



WBI ENERGY TRANSMISSION, INC.

Grasslands South Expansion Project

FERC Docket No. CP23-__-000

Environmental Report

FINAL

Volume II - Public

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Abbreviations and Acronyms

A-wt.	A-weighted
AIS	aquatic invasive species
ANS	aquatic nuisance species
AOI	Area of Interest
APE	Area of Potential Effects
APHIS	Animal and Plant Health Inspection Service
API	American Petroleum Institute
AR	Access Road
BCR	Bird Conservation Regions
BCC	Birds of Conservation Concern
Bear Creek Plant	Bear Creek natural gas processing facility
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
CAA	Clean Air Act
CEII	Critical Energy Infrastructure Information
CEMP	Plan for Unanticipated Discovery of Contaminated Environmental Media
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DASK	Dakota skipper
dB	decibel
dBA	decibel of the A-weighted frequency scale
dkbt/day	dekatherms per day
DOT	U.S. Department of Transportation
EC	Electrical Conductivity
EI	Environmental Inspector
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
EWS	extra temporary workspace
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FRS	Facility Registry System
FSA	Farm Service Agency
GHG	greenhouse gas

GIS	geographic information system
GPS	Global Positioning System
HAP	hazardous air pollutant
HUC	Hydrologic Unit Code
IBA	Important Bird Areas
IPaC	Information for Planning and Conservation
km	kilometer
L _d	daytime sound level
L _{eq}	equivalent sound level
L _n	nighttime sound level
LUST	leaking underground storage tanks
M	Magnitude
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MLRA	Major Resource Land Area
MOU	Memorandum of Understanding
MP	milepost
NAAQS	National Ambient Air Quality Standards
NABCI	North American Bird Conservation Initiative
NCEI	National Centers for Environmental Information
NDA	North Dakota Department of Agriculture
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDEQ	North Dakota Department of Environmental Quality
NDDWR	North Dakota Department of Water Resources
NDGF	North Dakota Game and Fish Department
ND ESFO	North Dakota Ecological Services Field Office
NDGS	North Dakota Geological Survey
NDIC	North Dakota Industrial Commission
NDPRD	North Dakota Parks and Recreation Department
NDPSC	North Dakota Public Service Commission
NDSG	North Dakota State Government
NDTL	North Dakota State Trust Lands
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NOAA	National Oceanic & Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service

NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standard
NSR	New Source Review
NWI	National Wetlands Inventory
O ₃	ozone
OHWM	ordinary high water mark
ONEOK	ONEOK Rockies Midstream, L.L.C.
OSHA	Occupational Safety and Health Administration
PEM	palustrine emergent
Plan	FERC's Current <i>Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PM	particulate matter
PM _{2.5}	particulate matter with a nominal aerodynamic diameter of 2.5 microns
PM ₁₀	particulate matter with a nominal aerodynamic diameter of 10 microns
ppb	parts per billion by volume
ppm	parts per million by volume
Procedures	FERC's Current <i>Wetland and Waterbody Construction and Mitigation Procedures</i>
Project	Grasslands South Expansion Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
RCRA	Resource Conservation and Recovery Act
SAAQS	state ambient air quality standards
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SHSND	State Historical Society of North Dakota
SO ₂	sulfur dioxide
SOC	species of concern
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SSA	sole source aquifer
SSURGO	U.S. Department of Agriculture Soil Survey Geographic Database
SWPPP	Stormwater Pollution Prevention Plan
TMDL	total maximum daily load
tpy	tons per year
TWS	temporary workspace
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
UDP	Plan for Unanticipated Discovery of Historic Properties or Human Remains During Construction
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

UST	underground storage tanks
USC	United States Code
UWYO	University of Wyoming
VOC	volatile organic compounds
WAQSR	Wyoming Air Quality Standards and Regulations
WBI Energy	WBI Energy Transmission, Inc.
WEG	wind erodibility group
WGFD	Wyoming Game and Fish Department
WHPA	Wellhead Protection Area
WOGCC	Wyoming Oil and Gas Conservation Commission
WSGS	Wyoming State Geological Survey
WWPC	Wyoming Weed and Pest Council
WYCRO	Wyoming Cultural Records Office
WYDEQ	Wyoming Department of Environmental Quality
WY ESFO	Wyoming Ecological Services Field Office
WYSEO	Wyoming State Engineers Office

1.0 GENERAL PROJECT DESCRIPTION

Resource Report 1 describes WBI Energy Transmission, Inc.’s (WBI Energy) proposed Grasslands South Expansion Project (Project) and summarizes the purpose, need, and land requirements for the Project. Table 1.0-1 summarizes the Federal Energy Regulatory Commission’s (FERC’s or Commission’s) filing requirements for Resource Report 1 and where each requirement is addressed.

TABLE 1.0-1 Summary of Filing Information for Resource Report 1	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Provide a detailed description and location map of the project facilities. (18 CFR §380.12(c)(1)) <ul style="list-style-type: none"> • Include all pipeline and aboveground facilities. • Include support areas for construction or operation. • Identify facilities to be abandoned. 	Section 1.3, Appendix 1A Figures 1.3-1, 1.3-2, and 1.3-3
Describe any non-jurisdictional facilities that would be built in association with the project. (18 CFR §380.12(c)(2)) <ul style="list-style-type: none"> • Include auxiliary facilities. (§ 2.55(a)) • Describe the relationship to the jurisdictional facilities. • Include ownership, land requirements, gas consumption, megawatt size, construction status, and an update of the latest status of federal, state, and local permits/approvals. • Include the length and diameter of any interconnecting pipeline. • Apply the four-factor test to each facility. (18 CFR § 380.12(c)(2)(ii)) 	Section 1.10
Provide current original U.S. Geological Survey (USGS) 7.5-minute series topographic maps with mileposts showing the project facilities. (18 CFR §380.12(c)(3)) <ul style="list-style-type: none"> • Show locations of all linear project elements and label them. • Show locations of all significant aboveground facilities and label them. 	Appendix 1A
Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the project facilities. (18 CFR §380.12(c)(3)) <ul style="list-style-type: none"> • No more than 1 year old. • Scale no smaller than 1:6,000. 	Appendix 1A Appendix 1B-1 (Public Version – Volume II) Appendix 1B-2 (Privileged and Confidential – Volume IV)
When new or additional compression is proposed, include large scale plot/site plans of compressor station showing the location of the nearest noise sensitive areas (NSA) within 1 mile. (18 CFR §380.12(c)(3,4)) <ul style="list-style-type: none"> • Scale no smaller than 1:3,600. • Show reference to topographic maps and aerial alignments provided above. 	Appendix 1C-2 – Compressor Station Plot Plans (Critical Energy Infrastructure Information [CEII] - Volume III) Note: No new compression is proposed as part of the Project; therefore, NSAs are not included on plot plans.
Describe construction and restoration methods. (18 CFR §380.12(c)(6)) <ul style="list-style-type: none"> • Include this information by milepost. 	Section 1.5
Identify the permits required for construction across surface waters. (18 CFR §380.12(c)(9)) <ul style="list-style-type: none"> • Include the status of all permits. 	Section 1.8
Provide the names and addresses of all affected landowners and certify that all affected landowners will be notified as required in §157.6(d). (§§380.12(a)(4) and (c)(10)) <ul style="list-style-type: none"> • Affected landowners are defined in §157.6(d). • Provide an electronic copy directly to the environmental staff. 	Section 1.9 Appendix 1I (Privileged and Confidential - Volume IV)
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Describe all authorizations required to complete the proposed action and the status of applications for such authorizations.	Section 1.8
Provide plot/site plans of all other aboveground facilities that are not completely within the right-of-way.	Appendix 1C-1 – Aboveground Facilities Plot Plans (Public Version – Volume II) Appendix 1C-2 – Compressor Station Plot Plan (CEII - Volume III)

**TABLE 1.0-1
Summary of Filing Information for Resource Report 1**

Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent right-of-way, and temporary construction right-of-way.	Appendix 1D
Summarize the total acreage of land affected by construction and operation of the project.	Section 1.4, Table 1.4-1
If Resource Report 5, Socioeconomics, is not provided, provide the start and end dates of construction, the number of pipeline spreads that would be used, and the workforce per spread.	Section 1.5.1
Send two (2) additional copies of topographic maps and aerial images/photographs directly to the environmental staff of the Office of Energy Projects.	Attached

1.1 PROJECT OVERVIEW

WBI Energy owns and operates a natural gas transmission pipeline system and associated aboveground facilities in the states of Minnesota, North Dakota, South Dakota, Montana, and Wyoming. WBI Energy is filing an application with the FERC pursuant to Title 18 Code of Federal Regulations (CFR) Sections 157.205 and 157.208 of the Commission's regulations and WBI Energy's blanket certificate authority granted in Docket Nos. CP82-487-000, et al., requesting approval for the construction and operation of the natural gas transmission facilities described herein for the Project.

The Project will provide 94,000 equivalent dekatherms per day (dkt/day) of incremental firm natural gas transportation capacity from a new receipt station (Bear Creek Receipt Station) at the existing ONEOK Rockies Midstream, L.L.C. (ONEOK) Bear Creek natural gas processing facility (Bear Creek Plant) in Dunn County, North Dakota to a new interconnect with Big Horn Gas Gathering, L.L.C. (Big Horn Gas) in Sheridan County, Wyoming (Big Horn Gas Interconnect) as more fully described in WBI Energy's application. Maps depicting the proposed Project in relation to WBI Energy's existing system are provided in appendix 1A.

1.2 PURPOSE AND NEED

The purpose of the Project is to provide incremental firm natural gas transportation capacity from ONEOK's existing Bear Creek Plant in Dunn County, North Dakota to the Big Horn Gas system in Sheridan County, Wyoming. WBI Energy has entered into a precedent agreement with ONEOK for 94,000 equivalent dkt/day of incremental firm transportation service from the proposed Bear Creek Receipt Station to the proposed Big Horn Gas Interconnect. The Project will provide an additional market connection for ONEOK's processed natural gas.

1.3 PROPOSED FACILITIES

Project facilities will be located in Dunn County, North Dakota, and Campbell and Sheridan Counties, Wyoming. Table 1.3-1 describes the pipeline, aboveground facilities, and new equipment that are proposed for the Project. Figures 1.3-1 through 1.3-3 provide overview maps of the Project. Narrative descriptions of each Project component follow the table and figures.

Topographic maps depicting the location of the pipeline route and aboveground facility sites are provided in Volume II, appendix 1A. Appendix 1B contains public aerial photo-based alignment sheets in Volume II and privileged and confidential alignment sheets (i.e., with landowner information) in Volume IV. Plot plans for the Bear Creek Receipt Station, Midpoint Valve, and Big Horn Gas Interconnect are provided in appendix 1C-1 in Volume II. Plot plans for the Manning and Landeck Compressor Stations are included in appendix 1C-2. Due to the specific details related to the operation and engineering of the compressor

stations, the plot plans have been segregated and labeled as Critical Energy Infrastructure Information (CEII) and are being filed separately in Volume III. Mileposts (MPs) provided throughout this report are approximate and may not align with civil survey stationing on engineering drawings and alignment sheets; reference mile markers that match MPs in this report are shown on the alignment sheets for ease of review.

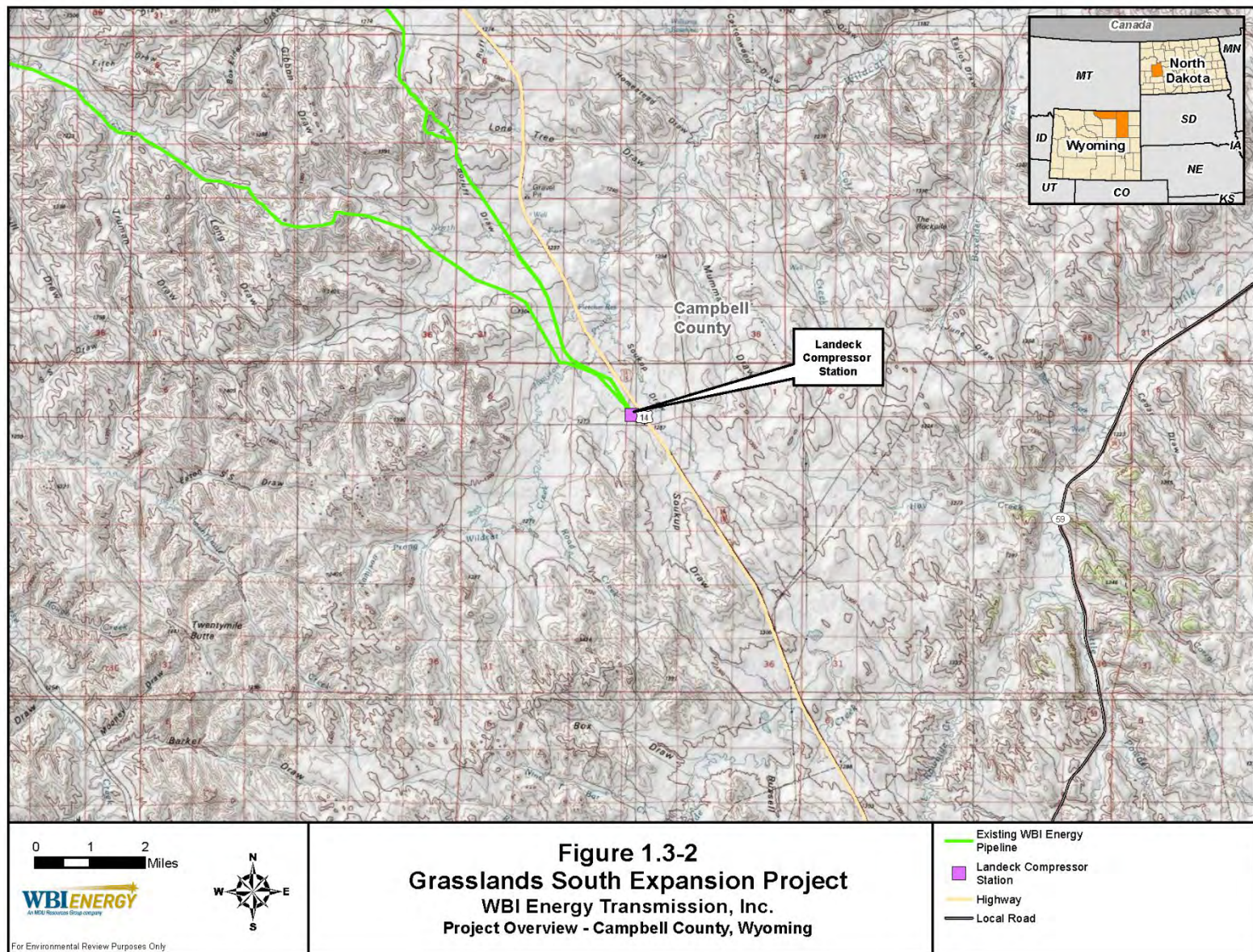
State/County/Facility	Description	Location (Township/Range)	Location (Section)
North Dakota, Dunn County	Pipeline	T144N, R95W	Sec. 6, 7, 17, 18, 19, 20, 28, 29, 30, 31, 32, 33
		T145N, R95W	Sec. 4, 5, 8, 9, 16, 20, 21, 28, 29, 32, 33, 34
		T146N, R95W	Sec. 27, 28, 33, 34
	Bear Creek Receipt Station	T146N, R95W	Sec. 28
	Midpoint Valve	T144N, R95W	Sec. 18
Wyoming, Campbell County	Manning Compressor Station	T144N, R95W	Sec. 31, 32, 33
	Landeck Compressor Station	T52N, R73W	Sec. 3
Wyoming, Sheridan County	Big Horn Gas Interconnect	T54N, R76W	Sec. 19, 20, 30

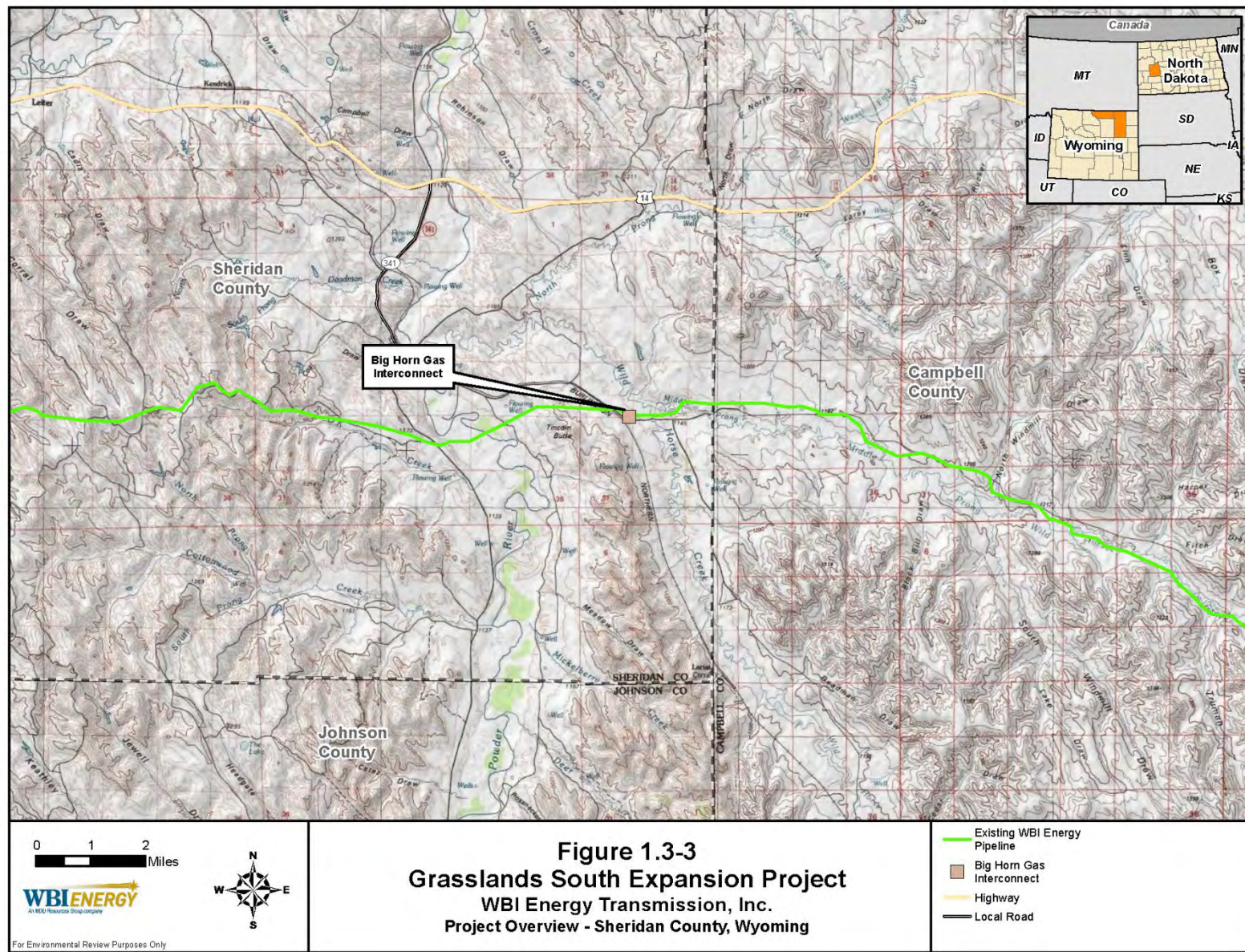
1.3.1 Pipeline Facilities

WBI Energy will construct approximately 15.3 miles of new 12-inch-diameter natural gas lateral pipeline from the new Bear Creek Receipt Station to WBI Energy's existing Manning Compressor Station in Dunn County, North Dakota. The pipeline will have a maximum allowable operating pressure (MAOP) of 1,480 pounds per square inch gauge (psig). Pig launcher/receiver facilities will be installed at each end of the proposed pipeline. Following successful installation of the pipeline, hydrostatic testing will be completed to confirm the integrity of the pipeline. Cathodic protection will be installed along the pipeline route, as necessary, along with cathodic protection test leads to test the potential for corrosive conditions to develop along the pipeline.

