal fritillaries were observed in Slope, Grant, Morton, and Oliver counties in North Dakota during Dakota skipper occupancy surveys (WEST 2024b) and Hettinger County, North Dakota, during general habitat surveys.

The whooping crane (*Grus americana*) population is listed as endangered and state-listed as an SOC in Montana and an SCP: Level III in North Dakota. The population migrates from Aransas National Wildlife Refuge in Texas to Wood Buffalo National Park in Canada. This migration corridor is defined in bands, indicating the percentage of observed individuals in the migratory population (Grid United 2024b). The Project impact areas in Montana are outside of the

95 percent migration corridor. In North Dakota, the Project area crosses the 95 percent migration corridor and potentially suitable habitat. The whooping crane was not observed during the Project surveys; however, it could potentially occur. The Proponent would employ measures to mitigate impacts and notify the USFWS if whooping cranes are observed during Project construction. Since the species was not identified during the surveys, it is not discussed further in the EIS.

For the other species that are federally listed, proposed listed, or under review that were not identified during surveys but have potential habitat within Project impact areas, the Proponent would inform the appropriate regulatory agency if such species are observed and adhere to the measures determined during formal consultation with USFWS.

Species of Concern / Conservation Priority

Montana Species of Concern

The MTNHP and the FWP produce the Montana SOC list (MTNHP 2024). SOC are native species that are at-risk due to declining populations, habitat threats, and/or restricted distributions. The little brown bat, northern long-eared bat, and monarch butterfly are listed as SOC and discussed in Section 3.14.2.2, [Fisheries and Wildlife; Affected Environment; Wildlife; Federal, State, and Other Special Status Species] Federally Endangered, Threatened, or Proposed Species. An additional 62 terrestrial species classified as SOC have potential to occur in Project impact areas, of which 27 were identified in Montana during surveys. Information on the habitat and listing status of the species identified in Project impact areas can be found in Table 3.14-3.

North Dakota Species of Conservation Priority

The little brown bat, northern long-eared bat, monarch butterfly, and western regal fritillary are SCP: Level I species that were observed in Project impact areas (based on publicly available data, natural heritage inventory data, and/or survey data), and the Dakota skipper is an SCP: Level II species, as discussed above. In addition to the four SCP: Level I and one SCP: Level II species that are federally cross listed, 23 Level I terrestrial wildlife species, 24 Level II terrestrial wildlife species, and 13 Level III terrestrial wildlife species have the potential to occur in Project impact areas. Of the North Dakota SCP, 12 SCP: Level I, 8 SCP: Level II, and 3 SCP: Level III were observed in North Dakota Project impact areas. Information on the habitat and listing status of the species identified in Project impact areas can be found in Table 3.14-3.

Other Special Status Species

Project impact areas cross BLM lands in the Montana portion of the route, and SSS were recorded as part of survey efforts. The BLM classifies native species that are either federally listed or that require special management to avoid federal listing as SSS (BLM Undated). Forty-five terrestrial species listed as SSS have the potential to occur in Project impact areas. Based on a combination of publicly available data, natural heritage inventory data, and survey data, 24 terrestrial SSS were identified to have documented occurrences within Project impact areas (Table 3.14-3; Grid United 2025a). Some of the species identified included black-tailed prairie dog, hoary bat (*Lasiurus cinereus*), Townsend's big-eared bat (*Corynorhinus townsendii*), Baird's sparrow (*Centronyx bairdii*), burrowing owl (*Athene cunicularia*), greater sage-grouse, loggerhead shrike (*Lanius ludovicianus*), plains hognose snake (*Heterodon nasicus*), short-horned lizard (*Phrynosoma hernandesi*), snapping turtle (*Chelydra serpentina*),

spiny softshell (*Apalone spinifera*), western milksnake (*Lampropeltis gentilis*), and great plains toad. Additional species and habitat information is provided in Table 3.14-3.

The USDA Forest Service objectives for RFSS species is to ensure viable populations throughout their geographic ranges. Project impact areas cross the LMNG in North Dakota, and RFSS species were identified to have documented occurrences within Project impact areas according to a combination of publicly available data, natural heritage inventory data, and survey data (Grid United 2025a). The six documented RFSS species in North Dakota were black-tailed prairie dog, little brown bat, long-eared myotis (*Myotis evotis*), Townsend's big-eared bat (*Corynorhinus townsendii*), Baird's sparrow, and Ottoe skipper (*Hesperia ottoe*) (Table 3.14-3).

The greater sage-grouse is a year-round, nonmigratory Montana resident, and males gather at leks during the spring. The preferred habitat of the species is sagebrush-dominated landscapes such as riparian meadows, steppe, and shrub/scrub (WEST 2023c). The greater sage-grouse populations in eastern Montana and western North Dakota rely heavily on dense sagebrush habitat in the winter (Swanson et al. 2012). As of 2024, there are an estimated 48,783 birds within the state of Montana, which is a 1 percent decline from 2023 and is down 30 percent from a peak in 2021 (FWP 2024). Populations are declining overall due to habitat loss and degradation (USDA 2012). States with known greater sage-grouse populations have formed management plans; however, this is not a federally recognized T&E species. Further information on the greater sage-grouse status would be provided in the Montana Greater Sage Grouse Mitigation Plan, which is in development and will be included in Appendix E.

The Montana Greater Sage Grouse Stewardship Act of 2015 and Montana Executive Order (EO) 12-2015 are state regulations that provide specific stipulations for the greater sage-grouse. EO 12-2015 and the Stewardship Act further established the Montana DNRC Sage Grouse Habitat Conservation Program (Montana DNRC Sage Grouse Program) in 2014. The BLM is currently updating a Proposed Resource Management Plan (Proposed RMP Amendment) and anticipates it will go into effect in 2025. Based on the Final EIS for the Proposed RMP Amendment and coordination with the Montana DNRC Sage Grouse Program, revisions are expected to improve the consistency of sage-grouse management among BLM field offices and the alignment between Montana's regulations and BLM guidance. The Project is located within BLM's General Habitat MA for sage-grouse, and changes to Project mitigation or routing due to the Proposed RMP Amendment are not anticipated. The Proponent would work with regulators to meet the updated requirements. In addition to these regulations, greater sage-grouse regulation is guided by the management plans and conservation strategies for sage-grouse in Montana and North Dakota (MSGWG 2005; Robinson 2014). Surveyors consulted with the FWP, and it provided historic greater sage-grouse lek locations. Similarly, NDGFD provided historic greater sage-grouse lek locations. In 2022, 9 leks were identified as active for greater sage-grouse (WEST 2023a). The identified active greater sage-grouse leks were within 2 miles of the centerline in Custer, Fallon, and Rosebud counties in Montana, and no greater sage-grouse leks were identified in North Dakota (WEST 2023a). The largest lek surveyed in 2022 had 29 birds, 18 of which were males (WEST 2023a). In 2023, four active leks were identified in Custer County, Montana (WEST 2023c). The largest lek surveyed in 2023 had 35 birds, 7 of which were male. Three greater sage-grouse leks that were active in 2022 were inactive in 2023 (WEST 2023c). There are no active leks within 0.25 mile of the centerline. Additional survey and

greater sage-grouse information will be available in the Project's Montana Greater Sage Grouse Mitigation Plan, which is in development and will be included in Appendix E.

The sharp-tailed grouse is considered an SGCN under Montana's SWAP and is closely monitored as an SCP in North Dakota (FWP 2015; NDGFD 2015b) and was included in the lek surveys. During the 2022 surveys, 35 active sharp-tailed grouse leks were identified in Custer, Fallon, and Rosebud counties in Montana (WEST 2023a). In 2022, A total of 33 active sharp-tailed grouse leks were identified in Golden Valley, Slope, Hettinger, Grant, and Morton counties in North Dakota (WEST 2023a). Additional aerial grouse surveys took place in Montana in 2023 (WEST 2023c). During the 2023 surveys, 42 active sharp-tailed grouse leks were surveyed in Custer, Fallon, and Rosebud counties in Montana (WEST 2023c).