To the extent possible, WBI Energy routed the pipeline along roadways, pipelines, and powerlines and in accordance with landowner requests to parallel existing infrastructure. The pipeline route is collocated within 300 feet of existing roads, pipelines, and powerlines for approximately 8.3 miles, or 54.2 percent of its total length.







1.3.2 Bear Creek Receipt Station

WBI Energy will construct the Bear Creek Receipt Station adjacent to the existing ONEOK Bear Creek Plant which is approximately 4.6 miles north/northwest of the town of Killdeer, North Dakota. WBI Energy's Bear Creek Receipt Station facilities will consist of a 12-inch ultrasonic meter and auxiliary equipment, including a pig launcher/receiver to accommodate pipeline integrity operations. A chain link fence will be installed around the perimeter of WBI Energy's facilities. To access the Bear Creek Receipt Station during construction, WBI Energy will use existing and planned gravel access roads within ONEOK's Bear Creek Plant constructed and maintained by ONEOK (depicted as Access Road [AR] 1 in appendices 1A and 1B). Additional information about the access road to the Bear Creek Receipt Station is provided in section 1.10 Non-Jurisdictional Facilities. The location of the Bear Creek Receipt Station is depicted on the maps provided in appendices 1A and 1B.

1.3.3 Midpoint Valve

The new Midpoint Valve will be installed at MP 11.7 along the pipeline route in Dunn County, North Dakota, as identified in table 1.3-1. The Midpoint Valve will be installed with aboveground equipment, including a valve operator, riser, and blowdown valve. A new permanent access road to the facility will be constructed off of 8th Street. The location of the new Midpoint Valve is depicted on the maps provided in appendices 1A and 1B.

1.3.4 Manning Compressor Station

WBI Energy proposes to install a pig launcher/receiver and a cathodic protection unit to accommodate the new pipeline (see table 1.3-1). The new facilities and equipment will be installed within the existing fence line of the compressor station and no new permanent easement or additional access to the station is required.

1.3.5 Landeck Compressor Station

WBI Energy will install measurement equipment and modify piping within the Landeck Compressor Station to measure the increased volume of natural gas for line section accounting purposes (see table 1.3-1). The existing meter and associated piping will be removed. The new equipment will be installed in graveled areas within the existing fence line of the compressor station and no new permanent easement or additional access to the station is required.

1.3.6 Big Horn Gas Interconnect

WBI Energy will transport the incremental volume of natural gas from the Bear Creek Receipt Station through the new lateral pipeline and WBI Energy's existing pipeline system in North Dakota, Montana, and Wyoming to a new interconnect with Big Horn Gas in Sheridan County, Wyoming.

The Big Horn Gas Interconnect will include the construction of a mainline valve setting, measurement equipment, and associated communication and gas quality equipment. The Big Horn Gas Interconnect will also include approximately 300-feet of 12-inch-diameter interconnecting pipeline between the new mainline valve setting and the measurement equipment. WBI Energy will own and maintain a permanent easement for the interconnect facility, including installation of fencing around the new facility. A new permanent access road will be constructed for access to the facility during operation.

1.4 LAND REQUIREMENTS

Construction of the Project will affect a total of 222.1 acres of land, including temporary workspace (TWS) needed for construction of the pipeline and aboveground facilities, extra temporary workspace (EWS), the Frontier Laydown Yard, and temporary access roads. The total acreage required for operation of the Project is approximately 95.3 acres, including the new permanent pipeline easement and new permanent aboveground facility footprints and access roads to these facilities. Table 1.4-1 provides the total acres of land required temporarily for construction and permanently for operation of the pipeline and aboveground facilities.

TABLE 1.4-1 Land Requirements for the Grasslands South Expansion Project		
State/County/Facility	Construction (acres)	Operation (acres)
North Dakota, Dunn County		
Pipeline Facilities		
Temporary Workspace	136.7	--
Permanent Right-of-Way	--	92.5
Extra Temporary Workspace	26.1	--
Access Roads	24.7	--
Frontier Laydown Yard	20.0	--
Pipeline Facilities Subtotal	207.5	92.5
Aboveground Facilities		
Bear Creek Receipt Station ^{a, b}	3.7	0.7
Midpoint Valve ^{a, c}	0.2	0.2
Manning Compressor Station	4.3	0.1
Aboveground Facilities Subtotal	8.2	1.0
North Dakota Subtotal	215.7	93.5
Wyoming, Campbell and Sheridan Counties		
Landeck Compressor Station ^d	1.2	--
Big Horn Gas Interconnect ^a	5.2	1.8
Wyoming Subtotal	6.4	1.8
Project Total	222.1	95.3
^a Acreage includes the temporary and permanent access roads/approaches that will be used for aboveground facilities. Additional information is provided in section 1.4.2. ^b The permanent access road to the Bear Creek Receipt Station will be constructed by ONEOK and is not included in the permanent impact acreages. See section 1.10 Non-jurisdictional Facilities for a discussion of impacts associated with the permanent access road to the Bear Creek Receipt Station. ^c Temporary impacts associated with installation of the Midpoint Valve are included in the acreages for the pipeline. Where the permanent footprint of the Midpoint Valve overlaps with the permanent right-of-way for the pipeline corridor, acreage is assigned to the Midpoint Valve only to avoid double counting. ^d Temporary workspace required for installation of new equipment within the existing Landeck Compressor Station is fully located within a graveled area within the permanent facility site. After installation of the new equipment is complete, gravel will be replaced. No new easement is required and land use would remain the same after construction (graveled, impervious surface); therefore, no new permanent impacts are calculated.		

1.4.1 Pipeline Facilities

The land required for construction of the pipeline will include the new permanent right-of-way, TWS needed for typical pipeline construction procedures (described in section 1.5.3), EWS for specialized construction procedures (described in section 1.5.4), the Frontier Laydown Yard, and temporary access roads to the work areas from public roads. In total, pipeline construction will require approximately 207.5 acres, of which approximately 92.5 acres will be retained as permanent easement.

WBI Energy is proposing to use a 75-foot-wide TWS corridor for conventional construction procedures in upland areas along the pipeline route. The typical TWS for construction will consist of a 50-foot-wide

working side and a 25-foot-wide spoil-storage side. WBI Energy also proposes to install travel lanes to cross ditches, roads, and other features intersected by the pipeline route; travel lanes would be installed within the TWS and would be removed after the completion of construction.

EWS of varying widths will be required adjacent to the TWS in certain locations for specialized construction methods such as guided bore crossings, wetland and waterbody crossings, at the beginning and end of the pipeline, tie-in points, and pipeline and road crossings. Locations of the EWS are depicted on the route maps provided in appendices 1A and 1B. Specialized construction methods are described in section 1.5.4.

Temporary access roads will be needed to access the TWS for construction. Access points will include newly built access roads, existing roads, driveways, and field access points. No modifications are currently planned for use of existing paved and gravel access roads; however, improvements (e.g., grading, adding gravel) may be conducted where necessary to facilitate ingress and egress of equipment and vehicles, and widening up to 30 feet may be necessary to accommodate the turning radius of some trucks. If any existing access roads are damaged as part of the Project, WBI Energy will restore the roads to pre-existing condition or better. Refer to section 8.2.1.2 for additional information regarding access roads for the Project.

In addition to the TWS, EWS, and temporary access roads, WBI Energy has identified the Frontier Laydown Yard that will be utilized for pipe and material storage, and equipment staging and maintenance. The Frontier Laydown Yard is an existing storage yard located on the west side of 109th Avenue SW in Township 145N, Range 95W, Section 29, Dunn County, North Dakota. The entire 20-acre yard has previously been disturbed and most of the area is graveled, though some vegetated areas are present on the outer fringes of the yard. Prior to use of the Frontier Laydown Yard for the Project, WBI Energy plans to grade and gravel the entire 20-acre parcel to create a safe working surface for construction equipment and vehicles. The landowner of the yard has requested that WBI Energy leave the improvements in place following construction.

Following construction, WBI Energy will retain a 50-foot-wide permanent easement centered on the pipeline. The easement required for operation of the Midpoint Valve will be within the permanent easement for the pipeline right-of-way (see section 1.4.2 for additional details). The remainder of the TWS, EWS, and temporary access roads will be restored to pre-existing conditions.

Table 1.4-1 summarizes the approximate land requirements for construction and operation of the Project. The specific locations and dimensions of the TWS, EWS, access roads/approaches, and the Frontier Laydown Yard are shown on the maps and aerial photo-based alignment sheets provided in appendices 1A and 1B. Typical cross-section drawings of the TWS for construction of the new pipeline are provided in appendix 1D. Additional descriptions of the land required for construction and operation of the pipeline facilities are provided in Resource Report 8.

1.4.2 Aboveground Facilities

Construction of the Bear Creek Receipt Station and the temporary access road that will be used to access this facility during construction (AR1) will require approximately 3.7 acres of TWS. The receipt station will be installed within a 200-foot by 200-foot (0.8-acre) area and WBI Energy will use a 4,197-foot by 30-foot (2.9 acres) temporary access road that is predominantly located within the Bear Creek Plant to access the site. After equipment is installed for the receipt station, WBI Energy will fence and gravel a 160-foot by 180-foot (0.7-acre) area for operation of the receipt station. The area beyond the fence line of the receipt station (0.1 acre) will be restored to preconstruction condition. As part of the agreement between WBI Energy and ONEOK, ONEOK will extend the existing plant roads to provide a permanent access road to the Bear Creek Receipt Station. Following construction, this permanent access road will be owned and

maintained by ONEOK. For this reason, the permanent acreage associated with the access road is not carried forward in the discussion of environmental impacts in this Environmental Report; additional details about the permanent access road are provided in section 1.10 Non-jurisdictional Facilities.

The Midpoint Valve that will be used to isolate the pipeline for safety, operations, and maintenance purposes will be constructed within the TWS for the pipeline route at MP 11.7. The operational footprint of the Midpoint Valve will be a 50-foot by 50-foot area within the 50-foot-wide permanent right-of-way for the pipeline; this area will be graveled, fenced, and maintained for operation of the valve. WBI Energy will construct a 30-foot by 178-foot (0.1-acre) permanent access road to provide access to the Midpoint Valve site during operation. In total, the operational footprint of the Midpoint Valve and permanent access road will be 0.2 acre.

Installation of new facilities and equipment at the Manning and Landeck Compressor Stations will be conducted within the permanent operational easements of the facilities and established permanent access roads will be used; no new easement or access will be necessary.

WBI Energy proposes to use the 4.3-acre operational footprint of the Manning Compressor Station to install the new facilities and equipment. Following installation, a 50-foot by 50-foot (0.1-acre) area will be graveled for operation of the new pig launcher/receiver, resulting in approximately 0.1 acre of new permanent impacts within the operational footprint of the Manning Compressor Station.

Installation of new equipment at the Landeck Compressor Station will require approximately 1.2 acres of TWS. The entire 1.2-acre area is within the existing graveled area of the compressor station. After the new equipment is installed, WBI Energy will replace the gravel in this area for operation of the new equipment. No new operational easement will be needed and no new impervious surfaces will be created.

At the Big Horn Gas Interconnect, approximately 5.2 acres of TWS will be required to construct the facility and following construction 1.8 acres will be maintained for operation of the interconnect. Permanent facilities for the interconnect will include a 0.3-acre area for the valve setting and a 0.7-acre area for the measurement facilities. Both of these sites will be graveled, and a chain-link fence will be installed around the perimeter of each facility. One permanent building will be installed along with the measurement facilities. A 50-foot permanent easement (0.2 acre) will be maintained in an herbaceous state over the interconnecting pipeline that runs between the valve setting and the measurement facilities. An approximately 30-foot by 787-foot (0.6-acre) access road will be maintained for operation of the Big Horn Gas Interconnect. Areas outside the fence lines that were used as TWS during construction will be restored to preconstruction conditions.

The specific locations and dimensions of the Bear Creek Receipt Station, Midpoint Valve, Big Horn Gas Interconnect, and the existing Manning and Landeck Compressor Stations are shown on the topographic maps and aerial photo-based alignment sheets provided in appendices 1A and 1B, respectively. Plot plans for the Bear Creek Receipt Station, Midpoint Valve, and Big Horn Gas Interconnect are provided in appendix 1C-1 in Volume II. Plot plans for the Manning and Landeck Compressor Stations are included in appendix 1C-2 and filed separately as CEII in Volume III. Additional descriptions of the land required for construction and operation of the Project is provided in Resource Report 8.

1.5 CONSTRUCTION PROCEDURES

The Project facilities will be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) regulations contained in 49 CFR Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, and other applicable federal, state, and local regulations, including the applicable requirements of the Occupational Safety and Health Administration (OSHA). The requirements set forth in these regulations have been or will be provided to WBI Energy’s employees engaged in the planning, construction, maintenance, and operation of the Project and will be provided to WBI Energy’s construction contractors and third-party inspectors. These employees and contractors will be instructed to follow these requirements, as applicable, when planning, installing, and operating the facilities.

WBI Energy is adopting the current version of FERC’s *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) (FERC, 2013a) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) (FERC, 2013b) for the Project, which are incorporated herein by reference. Based on the current Project design, WBI Energy is not requesting any modifications to the Plan or Procedures.

Throughout the permitting process, various regulatory agencies, including FERC, the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS), and various state and local agencies, may require additional resource protection measures. These additional measures will be detailed in the applicable federal, state, and local permits. Regulatory and landowner specifications will be incorporated into the general construction documents.

WBI Energy will implement additional Project-specific plans. These include:

- Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) (see appendix 1E-1);
- Plan for Unanticipated Discovery of Contaminated Environmental Media (CEMP) (see appendix 1E-2)
- Guided Bore Drilling Fluid Monitoring and Operations Plan (see appendix 1E-3);
- Noxious Weed Management Plan (see appendix 1E-4);
- Plan for Unanticipated Discovery of Historic Properties or Human Remains During Construction (UDP; see appendix 1E-5), and
- Fugitive Dust Control Plan (see appendix 1E-6).

1.5.1 Construction Schedule and Workforce

WBI Energy is seeking regulatory approvals by March 2023 in order to begin construction of the Project in the spring of 2023 and meet the desired in-service date of November 1, 2023. WBI Energy anticipates that construction of the pipeline facilities will occur as a single spread, or workgroup, but may add additional crews if the schedule requires it. Separate spreads or crews will be used for construction of the interconnect facilities and the installation of new equipment within existing facilities. Restoration measures will begin as soon as practicable following the completion of trench backfilling. WBI Energy anticipates areas disturbed during construction will meet stabilization requirements, weather permitting, by December 2023 and continue into spring of 2024 (as needed). Temporary erosion control measures will remain in place until restoration is successful.

WBI Energy estimates the duration of construction for the pipeline will be about 180 days over a period of 6 months, construction of the Bear Creek Receipt Station and Big Horn Gas Interconnect facilities will be up to 60 days over a period of six months, and the installation of new facilities and equipment at the Manning and Landeck Compressor Stations will be up to 30 days over a period of six months. Pipeline

construction will generally take place Monday through Saturday during daylight hours; however, some activities may extend beyond daylight hours and into Sunday, as necessary, to maintain the Project schedule. If necessary, applicable noise mitigation measures will be implemented in accordance with FERC guidelines and as described in section 9.2.2.

WBI Energy anticipates the peak temporary workforce for construction of the pipeline will include 100 construction workers, 30 construction workers for construction of the Bear Creek Receipt Station and Big Horn Gas Interconnect, and up to 30 construction workers for the installation of new facilities and equipment at the Manning and Landeck Compressor Stations; these numbers include inspection personnel. At this time, no new permanent staff, beyond those already working for WBI Energy, will be required to operate the Project facilities after completion of construction.

1.5.2 Training, Inspection, and Environmental Compliance

WBI Energy is committed to designing, building, and conducting its operations in ways that avoid adverse impacts on human health and the environment. WBI Energy will require that designated environmental requirements are incorporated in construction documents. WBI Energy will train company and contractor personnel to familiarize them with environmental plans and other conditions and employ up to two Environmental Inspectors (EIs) to monitor compliance during construction, clean up, and restoration. WBI Energy will be responsible for implementation of environmental requirements during construction of all Project facilities.

WBI Energy will include Project-specific environmental requirements in construction contract documents. These will include the Plan and Procedures, applicable permits, and other environmental requirements. WBI Energy will effectively communicate the environmental requirements for the Project to the contractor. If, during construction, the contractor is in violation of an environmental requirement, WBI Energy will require an immediate correction of the problem, issue a stop work order if necessary, and resolve discipline issues with the contractor.

Before construction begins, WBI Energy will conduct environmental training for company and contractor personnel and inspectors to familiarize them with the specific conditions associated with the Project. The training program will focus on the Plan and Procedures, Project-specific permit conditions, and Project-specific plans. If specialized construction, avoidance, or monitoring measures are required, WBI Energy will present these measures as part of the environmental training. Periodic follow-up training for groups of newly assigned personnel will be provided as necessary by the EI(s).

As required in the Plan, WBI Energy will utilize EI(s) during construction and considers the role of the EI to be a critical part of the construction management team. The EI position will be a full-time position with stop-work authority, and will be present onsite on a daily basis during construction. WBI Energy's EI(s) will have peer status with other inspectors and will report directly to WBI Energy's Environmental Specialist. The EI(s) will have the authority throughout the course of the Project to assess and evaluate any construction-related activity to confirm compliance with the environmental conditions of local, state, or federal agency permits or certificates. The EI's responsibilities will be consistent with those contained in section II.B (Responsibilities of the EIs) of the Plan.

WBI Energy's Project Manager and Environmental Specialist will review daily reports generated by the EI(s). Agency notifications required by permit conditions will be made by the Environmental Specialist. WBI Energy's Environmental Specialist and WBI Energy's Project Manager will review all agency notifications.