Big Game Species

Species considered game animals in Montana and North Dakota are mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), moose (*Alces alces*), pronghorn (*Antilocapra americana*), mountain goat (*Oreamnos americanus*), and bighorn sheep (*Ovis canadensis*) (NDCC § 20.1-01-02(5) and § 87-6-101(13), MCA). Montana classifies additional species as big game: caribou (*Rangifer tarandus*), mountain lion (*Puma concolor*), bear (*Ursidae* spp.), and American bison (*Bison bison*) (§ 87-6-101(13), MCA). Of these species, only the bighorn sheep, elk, moose, mule deer, pronghorn, and white-tailed deer have the potential to occur in Project impact areas, and suitable habitat has been documented for these species within the wildlife and fisheries analysis area (Grid United 2024b). The species discussed below have the potential to occur or were observed during field surveys.

American Black Bear

The American black bear (*Ursus americanus*) is widely distributed and has a stable population (MTNHP and FWP 2025a). The black bears habitat use is tied to seasonal food availability and plant phenology, and they are documented in Montana counties crossed by the Project (MTNHP and FWP 2025a). There are no known breeding populations of black bears in North Dakota; however, they are occasionally seen in forested areas of the state (NDGFD 2025d). Black bears were observed on the western side of Custer County, Montana, in 2023 and at White Lake National Wildlife Refuge in Slope County, North Dakota, in 2024. The observations were noted for safety concerns, as black bears are not considered special status species (M. Voth, Pers. Comm., May 23, 2025).

Bighorn Sheep

Most bighorn sheep are found in the western side of Montana; however, a small population was introduced in the Blue Hills in Custer and Prairie counties. This population is not migratory, and both their wintering and summer habitat crosses Project impact areas. Bighorn sheep critical habitat in North Dakota is north of Project impact areas, near the Theodore Roosevelt National Park and Little Missouri River. They have the potential to occur along the route based on suitable habitat but are not documented to occur within Project impact areas. One bighorn sheep lambing area was incidentally identified in Custer County, Montana, during the 2022 aerial raptor nest surveys. The lambing area was approximately 1.7 miles from the Project centerline and over 1 mile from the nearest Project impact areas; however, any incidental observations were not noted, as they are not special status species (Grid United 2024b; M. Voth, Pers. Comm., May 23, 2025).

Elk

Elk prefer coniferous habitats but are found in a range of habitats. Project impact areas cross three hunting districts in Rosebud, Custer, and Fallon counties, Montana. These three districts are home to elk that are not migratory but shift in range, depending on resources and hunting pressure. Within the hunting districts, the areas regularly occupied by elk do not cross Project impact areas. In North Dakota, Project impact areas cross the primary range of elk in the LMNG along the Little Missouri River and Deep Creek (Grid United 2024b). Similar to the bighorn sheep, elk are not listed as special status species, and incidental observations were not noted, even though they have the potential to occur based on agency data (Grid United 2024b).

Moose

Moose are found in low densities in eastern Montana and typically prefer summer habitats of meadows, valleys, wetlands and willow flats. They shift to coniferous forests and willow flats for winter habitats. In North Dakota, moose occur along the Missouri River and north to Canada. Moose winter range does not cross Project impact areas in either state, and no moose were incidentally documented within Project impact areas (Grid United 2024b).

Mule Deer

Mule deer occupy diverse habitats and can be found in grassland, sagebrush, forests, and riparian habitats. This habitat can be found along with Project impact areas in Montana and North Dakota. In North Dakota, there are mapped fawning and foraging areas that cross Project impact areas. The winter range of the mule deer crosses Project impact areas in Montana (Grid United 2024b). Mule deer were observed during Project surveys and are expected to occur within Project impact areas; however, incidental observations were not recorded, as the species does not have special status (Grid United 2024b; M. Voth, Pers. Comm., May 23, 2025).

Pronghorn

Pronghorn typically occupy sagebrush and grassland habitats and can also be found in agricultural lands. Project impact areas cross pronghorn winter range in Montana and primary and secondary range in North Dakota (Grid United 2024b). Despite the overlap in winter range, there are no known winter concentration areas within Project areas. There are extensively mapped fawning and foraging areas near the badlands along the Montana / North Dakota border (Grid United 2024b). Pronghorn are not listed as special status species, and incidental observations were not recorded; however, they were observed during Project surveys and are expected to occur within Project impact areas (Grid United 2024b; M. Voth, Pers. Comm., May 23, 2025).

White-Tailed Deer

Like the mule deer, the white-tailed deer are highly adaptable and occupy grassland, forest, and riparian habitats and can be found in human-disturbed habitat. These deer are widely distributed across Montana and North Dakota. The winter range in Montana crosses Project impact areas and is near the Tongue River (Grid United 2024b). White-tailed deer were incidentally observed in the North Dakota Project impact areas and are assumed to occur within the Project ROW; however, the species is not listed as special status species, and occurrences were not noted (Grid United 2024b).

Migratory Birds

There are 23 species with potential to occur within 1 mile of Project impact areas identified by the USFWS IPaC as Birds of Conservation Concern (BCC). These species are Baird's sparrow, black-billed cuckoo (*Coccyzus erythropthalmus*), black tern (*Chlidonias niger*), bobolink (*Dolichonyx oryzivorous*), California gull (*Larus californicus*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk (*Buteo regalis*), Franklin's gull (*Leucophaeus pipixcan*), grasshopper sparrow (*Ammodramus savannarum*), lark bunting (*Calamospiza melanocorys*), lesser yellowlegs (*Tringa flavipes*), Lewis's woodpecker (*Melanerpes lewis*), long-eared owl (*Asio otus*), marbled godwit (*Limosa fedoa*), mountain plover (*Charadrius montanus*), northern harrier (*Circus hudsonius*), pinyon jay (*Gymnorhinus cyanocephalus*), prairie falcon (*Falco mexicanus*), red-headed woodpecker (*Melanerpes erythrocephalus*), Sprague's pipit (*Anthus spragueii*), thick-billed longspur (*Rhynchophanes mccownii*), western grebe (*Aechmophorus occidentalis*), and willet (*Tringa semipalmata*). Despite not being listed as BCC in this area, bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) were both included in the IPaC, as they are protected under the Bald and Golden Eagle Protection Act (BGEPA).

In 2022 and 2023, the Proponent conducted aerial surveys to identify raptor nests within a 1-mile buffer of the Project centerline. Seven species of raptors nesting were documented during the surveys: prairie falcon, ferruginous hawk, red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), Cooper's hawk (*Astur cooperii*), sharp-shinned hawk (*Accipiter striatus*), and great-horned owl (*Bubo virginianus*). Three prairie falcon and two ferruginous hawk nests were identified in 2022 (WEST 2023b). In 2023, surveys documented six raptor nests within 1 to 2 miles of the Project centerline (WEST 2023d). Avoidance and mitigation measures will be listed in the Migratory Bird Treaty Act (MBTA) Compliance Plan, which is in development and will be included in Appendix E.

Bald and Golden Eagles

In 2022 and 2023, the Proponent conducted aerial surveys to identify bald and golden eagle nests inside and within a 1-mile buffer (or 2-mile buffer in areas with high predicted golden eagle nest density) of the Project centerline. In 2022, 6 bald eagle nests, 9 golden eagle nests, and 16 potential eagle nests were identified (WEST 2023b). In 2023, surveys documented 42 potential eagle nests, 6 confirmed bald eagle nests, and 21 confirmed golden eagle nests (WEST 2023d).

Of these, 20 nests are located within 1 mile of the Project centerline, including 1 bald eagle nest, 10 golden eagle nests, and 9 potential eagle nests. The closest golden eagle nest is 370 feet from the ROW, and the closest bald eagle nest is 792 feet from an access road. No eagle nests were found within Project impact areas or the ROW. Despite not being documented to occur within Project impact areas, the proximity of the nests suggests that the eagles would likely be foraging in the impact areas. Avoidance and mitigation measures are included as attachments to the CMRP (Appendix E).

General Wildlife

In addition to the special status species, a variety of wildlife were identified as having the potential to occur throughout the Project impact areas. Common species that may be found in Project impact areas are coyote (*Canis latrans*), red fox (*Vulpes vulpes*), red-winged blackbird

(*Agelaius phoeniceus*), western meadowlark (*Sturnella* neglecta), great plains toad (*Anaxyrus cognatus*), and painted turtle (*Chrysemys picta*).

3.14.3. Environmental Consequences

The impacts on fisheries and wildlife are discussed in the following sections.

3.14.3.1. Fisheries

No Action Alternative

Under the No Action Alternative, there would be no impacts on fisheries, as the Project would not be built.

Proposed Alternative

During construction, the potential direct impacts on fisheries include changes to water quality resulting from alteration or removal of in-stream aquatic habitat required for construction and inadvertent introduction of pollutants from equipment fueling or maintenance associated with construction. Secondary impacts during construction include potential introduction of AIS or ANS through equipment contact with aquatic habitats.

During operations, direct impacts include periodic vegetation management, which could decrease shade and/or cover for aquatic species and influence both water quality and aquatic habitat conditions, particularly during routine vegetation removal along banks. This would have the greatest impact on coldwater species affected by water temperature increases (e.g., northern redbelly dace) and juvenile fish that use the aquatic macro habitat created by fallen trees or branches (e.g., pallid sturgeon). The long-term impacts of vegetation management during construction would be direct and secondary, long-term, and localized. Similar to construction, use of equipment during maintenance that contacts aquatic habitat could potentially introduce AIS or ANS; however, in-stream work is unlikely during operations.

Mitigation measures would be included in the SWPPP prepared in accordance with permits administered by the MTDEQ and the NDDEQ (Appendix E). The BMPs described in these documents would be applied BMPs to reduce sediment transport into waterbodies, avoid or contain spills or leaks of pollutants, and manage construction dewatering to maintain compliance with water quality standards (Grid United 2024a). Further discussion of avoidance and mitigation measures are included as attachments in the CMRP (Appendix E).

Clearing and Grading

During construction, Project impact areas would be prepared by removing large rocks and cutting vegetation. Clearing and grading activities could result in temporary increases of total suspended solids, turbidity, and sedimentation in waterbodies. These direct impacts would be short-term and could lower primary productivity, reduce dissolved oxygen in the water column, cause physiological impacts in aquatic species, decrease foraging efficiency, and reduce suitability of habitat for reproduction of aquatic species (Chapman et al. 2014). The extent of these impacts would be dependent on the size of the disturbed area and the type of waterbody disturbance activities occur in; it is expected that the greatest intensity of these impacts would be limited to the immediate area of disturbance and decrease with distance from the area of disturbance. Impacts on waterbodies such as ponds or lakes could be more localized to the immediate area of disturbance compared with streams or rivers, where current can carry

disturbed sediments downstream. The impacts on water quality from clearing and grading on fisheries would be direct, short-term, and localized.

Clearing tall trees and shrubs along waterbodies would also decrease shade and cover for aquatic species, as well as remove the in-stream macro habitat created when the tall trees fall into the water as they die. This would result in long-term alteration of the riparian habitat and loss of aquatic macro habitat, which is used by pallid sturgeon. The increase in water temperature would have the greatest impact on coldwater species that would be affected by water temperature increases (e.g., northern redbelly dace). This change would be localized to the aquatic habitat perpendicular to the transmission line ROW. To reduce erosion potential, vegetation would be cut at slightly above the ground surface. The impacts of vegetation clearing on fisheries in Montana and North Dakota would be long-term, direct and secondary, and localized.

Waterbody Crossings

With the exception of Project access roads, Project impact areas have been designed to avoid placing permanent transmission line structures or temporary work areas within waterbodies. Existing access roads would be used to access Project work areas to the extent practicable. Where public or private roads are not available to access remote segments, the Proponent would construct new access roads, siting them to avoid impacts on waterbodies where possible. The Proponent would comply with the design specifications required by federal and state agencies for waterbody crossings and acquire all necessary permits from federal, state, and local agencies in compliance with minimization and mitigation measures for permanent waterbody impacts identified in the CMRP (Appendix E). Access roads installed during construction could disturb the streambed and cause minor changes in water quality and in-stream habitat characteristics at the crossing location. These impacts could affect water quality and aquatic life downstream of the immediate location disturbed, and would be direct, short-term, and localized.

As described in the CMRP, proposed waterbody crossings could include clear span bridges, span bridges with in-water supports, culverts/flumes, vented rock fords, or low water crossings. During construction, the Proponent would adhere to relevant BMPs to minimize the impact of all waterbody crossings on the aquatic environment and acquire the necessary permits for establishment of temporary and permanent crossings. Impacts resulting from the waterbody crossings may persist beyond construction if the crossing is one that is used within the streambed itself (e.g., a vented rock ford or low water crossing); therefore, there would be ongoing direct impacts on aquatic organisms, particularly benthic invertebrates, through injury or mortality and altered aquatic habitat and substrates as long as the road is in use. To minimize the impacts on the aquatic environment, the majority of waterbody crossings proposed would be temporary and established in intermittent or ephemeral streams (Grid United 2024b). Impacts on waterbodies are summarized in Section 3.6, Surface Water Hydrology.

The Proponent would determine the design of permanent culverts or bridges for waterbody crossings based on site-specific conditions (Grid United 2024b). Culvert sizing and design would also align with any U.S. Army Corps of Engineers permit requirements and the Omaha District's required BMPs in Montana and North Dakota.

Following construction, the Proponent would remove crossings on temporary roads and restore the streambeds and banks as discussed in the CMRP, while waterbody crossings on permanent roads would be left in place. Where temporary crossings are located, BMPs would be used to minimize erosion and reduce long-term impacts on fisheries and other aquatic resources.

No in-stream construction is proposed within the Tongue or Powder rivers where the federally listed pallid sturgeon occurs, and existing roads would be used to cross the waterbodies. Therefore, no impacts on these waterbodies or fisheries are anticipated. The Proposed Alternative does not cross waterbodies containing known habitat for other federally listed aquatic species. Overall, the impacts of waterbody crossings on fisheries in Montana and North Dakota would be direct and secondary, short-term to long-term, and localized.

Aquatic Invasive Species and Aquatic Nuisance Species

Regulations in Montana and North Dakota require that vessels and equipment be inspected for AIS or ANS when entering the state or transferring equipment between certain waterbodies. In Montana, in-water work during construction and maintenance would be avoided to the extent practicable to reduce the likelihood of encountering and transferring AIS. In North Dakota, in addition to inspections when entering the state, the NDGFD must certify construction equipment that has been in a Class I ANS infested waterbody as free of ANS before it can enter another waterbody of the state. The Proponent would obtain necessary certifications prior to Proposed Alternative work in any waterbody. Currently, the common carp is the only ANS of 46 species reported in North Dakota waters within Project impact areas, and this species is unlikely to be spread via construction equipment. However, if a Class I ANS infests a waterbody crossed by the Proposed Alternative, the Proponent would coordinate with the NDGFD to develop avoidance and mitigation measures for in-water work.

The Proponent has prepared the Invasive and Noxious Species Management Plans (Appendix E), which includes both the Montana Noxious Weed and Aquatic Invasive Species Management Plan and the North Dakota Noxious Weed Management Plan. These plans include management of AIS and ANS weeds and document actions the Proponent would implement to manage the spread of these species during construction. AIS and ANS preventive measures include vehicle and equipment inspections prior to Proposed Alternative use and cleaning vehicles and equipment after in-water work at designated wash stations. A full list of measures is included in the CMRP. Overall, the impacts from AIS and ANS on fisheries in Montana and North Dakota would be direct and secondary, long-term, and localized with the potential to affect drainage.

Spill Prevention

Unplanned spills or leaks of hazardous liquids during equipment refueling, operation, maintenance, or storage could occur during construction or operations. These liquids could potentially enter a waterbody, resulting in injury or mortality of aquatic species (particularly of benthic organisms with limited mobility). However, the limited volumes of hazardous substances present in any one location along the Project area would be unlikely to result in long-term impacts. To minimize the potential release of hazardous materials into waterbodies, the Proponent would follow mitigation measures outlined in the Hazardous Materials and Waste Management Plan (Appendix E), including performing regular maintenance and inspection of equipment and vehicles that operate near or cross waterbodies. In the event of an unanticipated release, the Proponent would follow the steps and notification requirements

outlined in the SPRP (Appendix E). Impacts from spills on fisheries in Montana and North Dakota would be direct, long-term, and localized.

Water Withdrawal

Water would be withdrawn from municipal sources and not directly from surface waters for Proposed Alternative water needs, including dust suppression and batching of concrete during construction. The Proponent estimates approximately 2.4 million gallons of water would be needed for concrete batching and approximately 272,000 gallons of water per mile for access road dust control based on the anticipated construction duration. If additional water is needed, it would be supplied by existing water rights holders via groundwater wells near the Proposed Alternative (Grid United 2024b). No impacts are anticipated on fisheries in Montana or North Dakota from water withdrawals during construction, and water withdrawals during operations are not anticipated. For more information, refer to Section 3.5, Groundwater Hydrology.