1.5.3 General Pipeline Construction Procedures

Construction of the pipeline facilities will involve conventional overland pipeline construction techniques that follow a sequential set of operations, as described below and depicted on figure 1.5.3-1. In the typical pipeline construction scenario, construction proceeds along the pipeline route in one continuous operation. Construction at any single point, from initial clearing to backfilling and final grading, will last approximately 6 to 8 weeks. The entire process is coordinated in such a manner as to minimize the total time a tract of land is exposed to erosion after disturbance.

1.5.3.1 Surveying and Staking

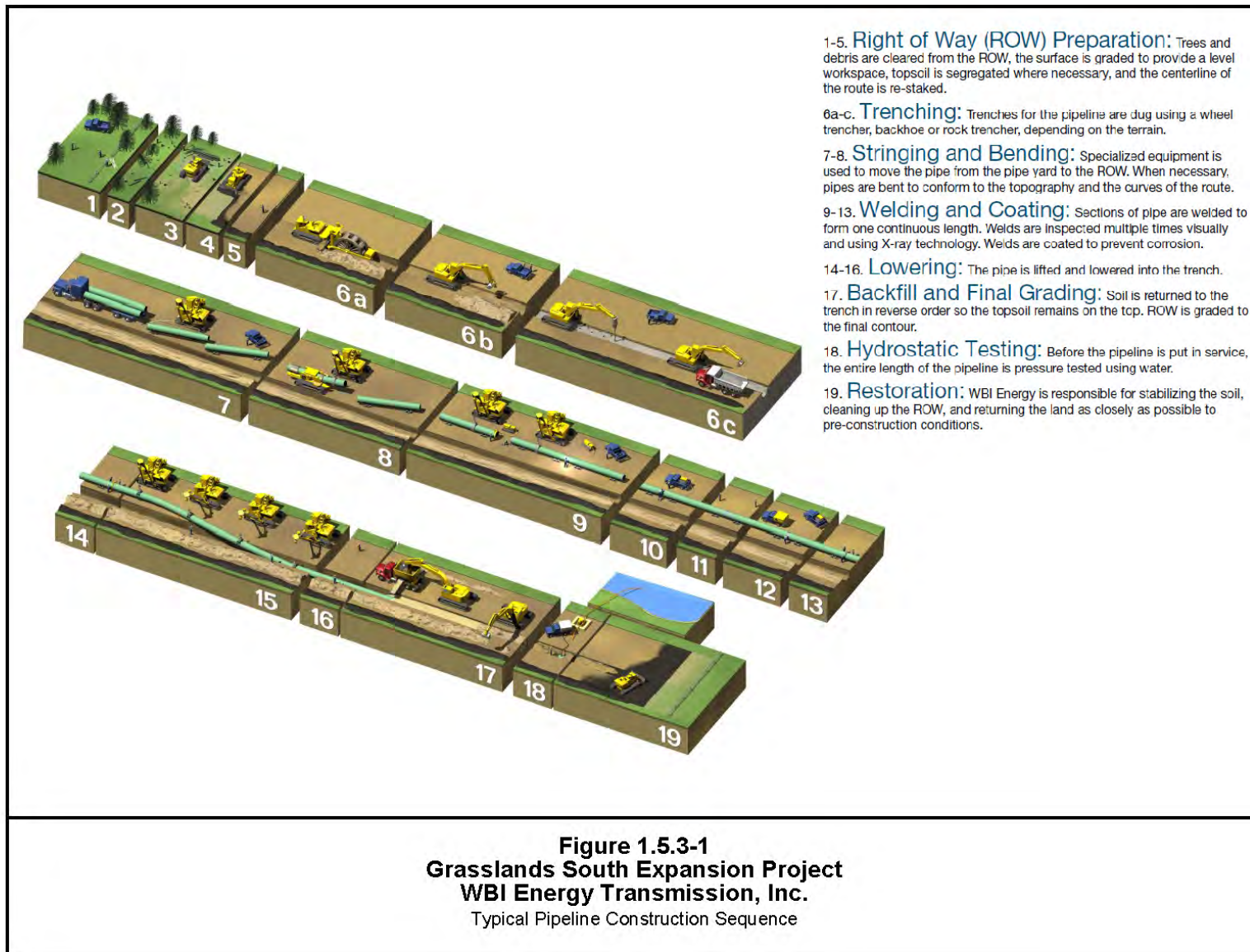
The initial step in preparing the right-of-way for construction is preconstruction survey and staking. Affected landowners will be notified before these activities are started. After these notifications, WBI Energy's civil survey contractor will survey the construction corridor and place stakes along the centerline of the pipeline and at the outside limits of the TWS and EWS areas. Flags or other markers will also be placed at wetlands and waterbody crossings, highway crossings, sensitive environmental feature boundaries, access roads, and known underground facilities. Roads that are travel-prohibited will be clearly marked with no-access signs. WBI Energy's contractor will coordinate with the North Dakota and Wyoming one-call systems to have existing utility lines (e.g., cables, conduits, and pipelines) located and marked with flags, stakes, or other devices to prevent accidental damage during pipeline construction.

1.5.3.2 Erosion and Sedimentation Control

Prior to ground-disturbing activities, erosion and sediment control devices will be installed along the construction TWS, access roads, and EWS in accordance with the Project-specific Stormwater Pollution Prevention Plans (SWPPPs). The SWPPPs will incorporate the requirements from the Plan and Procedures as well as any site-specific erosion control information. The SWPPPs will be completed in conjunction with WBI Energy's applications for construction stormwater permits to be submitted to the applicable regulatory agencies prior to the commencement of construction activities.

The SWPPPs will describe general measures that will be implemented during Project activities to limit the potential for erosion during construction. These measures will include the following:

- Limiting the quantity and duration of soil exposure.
- Implementing dust mitigation measures.
- Reducing the velocity of runoff water and redirecting runoff, as appropriate.
- Installing and maintaining erosion and sediment control measures during construction.
- Establishing vegetation following final grading in non-agricultural areas.
- Inspecting the right-of-way and maintaining erosion and sediment control as needed until final stabilization is achieved in non-agricultural land.



1.5.3.3 Access Roads and Travel Lanes

Prior to construction activities, improvements may be required to allow heavy equipment access to the right-of-way using existing roads, field access points, or driveways. If necessary, WBI Energy will build temporary approaches from public and/or private roads to gain access to the workspace areas. Where it is not practical to move around, WBI Energy will use travel lanes to cross ditches, waterbodies, or other features; travel lanes will be installed in accordance with the specifications in section V.B.5 of the Procedures relating to equipment bridge installation. Travel lanes are shown on the construction alignment sheets included in appendix 1B.

Rock installed for new temporary access roads will be underlain by a geotextile fabric to facilitate removal after construction. WBI Energy will employ standard construction practices to maintain and protect roadside ditches and water flow, if present, including installation of culverts, if necessary, pursuant to state and county specifications. If necessary, the culverts will be covered with environmentally friendly geotechnical fabric, rock, and dirt. These materials will be removed following construction, resulting in the preservation of the original contours of the ditch. If any existing access roads are damaged as part of the Project, WBI Energy will restore the roads to pre-existing condition or better.

1.5.3.4 Clearing, Grading, and Fencing

Following the installation of staking and flagging, the right-of-way will be cleared and graded to remove brush, roots, and other obstructions such as large rocks and stumps within upland areas. Minimal timber removal is expected to be necessary due to the open and agricultural setting of the Project. Non-woody vegetation may be mowed and left in place to limit soil erosion. A fence crew, typically operating in conjunction with the clearing crews, will cut and brace fences along the pipeline route. Temporary gates may be installed in accordance with individual landowner requests. The fence crew will also fence off avoidance areas with temporary construction fence, as necessary, to avoid impacting sensitive sites or maintain public safety.

After the TWS has been cleared, the ground will be graded as necessary to create a safe working area and allow the operation and travel of construction equipment. Minimal grading will be required in flat terrain. The majority of the Project is flat terrain; however, where steeper hills are encountered, more extensive grading may be necessary. The existing surface drainage will be preserved to the extent possible.

Topsoil will be segregated in accordance with the Plan to preserve soil productivity. Topsoil that has been removed or stripped will typically be stored on the spoil side of the TWS during construction; however, some circumstances may require the topsoil be stored or placed on the working side adjacent to the ditch or at the edge of the TWS. Typical drawings depicting topsoil segregation are provided in appendix 1D and section 7.3.1 provides detailed information about measures that will be implemented on agricultural lands.

1.5.3.5 Stringing

Steel pipe for the pipeline will be protected with a fusion-bonded epoxy coating applied at the factory, and the beveled ends will be left uncoated for welding. The individual joints will be transported from the storage yard to the right-of-way by stringing trucks, observing load restrictions on local roads and state and federal highways. The stringing trucks will place the pipeline joints end-to-end along the right-of-way. Stringing pipe will be placed on the working side of the pipeline centerline for efficient welding operations to proceed. At sensitive crossing locations (e.g., wetlands, waterbody crossings, streets, highways), the amount of pipe required for the crossing will be stockpiled within the TWS or EWS.

1.5.3.6 Pipe Bending

The pipe will be delivered to the Project right-of-way in straight sections. Some bending of the pipe will be required to allow the pipeline to follow natural grade changes and direction changes of the right-of-way. Selected joints will be field-bent by hydraulic bending machines prior to welding.

1.5.3.7 Pipe Assembly, Welding, and Inspection

Following stringing and bending, the joints of pipe will be placed on temporary supports adjacent to the trench. The ends will be carefully aligned and welded together using multiple passes for a full penetration weld. Only welders qualified according to WBI Energy's welder qualification procedures and American Petroleum Institute (API) standards will be permitted to perform the welding. Welding will be conducted in compliance with 49 CFR Part 192 and API Standard 1104 Welding of Pipelines and Related Facilities. Completed welds will be visually and radiographically inspected, and all pipe welds will be coated in accordance with required specifications. The coating will be inspected for defects and repaired, if necessary, prior to lowering the pipe into the trench.

1.5.3.8 Trenching

Trenching to excavate a ditch for the pipeline will typically be conducted with a track-mounted backhoe, rotary trenching machine, or similar equipment. WBI Energy does not anticipate that any blasting will be required to establish the trench line.

The bottom of the trench will be excavated to a width sufficient to accommodate the 12-inch-diameter pipe. The width at the top of the trench will vary as necessary to avoid side slope slumping and to ensure safety and compliance with OSHA requirements. The trench will be excavated to a sufficient depth, typically 6 feet, to allow for a normal depth of cover of 4 feet (48 inches) over the pipe. This is in accordance with 49 CFR Part 192.327, which establishes a minimum of 2.5 feet (30 inches) for most pipelines in Class 1 areas and 3 feet (36 inches) of cover for most pipelines in Class 2, 3, and 4 areas. Additional cover will be provided at road and waterbody crossings for a minimum depth of cover of 6 feet. In the unlikely event rock is encountered during construction, the pipeline will be installed with at least 2 feet of cover.

Excavated subsoil will typically be stockpiled along the right-of-way on the side opposite the construction traffic and pipe assembly area. Subsoil will be stockpiled separately from topsoil. This segregation of topsoil and subsoil will be maintained throughout Project construction.

To date, no drain tile has been identified in the Project area. During trenching, previously unidentified or unknown drain tile may be crossed. If drain tile is encountered, WBI Energy will restore the functionality of the drain tile through the relocation, reconfiguration, or replacement of the existing tile. Additional details about WBI Energy's drain tile identification and restoration measures are described in section 1.5.4.5.

1.5.3.9 Pipe Lowering

The welded and coated sections of pipe will be lifted from the temporary supports and lowered into the trench by side-boom tractors or similar equipment. Before lowering the pipe, the trench will be inspected to see that it is free of rocks and other debris that could damage the pipe or the coating and that the pipe and trench configurations are compatible. As necessary, trench breakers (stacked sandbags or foam) will be installed in the trench around the pipe to prevent movement of subsurface water along the pipeline, and weights will be added around the pipe in areas where buoyancy control is needed. Inspection will also verify that minimum cover requirements are met.

Trench dewatering may be necessary to inspect the trench prior to lowering the pipe. Trench dewatering will be conducted in accordance with the Plan and Procedures and applicable permit conditions using appropriate best management practices (BMPs). If trench dewatering is required, WBI Energy will discharge the water in a manner that will not cause erosion or result in silt-laden water flowing into a waterbody or wetland, such as through a sediment filter bag in an upland area. Discharge rates will be monitored to minimize the potential for erosion at the discharge point. Dewatering will be completed in accordance with applicable permit requirements. Additional discussion about dewatering is provided in Resource Report 2.

1.5.3.10 Tie-ins

At select locations, such as stream crossings, road crossings, and terrain changes along the pipeline system, the pipe will be lowered into the trench in segments. The segments will then be welded together, or tied in, prior to final coating inspection and backfilling. A crew will be assigned to making these tie-ins at designated locations ahead of the backfill operations.

1.5.3.11 Padding and Backfilling

After the pipe is lowered into the trench, bladed equipment or backhoes will backfill the trench with previously excavated material typically consisting of the subsoil excavated from the trench. Where the previously excavated material contains large rocks or other materials that could damage the pipe or coating, clean fill and/or protective coating (i.e., padding material) will be placed around the pipe prior to backfilling. Rock excavated from the pipeline trench may be used to backfill the trench only to the depth of the existing bedrock profile. Rock that is not returned to the trench will be disposed of onsite per landowner request or offsite as construction waste.

Where topsoil and subsoil piles are segregated, subsoil will be used for backfilling and padding. Following backfilling, a small crown of material may be left over the trench to account for any potential soil settling. During backfilling, special care will be taken to avoid mixing of topsoil and subsoil, minimize erosion, restore the natural contour of the ground, and restore surface drainage patterns as close to preconstruction conditions as practicable.

1.5.3.12 Pressure Testing

WBI Energy will pressure test its new pipeline as required by 49 CFR Part 192. Pressure testing for the Project will consist of adding water to the pipeline and then pressurizing it to a point above its MAOP and holding the elevated pressure for a specified amount of time to document the pipeline has no leaks. If leaks are detected, the defect will be repaired, and the section of pipe retested until all required specifications are met. Refer to section 2.2.9 for more information on WBI Energy's planned procedures and proposed mitigation measures for water use related to pressure testing.

Water will be withdrawn from municipal/commercial sources and pumped into the test section behind a fill pig. Prior to testing, a small volume of water may be pushed through the pipeline to rinse out dust, dirt, and debris that may have accumulated in the pipe during construction. No chemicals will be added to the rinse water, unless necessary to neutralize chlorinated source water, and rinse water will be discharged to a dewatering structure located in an upland area to prevent runoff into wetlands or waterbodies. If a suitable upland area is not available, the water will be hauled to an approved off-site location for disposal.

WBI Energy will submit an application to the North Dakota Department of Environmental Quality (NDDEQ) requesting authorization to discharge hydrostatic test water in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements in the event WBI Energy chooses to

discharge hydrostatic test water to the environment as part of this Project. Discharge activities will be conducted in accordance with permit requirements.

1.5.3.13 Final Tie-in and Commissioning

After pressure testing, the final pipeline tie-in will be completed, and commissioning of the pipeline and facilities will commence. Commissioning involves activities to verify that equipment is properly installed and working, controls and communications systems are functional, and the pipeline is ready for service. The pipeline will be cleaned, dried, and inspected using in-line inspection tools (e.g., pigs) to detect anomalies in the pipeline that may have been introduced during construction. Once completed, the pipeline will be prepared for service by purging the line of air and loading the line with natural gas.

1.5.3.14 Clean up and Restoration

Final cleanup will begin after backfilling and as weather and site conditions permit, including final grading, disposal of remaining trash and debris, and installation of permanent erosion control devices and pipeline markers. Every reasonable effort will be made to complete final cleanup within timeframes required by permits, in accordance with landowner requests, or as required by the Plan and Procedures.

After the completion of construction, the right-of-way will be protected through utilization of BMPs as appropriate and the installation of erosion and sediment control devices, including site-specific contouring, permanent slope breakers, mulch, and reseeded or sodding to stabilize the disturbed soils. The erosion control measures used will be in accordance with the Project SWPPP, appropriate state agency requirements, and WBI Energy's construction procedures. Non-cropland will be revegetated in compliance with seed, fertilizer, and soil additive recommendations obtained from the local soil conservation authority or as requested by the landowner. WBI Energy will work with landowners to determine if their property will need to be seeded with a native grass seed mix.

Cathodic protection test stations, rectifiers, and pipeline markers will be located along the right-of-way and installed in accordance with 49 CFR Part 192 and DOT safety requirements. The pipeline markers will identify WBI Energy as the operator and also list telephone numbers for emergencies and inquiries. These facilities will generally be located at regular intervals and adjacent to road crossings but within the permanent right-of-way. Periodic inspections of the right-of-way will be conducted, and further restoration measures will be implemented, if necessary.

1.5.4 Specialized Pipeline Construction Procedures

In addition to standard pipeline construction methods described in section 1.5.3, WBI Energy will use special construction techniques where warranted by site-specific conditions, such as wetlands, waterbodies, roads, and agricultural areas. The construction footprint for the Project will not occur within 50 feet of any residences. The specialized pipeline construction procedures are described in the following subsections.

1.5.4.1 Wetland and Waterbody Crossings

Eight waterbodies and 19 wetlands will be crossed as a result of proposed Project activities. Where wetlands/waterbodies are crossed, WBI Energy will complete crossings in accordance with the Procedures, applicable permit conditions, and WBI Energy's construction plans. The TWS width will be limited to 75 feet or less through wetlands/waterbodies. Wetland and waterbody crossing locations are detailed in sections 2.2.2 and 2.3.2.

The Procedures require EWS to be set back a minimum of 50 feet from wetland/waterbody boundaries, except where the adjacent uplands consist of cultivated or rotated cropland or other disturbed land. WBI Energy has designed the Project to be consistent with this requirement and all EWS will be set back 50 feet from wetlands.

Open-ditch or guided bore construction methods will be implemented for wetland/waterbody crossings, depending on conditions at the time of crossing. Guided bore methods may be implemented as an alternative to open-ditch methods if higher water levels exist at the time of crossing. Open-ditch methods may be implemented as an alternative to guided bore methods if water levels are low at the time of crossing. For open-ditch crossings, pipeline installation will be completed as described above for general pipeline construction. The guided bore method is further described in section 1.5.4.2 below. All wetland/waterbody crossings will be restored to original conditions and function following construction.

Sediment barriers, such as silt fence and staked straw bales, will be installed and maintained adjacent to wetlands and within EWS, as necessary to minimize the potential for sediment runoff into wetlands. Sediment barriers will be installed across the full width of the TWS at the base of slopes adjacent to wetland boundaries. Sediment barriers will also be installed along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the TWS and into wetland areas outside the construction work area. If trench dewatering is necessary near wetlands, the trench water will be discharged in a manner that does not cause erosion and does not result in silt-laden water flowing into a wetland, as outlined in the Procedures, and in accordance with all applicable state and local permits.

Refueling of equipment and storage of hazardous materials will occur at least 100 feet from all wetlands/waterbodies unless approved by the EI. Erosion and sediment control devices will be installed in accordance with the Project SWPPP to minimize runoff or other impacts into wetland and waterbody areas. Equipment bridges and equipment mats may be installed to facilitate travel lanes for equipment and materials across wetland areas. Construction equipment traveling across wetlands and waterbodies will be operated on equipment mats or bridging as necessary to reduce the potential for rutting and the mixing of topsoil and subsoils, in accordance with the Procedures. Equipment bridges at waterbody crossings, if required, will be installed as specified in section V.B.5 of the Procedures to maintain water flow and flow capacity at all times. Temporary equipment bridges will be removed following the completion of pipeline construction. Additional detail on the wetland and waterbody crossings, construction and restoration measures, and potential impacts and mitigation measures is provided in section 2.2.8 and 2.3.2.

1.5.4.2 Guided Bore Crossing Methods

The guided bore method will be utilized at several road, wetland, and waterbody crossings to install the pipeline. The guided bore method is similar to the horizontal directional drill method but is used for crossings that are relatively short and shallower with a small arc bore path. The guided bore method avoids direct impacts on sensitive environmental features, allowing for trenchless construction across an area by drilling a hole beneath the crossing and pulling a prefabricated section of pipe through the bore hole. A boring contractor will be hired to complete 18 guided bore crossings, listed in table 1.5.4-1 below. Site-specific drawings depicting each of the guided bore crossings, including the plan and profile views and equipment layouts, are provided in appendix 1F.

TABLE 1.5.4-1
Guided Bore Crossing Locations for the Grasslands South Expansion Project

Approximate Milepost		Approximate Crossing Distance in Feet	Features Avoided by Guided Bore
Begin	End		
0.4	0.6	1,163	Jim Creek
0.7	0.8	281	1 st Street NW
2.5	2.5	118	Main Street
2.9	3.0	674	State Highway 22, wetland areas, two unnamed streams
3.7	3.7	377	
4.6	4.7	509	106 th Avenue
5.9	6.0	338	3 rd Street SW (New Paved Road)
6.4	6.5	564	Spring Creek Road and Spring Creek
6.9	6.9	116	3T Street
7.2	7.2	231	State Highway 200 (4 th Street SW)
9.3	9.4	373	Wetland area
9.5	9.6	116	6 th Street SW
10.6	10.7	121	7 th Street SW
11.5	11.6	600	Murphy Creek
11.7	11.7	116	8 th Street SW
12.4	12.5	727	Unnamed tributary and Highway 22 (2 nd crossing of highway), and Dakota Skipper Habitat
15.1	15.2	1,296	Dakota Skipper Habitat
15.2	15.3	314	11 th Street SW

To begin each guided bore crossing, pits at either end of the bore path will be excavated to allow for visual identification of the bore drill and string and to receive bore mud and cuttings. A drill rig will be placed on the entry side of the guided bore and a small pilot hole will be drilled along a predetermined path beneath the crossing.

The position of the drill head is electronically monitored, and directional corrections are made if needed to maintain the desired alignment. Electromagnetic sensors located on the tip of the drill bit will allow the operator to follow the sensor cables or grid along the prescribed path. The directional cables will be laid between the entry and exit points and in thickly vegetated areas, a small pathway approximately 2 to 3 feet wide may be cut using hand tools to lay the electric-grid guide wires resulting in minimal ground and vegetation disturbance. No large trees will be cut as part of this process; however, minimal trimming of woody vegetation may be necessary. Other steering techniques may be employed, pending the selection of the drilling contractor.

A reaming tool will be installed at one end of the drill string on the exit side of the pilot hole and then pushed or drawn back to the drill rig to enlarge the hole. Several passes with progressively larger reaming tools may be required to enlarge the hole to a sufficient diameter to accommodate the pipeline. During this process, drilling fluid or mud consisting of water and in-situ material or bentonite (a non-toxic, naturally occurring sedimentary clay) will be circulated through the hole to remove drill cuttings and to maintain the integrity of the hole. Once the reaming process is complete, a prefabricated segment of pipe will be attached to the drill string on the exit side of the crossing and pulled back through the hole toward the drill rig. After the bore string is welded and prior to pull back, a pre-installation hydrostatic test will be conducted. Water from this test will be obtained from the same sources outlined in section 2.2.9 of this report. Approximately 48,870 gallons of water will be required to complete bore hydrostatic pre-testing activities. Following successful hydrostatic testing, the pipe segment will be connected on either side of the crossing to adjoining sections of pipe.

Water for mixing drilling mud will be obtained from a municipal source. The used drilling mud will either be integrated with the subsoil and returned to the trench during backfilling operations and/or disposed of at an approved disposal facility by the contractor. Although the guided bore method minimizes impacts on sensitive resources, an unintended release of drilling mud (referred to as an inadvertent return) could occur if drilling fluids escape the drilled hole and are forced through the subsurface substrate to the ground surface. In order to assess the potential for successful guided bores, WBI Energy conducted geotechnical assessments to determine the potential for an inadvertent release. These assessments utilized geotechnical bores collected in the Project area, geotechnical engineering, and other available soils and geological information of the Project area. For the assessment, geotechnical bore locations were selected at the northern and southern ends of the Project, near the longest and deepest guided bores planned for the Project and where guided bore techniques will be used to avoid sensitive environmental areas. Reports from the subsurface geotechnical bores is provided in appendix 1G. The geotechnical assessment concluded that the guided bores are feasible considering the geotechnical conditions in the Project area. To minimize potential impacts of inadvertent releases of drilling fluids, WBI Energy will implement the measures identified in the Guided Bore Drilling Fluid Monitoring and Operations Plan (see appendix 1E-3). This plan describes procedures to be used to monitor, contain, and clean up any potential releases of drilling fluids.

1.5.4.3 Road Crossings

The impact upon traffic and transportation facilities and public inconvenience at crossings will be minimized to the extent practicable. Appropriate safety procedures will be implemented to protect workers and the public. Traffic warning signs, detour signs, and other traffic control devices will be used as required by federal, state, and local Departments of Transportation and other regulating bodies. In addition, crossings will be completed in accordance with the requirements of road crossing permits or approvals.

Construction of the pipeline across public roads will be accomplished by the guided bore or open-cut crossing methods. Under the guided bore method, the pipeline will be installed by boring a hole under the road using specialized boring equipment as described in 1.5.4.2.

Highway crossings will be uncased, unless otherwise required by permits. Uncased crossings are preferred over cased crossings due to the increased potential for problems with installation, the cathodic protection system, and corrosion on cased crossings. The pipeline will be buried to a depth of at least 4 feet and up to 6 feet below the roadside ditches, in accordance with permit requirements, and will be designed to withstand anticipated external loads. For all road crossings, the pipeline has been designed in accordance with DOT regulations 49 CFR 192.

The Project crosses 15 public roads and one private drive. Table 1.5.4-2 summarizes the crossing locations by milepost along with the surface type and the anticipated (planned) and secondary (back-up) crossing methods. Secondary crossing methods will be used only if the planned crossing method is not successful.

Road Name	Approximate Milepost	Surface Type	Planned Crossing Method	Secondary Crossing Method
105 th Avenue SW	0.7	Gravel	Guided Bore	Open Cut
Main Street	2.5	Gravel	Guided Bore	Open Cut
State Highway 22	2.9	Paved	Guided Bore	Open Cut
1 st Street SW	3.7	Gravel	Guided Bore	Open Cut
106 th Avenue	4.7	Gravel	Guided Bore	Open Cut
3 rd Street SW (New Paved Road)	6.0	Paved	Guided Bore	Open Cut
Spring Creek Road	6.4	Gravel	Guided Bore	Open Cut

TABLE 1.5.4-2
Roads Crossed by the Grasslands South Expansion Project

Road Name	Approximate Milepost	Surface Type	Planned Crossing Method	Secondary Crossing Method
3T Street	6.9	Gravel	Guided Bore	Open Cut
State Highway 200 (4 th Street SW)	7.2	Paved	Guided Bore	Open Cut
6 th Street SW	9.5	Gravel	Guided Bore	Open Cut
7 th Street SW	10.6	Paved	Guided Bore	Open Cut
8 th Street SW	11.7	Gravel	Guided Bore	Open Cut
State Highway 22	12.5	Paved	Guided Bore	Open Cut
9 th Street	13.5	Dirt	Open Cut	Guided Bore
Private Drive	14.2	Gravel	Open Cut	Guided Bore
11 th Street SW	15.3	Gravel	Guided Bore	Open Cut

1.5.4.4 Residential Areas

The Project is not located within 50 feet of any residences.

1.5.4.5 Agricultural Areas

Construction in agricultural areas will be conducted in accordance with the Plan. To preserve topsoil productivity, WBI Energy will prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area in cultivated and rotated croplands, managed pastures, and hayfields. In areas with more than 12 inches of topsoil WBI Energy will segregate at least 12 inches of topsoil and make every attempt to segregate the entire topsoil layer in soils with less than 12 inches of topsoil. The topsoil and subsoil will be stored in separate windrows within the TWS and will not be allowed to mix. See additional discussion of soil handling procedures in agricultural areas provided in section 7.3.1.

No drain tile has been identified within the Project area to date. WBI Energy will continue to consult with landowners in agricultural areas prior to construction in an effort to identify any known drain tile locations. If drain tile is identified by landowners, WBI Energy will follow the protocols outlined in the FERC Plan to minimize impacts on existing drain tile systems.

Following construction, topsoil and subsoil will be tested for compaction in agricultural areas. The contractor will plow subsoil in accordance with the soil compaction mitigation procedures described in the Plan. Compaction testing will be conducted to verify compaction is relieved to a level equal to or better than adjacent undisturbed areas. Once plowing of the subsoil is complete, the segregated topsoil will be returned to the right-of-way. The restoration activity will be considered complete once the topsoil has been restored to near preconstruction conditions.

During right-of-way negotiations, WBI Energy determined that no specialty crops, such as orchards, conservation reserve program lands, or organic farms exist within the Project area. If present, WBI Energy will work with the landowners and applicable agencies to determine appropriate impact mitigation and protection measures for these properties. If construction requires the removal, addition, or modification of private property features, such as gates or fences, the landowner or tenant will be notified prior to the action. Following completion of major construction, the grade will be restored, as near as practicable, to the original contours. Fences and gates will be repaired following construction.

Temporary access roads located within agricultural fields will be restored, as near as practicable, to preconstruction conditions in adherence with the Plan and Procedures. Specific construction procedures

for access roads within agricultural areas include topsoil removal in conjunction with grading activities and subsoil plowing (decompaction) prior to topsoil replacement.

Additional discussion about agricultural areas crossed by the Project, including potential impacts and proposed mitigation measures, are provided in section 7.3.1 and in section 8.3.1.

1.5.5 Aboveground Facility Construction

Typical construction activities associated with the Project aboveground facilities are summarized below. Construction activity and storage of construction material will be limited to the Project TWS/EWS areas. Waste materials will be disposed of in a manner consistent with state and local regulations. Disturbed areas will be restored in a timely manner. Construction will include general activities such as clearing and grading, concrete pad installation, erection of aboveground facilities, installation of piping equipment, testing of equipment, and cleanup and restoration of the Project area. These activities, as described below, are typical and actual construction may vary.

1.5.5.1 Clearing and Grading

The sites will be partially cleared of existing vegetation (if applicable; some existing facility sites are graveled), graded as described in the Project SWPPPs, and prepared for construction. Prior to ground-disturbing activities, wetlands and waterbodies within or adjacent to facility sites will be flagged and fenced for avoidance, and to maintain setbacks for equipment storage, workspace, and refueling in accordance with the Procedures. Construction activities, including installation of site access and temporary storage of equipment, materials, and waste will be limited to the TWS/EWS. Excess soil removed during construction activities will be stored onsite for future restoration or disposed of in an approved manner.

1.5.5.2 Concrete Pad Installation

After site preparation is complete, excavation will be performed, as necessary, to accommodate the new concrete pads. Forms will be set, rebar installed, and the concrete poured and cured in accordance with minimum strength requirements. Backfill will be compacted in-place and excess soil will be evenly spread within the boundaries of the facility or hauled off for proper disposal.

1.5.5.3 Erection of Aboveground Facilities

Aboveground facilities will be installed after concrete pads are installed. The aboveground facilities include but are not limited to auxiliary buildings, associated above-grade piping, mainline valves, pig launchers/receivers, station control valves, and communications and measurement equipment.

1.5.5.4 Piping Equipment

All welders and welding procedures will be qualified in accordance with API 1104 Standards. Equipment and structures will be installed in compliance with applicable local, state, and federal code requirements. Aboveground piping will be prepared and painted according to WBI Energy's specifications and in accordance with regulatory requirements.

1.5.5.5 Testing

Prior to placing in-service, all controls and safety equipment and systems, such as emergency shutdown systems, relief valves, gas and fire detection, and other protection equipment will be tested. Pressure testing will be conducted on piping, in accordance with the requirements of DOT pipeline safety regulations (49

CFR Part 192), WBI Energy's testing specifications and applicable permits. Testing will follow all applicable federal, state, and local requirements.

1.5.5.6 Clean up and Restoration

The Project areas will be cleaned and restored in accordance with applicable state and federal permits and plans. Final grading will be completed, gravel surfaces refreshed (as needed), and grass or appropriate vegetation seeded per specifications. Compliance with the Project SWPPPs and other permanent mitigation measures according to state and federal permits will be verified.

1.6 OPERATION AND MAINTENANCE PROCEDURES

WBI Energy will operate and maintain the facilities in compliance with DOT regulations provided in 49 CFR Part 192, FERC directives in 18 CFR Part 380.15, and maintenance requirements in the Plan and Procedures. All Project facilities will be marked and identified in accordance with applicable regulations. In accordance with 49 CFR Part 192, the pipeline will be inspected for leakage as part of scheduled operations and maintenance. WBI Energy will also participate in the local One Call system. These standards are in accordance with the National Pipeline Safety Act of 1968, as amended.

Operational activity on the pipeline will be limited primarily to maintenance of the right-of-way and inspection, repair, and cleaning of the pipeline itself. Periodic ground inspections (e.g., on foot, by all-terrain vehicle, or by other vehicle) by pipeline personnel will identify:

- soil erosion that may expose the pipe;
- dead vegetation that may indicate a leak in the line;
- conditions of the vegetative cover and erosion control measures;
- unauthorized encroachment on the right-of-way, such as buildings and other substantial structures; and
- other conditions that could present a safety hazard or require preventative maintenance or repairs.

The pipeline cathodic protection system also will be monitored and inspected periodically to verify proper and adequate corrosion protection. WBI Energy will use public roads to gain access to the right-of-way and facility sites for maintenance and inspection activities. WBI Energy will work with landowners to obtain temporary access if such access is required. Appropriate actions to address conditions observed during inspection will be taken as necessary.

In order to maintain accessibility of the right-of-way and to accommodate pipeline integrity surveys, vegetation along the right-of-way will be cleared periodically, and as necessary, in accordance with the Plan and Procedures. In Project areas crossed by the guided bore method, no clearing of vegetation is planned to complete these crossings and WBI Energy generally will not control or maintain vegetation. Vegetation maintenance is normally not required in agricultural cropland or grazing areas, or in herbaceous wetlands. However, large brush and trees may be periodically removed in these areas in accordance with the Plan and Procedures if trees or deep-rooted shrubs could damage the pipeline's protective coating, obscure periodic surveillance, or interfere with potential repairs. The need for and frequency of any vegetation maintenance will depend upon the vegetation growth rate during operation of the pipeline facilities. Where necessary and when required, WBI Energy typically will use mechanical mowing or cutting along its right-of-way for normal vegetation maintenance. Additional discussion of Project impacts on vegetation is provided in section 3.2.4.

The Pipeline and Hazardous Materials Safety Administration requires pipeline operators to place pipeline markers at frequent intervals along the pipeline right-of-way, such as at intersections with a street, highway,

railway, or waterway, and at other prominent points along the route. Pipeline markers will be placed along the upland portion of the pipeline and will have a pole-mounted design. Pipeline right-of-way markers can help prevent encroachment and excavation-related damage to pipelines. State laws require excavators to contact their state One Call center in advance of any excavation to locate the marked underground pipelines. WBI Energy will continue to participate in North Dakota and Wyoming's One Call systems to make requisite utility locate requests.

In addition to the pipeline, WBI Energy personnel will also perform regular operation and maintenance activities on equipment at the compressor stations, interconnects, and other aboveground facilities. These activities will include calibration, inspection, and scheduled and routine maintenance. Operational testing will be performed on safety equipment to ensure proper functioning, and problems will be corrected. WBI Energy has company standards and procedures in place to minimize the potential for uncontrolled releases of hazardous materials and oil.

1.7 FUTURE PLANS AND ABANDONMENT

WBI Energy has no current or reasonably foreseeable future plans to expand or abandon the Project facilities described in this report at this time. WBI Energy's pipeline system includes an integrated network of transmission facilities in the upper Midwest. If future market demands warrant an expansion of the Project, WBI Energy will file an application with FERC, as appropriate.

1.8 PERMITS AND APPROVALS

Table 1.8-1 provides a summary of the federal and state permits and approvals required to construct and operate the Project, along with the status of each permit or approval. Key agency consultations were initiated in October 2022 to introduce the Project and inform them about the FERC Prior Notice process. Copies of agency correspondence are provided in appendix 1H.

TABLE 1.8-1		
Permits, Approvals, and Consultations Required for the Grasslands South Expansion Project		
Administering Agency	Permit or Approval	Status
Federal		
U.S. Army Corps of Engineers (USACE): Omaha District	Section 404, Clean Water Act (CWA) – Dredge and Fill; Nationwide Permit 12 Section 408, Civil Works Project applicability review	Consultation initiated October 2022; response received December 2022. Pre-Construction Notification for Nationwide Permit 12 not anticipated.
U.S. Fish and Wildlife Service, Region 6: North Dakota Ecological Service Field Office	Section 7 Endangered Species Act, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act consultations	Project notification letter sent October 2022. Informal consultation initiated November 2022; a response was received from the North Dakota Field Office in November 2022 concurring with the effects determinations in WBI Energy's November 2022 letter.
Wyoming Ecological Service Field Office		Project notification letter sent October 2022. In December 2022 a response was received from the Wyoming Field Office stating the Project is in compliance with the Endangered Species Act.
U.S. Department of Agriculture: Natural Resource Conservation Service (NRCS)	Conservation Easement Programs and seeding recommendations	Consultation initiated October 2022; response from North Dakota NRCS received October 2022. A response from Wyoming NRCS has not been received to date.