3.14.3.2. Wildlife

No Action Alternative

Under the No Action Alternative, there would be no impacts on wildlife, as the Project would not be built.

Proposed Alternative

During construction, direct impacts on wildlife could include habitat loss and degradation, habitat fragmentation, vehicle collisions from an increased human presence, collisions with infrastructure, light and noise disturbance, ground disturbance, and avoidance behavior due to increased ground and air traffic. Secondary impacts would be the potential introduction of invasive or noxious species (Table 3.13-2) following grading and vegetation removal.

During operations, direct impacts could include periodic vegetation management using herbicides, occasional increased human disturbance during routine inspections of structures, and potential wildlife collisions with infrastructure. Like construction, disturbances from vegetation management could allow for the establishment of invasive species. Impacts on habitat and wildlife and mitigation measures are described below. Additional mitigation measures are provided in Section 6.3 of the CMRP (Appendix E). The Proponent would implement the proposed avoidance, minimization, and mitigation measures found in the CMRP, Invasive and Noxious Species Management Plans, SWPPP, SPRP, and MBTA Compliance Plan to minimize impacts on wildlife. Further discussion of avoidance and mitigation measures are attached in the CMRP (Appendix E).

Habitat Loss and Degradation

Construction of the Proposed Alternative would lead to habitat loss/conversion and degradation through grading and vegetation removal. The Proposed Alternative would permanently affect approximately 780.6 acres and temporarily affect 10,963.8 acres in Project impact areas and through vegetation clearing in the ROW (Table 3.13-3). The majority of Project impact areas consists of herbaceous grasslands, followed by agricultural lands, shrublands, and forests and woodlands. During vegetation removal and ROW clearing, approximately 428.5 acres of forest and woodland would be permanently removed due to clearing or conversion to herbaceous grassland in the ROW. Forest and woodlands would be temporarily affected during construction, and approximately 45.6 acres would be cleared and

allowed to regrow following construction. Similar to forest and woodlands, approximately 114.2 acres of shrubs would be removed permanently to establish access roads and for structure footprints. Low-growing shrubs (e.g., sagebrush) would be allowed within the ROW, and approximately 1,377.4 acres would be affected temporarily during construction. The Colstrip Substation expansion would result in the removal of 13.2 acres of potentially disturbed grassland habitat and several trees. Additional Proposed Alternative vegetation impact acreages can be found in Table 13.3-3. Loss of forest and woodland habitat could affect bat species that rely on trees for summer roosting habitat. Grading and removal of grassland habitat could introduce invasive species that would decrease forage and habitat quality. Permanent removal of approximately 240 acres of potentially undisturbed (unbroken) grassland would occur within permanent Project impact areas (216 acres in Montana and 24 acres in North Dakota; Fields and Barnes 2019). Construction activities would also result in up to 1,786 acres of temporary impacts on unbroken grassland (871 acres in Montana and 915 acres North Dakota). Temporary impacts in unbroken grassland would primarily occur within overland travel areas and wire-pulling and tensioning sites, which could result in crushed vegetation but would have limited ground-disturbing activities (e.g., grading). Timber matting would also be used to prevent ground disturbance within Dakota skipper habitat, where practicable. The temporary impacts of staging and construction of the line would be direct, short-term, and localized.

During operations, tree and shrub removal would periodically take place in the ROW using mechanical controls or herbicides, and the Proponent would restore impact areas as near as practicable to pre-construction conditions in accordance with Section 6 of the CMRP (Appendix E). The permanent ROW would be maintained as herbaceous with low-growing shrubs throughout operations, and seed mixes would be used to revegetate areas disturbed during grading. The Proponent would revegetate impact areas using methods and seed mixes appropriate to existing land uses and cover types. When possible, root balls of trees and shrubs would be left during construction to support restoration efforts.

The Biological Assessment identifies conservation measures specific to ESA species, and the Biological Evaluation identifies conservation measures for RFSS on NFS-managed lands. The extent of the impacts during construction and operations would be direct and localized and limited to Project impact areas and adjacent habitats.

Impacts of the new infrastructure in the landscape would elicit varied reactions from wildlife species. Species may exhibit avoidance of vertical structures, neutral behavior, or positive behavior, including using the structures.

Grading and Excavation

Ground disturbance from grading and excavation would generally be limited to locations around transmission structures and temporary access roads. Grading and excavation could result in the mortality of ground-dwelling and burrowing species (e.g., black-tailed prairie dog, ground-nesting bird species, reptiles, and amphibians). These species may not be able to move quickly enough to avoid impacts during grading.

Grading and excavation would directly affect ground-dwelling species in temporary and permanent impact areas. The impacts would be direct and short-term (in temporary impact areas) to permanent (in permanent impact areas). These impacts would be localized to species

populations near the Proposed Alternative. Mitigation for ground-dwelling bird species would be provided in the MBTA Compliance Plan, which is in development and will be included in Appendix E.

Fragmentation

The removal of vegetation and establishment of a maintained ROW would break up continuous areas of habitat leading to fragmentation. Fragmentation can reduce habitat quality and affect wildlife behavior, as some species avoid forest or habitat edges. The majority of Project impact areas are grassland and agricultural and would not be affected by fragmentation; however, the permanent removal of 428.5 acres of forest habitat within the permanent impact areas could affect interior forest dwelling species. Although limited along the Project, fragmentation would have direct, permanent, and localized impacts and affect local populations.

Vehicle Collisions

During construction, 800 workers would be mobilized across the Project (Section 3.10, Socioeconomics). The additional traffic due to commuting or direct activities could lead to vehicle strikes, resulting in severe injury or mortality of big game species, small mammals, birds, reptiles/amphibians, and insects. Montana has the second highest incidence of wildlife-vehicle related collisions (McKean 2022). All species groups discussed in Section 3.14.2, [Fisheries and Wildlife] Affected Environment, are susceptible to vehicle strikes that could result in an individual's injury or mortality.

Increased risk of vehicle collisions due to temporarily increased vehicle traffic would be a direct and short-term impact for which the likelihood of a collision would decrease significantly after construction. During operations, the risk of vehicle collisions would be due to ongoing maintenance activities. This would be a localized impact and would not affect regional wildlife populations. Per the CMRP, the Proponent would implement a speed limit of 15 miles per hour on non-public Project access roads to reduce the potential for wildlife-vehicle strikes.

Collisions with Infrastructure

The Proposed Alternative could lead to bird species mortality, as they may collide in flight with the conductors or, more likely, the overhead ground wire. Bat collisions are uncommon and are not listed as a current threat for the northern long-eared bat (USFWS 2022). Bird species with larger wingspans and slower maneuverability (e.g., cranes, herons, swans, pelicans, and geese) are more susceptible to power line collisions, as are smaller, heavy-bodied birds than fast flyers (e.g., ducks). Eagles and other raptors are adept flyers, and collision incidents with overhead lines occur with much less frequency than collision incidents involving other bird species (Bevanger 1994). Factors such as increased human activity may flush birds and result in collisions; inclement weather and low-light conditions during bird migration may also increase collision risk. To mitigate these impacts, the Proponent would implement a specific MBTA Compliance Plan and Avian Protection Plan (Section 2 of the CMRP), which would outline measures to avoid, minimize, and address adverse impacts on migratory birds, including bald and golden eagles. The installation of bird flight diverters increases a power line's visibility and is an accepted minimization approach for power lines in the United States (APLIC 2012). Discussions with the USFWS regarding bird flight diverter use and placement are ongoing and will be addressed in the MBTA Compliance Plan, which is in development and will be included in Appendix E.

Collisions with infrastructure would be a direct, permanent, and localized impact on local bird species, as the risk of injury would persist through operations.

Sensory Impacts from Light and Noise

Noise and light impacts are anticipated from Proposed Alternative construction and operations. Construction-related noise would exceed the ambient noise levels in the Project area. Noise and light from equipment, helicopters, and localized blasting during construction have the potential to alter behavior and increase stress leading to mortality or other harm to wildlife, which can lead to habitat avoidance and injury.