TABLE 1.8-1

Permits, Approvals, and Consultations Required for the Grasslands South Expansion Project

Administering Agency	Permit or Approval	Status
Farm Service Agency		Consultation initiated October 2022; no response received to date.
State of North Dakota		
North Dakota Department of Environmental Quality	National Pollutant Discharge Elimination System (NPDES) Temporary Dewatering/ Hydrostatic Test Discharge (NDG07-0000)	Application to be submitted April 2023; approval anticipated May 2023.
	NPDES Stormwater Permit (NDR11-0000)	Application to be submitted April 2023; approval anticipated May 2023.
	Section 401 CWA Water Quality Certification	Granted concurrent with Nationwide Permit 12; no additional approval anticipated.
	Wellhead protection area and potable surface water intake data request	Response with locational information received October 2022.
North Dakota Parks and Recreation Department (NDPRD)	Protected Species and State Species of Conservation Concern and state owned or administered lands/projects consultation	Informal consultation initiated October 2022; response received October 2022 indicating no NDPRD or Land and Water Conservation Fund lands, nor rare plants, animals of concern, or significant ecological communities are within or adjacent to the Project.
North Dakota Game and Fish Department	Protected Species and State Species of Conservation Concern Consultation	Informal consultation initiated October 2022; response received October 2022.
	Eagle nest data request	Data request submitted October 2022; response received October 2022. No known eagle nests within 0.25 mile.
North Dakota State Historic Preservation Office (SHPO)	Section 106 Consultation, National Historic Preservation Act (NHPA)	Class III surveys occurred August through October 2019. Consultation for the Project was initiated in early 2022 with the submittal of the 2019 survey report; concurrence on 2019 survey work was received May 2022. Additional Class III surveys occurred in 2022. Reports for 2022 surveys and additional Project consultation submitted August through November 2022; concurrence on 2022 survey work received in November and December 2022.
State of Wyoming		
Wyoming Department of Environmental Quality	NPDES Temporary Dewatering/ Hydrostatic Test Discharge	Application to be submitted April 2023; approval anticipated May 2023.
	NPDES Stormwater Permit	Application to be submitted April 2023; approval anticipated May 2023.
Wyoming Game and Fish Department	Protected Species and State Species of Conservation Concern Consultation	Informal consultation initiated October 2022; response received November 2022.
Wyoming SHPO	Section 106 Consultation, NHPA	Literature review and Class III archaeological and architectural history surveys for Big Horn Gas Interconnect completed in July 2022; Wyoming SHPO concurrence received August 2022. Literature review and consultation for Landeck Compressor Station submitted in October 2022; concurrence received in October 2022.

1.9 AFFECTED LANDOWNERS

A list of the landowners affected by the Project, as defined in 18 CFR Part 157.6(d)(2), is provided as appendix 1I in Volume IV as Privileged and Confidential information. Pursuant to 18 CFR § 157.203(d)(2), WBI Energy certifies that all affected landowners have been or will be notified.

1.10 NON-JURISDICTIONAL FACILITIES

ONEOK will construct, own, and operate new piping connecting the ONEOK Bear Creek Plant to WBI Energy's Bear Creek Receipt Station. In addition, as part of the agreement between WBI Energy and ONEOK, ONEOK will extend the existing plant roads creating a permanent access road to the Bear Creek Receipt Station. Details of the design, construction timing, or permitting requirements for ONEOK's piping and road work are unknown at this time. ONEOK will be responsible for any required road maintenance during operation of the Bear Creek Receipt Station. Kinder Morgan owns and operates Big Horn Gas and plans to install metering equipment adjacent to the south side of the Big Horn Gas Interconnect. At this time, Kinder Morgan's specific plans for developing these facilities is unknown and may not be developed until closer to construction.

Power and communication facilities will be needed to operate the Bear Creek Receipt Station and Big Horn Gas Interconnect facilities. These facilities are expected to be built by the local power and telecommunications companies that will likely build from the nearest available supply lines. At this time, no specific plans have been developed to provide those facilities, and it is not likely they would be developed until after each facility is constructed. Therefore, no additional details about these facilities or potential state or local permitting requirements, or status of correspondence with regulatory agencies are known.

WBI Energy is not aware of any other non-jurisdictional facilities that will be needed for the Project.

2.0 WATER USE AND QUALITY

Resource Report 2 describes the groundwater resources (section 2.1), the surface water resources (section 2.2), and wetland resources (section 2.3) that occur in the Project area. The sections identify existing resources, Project effects to those resources, and measures to avoid, minimize, or mitigate effects. A variety of publicly available data sources were used to compile this report including information from the U.S. Environmental Protection Agency (EPA), the USFWS, the U.S. Geological Survey (USGS), the Federal Emergency Management Agency (FEMA), the Natural Resources Conservation Service (NRCS), the NDDEQ, the North Dakota Geological Survey (NDGS), the North Dakota Department of Water Resources (NDDWR), the Wyoming Department of Environmental Quality (WYDEQ), and the Wyoming State Engineers Office (WYSEO). County- and municipal-level websites were also reviewed. Field data gathered during natural resources survey of the Project facilities was used where applicable. Table 2.0-1 summarizes FERC’s filing requirements for Resource Report 2 and where each requirement is addressed.

TABLE 2.0-1 Summary of Filing Information for Resource Report 2	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Identify all perennial surface waterbodies crossed by the proposed project and their water quality classification. (§ 380.12(d)(1)) <ul style="list-style-type: none"> Identify by milepost Indicate if potable water intakes are within 3 miles downstream of the crossing. 	Sections 2.2.2 and 2.2.6
Identify all waterbody crossings that may have contaminated waters or sediments. (§ 380.12(d)(1)) <ul style="list-style-type: none"> Identify by milepost Include offshore sediments. 	Section 2.2.3.2
Identify watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the proposed project. (§ 380.12(d)(1)) <ul style="list-style-type: none"> Identify by milepost 	Sections 2.1.4, 2.2.1, 2.2.3, and Table 2.2.1-1
Provide a table (based on NWI maps if delineations have not been done) identifying all wetlands, by milepost and length, crossed by the proposed project (including abandoned pipeline), and the total acreage and acreage of each wetland type that would be affected by construction. (§ 380.12(d)(1&4))	Table 2.3.2-1
Discuss construction and restoration methods proposed for crossing wetlands, and compare them to staff’s Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12(d)(2))	Sections 2.3.2 and 2.4
Describe the proposed waterbody construction, impact mitigation, and restoration methods to be used to cross surface waters and compare to the staff’s Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12(d)(2)) <ul style="list-style-type: none"> Although the Procedures do not apply offshore, the first part of this requirement does apply. Be sure to include effects of sedimentation, etc. This information is needed on a mile-by-mile basis and will require completion of geophysical and other surveys before filing. (See also Resource Report 3.) 	Sections 2.2.7, 2.2.8, and 2.4
Provide original National Wetlands Inventory (NWI) maps or the appropriate state wetland maps, if NWI maps are not available, that show all proposed facilities and include milepost locations for proposed pipeline routes. (§ 380.12(d)(4))	Appendix 2A
Identify all U.S. Environmental Protection Agency (EPA) - or state- designated aquifers crossed. (§ 380.12(d)(9)) Identify the location of known public and private groundwater supply wells or springs within 150 feet of construction.	Sections 2.1.2 and 2.1.3
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Identify proposed mitigation for impacts on groundwater resources.	Section 2.1.6
Discuss the potential for blasting to affect water wells, springs, and wetlands, and associated mitigation.	Section 2.1.6
Identify all sources of hydrostatic test water, the quantity of water required, methods for withdrawal, and treatment of discharge, and any waste products generated.	Section 2.2.9
If underground storage of natural gas is proposed, identify how water produced from the storage field will be disposed.	Not applicable

TABLE 2.0-1
Summary of Filing Information for Resource Report 2

If salt caverns are proposed for storage of natural gas, identify the source locations, the quantity required, the method and rate of water withdrawal, and disposal methods.	Not applicable
For each waterbody greater than 100 feet wide, provide site-specific construction mitigation and restoration plans.	Not applicable
Indicate mitigation measures to be undertaken to ensure that public or private water supplies are returned to their former capacity in the event of damage resulting from construction.	Section 2.1.6.1
Describe typical staging area requirements at waterbody and wetland crossings.	Sections 2.2.7 and 2.3.2; Appendices 1A, 1B, and 1D
If wetlands would be filled or permanently lost, describe proposed measures to compensate for permanent wetland losses.	Not applicable
If forested wetlands would be affected, describe proposed measures to restore forested wetlands following construction.	Not applicable
Describe techniques to be used to minimize turbidity and sedimentation impacts associated with offshore trenching, if any.	Not applicable

2.1 GROUNDWATER RESOURCES

2.1.1 Regional Aquifers

The Project facilities in North Dakota are located predominantly over glacial deposits that overlie Tertiary sedimentary bedrock strata (NDDEQ, 2021), while the Project facilities in Wyoming are located predominantly over Eocene and Paleocene Wasatch Formation; however, the Paleocene Fort Union Formation is within 500-feet of both facilities (Olcott, 1992; WSGS, 2022a). Aquifers occur in both glacial deposits and tertiary sedimentary bedrock in North Dakota. Aquifers in Wyoming primarily occur in the sedimentary rock sequence and unconsolidated stream-valley alluvium deposits (Olcott, 1992).

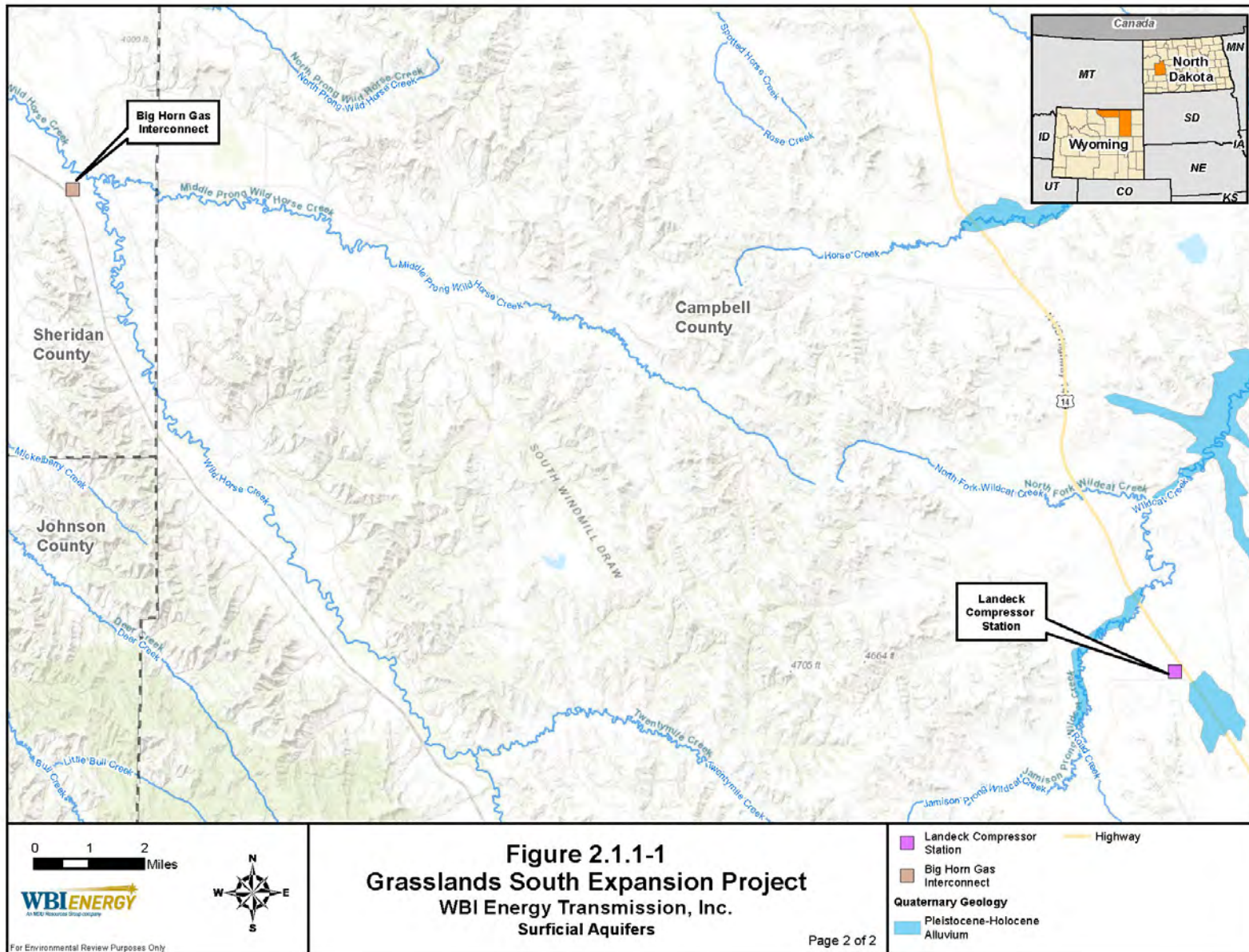
2.1.1.1 Unconsolidated Aquifers

Unconsolidated aquifers primarily consist of glacial sand and/or gravel outwash and ice-contact deposits, as well as more recent sand and gravel alluvium deposited by existing streams. The glacial drift aquifers may consist of either surficial aquifers in which the water table occurs, or in buried aquifers that are separated from the ground surface by laterally continuous deposits of lower permeability silts and/or clays, such as moraine, till, or lacustrine deposits that function as an aquitard. Buried glacial drift aquifers typically behave as a hydrologically confined aquifer and are recharged primarily by downward leakage through the aquitard and typically discharge via upward leakage in the vicinity of groundwater discharge zones, such as rivers. In general, glacial aquifers do not commonly constitute regional aquifers owing to the variable conditions of glacial deposition. Nonetheless, these aquifers can still be an important source of groundwater throughout glaciated regions, providing adequate water volumes to supply municipalities and irrigation systems.

The Project area in North Dakota consists of glacial lake sediment, predominantly silt and clay, loam, and clay loam, with limited surficial and buried sand aquifers (Olcott, 1992). The Project area in North Dakota intersects Holocene aged river sediment unconsolidated aquifer, which primarily contains clay and sand. Holocene aged river sandstone is within 2 miles of the Project area to the west. Pleistocene aged glacial till aquifer is within four miles of the Project area. In Wyoming, the Landeck Compressor Station is within approximately 1,500-feet, and the Big Horn Gas Interconnect facility is within approximately 2 miles of alluvium deposits, consisting of primarily course-grained deposits (WSGS, 2022a). Figure 2.1.1-1 illustrates the unconsolidated, surficial aquifers within the Project area.



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2.1.1.2 Bedrock Aquifers

The bedrock aquifers underlying the Project facilities in North Dakota are limited to Tertiary aged Sentinel Butte Formation, containing unconsolidated and consolidated silt, sand, clay, sandstone, and lignite. Bedrock aquifers near the Project facilities in Dunn County, North Dakota can be greater than 250 feet below surface or exposed near ground surface, with soil or patches of glacial or alluvial material on the bedrock surface (Bluemle, 1986).

The bedrock aquifers underlying the Project facilities in Wyoming are limited to the Eocene and Paleocene Wasatch Formation, consisting of sandstone, siltstones, and claystone. The Wasatch Formation is part of the lower Tertiary aquifer system. Permeability within the lower Tertiary aquifers is variable and directly related to the amount of interconnected pore space in the sandstone beds that compose the aquifers. Thick coal seams are present in the lower Tertiary aquifers (Olcott, 1992). Based on review of available drilling logs from the Wyoming Oil and Gas Conservation Commission (WOGCC), bedrock depths near the Wyoming facilities range from 20 feet to 235 feet (WOGCC, 2022a).

2.1.2 Sole Source Aquifers

The EPA defines a sole source aquifer (SSA) or principal source aquifer area as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer, where contamination of the aquifer could create a significant hazard to public health, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer (EPA, 2021). There are currently no EPA-designated SSAs crossed by the Project (EPA, 2020).

2.1.3 Wells and Springs

The NDDWR and WOGCC maintain records of private and public water wells in the states of North Dakota and Wyoming, respectively (NDDWR, 2022; WOGCC, 2022a). Four wells were identified within 150 feet of Project facilities in North Dakota. Two of the wells (Well Index 5123 and 5124) are noted as plugged observation wells. Well 5123 is located within the boundary of the Frontier Laydown Yard. Well 5124 is located approximately 112 feet southwest of the Project workspace near MP 9.5. Two observation wells were also identified (Well Index 115855 and 115871) within 150 feet of access roads in North Dakota. Well 115855 is a plugged observation well located approximately 93 feet southwest of Access Road 5 and Well 115871 is an observation well located approximately 37 feet south of Access Road 19. WBI Energy will verify the location of the plugged observation well within the Frontier Yard and avoid impacts, if possible. No impacts on the other three observation wells are anticipated.

One well (Landeck Fed 14C-323) was identified within 150 feet of Project workspace at the Landeck Compressor Station in Wyoming. This well was identified as being owned by Patriot Energy Resources, LLC and is located approximately 16 feet north of the northern boundary of the station. The well previously was operated as a coal bed methane well and is permanently abandoned. The installation of new equipment within the Landeck Compressor Station will not extend outside of the existing fence line of the facility; therefore, no impacts on this well are anticipated.

On October 21, 2022, WBI Energy submitted a Project notification to the NDDEQ. In an October 26, 2022 response, NDDEQ provided a map displaying locations of water wells within a 3-mile “Area of Interest” associated with the Project. The location of the wells displayed on the map appears to match data analyzed by WBI Energy as part of its environmental review of the Project (NDDWR, 2022).

To WBI Energy’s knowledge, North Dakota and Wyoming do not maintain a formal inventory of natural springs. Based on the natural resources field surveys conducted in 2019 and 2022, there are no springs

identified near Project facilities in North Dakota or Wyoming (see appendix 2A). If WBI Energy becomes aware of any additional wells or springs through discussions with landowners or during pre-construction survey work, it will file this information with FERC, as appropriate.