The Proponent would implement a Blasting Plan to mitigate noise impacts (Appendix E). Time-of-year restrictions intended to reduce construction noise, light, and activity impacts on federally protected species during sensitive breeding and rearing seasons will be discussed in the MBTA Compliance Plan and the Biological Assessment. Disturbances to bat hibernation from winter work could lead to illness or death. To minimize winter impacts, pre-construction surveys would take place at the identified potential hibernacula; if occupied, the Proponent would take additional measures to prevent impacts. Helicopter use would generate the highest noise levels, which would only occur for brief periods (i.e., wire stringing along the line during construction and periodic inspections during operations). Therefore, no long-term impacts would be expected.

Noise and light impacts directly affect wildlife, and the extent would depend on the distance, duration, and noise and light levels. Most impacts would be localized, as the sound levels would be expected to attenuate to near ambient levels past 1,000 feet from construction, and functional mufflers would be used on construction equipment to mitigate noise (additional noise mitigation measures are detailed in Section 3.12, Noise). Noise and light impacts would be short-term during construction. Wildlife species may be temporarily displaced due to noise and construction activities, but most displacement would be temporary as animals disperse to adjacent habitat.

During operations, noise and light impacts would be permanent at some locations. The Rosebud County Converter Station, Morton County Converter Station, the Morton County Switchyard, and the expanded Colstrip Substation would produce noise and may contain lighting during operations. There would be some noise impacts along the transmission line due to corona noise (i.e., crackling, hissing sounds) and aeolian noise (i.e., whistling, humming sounds), but these sensory impacts would be mostly localized. For more information on the Project's noise impacts and converter station noise attenuation, refer to Section 3.12.

Impacts on Greater Sage-Grouse

Energy development and infrastructure has led to a greater decline rate of greater sage-grouse (Naugle et al. 2011). Transmission line impacts on the greater sage-grouse are expected to be similar to those described above. The removal of suitable sage-grouse habitat would potentially affect the species, as they are sensitive to habitat loss and could introduce nonnative species that could further degrade the ecosystem. Greater sage-grouse avoid transmission line corridors; transmission lines have an adverse impact on habitat selection and survival due to avian predators using transmission lines near leks to perch (Lebeau et al. 2019). Adverse impacts on nesting success have been demonstrated up to 1.6 miles from transmission lines (Kohl et al. 2019). Similar to other species, there would be an increased potential of greater

sage-grouse collisions with vehicles, as the Project would require the deployment of additional workers primarily during construction. Noise also affects the greater sage-grouse, as both males and females are less likely to visit leks with increased noise (Blickley et al. 2012); however, noise impacts would primarily occur during construction and decrease during operations. Additional information about the Project's impacts on the greater sage-grouse will be provided in the Montana Greater Sage Grouse Mitigation Plan, which is in development and will be included in Appendix E.

Impacts on greater sage-grouse would be direct and secondary, long-term, and localized. To mitigate impacts, the Proponent would undergo consultation with the Montana Sage Grouse Oversight Team. The Project does not cross any state-designated core habitat, would adhere to March 15 to July 15 time-of-year construction restrictions for work within 2 miles of active leks, and would avoid no surface occupancy (0.25-mile) buffers around leks (Montana Greater Sage Grouse Mitigation Plan [Appendix E]). The Proponent would consult with the DNRC and Montana Sage Grouse Oversight Team to incorporate mitigation and offsets for the Project. Additionally, a specific Montana Greater Sage Grouse Mitigation Plan would be implemented to further minimize impacts (Appendix E).

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4. CUMULATIVE AND REASONABLY FORESEEABLE EFFECTS

This chapter assesses reasonably foreseeable effects (pursuant to NEPA) and the cumulative, unavoidable, irreversible and irretrievable impacts, and regulatory restrictions of the Project (pursuant to MEPA).

4.1. CUMULATIVE IMPACTS

4.1.1. Methodology

NEPA requires not only an analysis of the reasonably foreseeable effects of the proposed agency action but also any reasonably foreseeable adverse environmental effects, which cannot be avoided, should the proposal be implemented (42 USC § 4332(c)(ii)). Federal agency guidance further clarifies that such reasonably foreseeable effects should have a "close causal relationship to the proposed action or alternatives" (7 CFR § 1b.11(a)(12). The EIS also relies on DOE NEPA Implementing Procedures and the DOI Handbook of NEPA Implementing Procedures, both dated June 30, 2025.

For work areas in Montana, the analysis of such reasonably foreseeable effects was expanded to include the "collective or secondary impacts on the human environment, which are the impacts of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type," as well as further impacts on the human environment that may be stimulated or induced by, or otherwise result from, a direct impact of the action (ARM 17.4.603(7) and (18)).

The following approach was used to identify and analyze reasonably foreseeable collective or secondary impacts:

- Identify the resources at risk or likely experience interactions with the Project (Chapter 3, Affected Environment and Environmental Consequences);
- Determine the geographic extent of evaluation for each potentially affected resource;
- Identify relevant past, present, and reasonably foreseeable future activities, including all federal, nonfederal, and private actions occurring within suitable boundaries surrounding the Project for consideration; and
- Determine and address potential additive, countervailing, and synergistic cumulative impacts from spatial or temporal overlap between the Project and the identified activities.

4.1.1.1. Resources and Geographic Extent of Evaluation

The area and location of a potentially affected resource provide the geographic extent of cumulative impacts and vary depending on resource and impact. Resources such as soil and vegetation may have direct, secondary, and cumulative impacts limited to within the Project area[19], whereas resources such as noise and air quality may require a wider geographic extent.

Resources have been grouped as physical (non-living environmental components, including landscape, air, soils, and water), biological (living environmental components, including vegetation, wildlife, and aquatic ecology), social, and cultural for the purposes of the cumulative impact analysis due to potentially overlapping or similar impacts among these resource groups.

[19] "Project area" is the permanent, operational ROW and areas with temporary/permanent impacts within and outside of the ROW.

The general analysis area for cumulative impacts includes all counties crossed by the Project, with a wider area evaluated for impacts on social resources. Resource categories and their respective areas of evaluation for cumulative impacts are shown in Table 4.1-1.

4.1.1.2. Identification of Relevant Past, Present, and Reasonably Foreseeable Future Activities

Historically, Montana has undergone significant changes in vegetative cover and habitat suitability due to anthropogenic influences, particularly since Euro-American settlement in the 19th century. Since that time, the native grasslands that used to dominate eastern Montana have been partially converted, with approximately 66 percent of land converted to farms and ranches for livestock grazing pasture and rangeland and 28 percent converted to cropland (USDA NASS 2023). Agricultural and urban development has resulted in draining and filling of wetlands, further converting land use types. Current land cover in Montana is predominantly grass/pasture, shrubland, and mixed forest (USDA NASS 2024; USGS 2024).

Much of North Dakota was historically dominated by native mixed-grass and tallgrass prairies before development, which have been extensively converted to row-crop agriculture—primarily spring wheat, corn, soybean, canola, and sunflowers (USDA NASS 2024; USGS 2024). Generally, the larger shifts in land cover are due to urban development (i.e., major cities) and changes in land use from open prairie land to widespread ranching and agriculture.

Historical development and land transitions have been captured in the Affected Environment and Environmental Consequences sections by resource in Chapter 3.

In addition to the NEPA definition above, MEPA defines cumulative impacts as "the collective impacts on the human environment within the borders of Montana of the proposed action when considered in conjunction with other past, present, and future actions related to the proposed action by location or generic type" (§ 75-1-220, MCA). Under ARM 17.4.603(7), related future actions are those that are related to the Project by either location or generic type and "must also be considered when these actions are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures."

Information on past, present, and reasonably foreseeable future activities within the geographic extent of the resources was provided by federal and state agencies and through research of publicly available resources (e.g., county and company websites). Activities include substation and transmission line upgrades, a coal ash pond cleanup, residential subdivisions and road projects, mining activities, oil and gas developments, ranching/grazing, a solar development, and multiple wind farms throughout the counties crossed by the Project in Montana and North Dakota.

The timeframe in which other activities may overlap with the Project includes construction and operations of the Project. Construction is expected to begin in 2028 and finish by 2032, with operations expected to last indefinitely. Operations would involve regular inspections and occasional maintenance activities (e.g., tree removal, maintaining vegetation to approved heights within the ROW, possible spraying for weeds or invasive species, and maintenance of the transmission line infrastructure). Project construction and operation are discussed in detail in Chapter 2, Description of Alternatives, and impacts by resource in Chapter 3.