2.1.4 Wellhead Protection Areas

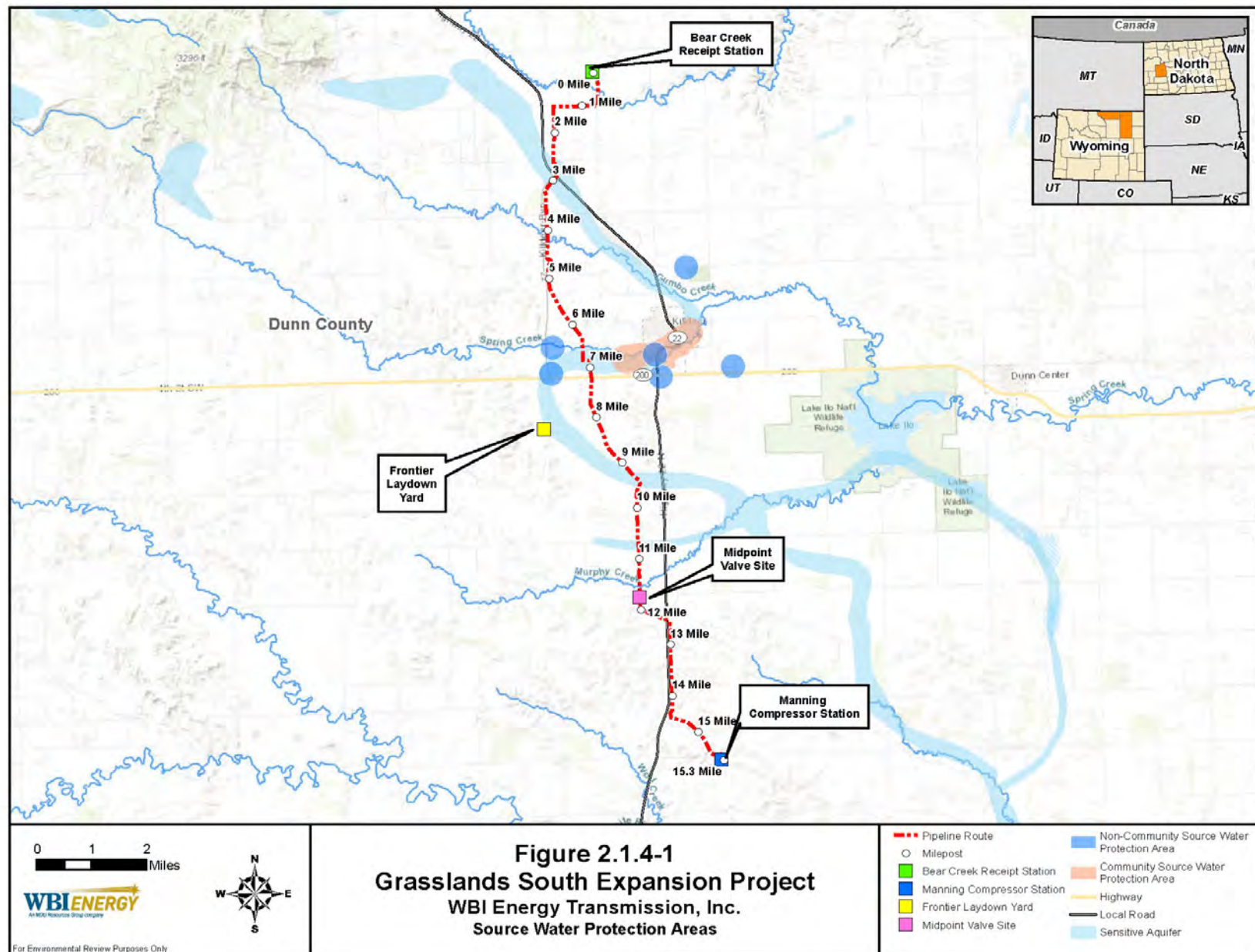
Under the Safe Drinking Water Act (SDWA), each state is required to develop and implement a Wellhead Protection Program to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. The SDWA was updated in 1986 with an amendment requiring the development of a broader-based Source Water Assessment Program, which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. A Wellhead Protection Area (WHPA) encompasses the area around a drinking water well where contaminants could enter and pollute the well. Public and non-public community water supply source-water protection is administered in North Dakota by the NDDEQ through the Source Water Protection program. The WHPAs for public and community water-supply wells are delineated based on existing hydrologic and geologic information collected by state and federal agencies, the public water system, water well contractors, and consultants. The inventory identifies the presence and location of sources or activities within the protection area that may contaminate groundwater or surface water, and the susceptibility of the public water system to contamination (NDDEQ, 2022a).

A search for WHPAs in the NDDEQ databases indicated that no portions of the pipeline overlie a WHPA; however, the community-WHPA for the city of Killdeer is located approximately 1,380 feet east of the Project near MP 7.0. This WHPA is listed as “not likely susceptible” to contamination. In addition, one “non-community” WHPA is crossed by Access Road 14. Locations of WHPAs are included on figure 2.1.4-1.

On October 21, 2022, WBI Energy submitted a Project notification and request to the NDDEQ to confirm the location of WHPAs and source water protection areas in close proximity to the Project. In an October 26, 2022 response, NDDEQ provided a Groundwater Protection Program General Site Review Form and maps displaying WHPAs, aquifers, and wells within an approximately 3-mile “Area of Interest” (AOI) around the Project pipeline in North Dakota. The report notes the AOI overlies the Killdeer, Lake Ilo, and Horse Nose Butte aquifers and that the Lake Ilo and Killdeer aquifers are considered “sensitive” groundwater areas. Sensitive groundwater areas are defined in North Dakota Administrative Code (NDAC) 33-25-01 as areas of vulnerable hydrogeologic settings such as glacial outwash deposits or alluvial or aeolian sand deposits that are critical to protecting current or future underground sources of drinking water.

The Lake Ilo and Horse Note Butte aquifers are not crossed by the Project; however, the Killdeer aquifer is crossed in four locations (MPs 2.5 - 3.1, 6.5 - 7.1, 9.2 - 9.6, and 10.7 - 10.8). The location of the sensitive aquifers identified by NDDEQ matches what WBI Energy identified during its desktop review and are displayed on figure 2.1.4-1.

In addition, three active non-community water system, three inactive non-community water system, and one inactive community water system WHPAs are present within the AOI. A large number of water supply wells are also present with the AOI. Locations of the aquifers, WHPAs, and wells were included on the maps in NDDEQ’s response, and appear to match what WBI Energy identified during its desktop review. The NDDEQ report recommended that “care should be taken to avoid spills of any materials that may have an adverse effect on groundwater quality. All spills must be immediately reported to this department and appropriate remedial actions performed.”



Wyoming does not maintain a publicly available database of WHPAs; however, WYDEQ produced an assessment report in 2004 which contains maps and other details related to source water and wellhead protection (WYDEQ, 2022a). The report is not available online; however, is subject to a public records request. On October 21, 2022, WBI Energy submitted a public records request to WYDEQ to determine if the either the Landeck Compressor Station or Big Horn Gas Interconnect are located within 1 mile of any WHPAs. The request was assigned file number 22-845, and based on an October 27, 2022 response, WYDEQ did not identify any records of source water protection or wellhead protection areas within 1 mile of either facility.

As detailed in its SPCC Plan (see appendix 1E-1), WBI Energy will train its Contractor(s), identify a spill coordinator for the Project, and will implement preventive measures regarding material storage and refueling, spill response and containment procedures, and spill reporting and cleanup procedures. With these measures in place, WBI Energy does not anticipate any impacts on sensitive groundwater areas crossed by the Project or WHPAs within a 3-mile radius of the Project.

2.1.5 Potential Sources of Groundwater Contamination

WBI Energy reviewed publicly available databases to identify various facilities with potential and/or actual sources of contamination within 500 feet of Project construction workspaces that could impact nearby groundwater if disturbed. The EPA's Facility Registry System (FRS) map service was reviewed for sites that are listed on the Comprehensive Environmental Response, Compensation, and Liability Information System (also known as Superfund sites); Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal; RCRA hazardous waste generators; the Assessment, Cleanup, and Redevelopment Exchange System; Leaking Underground Storage Tank—American Recovery and Reinvestment Act database; and EPA's Community Cleanup Mapper (EPA, 2022a). In addition, the search was expanded by reviewing state-specific databases maintained by and the NDDEQ and WYDEQ including the NDDEQ Brownfields and Leaking Underground Storage Tanks and the WYDEQ Storage Tank – Contaminated Sites.

The following types of sites/facilities listed in the FRS database are not considered potential sources of contamination in the Project area: sites permitted for construction or industrial stormwater discharge, feedlots, wastewater dischargers, and small to minimal hazardous waste generators regulated under RCRA. Additionally, tank sites (active and inactive) with no reported releases were eliminated from further review because the presence of tanks alone is not indicative of a release.

A search of the databases discussed above identified no known sites with potential for contamination within 500 feet of the Project facilities. There is one reported spill site that is approximately 0.2 mile southeast of the Landeck Compressor Station. The installation of new equipment within the Landeck Compressor Station will not extend outside of the existing fence line of the facility; therefore, no potential exists for disturbing this recorded spill site.

If any contaminated soils or groundwater are encountered, they would be handled and disposed of in accordance with WBI Energy's CEMP (appendix 1E-2). The CEMP describes steps that WBI Energy and its Contractors will implement in the unanticipated event that contaminated environmental media (soils, water, etc.) is encountered during construction. If signs of contamination are encountered, the Contractors will stop work in the vicinity of the suspected contamination, restrict access to the suspected contamination site, and immediately notify the EI and Spill Coordinator of the find. The EI and Contractor will initiate measures to avoid the spread of contaminants until the nature and type of contamination is properly evaluated. Work in the area will not resume until an assessment of the types and levels of contaminants has been determined by qualified personnel. Depending on the nature of the contamination, WBI Energy will notify the appropriate federal, state, and local regulatory agencies.

2.1.6 Groundwater Impacts and Mitigation

2.1.6.1 Construction Impacts and Mitigation

Activities associated with the construction of the pipeline and aboveground facilities have the potential to affect groundwater in different ways. Surface drainage and groundwater recharge patterns can be temporarily altered by clearing, grading, trenching, and soil stockpiling activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. Additionally, soil compaction caused by heavy construction vehicles can reduce infiltration and increase surface runoff and ponding. These impacts will be minimized or avoided through implementation of the construction practices outlined in the FERC Plan and Procedures (FERC, 2013a and FERC, 2013b).

Construction of pipeline and aboveground facilities is typically confined to a depth of no more than 10 feet. This is above the minimum depth of the bedrock aquifers underlying the Project facilities; however, this is generally expected to be within the water table of surficial aquifers. Shallow surficial aquifers are typically comprised of relatively permeable alluvial sands and gravels that respond rapidly to changes in water level elevations or groundwater flow. If excavation occurs below the water table, the resulting changes in water levels and/or turbidity in these aquifers are expected to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside. WBI Energy will avoid or further minimize potential impacts by using construction techniques described in the Plan, such as using temporary and permanent trench plugs and interceptor dikes for pipelines. Following construction, WBI Energy will restore the ground surface to original contours, de-compact compacted soils, and restore soils and vegetation along the right-of-way to surface drainage and recharge conditions as closely as possible to those that existed prior to construction.

Where groundwater is encountered that needs to be dewatered from the trench line, WBI Energy will discharge the water in a manner that prevents heavily silt-laden water from flowing into any waterbody, as required in the Procedures.

Given that no wells are located within the construction workspace of the Project and the negligible impacts to groundwater during construction, no impact on wells are anticipated from construction of the Project. WBI Energy will continue to work with landowners to identify the location of any additional private water wells and water supply springs within 150 feet of approved construction workspaces. If any private wells are identified within 150 feet of the construction workspace, WBI Energy will consult with the landowners, and upon their approval, may test the private wells for water quality, recharge, and depth to water prior to commencing with construction and again after final cleanup. These tests will be used to determine whether construction-related activities have impacted the wells. If construction of the Project were to adversely affect a well, the damaged well would be restored to its former quality, to the extent practicable, or replaced. WBI Energy would provide an alternative source of water or compensate affected landowners if adverse effects to wells occur from construction of the Project.

The introduction of contaminants into groundwater due to accidental release of construction-related chemicals, fuels, or hydraulic fluid could have an adverse effect on groundwater quality, most notably near shallow water wells. Spill-related impacts from pipeline construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. To avoid spill-related impacts, as noted above, WBI Energy has developed a SPCC Plan (see appendix 1E-1) that outlines measures that will be used to prevent accidental releases of fuels and other hazardous substances and describes response, containment, and cleanup procedures. By implementing the protective measures set forth in the SPCC Plan, long-term contamination due to construction activities is not anticipated.

In the unlikely event that undocumented sites with contaminated soils or groundwater are encountered, WBI Energy's will implement its CEMP (appendix 1E-2). The CEMP describes containment measures

which would be implemented to isolate and contain the suspected soil or groundwater contamination and collect and test samples of the substrate or groundwater to identify the contaminants. Once the type, magnitude, and extent of the contamination are determined, a response plan would be developed for crossing or avoiding the area of potential contamination.

WBI Energy plans to utilize the guided bore method to install the pipeline underneath some sensitive features such as waterbodies, wetlands, and roads. The guided bore method may penetrate below the water table and may create short-term and highly localized impacts on groundwater such as increased turbidity; however, because the drilling fluid is composed of water and bentonite clay, and no hazardous additives will be used, no impacts on groundwater quality, levels, or groundwater flow directions are anticipated. An additional discussion of WBI Energy’s planned construction procedures for guided bore crossings are provided in section 1.5.4.2 and a copy of WBI Energy’s Guided Bore Drilling Fluid Monitoring and Operations Plan, which includes contingency measures in the event of an unanticipated release of drilling fluids, is provided in appendix 1E-3.

Because the typical thickness of unconsolidated deposits beneath most of the Project facilities is more than 50 feet (see section 6.1.3), the need for blasting of shallow bedrock is not expected.

2.1.6.2 Operations Impacts and Mitigation

Routine operations and maintenance of the Project facilities are not expected to affect groundwater resources. During operations, potential minor, short-term groundwater quality degradation is possible from maintenance equipment, vehicle spills, and maintenance activities that may require excavation. Although there is potential for temporary dewatering of shallow groundwater aquifers and potential changes in groundwater quality during trenching, excavation, and backfilling maintenance activities, these changes are expected to be temporary because the aquifers are likely to recharge immediately after these activities conclude.

2.2 SURFACE WATER RESOURCES

Surface water resources within the Project area were identified through an examination of publicly available desktop data and field surveys completed in 2019 and 2022. This section describes the surface water resources that will be crossed by the Project, potential construction and operation impacts, and the measures WBI Energy will implement to avoid and minimize potential impacts.

2.2.1 Existing Resources

2.2.1.1 Watersheds

Construction of the Project will occur within the Little Missouri, Cannonball-Heart-Knife, and Powder River basins and multiple subwatersheds, as indicated in table 2.2.1-1 and shown on figure 2.2.1-1.

TABLE 2.2.1-1 Hydrologic Units Crossed				
State/County/Facility	Milepost Range	Watershed (Hydrologic Unit Code [HUC] 12)	Watershed (HUC 8)	River Basin
North Dakota, Dunn County				
Pipeline and Bear Creek Receipt Station	0.0 – 2.0	Jim Creek (101102050507)	Lower Little Missouri (10110205)	Little Missouri
Pipeline	2.0 – 5.3	Gumbo Creek (101302010801)	Knife River (10130201)	Cannonball- Heart-Knife

TABLE 2.2.1-1 Hydrologic Units Crossed				
State/County/Facility	Milepost Range	Watershed (Hydrologic Unit Code [HUC] 12)	Watershed (HUC 8)	River Basin
Pipeline	5.3 – 7.7	Town of Killdeer (101302010802)	Knife River (10130201)	Cannonball-Heart-Knife
Pipeline	7.7 – 13.4	Murphy Creek (101302010803)	Knife River (10130201)	Cannonball-Heart-Knife
Pipeline and Manning Compressor Station	13.4 – 15.3	Town of Emerson (101302010109)	Knife River (10130201)	Cannonball-Heart-Knife
Wyoming, Campbell County				
Landeck Compressor Station	N/A	Jamison Prong Wildcat Creek (100902080301)	Little Powder (10090208)	Powder River
Wyoming, Sheridan County				
Big Horn Gas Interconnect	N/A	Lower Wild Horse Creek (100902020709)	Upper Powder (10090202)	Powder River
HUC = Hydrologic Unit Code				
N/A = Mileposts not available for this aboveground facility.				
Source: USGS, 2022a				

Each of the watersheds within the Project area (in North Dakota and Wyoming) are sparsely populated and largely rural in nature, and ultimately drain to the Missouri River (HUC-2: 10). Impacts on these watersheds are expected to be minor and temporary in nature as the pipeline workspaces will be restored to pre-construction contours following construction. The installation of new aboveground facilities associated with the Project is anticipated to have a negligible impact on the watersheds due to the minimal conversion of undeveloped to developed land (see sections 1.4.2 and 8.2.2).

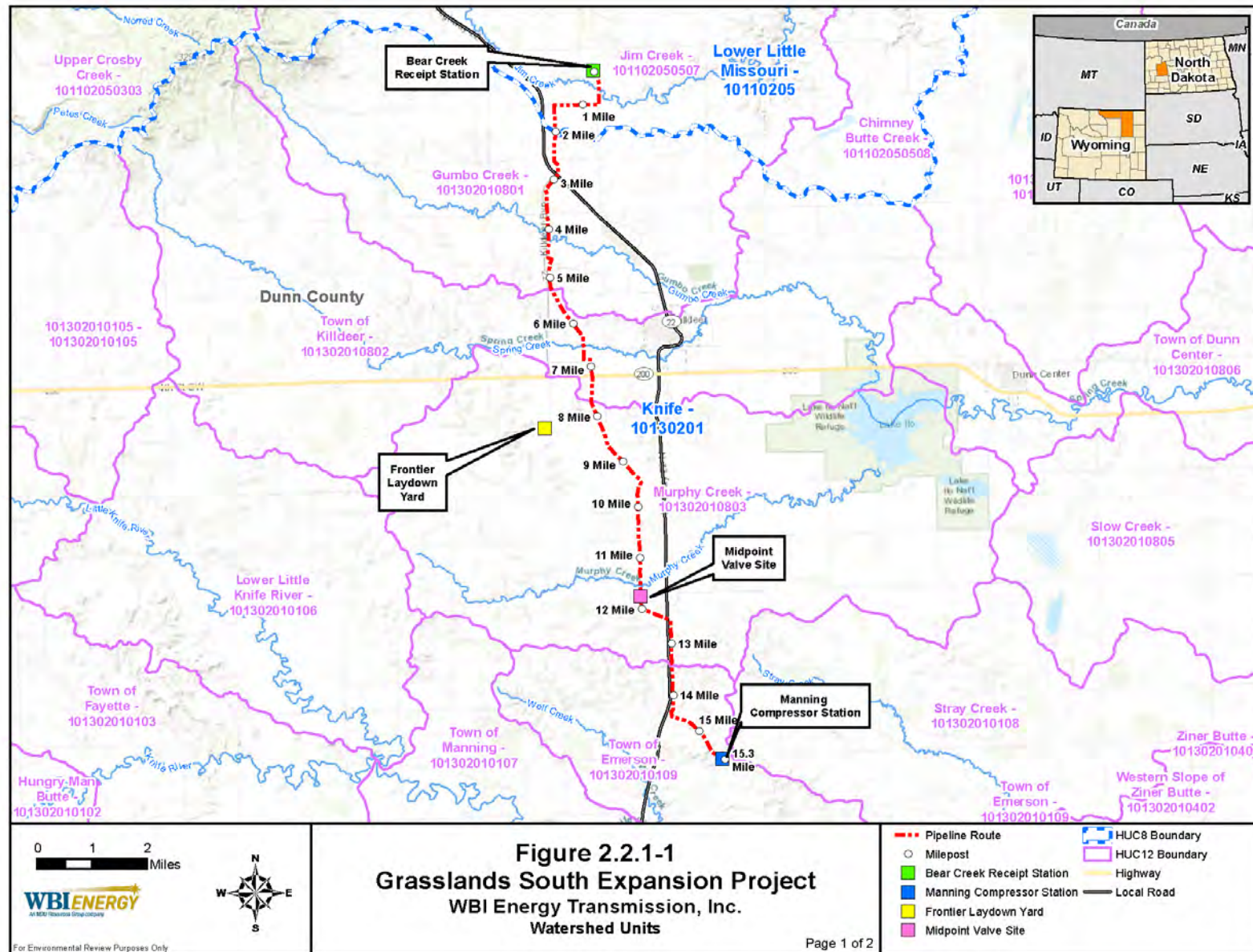
2.2.2 Waterbodies Crossed

According to the FERC Procedures, a waterbody is “any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes.” (FERC, 2013b). Minor waterbodies are those measuring less than or equal to 10 feet wide at the water’s edge; intermediate waterbodies are greater than 10 feet wide but are less than or equal to 100 feet wide at the water’s edge; and major waterbodies measure greater than 100 feet wide at the water’s edge (FERC, 2013b). A perennial stream has a well-defined channel containing water year-round during years with normal rainfall. Intermittent streams also have a well-defined channel, but only contain water seasonally or following rain events or snow melt. Ephemeral streams are features that carry only stormwater as a direct response to precipitation.