Impacts from past and existing projects within the Project area, such as those from ongoing agricultural grazing and air quality impacts from past or existing projects outside of the Project area, have generally been incorporated into the analysis of baseline conditions and impacts (Chapter 3). Relevant activities, including their locations and timeframes, were used to determine whether an activity would overlap in time and space with resources affected by the Project (Table 4.1-2).

4.1.2. Cumulative Impact Analysis

Cumulative impacts from the relevant activities that have spatial or temporal overlap with the Project are discussed below.

4.1.2.1. Physical Resources

Cumulative impacts on physical resources from activities identified in Table 4.1-2 include the following:

- **Soil compaction, land use changes, and surface water impacts**: Activities may result in conversion of vegetated areas to impervious surfaces, leading to increased stormwater runoff (velocity and pollutant load) into surface waters within affected HUC 8 watersheds. There may be prior soil compaction within the Project area resulting from the construction of the Cabin Creek Project and from the Project and Project-related operational activities (e.g., access roads and overland travel). Loss of riparian vegetation could cause increased erosion, leading to impacts on water quality. There is also the potential for hazardous material spills into surface or groundwater. These impacts are associated with road construction, wind farm development, oil and gas development and replacement, fiber optic line installation, the BNI Center Mine, Rosebud Coal Mine, Colstrip ash pond remediation work, and substation upgrades (Oliver County and Colstrip).
- **Air emissions from construction equipment** used during construction and maintenance activities, road building, wind energy projects, substation upgrades, oil and gas development, the Cabin Creek Project, and the Rosebud and BNI coal mines.
- **Mining impacts**, including increased soil erosion, surface and groundwater quality, and landscape fragmentation, etc. In addition to possible physical resource impacts, mining capabilities within the maintained ROW would be limited, and coal mining activities would not be allowed within 35 feet of the Project transmission line infrastructure (30 CFR § 77.807-2). BNI Center Mine and Areas A, B, C, and F of Rosebud Coal Mine do not come within 35 feet of the Project. The Project crosses the reclaimed Area D of Rosebud Coal Mine; however, there is no active mining in this area.

The cumulative impacts on physical resources associated with any construction activities would be temporary (limited to the overlap of projects with the construction phase of 2028 to 2032) and both direct and secondary. Construction activities are expected to follow applicable local, state, and federal construction regulations, mitigation measures, and BMPs, which would mitigate the cumulative impacts of these activities. Additionally, Project construction would occur sequentially along specific segments of the transmission line, rather than all at once, which would further limit the spatial extent of disturbances at any given time. Operational impacts on physical resources are expected to be negligible, as vegetation and transmission line infrastructure maintenance would not require ground disturbance. Due to their temporary nature and BMPs associated with construction, anticipated impacts from the related activities

on the physical resources combined with the Project's impacts are anticipated to be short-term and localized.

4.1.2.2. Biological Resources

Cumulative impacts on biological resources from activities identified in Table 4.1-2 are described below. Cumulative impacts for terrestrial species and sage-grouse would be limited to a smaller cumulative impact area (approximately 10 miles), whereas migratory birds and eagles could have cumulative impacts from collisions with taller infrastructure (wind turbines, transmission line infrastructure) for a larger range.

- **Temporary and permanent habitat loss, degradation, and fragmentation** from vegetation clearing and conversion to herbaceous vegetation and ground disturbance and ongoing vegetation maintenance would result in temporary and permanent habitat removal and avoidance. Tree removal would impact bird and bat roosting habitat and ground species/insects that use forested areas for habitat or cover. Greater sage-grouse (Centrocercus urophasianus), Dakota skipper, and other prairie species would be impacted by temporary and permanent loss of habitat and may be disturbed by operational maintenance activities. Foraging habitat could potentially be degraded by the introduction of non-native species. Temporary and permanent impacts on wetlands and wetland vegetation could add to cumulative habitat loss. Vegetation loss and soil compaction can result in increased stormwater runoff (velocity and pollutant load) into surface waters, which can degrade habitat for aquatic wildlife and drinking water for terrestrial and aquatic wildlife. These impacts are associated with road construction, wind farm development, oil and gas development and replacement, fiber optic line installation, the BNI Center Mine, Rosebud Coal Mine, Cabin Creek Project, Colstrip ash pond remediation work, solar project development, and substation upgrades (Oliver County and Colstrip). Ongoing ranching / cattle grazing or vegetation monitoring would have minimal cumulative impact.
- **Increased potential for vehicle or infrastructure collision with wildlife:** In particular, birds and bats may collide with infrastructure (e.g., wind turbines or transmission lines) and birds, insects, and terrestrial wildlife may be at risk for vehicle collision. An estimated 140,000 to 328,000 birds are killed annually within the United States at monopole wind turbines (Loss et al. 2013). In 2012, an estimated 600,000 bats died as a result of interactions with wind turbines (Hayes 2013). The increased presence of wind farms in the vicinity of the Project has a permanent and direct impact on birds and bats. Large game, small mammals, birds, amphibians, reptiles, and insects could all potentially experience mortality, where increased traffic from construction activities overlaps with Project construction.
- **Increased light and noise impacts** on wildlife where the Project overlaps with construction of the Colstrip and Oliver County Substation upgrades. Light and noise during construction could deter wildlife and cause increased stress, resulting in physical declines. Cumulative noise impacts would be temporary and greatest during overlapping construction periods with the Project. Light impacts from the Project would be permanent at the substations, and there would be a slight permanent increase in corona noise along the entire transmission line infrastructure. In conjunction with other projects, these could cause direct impacts on wildlife.

As described under Section 4.1.2.1, Physical Resources, cumulative impacts associated with construction activities overlapping the Project would be temporary and are anticipated to be mitigated through permitting requirements and sequential Project construction. Overlapping construction-related impacts on biological resources would likely be both direct and secondary and temporary. Cumulative impacts on biological resources from activities overlapping with the Project during operations are expected to be temporary and minimal, as Project operational impacts would be limited to infrequent vegetation maintenance and the minor, yet consistent, corona noise from the transmission line infrastructure. Cumulative impacts on species from habitat loss due to other development projects and the Project's permanent infrastructure would be direct and secondary and a mixture of temporary and permanent. All cumulative impacts on biological resources would be distributed across discrete, non-contiguous areas, thereby minimizing the cumulative impact on biological resources. Overall, the cumulative impact on biological habitat is anticipated to be short-term and regional.

4.1.2.3. Social Resources

Cumulative impacts on social resources from activities identified in Table 4.1-2 include the following:

- **Beneficial impact on economics, employment, income, and taxes and revenues** where construction activities overlap in time with the Project (e.g., wind farm, solar, and oil and gas development; the Rosebud Coal Mine; the BNI Center Mine; and other residential and road development projects).
- **Potential housing shortages** associated with overlapping construction activities where workers would likely be seeking temporary accommodation in the same communities. Given the shortage of housing reported by state and local agencies, cumulative housing needs during construction of multiple projects could strain an already limited supply of affordable rental housing (Section 3.10, Socioeconomics). Key overlapping activities with the Project that may lead to housing shortages include wind farm and solar developments and upgrades to the Colstrip Switchyard and Oliver County Substation.
- **Increase in traffic** where construction activities overlap with Project construction, with a potential for temporary peak hour congestion on the local road network, including activities associated with nearby oil and gas development, the Rosebud Coal Mine, the BNI Center Mine, upgrades at the Colstrip Switchyard and Oliver County Substation, and general ranching/livestock grazing activities and vegetation monitoring studies.
- **Increased noise impacts** associated with construction activities of the Colstrip and Oliver County substations' upgrades, which may overlap with Project construction activities and corona noise from transmission line infrastructure during operations.
- **Visual impacts on public viewsheds** resulting from temporary overlapping construction phases and the permanent combined impact of the transmission line infrastructure and facilities where they overlap with other activities on the landscape, including the activities associated with nearby oil and gas development, Rosebud Coal Mine, BNI Center Mine, Diamond Willow Wind Project, NextEra Oliver Wind IV Project, Oliver County Substation, Cabin Creek Project, AES Sundog Solar Development, NextEra New Salem Wind I&2 Project, and Colstrip Switchyard upgrade.

- **Potential strain on public services** where construction activities overlap with Project construction. If multiple emergency events were to occur in an area where Project construction overlaps with other projects, public services (e.g., police, fire, or medical) may encounter strained response times and capacities.

As the Project would be constructed in segments and workers would be routinely relocating as construction advances, cumulative impacts on the availability of short-term housing would be temporary and localized, occurring only along overlapping portions of construction. Due to the longer period of construction required for the Rosebud County Converter Station (if it overlaps with the Colstrip Substation and other construction projects), there may be prolonged short-term housing impacts in Colstrip and nearby areas. Overlapping construction timelines may result in a strain on the local short-term or medium-term housing supply for non-local workers, resulting in short- to medium-term, localized impacts. Generally, construction traffic for the Project and reasonably foreseeable projects would be on regional highways with adequate capacity or on local roads near each project and would not result in cumulative impacts on the road network.

Cumulative impacts on social resources from activities overlapping with the Project during operations are anticipated to primarily be negligible, long-term, and in some instances, beneficial. The adverse cumulative impacts on social resources during Project operations would be limited to slight noise increases from the ongoing corona noise along the transmission line and occasional maintenance activities. Other adverse cumulative impacts during Project operations may include negligible impacts on housing and public services and facilities. Key areas of long-term beneficial impacts from overlapping activities with the Project include impacts on taxes and revenues and public health, welfare, and safety due to the generation of tax revenues that would accrue to county governments, fire districts, schools, and other public service authorities.

Cumulative visual impacts in the area would largely consist of direct, temporary, and significant modifications to the landscape (e.g., construction staging areas and equipment and access roads), while the overall visual impact on public viewsheds from the combined impact of transmission line infrastructure and facilities would result in changes that are permanent and regional. Cumulative visual impacts during construction would include road upgrades or construction activities (both temporary and permanent), the use of laydown yards, pulling sites, vegetation removal, and the installation of fencing and structures. Permanent cumulative visual impacts would include permanent roads, Project structures, and maintained vegetation mowing/clearing.

4.1.2.4. Cultural Resources

Cumulative impacts on cultural resources from activities identified in Table 4.1-2 include physical and non-physical impacts. Cultural resources studies and surveys to identify historic properties and tribal resources within the physical and non-physical APEs for the Project are ongoing, and evaluation of potential cumulative impacts is pending. Until the location and nature of known cultural resources within the physical and non-physical APEs are understood, specific cumulative impacts cannot be evaluated.

A Programmatic Agreement will include avoidance, minimization, and mitigation measures for cultural resources. Impacts on cultural resources from activities identified in Table 4.1-2 would

likely occur regardless of the Project. Pending a review of cultural resources reports currently in development, cumulative impacts on cultural resources are not anticipated.

4.2. UNAVOIDABLE ADVERSE IMPACTS

Under the No Action Alternative, unavoidable adverse impacts are not anticipated, as current conditions would not change. Under the Proposed Alternative, unavoidable adverse impacts would result from construction of permanent access roads or upgrades to existing access roads, installation of transmission line infrastructure, vegetation clearing within work areas and the ROW, and construction of the permanent facilities (Rosebud County Converter Station, Morton County Converter Station, and auxiliary components and equipment such as repeater stations, telecommunication systems, and grounding infrastructure). Unavoidable adverse impacts are detailed below.

4.2.1. Physical Resources Impacts

- Permanent conversion of land and soil compaction from construction and improvement of access roads and permanent facilities; increasing stormwater runoff velocity and potential pollutant loading into nearby surface waters;
- Temporary air quality impacts due to increased emissions from construction equipment and vehicles, including diesel exhaust (PM, NO_x, carbon monoxide [CO]); dust generation from ground disturbance; and
- Permanent, limited access to federal minerals (mineral materials and coal) with no change to overall availability of these minerals, which are abundant in the vicinity of the ROW.

4.2.2. Biological Resources Impacts

- Temporary and permanent vegetation clearing, leading to habitat loss and fragmentation;
- Temporary and permanent disruptions to wildlife from noise, light, human activity, and habitat alteration; and
- Temporary and permanent risk of mortality from vehicle collisions and infrastructure collisions with wildlife.

4.2.3. Social Resources Impacts

- Permanent visual and aesthetic changes to the landscape;
- Temporary disruptions to land use (e.g., agriculture, recreation) during construction;
- Potential concerns from nearby communities regarding noise, access, and long-term land use changes;
- Temporary increases in noise levels from construction equipment and activities (e.g., vegetation clearing, foundation drilling, or helicopter use); and
- Permanent increases in noise levels during operations of the transmission line infrastructure and converter stations.

Adverse impacts on cultural resources are anticipated to be avoided, minimized, or mitigated by implementing the Programmatic Agreement and the Post-Review Discovery Plan for Cultural Resources and Human Remains; however, there may be some unavoidable adverse impacts. Unavoidable cultural resources impacts are assessed in detail in Chapter 3 and summarized by resource in Chapter 5, Comparison of Alternatives. A Programmatic Agreement will include avoidance, minimization, and mitigation measures for cultural resources.

4.3. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As of 2024, NEPA and MEPA (for Project areas in Montana) require a detailed statement that addresses any irreversible and irretrievable commitments of resources that would be involved in the Proposed Alternative should it be implemented (42 USC § 4332(C)(v); § 75-1-201(b)(iv)(F), MCA). An irreversible or irretrievable commitment of resources refers to impacts on or a permanent loss of a resource that cannot be recovered or reversed and is either permanent or long-lasting. Under the No Action Alternative, no commitment of resources would be required, as current conditions would not change. Under the Proposed Alternative, resource commitments (discussed in detail in Chapter 3) are summarized below:

The Project would require the following permanent commitment of resources:

- Permanent commitment of 10,125.1 acres of land for the permanent maintained ROW, including approximately 387.9 acres of auxiliary facilities within the Project area, conversion of land to impervious or compacted surfaces for access roads, and transmission line infrastructure;
- Permanent loss of approximately 750.3 acres of vegetation (662.9 acres in Montana and 87.4 acres in North Dakota) cleared for structures, facilities, permanent access roads, or maintained ROW. Of these, approximately 168.6 acres would be herbaceous grasslands (143.5 acres in Montana and 25.0 acres in North Dakota), 114.2 acres would be shrubland (112.5 acres in Montana and 1.7 acres in North Dakota), 428.5 acres would be forest and woodland (405.0 acres in Montana and 23.6 acres in North Dakota), and 38.9 acres would be agricultural vegetation (1.9 acres in Montana and 37.1 acres in North Dakota) (Table 3.13-3);
- Permanent impacts associated with permanent structure placement and access road improvements on 18.4 acres of 100-year floodplains in Montana and 0.8 acres of 100-year floodplains in North Dakota;
- Permanent impacts on 0.4 acre of waterbodies (0.4 acre in Montana and less than 0.1 acre in North Dakota) for the establishment and upgrades of access roads and overland travel and secondary impacts on waterbodies through the clearing of adjacent forested vegetation;
- Permanent loss of 3.0 acres of PEM wetlands (2.9 acres in Montana and 0.1 acre in North Dakota) and the conversion of less than 0.1 acre of PFO and 0.3 acre of PSS wetland in North Dakota to PEM/PSS wetlands;
- Use of approximately 2.4 million gallons of water for concrete batching and approximately 272,000 gallons of water per mile for access road dust control;
- Permanent loss of approximately 240.0 acres (216.0 acres in Montana and 24.0 acres in North Dakota) of contiguous unbroken grasslands that provide habitat for species such as the federally threatened Dakota skipper (*Hesperia dacotae*), regal fritillary (*Speyeria idalia*), greater sage-grouse, black-tailed prairie dog (*Cynomys ludovicianus*), and other grassland species listed in Section 3.14, Fisheries and Wildlife (Table 3.14-4);
- Permanent, slight increase in noise levels along the transmission line due to corona noise and from converter stations at noise sensitive areas in Morton County and occasional noise associated with maintenance activities along the transmission line during operations; and

- Mining activities would be limited within the Project ROW for the duration of the Project life, and coal mining activities would be limited within 35 feet of the Project transmission line infrastructure (30 CFR § 77.807-2).