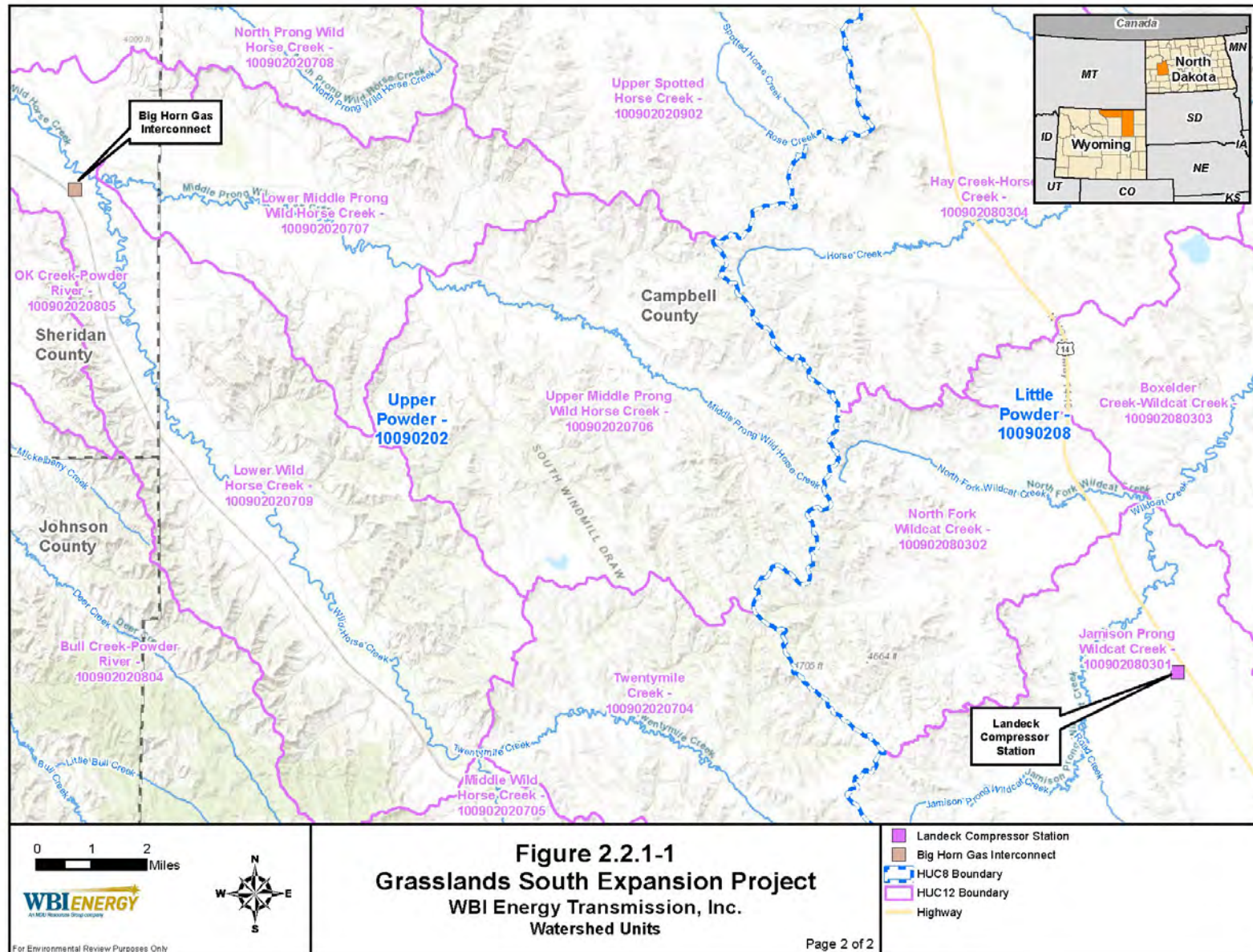
As detailed in WBI Energy’s Natural Resource Inventory Report (see appendix 2A), WBI Energy identified 8 waterbodies crossed by the Project footprint based on field surveys and review of USGS 7.5-minute topographic quadrangle maps, USFWS National Wetlands Inventory (NWI) maps, USGS National Hydrography Dataset (NHD), and current and historical aerial photographs of the Project area using Google Earth. A ninth waterbody near MP 14.3 is located within the Project’s TWS but is not directly crossed by the centerline.

TABLE 2.2.2-1
Waterbodies Crossed by the Project

State/County/Facility/Milepost	Feature Identification Number ^a	Waterbody Name	Flow Regime	Crossing Length (feet) ^b	FERC Classification ^c	State Stream Classification ^d	Crossing Method
North Dakota, Dunn County							
Pipeline Facilities							
0.4	s-19081a-001	Jim Creek	Intermittent	4	Minor	III	Guided Bore
3.0	s-19081a-002	Unnamed Tributary to Gumbo Creek	Ephemeral	2	Minor	III	Guided Bore
3.1	s-19081a-003	Unnamed Tributary to Gumbo Creek	Ephemeral	1	Minor	III	Guided Bore
4.2	s-19081a-004	Gumbo Creek	Ephemeral	14	Intermediate	III	Open Cut
4.7	s-19081a-005	Unnamed Tributary to Gumbo Creek	Ephemeral	2	Minor	III	Guided Bore
6.5	s-19081a-006	Spring Creek	Intermittent	3	Minor	III ^e	Guided Bore
10.9	s-19081b-003	Unnamed Tributary to Murphy Creek	Intermittent	7	Minor	III	Open Cut
11.5	s-19081a-008	Murphy Creek	Ephemeral	6	Minor	III	Guided Bore
14.3	s-19081a-009	Unnamed Tributary to Wolf Creek	Intermittent	--	Minor	III	Within workspace but not crossed by centerline
Access Roads							
AR 2	s-19081a-001	Jim Creek	Intermittent	4	Minor	III	N/A
AR 10	s-19081a-005	Unnamed Tributary to Gumbo Creek	Ephemeral	2	Minor	III	N/A
AR 10	s-19081a-004	Gumbo Creek	Ephemeral	10	Minor	III	N/A
AR 20	s-19081b-001	Murphy Creek	Intermittent	6	Minor	III	N/A
AR 20	s-19081b-002	Murphy Creek	Ephemeral	2	Minor	III	N/A
AR 22	s-19081a-008	Unnamed Tributary to Murphy Creek	Ephemeral	4	Minor	III	N/A
^a Feature Identification Number is a unique code designated to the waterbodies during field surveys. ^b Crossing Length measured during field surveys as ordinary high water mark (OHWM) to OHWM. ^c According to the Procedures, intermediate waterbodies are greater than 10 feet wide but are less than or equal to 100 feet wide at the water's edge, and major waterbodies measure greater than 100 feet wide at the water's edge (FERC, 2013b). ^d North Dakota State Water Classification: Class III = The quality of the waters in this class shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses, fish and aquatic biota, and wildlife uses. See additional discussion in section 2.2.6. Note: N/A = Not applicable.							



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In addition, temporary Access Road 2 will cross an intermittent stream; Access Road 10 will cross two ephemeral streams; Access Road 20 will cross an intermittent and an ephemeral stream; and Access Road 22 will cross an ephemeral stream. Where culverts are not currently present at these locations, WBI Energy will install temporary equipment bridges, if required. The bridges will be installed as specified in section V.B.5 of the Procedures to maintain water flow and flow capacity at all times. See sections 1.5.3.3 and 1.5.4.1 for more information.

Table 2.2.2-1 contains information about the waterbodies crossed by the Project facilities, including approximate milepost, waterbody name, flow regime, crossing length, and proposed crossing method. No waterbodies are located within aboveground facility sites in North Dakota or Wyoming or within the Frontier Laydown Yard; therefore, these facilities are not included in Table 2.2.2-1. Based on a review of the North Dakota Game and Fish Department's (NDGF) 2021 Fishing Waters, there are no boating ramps or listed fisheries intersected by the Project. The nearest listed fishery is Lake Ilo, located approximately 4.5 miles east of MP 8.5. WBI Energy submitted a consultation letter to the NDGF on October 5, 2022. In an October 19, 2022 response, NDGF did not identify any concerns related to fisheries. NDGF comments related to other wildlife resources are summarized in section 3.0.

2.2.2.1 Aboveground Facilities

No waterbodies are located within the boundary of the Bear Creek Receipt Station, the Midpoint Valve, or the Manning Compressor Station in North Dakota, or the Big Horn Gas Interconnect or Landeck Compressor Station facilities in Wyoming.

2.2.3 Sensitive Surface Waters

Sensitive surface waters include waterbodies that are listed as national wild and scenic rivers; have impaired segments or contaminated sediments; are state- or locally designated high-quality or outstanding natural resource waters; in sensitive and protected watershed areas or source water protection areas; and provide habitat for federal- or state-listed threatened or endangered species or critical habitats.

2.2.3.1 National Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve some rivers with outstanding natural, cultural, and recreational values in a free-flowing condition, with the goal of protecting and enhancing the values responsible for their designation. Under this system, rivers are classified as wild, scenic, or recreational. None of the waterbodies impacted by the proposed Project are included in the National Wild and Scenic Rivers System (National Wild and Scenic River System, 2022).

2.2.3.2 Impaired and Contaminated Waters

Under Section 303(d) of the Clean Water Act (CWA), states are required to assess all waters of the state to determine if they meet water quality standards, list waters that do not meet standards and update the list biannually, and conduct total maximum daily load (TMDL) studies to set pollutant-reduction goals needed to restore waters to the extent that they meet water quality standards for designated uses. Waters that do not meet the standards are commonly referred to as “impaired.”

The most recent assessment for 303(d) impaired waters was completed in North Dakota in 2018 and is summarized in the North Dakota 2018 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing TMDLs (NDDH, 2019). None of the waterbodies crossed by the Project are listed as impaired and there are no impaired waters within 1 mile of the Project in North Dakota.

There are no waterbodies within the footprint and no impaired waters within 1 mile of the Landeck Compressor Station. There are no waterbodies within the Big Horn Gas Interconnect facility. The closest waterbody is the Middle Prong Wild Horse Creek Lower, approximately 2,100 feet northwest of the Big Horn Gas Interconnect. The waterbody was listed as impaired with respect to *Escherichia coli* (E.coli); however, was delisted in 2020 due to a change in the assessed use from primary to secondary recreation (WYDEQ, 2020).

Based on review of the EPA Cleanups in my Community Sites database (EPA, 2022a), no waterbodies crossed by the Project are known to contain contaminated sediments.

2.2.3.3 State or Local Outstanding Resource Value Waters

North Dakota has more than 400 fishing waters that have public access and some degree of management by state biologists. Based on a review of the NDGF's 2020 North Dakota Fishing Waters list (NDGF, 2020), none of the waterbodies crossed by the Project are listed Fishing Waters. The nearest listed Fishing Water is Lake Ilo, located approximately 4 miles east of MP 8.5 of the pipeline route. In its October 19, 2022 response to WBI Energy's consultation letter, NDGF did not identify any concerns and no impacts on this fishery are anticipated.

As noted previously, neither of the aboveground facilities in Wyoming will impact any waterbodies or fisheries and there are no known fisheries in the vicinity of the Project in Wyoming. Please refer to section 3.1.1 for more information.

2.2.3.4 Potable Surface Water Supplies

The NDDEQ and WYDEQ do not publicize the location of surface water intakes. In an effort to determine if any public water supply intakes are located near Project facilities, WBI Energy sent a consultation letter to NDDEQ on October 21, 2022 and a public records request to WYDEQ on October 22, 2022 to identify public water intakes. In addition, WBI Energy also submitted a consultation letter to the city of Killdeer on October 21, 2022 to inquire if the city has any surface water intakes within 3 miles of the Project. Based on responses from NDDEQ and WYDEQ dated October 26, 2022 and October 27, 2022, respectively, neither agency identified any water supply intakes within 3 miles of the Project. In a November 14, 2022 response, the city of Killdeer stated that to its knowledge, there are no potable water sources within 3 miles and that the city purchases its water from Southwest Water Authority.

2.2.3.5 State and Federal Threatened and Endangered Species Habitat

No waters crossed by the Project have been identified as suitable habitat for any federally listed aquatic species. North Dakota does not maintain a list of state-listed species. Further discussion of federally listed species and their habitat is presented in section 3.4.

2.2.4 Floodplains

FEMA defines flood zones based on flood risk and type of flooding. Special Flood Hazard Areas are those that will be inundated by flood events having a 1-percent-annual chance of being equaled or exceeded in any given year (i.e., the 100-year or base flood). FEMA defines moderate flood hazard areas as those between the limits of the base flood and the 0.2-percent-annual chance, or 500-year flood. Areas of minimal flood hazard (i.e., areas outside the regulatory floodplain) are those that are above the elevation of the 0.2-percent-annual chance flood (FEMA, 2022).

The pipeline route crosses two Zone A (100-year) and Zone B (500-year) floodplains near MP 6.5 (Spring Creek) and MP 6.8 (Unnamed Tributary to Spring Creek) (see figure 2.2.4-1). Zone A floodplains are areas subject to inundation by a 1 percent annual chance flood event (100-year flood), generally determined using approximate methodologies. Zone B floodplains are subject to inundation by a 0.2 percent annual chance flood (500-year flood). The Project aboveground facilities in Wyoming and their associated workspace are not located in floodplains.

WBI Energy is not aware of any local floodplain permits that are required to install a buried pipeline across these floodplains. WBI Energy submitted a Project notification and request for information to the Dunn County Planning and Zoning Department and Water Resources District in North Dakota regarding floodplain permitting requirements on October 21 and October 17, 2022, respectively. WBI Energy followed up with the planning and zoning department via phone and email. As of this filing, the Dunn County Planning and Zoning Department and Water Resources District has not responded.

2.2.5 U.S. Army Corps of Engineers Section 10 Waters

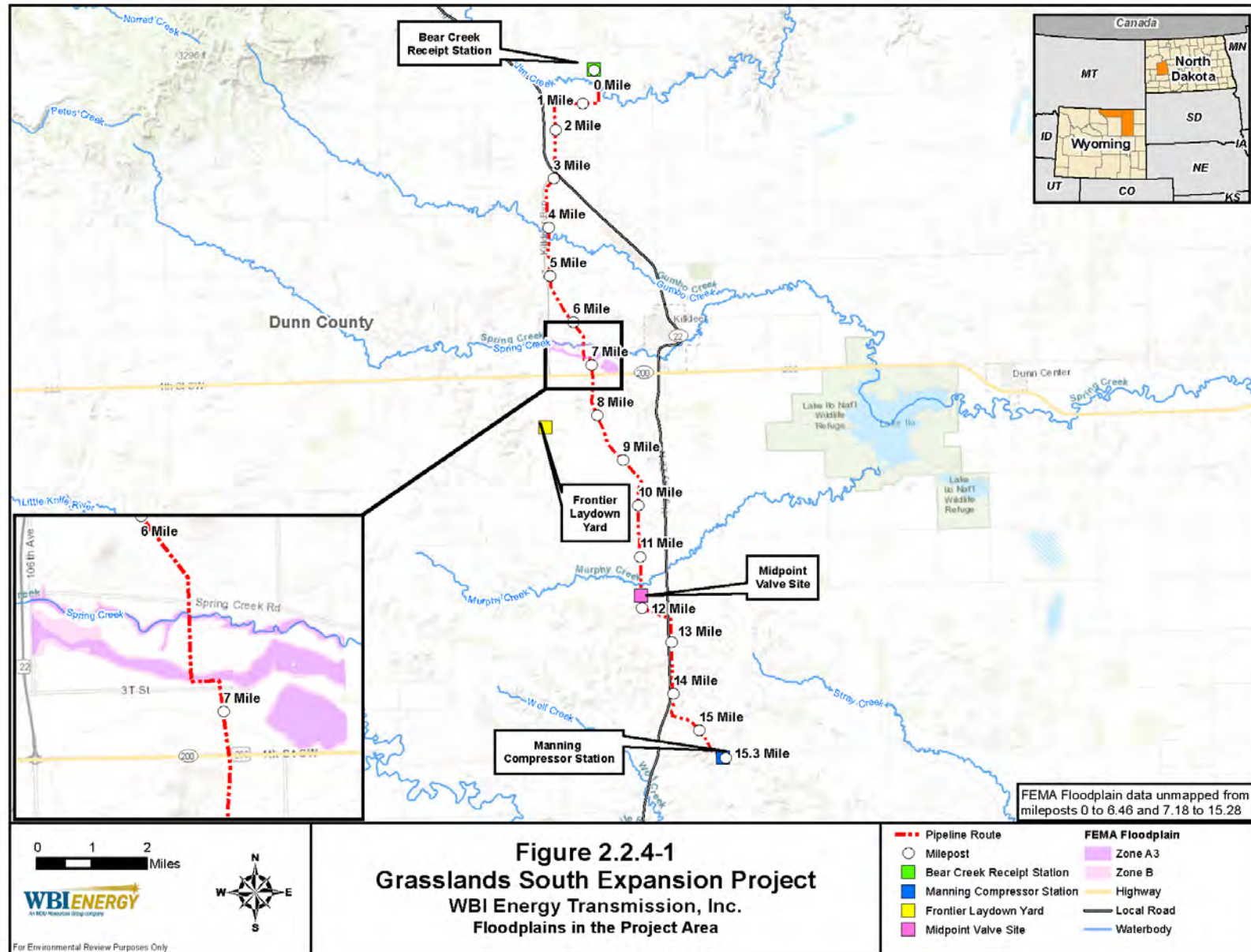
Navigable waters are defined by 33 CFR Part 329 as those waters that are subject to the ebb and flow of the tide and/or are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Navigable waters are designated by the USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. The Project will not impact any Section 10 waters (USACE, 2012).

2.2.6 Waterbody Use/Quality Classifications

Under the CWA, states have the primary responsibility for establishing, reviewing, and revising water quality standards, which consist of the designated uses of a waterbody, the numerical values or narrative water quality criteria necessary to protect those designated uses, and an antidegradation policy per 40 CFR §§ 131.10 - 131.12 and 131.4.

In North Dakota, NDDEQ classifies waterbodies into categories based on water quality, flow regime, and beneficial uses (NDAC, 2019). Streams are classified according to four categories.