While these resources would be permanently lost or converted, they would be the result of the construction of a bidirectional connection between the western and eastern electrical grids that would result in the following benefits:

- Improved reliability, efficiency and resiliency of both electrical grids;
- Increased balance in energy supply and demand beyond local utilities;
- Development of a robust transmission connection system to address growing energy demand and provide more stable and reliable energy transfer; and
- Potential tax revenues in the tens of millions of dollars during the first 30 years of operations (Grid United 2024a).[20]

4.4. MONTANA REGULATORY RESTRICTIONS

The Project crosses Montana lands managed by the BLM, USDA ARS, Montana State Trust Lands, and private owners. Additional details on lands crossed by the Project are provided in Section 3.8, Land Use and Recreation. In accordance with MEPA, private properties in Montana will be evaluated by state agencies to confirm all regulatory restrictions relating to access are in compliance (§ 75-1-201(1)(b)(iv)(D) *et seq.*, MCA). There are no regulations for private property access in North Dakota.

The Proponent would have established easements to allow for the construction of the transmission line infrastructure and maintenance of the ROW. Additionally, access agreements would be in place prior to construction for use of private roads and temporary access. The Project would not impair the use of private lands or roads and would follow the regulations of applicable authorities when constructing or modifying roads.

[20] Future valuation of the Proposed Alternative and resulting tax income to the counties within the socioeconomic analysis area would depend on information about the Project that is not yet available.

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5. COMPARISON OF ALTERNATIVES

This chapter compares impacts on each resource under the No Action Alternative and Proposed Alternative. This comparison is used as a baseline to measure potential impacts from the Project. Under the No Action Alternative, the Proponent would not construct or operate the transmission line, and impacts would be limited to the current land use activities.

The Proposed Alternative (Chapter 2, Description of Alternatives) is the construction of the bi-directional transmission line connecting the eastern and western electrical grids and associated facilities. Of the potential route alignments studied, only one was considered reasonable as well as technically and financially feasible; therefore, the Proposed Alternative is the only alternative to the No Action Alternative. The comparison of impacts provided in Table 5-1 was used to select the Joint Lead Agencies' Preferred Alternative. Mitigation measures for each impact in Table 5-1 are discussed in the resource sections of Chapter 3, Affected Environment and Environmental Consequences.

5.1. PREFERRED ALTERNATIVE

ARM 17.4.617(9) et seq. requires a Montana agency to declare a Preferred Alternative in the EIS, if one has been identified, and to give reason for the preference. For MTDEQ, the Preferred Alternative should achieve the best balance among location criteria, including the area of greatest potential local acceptance, using colocation and roaded areas (i.e., paralleling or sharing ROWs with existing utilities or roads), avoiding residential areas, using rangeland and non-irrigated land, siting in gently rolling or flat terrain, avoiding floodplains, siting for the least visual impacts, and being in accordance with public land plans (as specified in Circular MFSA-2 Section 3.1(1)(a-k) for Montana projects). The MTDEQ has identified the Proposed Alternative as the Preferred Alternative.

Given the lack of material difference in impacts between dismissed alternatives (Chapter 2) relative to the preferred location criteria and that the Proposed Alternative would avoid impacts on developed commercial and residential areas and minimize impacts on Class II VRM sites and other federally and state-managed special use areas, the Proposed Alternative achieves the best balance among the above preferred location criteria outlined in Circular MFSA-2 Section 3.1. The Proponent found greater local acceptance of the Proposed Alternative from landowners and officials. The majority of farmland along the Proposed Alternative is rangeland (rather than mechanically irrigated or non-irrigated or flood-irrigated cropland, which are less preferrable for transmission line siting).

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6. CONSULTATION AND COORDINATION

NEPA and MEPA require that the Joint Lead Agencies conduct interagency consultation and coordination. Under NEPA (42 USC § 4321 et seq.), the DOE must invite the participation of likely affected federal, state, tribal, and local agencies and governments as cooperating or participating agencies, as appropriate. Under MEPA (§ 75-1-201, MCA), MTDEQ must consult with and obtain comments from any state agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in Montana and with any Montana local government (as defined in § 7-12-1103, MCA) that may be directly affected by the Project. The state official responsible shall also consult with and obtain comments from Montana state agencies with respect to regulation of private property involved.

Consultation and coordination occurred in-person and via email and phone communication prior to and during the formal scoping period and during EIS preparation. The Proponent and/or Joint Lead Agencies consulted federal, state, and local agencies during the development of this EIS, which is summarized below and listed in Appendix A.

6.1. NATIONAL HISTORIC PRESERVATION ACT SECTION 106

The DOE must consult with the Montana SHPO and State Historical Society of North Dakota if the Project could affect historic properties, under Section 106 of the NHPA, 54 USC § 300101 *et seq*. The DOE is required to consult with Indian tribes and other consulting parties of opportunities to provide comments on the Project and effects determinations during the Section 106 process. On February 7, 2025, the DOE identified an APE and initiated the Section 106 consultation process with all consulting parties, including the Montana SHPO and the State Historical Society of North Dakota. The DOE Programmatic Agreement addresses the identification of resources; evaluations; findings of effect; and avoidance, minimization, and mitigation measures. With respect to site eligibility, the Programmatic Agreement allows the DOE to issue a decision on NRHP eligibility without site evaluations being completed. Additional discussion of these sites is provided in Section 3.3, Cultural /Tribal/ Historic Resources.

6.2. TRIBAL CONSULTATION

The DOE also must consult with any Indian tribe[21] that could be affected by the Project. Consultation is intended to document the concerns of Indian tribes. During the scoping process, the DOE sent consultation invitations via email (February 7, 2025) and postal mail (February 10, 2025) to the tribal governments listed in Appendix A.

The DOE will provide notice of the availability of the Draft EIS to all federally recognized Indian tribes with interest in the Project.

6.3. ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

Section 7 of the ESA requires federal agencies to confer with the USFWS on any agency action that is likely to jeopardize the continued existence of any species proposed for listing or result in the adverse modification of critical habitat proposed to be designated. The Proponent is

[21] Per 25 USC § 5130, "The term 'Indian tribe' means any Indian or Alaska Native tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe."

preparing a Biological Assessment for terrestrial species, aquatic species, and plant species for submittal to the USFWS. The Biological Assessment covers 15 mammal, bird, insect, and fish species that are in one of the following ESA listing status categories: (1) Threatened or Endangered, (2) Proposed Threatened or Endangered, or (3) Under Review. The Project does not cross critical habitat for any federally listed species.

6.4. Department of Natural Resources and Conservation Sage Grouse Habitat Conservation Program Consultation

The Montana Sage Grouse Oversight Team oversees the implementation of Montana's Sage Grouse Conservation Strategy by the Montana DNRC Sage Grouse Program. This team and the program implement the Montana Greater Sage-Grouse Stewardship Act of 2015, along with Montana EO 12-2015 ("Executive Order Amending and Providing for Implementation of the Montana Sage Grouse Conservation Strategy") and Montana EO 21-2015 ("Executive Order 12/2015 *Erratum*"). The Proponent is preparing a Montana Greater Sage Grouse Mitigation Plan for compliance with the requirements of Montana EO 12-2015 and the Montana Greater Sage-Grouse Stewardship Act of 2015 and to support state permitting in Montana. This plan is in development. Consultation between the Proponent and both the Montana DNRC Sage Grouse Program and Montana Sage Grouse Oversight Team is ongoing.

7. LIST OF PREPARERS AND REVIEWERS

The EIS preparation and review team consisted of specialists from the DOE, MTDEQ, USDA Forest Service, BLM, USDA ARS, and a third-party consultant, ERM. Consistent with NEPA (NEPA § 107(f) and 42 USC § 4336a(f)) and MEPA (ARM 17.4.635), responsible federal and state officials directed and independently evaluated this EIS, which was prepared by ERM, taking responsibility for its scope and contents.

7.1. JOINT LEAD AGENCIES

Specialists from the Joint Lead Agencies who participated in the evaluation of this EIS are listed in Table 7.1-1 and Table 7.1-2.

7.2. COOPERATING AGENCIES

Specialists from the Cooperating Agencies who participated in the evaluation of this EIS are listed in Table 7.2-1 through Table 7.2-3.

7.3. EIS CONSULTANT TEAM

Specialists from ERM who participated in the preparation and evaluation of this EIS are listed in Table 7.3-1.

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