- Class I streams: The quality of the waters in this class shall be suitable for the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation. The quality of the waters shall be suitable for irrigation, stock watering, and wildlife without injurious effects. After treatment consisting of coagulation, settling, filtration, and chlorination, or equivalent treatment processes, the water quality shall meet the bacteriological, physical, and chemical requirements of the department for municipal or domestic use.
- Class IA streams: The quality of the waters in this class shall be the same as for the quality of Class I streams, except that where natural conditions exceed Class I criteria for municipal and domestic use, the availability of softening or other treatment methods may be considered in determining whether ambient water quality meets the drinking water requirements of the department.



- Class II streams: The quality of waters in this class shall be the same as the quality of Class I streams, except that additional treatment may be required to meet the drinking water requirements of the department. Streams in this classification may be intermittent in nature, which would make these waters of limited value for beneficial uses such as municipal water, fish life, irrigation, bathing, or swimming.
- Class III streams: The quality of the waters in this class shall be suitable for agricultural and industrial purposes. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation, fish, and other aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses (e.g., wading), fish and aquatic biota, and wildlife uses.

The Project does not impact any lakes or reservoirs. The state water quality classifications for waterbodies crossed by the Project in North Dakota are listed in table 2.2.2-1. As the Project will not impact any waterbodies in the state of Wyoming, waterbody use and classification information related to the state of Wyoming is not provided.

2.2.7 Waterbody Crossing Methods

Crossings will be completed in accordance with the measures described in the Procedures and in accordance with federal, state, and local permits. As discussed in section 1.5.4.1, and denoted in table 2.2.2-1, WBI Energy proposes to install the pipeline across 6 of the 8 waterbodies using the guided bore method.

A description of WBI Energy's planned construction procedures for guided bore crossings is provided in section 1.5.4.2 and site-specific crossing plans that show plan and profile views, staging areas, and EWS requirements at guided bore crossings are provided in appendix 1F. WBI Energy's Guided Bore Drilling Fluid Monitoring and Operations Plan is provided in appendix 1E-3.

The locations and dimensions of EWS required for guided bore crossings are shown on the construction alignment sheets provided in appendix 1B. EWS generally will be in upland areas at least 50 feet from waterbody boundaries except where the adjacent land is actively cultivated.

Where an access road, travel lane, or EWS crosses a waterbody that does not have an existing or suitable equipment bridge crossing, a temporary equipment bridge may be installed to avoid waterbody impacts associated with equipment crossings. WBI Energy has identified 4 locations where temporary equipment bridges will be installed:

- Jim Creek – MP 0.4
- Unnamed Tributary to Gumbo Creek - MP 3.0
- Unnamed Tributary to Gumbo Creek - MP 4.7
- Spring Creek - MP 6.5

Where equipment bridges are necessary, they will be installed as specified in Section V.B.5 of the Procedures, which may include installation of culverts if necessary to maintain water flow, and in accordance with applicable permits. Where an access road parallels a waterbody, WBI Energy will attempt to maintain a buffer of undisturbed vegetation and install sediment barriers to minimize the potential for sedimentation.

2.2.8 Waterbody Impacts and Mitigation Measures

Construction of the Project across or near waterbodies has the potential to result in short-term and minor impacts on waterbodies. These impacts could result from initial equipment crossings; temporary bridge installation; construction adjacent to stream channels; clearing and grading of adjacent lands and streambanks; trench dewatering; unanticipated releases of drilling mud or chemical contaminants that could result in temporary modification of aquatic habitats through direct impacts; increased erosion, sedimentation and/or turbidity; decreased dissolved oxygen concentrations; and introduction of chemical contaminants such as fuel and lubricants.

To minimize the adverse impacts on waterbodies during construction, post-construction, and operation of the Project, WBI Energy will implement the measures in the Plan and Procedures, and WBI Energy's SPCC Plan (see appendix 1E-1) and Guided Bore Drilling Fluid Monitoring and Operations Plan (see appendix 1E-3).

WBI Energy submitted a Project notification to the USACE Omaha District on October 21, 2022 and received a response on October 24, 2022 confirming the notification was received and that it has been logged in to USACE's system, assigned a file number, and indicating they will reach back out with any questions. As currently designed, WBI Energy believes the Project will not trigger the need for a pre-construction notification. WBI Energy will comply with all general and regional conditions of USACE Nationwide Permit 12 in North Dakota as well as the accompanying state 401 Water Quality Certification. No further correspondence with the USACE Omaha District is planned at this time.

WBI Energy anticipates submitting permit applications to the NDDEQ and WYDEQ for construction stormwater permit coverage approximately one month prior to the initiation of construction activities. As required by the General Permits, WBI Energy will develop SWPPPs for Project facilities in each state. The SWPPP is a site-specific, written document developed to identify potential sources of stormwater pollution at a construction site and will outline the BMPs employed to reduce pollutants in stormwater discharges. The SWPPP is a "living" document that will be updated throughout the Project until final stabilization is achieved and the permits are terminated.

Copies of all correspondence referenced in this section are provided in appendix 1H. Additional discussion of potential waterbody impacts and proposed mitigation measures for specific activities are provided in the following subsections.

2.2.8.1 Streambank Protection

Destruction of streambank vegetation during construction can temporarily expose streambanks to erosion, cause sedimentation, increase turbidity, reduce riparian habitat, and result in increased water temperatures if there is a loss of shade vegetation. Where waterbodies are crossed via guided bore, clearing and grading of streambank vegetative cover will be avoided. This will reduce the amount of vegetation that will have to be cleared along the right-of-way and will eliminate the alteration of natural drainage patterns and streambanks due to the presence of heavy equipment near waterbodies. In addition, during operations, WBI Energy does not anticipate maintaining vegetation along the drill paths or across waterbodies as allowed by the Procedures.

Vegetation will be preserved to the greatest extent practicable at waterbody crossings and along stream banks. Upon installation of equipment bridges, WBI Energy will install erosion and sediment control devices and maintain them to prevent streambank erosion throughout the duration of construction. Once the bridges are no longer needed and removed, WBI Energy will reclaim and re-contour disturbed areas and maintain the erosion and sediment control devices until streambanks are revegetated and stabilized.

2.2.8.2 Floodplain Protection

As noted in section 2.2.4, WBI Energy submitted a Project notification and consultation request to the Dunn County Planning and Zoning Department and Water Resources District in North Dakota regarding floodplain permitting requirements on October 21 and October 17, 2022, respectively. WBI Energy followed up with the planning and zoning department via phone and email. As of this filing, the Dunn County Planning and Zoning Department and Water Resources District has not responded.

2.2.8.3 Trench Dewatering

Precipitation and/or the seepage of groundwater can necessitate the dewatering of trenches in order for construction to proceed. During trench dewatering, water typically will be discharged in a manner that does not cause erosion and does not result in silt-laden water flowing into a waterbody or wetland, as outlined in the Procedures. Trench dewatering is an allowable discharge under each state's Construction Stormwater General Permit. WBI Energy will address trench dewatering in the state-specific Project SWPPPs and abide by all conditions in the state's Construction Stormwater General Permits.

2.2.8.4 Inadvertent Release of Drilling Mud

Waterbody crossings completed using the guided bore method will generally avoid and significantly minimize the potential for surface water impacts resulting from erosion, sedimentation, and/or excess turbidity by limiting the surface disturbance in and immediately adjacent to the waterbody. Section 1.5.4.2 provides a description of the guided bore method that will be used for the Project. As described, the execution of the guided bore method requires the use of drilling mud under pressure and the potential exists for an inadvertent release of drilling mud if the drill path encounters fractures or fissures that offer a pathway of least resistance to the ground surface or the waterbody being crossed. Drilling mud released into a waterbody can result in temporary sedimentation of stream bottom habitats, increased turbidity levels, and cover stream bottom habitats and immobile benthic organisms.

In the event that an inadvertent return of drilling muds occurs, WBI Energy has developed a Guided Bore Drilling Fluid Monitoring and Operations Plan that outlines the measures to be implemented to effectively reduce and mitigate impacts on waterbodies. Based on these measures, WBI Energy believes impacts on waterbodies due to an inadvertent release will be minimized to the extent practicable.

WBI Energy will minimize the potential for an inadvertent release by designing its guided bore crossings to pass sufficiently deep beneath waterbodies to reduce the potential that drilling mud will encounter a fracture or fissure that extends back to the surface and could inadvertently release mud. While the potential for accidental release exists for all crossings, implementation of WBI Energy's Guided Bore Drilling Fluid Monitoring and Operations Plan (see appendix 1E-3), will minimize the potential for an adverse effect on waterbodies.

WBI Energy's contractor may use additives during drilling to prevent inadvertent return events and/or in certain cases when drilling fluid circulation seems to be diminishing. These may include inert and environmentally benign materials such as wood fibers, seed husks, ground walnut shells, and other natural materials to attempt to seal conduits or to aid in reestablishment of drilling fluid returns to the entry and/or exit pits. They may also include special polymers that swell when added to water, which are included on any state-approved well-drilling lists and non-hazardous.

2.2.8.5 Fueling and Hazardous Materials Storage

A release of fuel or hazardous material into a waterbody can cause direct mortality to aquatic organisms and potentially to wildlife that use the waterbody. To prevent the introduction of fuels and/or hazardous materials into waterbodies, WBI Energy has developed a SPCC Plan (see appendix 1E-1) to prevent, contain, and clean up spills as well as address necessary precautions during material storage. As part of the SPCC Plan, fuel storage and refueling of equipment will not be allowed within 100 feet of waterbody boundaries. Based on these measures, the potential for a fuel or hazardous material release into a waterbody is minimized to the extent practicable.

2.2.8.6 Erosion and Sediment Controls

As part of WBI Energy's temporary erosion and sediment control measures, WBI Energy will construct or install sediment barriers, stormwater diversions, trench breakers, mulch, and seeding to establish ground cover as necessary to protect wetlands and waterbodies along the construction right-of-way, access roads, EWS, spoil piles, and other areas where land disturbing activities occur within the Project area. Permanent erosion control will be executed by restoration of contours to preconstruction conditions and revegetation using approved seed mixes in upland areas as discussed in section 3.2.4. The temporary and permanent erosion and sediment control measures will be installed as specified in the Plan and Procedures and WBI Energy's NPDES Stormwater Permit(s). Based on these measures, the potential for erosion and sedimentation to adversely affect waterbodies will be minimized to the extent practicable.

2.2.9 Water Use for Hydrostatic Testing, Guided Bore Construction, and Dust Suppression

As required by 49 CFR Part 192, WBI Energy will conduct pressure testing of the new pipeline and aboveground facilities prior to placing them into service. For the execution of pressure testing, WBI Energy will obtain coverage under the respective state Temporary Discharges/Hydrostatic Test Water NPDES Discharge Permits issued by the NDDEQ and WYDEQ as described in section 1.5.3.12.

WBI Energy will use approximately 499,550 gallons of water to test the new pipeline and approximately 5,200 gallons of water to test the aboveground facilities. It is expected that one pressure test will be required for the pipeline and one pressure test will be required for each of aboveground facilities. The Midpoint Valve and the launcher/receiver within the Manning Compressor Station will be tested as part of the pipeline test. In addition, WBI Energy will pressure test each guided bore section of the pipeline (with the exception of unpaved roads) prior to installation.

The water for pressure testing will be obtained from nearby municipal or commercial sources in North Dakota and Wyoming. Table 2.2.9-1 provides hydrostatic test details for the pipeline and aboveground facilities.

TABLE 2.2.9-1 Anticipated Hydrostatic Test Water Source and Discharge Locations and Volumes				
State/County/Facility	Water Source	Approximate Volume (gallons)	Discharge Location	Discharge Rate (gallons per minute)
North Dakota, Dunn County				
Pipeline, Midpoint Valve, and Pig Launcher/Receiver at Manning Compressor Station	Municipal or Commercial	499,550	MP 0.0 ^a	50
Bear Creek Receipt Station	Municipal (WBI Energy's shop in Glendive, MT)	<1,000	N/A ^b	N/A
Campbell County, Wyoming				
New Equipment at Landeck Compressor Station	Municipal or Commercial	1,700	Within facility	50
Sheridan County, Wyoming				
Big Horn Gas Interconnect	Municipal or Commercial	2,500	Within facility	50
Total		504,750		
^a Upland area adjacent to Bear Creek Receipt Station boundary. ^b Pre-fabricated equipment will be pressure tested at WBI Energy's shop in Glendive, Montana before sending to the Bear Creek Receipt Station site. The shop is connected to municipal water and sewer systems. No discharge to the ground surface will occur. Notes: MP = Milepost N/A = Not applicable				

In addition to use of water for pressure testing, an estimated 111,920 gallons of water will be required for use during guided bore drilling to mix with bentonite, remove cuttings from the drill hole, and to pre-test guided bore pipeline segments prior to installing the pipe into the drill holes. Water for guided bore pre-tests will be obtained from a municipal or commercial source and will be discharged in an upland area adjacent to each bore location, or hauled off-site. Table 2.2.9-2 summarizes the volume of guided bore process and test water, including volumes for each guided bore crossing, each source, and the process, test, and Project totals. Potential discharge locations are shown on the aerial-photo based alignment sheets in appendix 1B.

TABLE 2.2.9-2 Anticipated Guided Bore Process and Test Water Sources and Volumes				
State/County/Facility/ Milepost	Guided Bore Crossing (Feature Crossed)	Water Source	Approximate Volume for Drill Process Water (gallons)	Approximate Volume for Pre-Test Water (gallons)
North Dakota, Dunn County				
Pipeline				
0.4	Jim Creek	Municipal/Commercial	8,500	7,050
0.7	1 st Street NW	Municipal/Commercial	4,000	1,700
2.5	Main Street	Municipal/Commercial	2,250	715
2.9	Highway 22, wetland areas, two unnamed streams	Municipal/Commercial	4,000	4,100
3.7	1 st Street SW	Municipal/Commercial	3,500	2,290
4.6	106 th Avenue	Municipal/Commercial	3,000	2,500
5.9	3 rd Street SW (New Paved Road)	Municipal/Commercial	2,500	2,055
6.4	Spring Creek Road and Spring Creek	Municipal/Commercial	3,350	3,445
6.9	3T Street	Municipal/Commercial	2,250	715
7.2	State Highway 200 (4 th Street SW)	Municipal/Commercial	3,000	2,830

TABLE 2.2.9-2
Anticipated Guided Bore Process and Test Water Sources and Volumes

State/County/Facility/ Milepost	Guided Bore Crossing (Feature Crossed)	Water Source	Approximate Volume for Drill Process Water (gallons)	Approximate Volume for Pre-Test Water (gallons)
North Dakota, Dunn County				
9.3	Wetland area	Municipal/Commercial	2,000	2,260
9.5	6 th Street SW	Municipal/Commercial	2,000	700
10.6	7 th Street SW	Municipal/Commercial	2,000	750
11.5	Murphy Creek	Municipal/Commercial	3,500	3,690
11.7	8 th Street SW	Municipal/Commercial	2,000	750
12.4	Unnamed tributary and Highway 22 (2 nd crossing of highway)	Municipal/Commercial	5,250	5,150
15.1	Dakota Skipper Habitat	Municipal/Commercial	9,000	7,400
15.2	11 th Street SW	Municipal/Commercial	3,200	1,485
Total			63,050	48,870

Notes: MP = Approximate Milepost

Water used to complete guided bores is expected to be consumed by the drilling process or ultimate disposal of drill cuttings. Water for pressure testing will be trucked to a municipal wastewater facility or discharged in accordance with the Procedures and NPDES permit discharge requirements using an energy dissipating device such as a straw bale or geotextile dewatering structure and/or a splash pup. Discharge rates will be controlled to prevent erosion, scouring and sedimentation, flooding, or the introduction of foreign or toxic substances into adjacent waterbodies. Hydrostatic test waters will be discharged in a manner that prevents erosion and discharge of silt-laden water flowing into a wetland or waterbody. Discharge will take place within the same watershed from which it was withdrawn, if possible. Water quality sampling of discharge will be conducted as dictated by permit conditions.

No significant water quality impacts are anticipated as a result of discharge from hydrostatic testing. The new pipeline will consist of new steel pipe that will be free of chemicals or lubricants, and no additives will be used.

Water may also be necessary for the control and mitigation of fugitive dust in areas disturbed by construction such as access roads. Typically, dust control is provided by contractors using trucks that hold approximately 2,000–4,000 gallons of water per load, and water is obtained from municipal or surface water resources under permits carried by the contractor, as necessary. WBI Energy estimates up to approximately 400,000 gallons of water may be used for dust suppression over the course of construction for all Project facilities. The actual amount of water required will vary based on climatic conditions at the time of construction. Additional details regarding the use of water for controlling fugitive dust are provided in WBI Energy’s Fugitive Dust Plan in appendix 1E-6.

2.3 WETLANDS

2.3.1 Existing Resources

In accordance with the methodologies established in the *USACE Wetlands Delineation Manual* (USACE, 1987) and *The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (Version 2.0) (USACE, 2010), WBI Energy identified 19 wetlands in the Project area by field delineation surveys conducted in 2019 and 2022 (see appendix 2A). Designations for each type of wetland follow the classifications developed by the USFWS (Cowardin et al., 1979).

Based on WBI Energy’s review, one class of palustrine (freshwater) wetland systems, palustrine emergent (PEM), is present in the Project area (Cowardin et al., 1979). A description of PEM wetlands is provided below, and habitat descriptions are presented in Resource Report 3 (Vegetation and Wildlife). Table 2.3.1-1 provides a summary of the wetland impacts by construction and operation of the Project. No wetlands are present within the Bear Creek Receipt Station, Frontier Laydown Yard, or Manning Compressor Station in North Dakota or within the Landeck Compressor Station or Big Horn Gas Interconnect in Wyoming; therefore, these facilities are not included in table 2.3.1-1. A discussion of specific Project impacts and mitigation measures and a tabulation of individual wetland impacts by Project facilities are provided in section 2.3.2.

TABLE 2.3.1-1 Summary of Wetland ^a Impacts from Project Construction and Operation		
State/County/Facility	Construction Impact ^b (acres)	Operational Impact (acres)
North Dakota, Dunn County		
Pipeline Right-of-Way	2.6	--
Access Roads	<0.1	--
Project Totals ^c	2.6	--
^a All wetlands impacted by the Project are classified as palustrine emergent (PEM) according to Cowardin (1979). ^b Construction impacts include all workspace during construction activities (temporary workspace and extra temporary workspace plus permanent right-of-way).		

WBI Energy also consulted with USFWS regarding wetland easements in North Dakota obtained by USFWS under regulations described in 16 United States Code (USC) 668dd(c). In a response dated October 28, 2022, the USFWS advised WBI Energy that no USFWS fee title or wetland easements exist within the Project area in North Dakota. As stated above, no wetlands are present within the two aboveground facilities in Wyoming.

2.3.1.1 Palustrine Emergent Wetlands

PEM wetlands are non-tidal wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. PEM wetlands usually are dominated by perennial plants and are commonly flooded for all or most of the year (Cowardin et al. 1979). Common emergent vegetation observed in PEM wetlands include foxtail barley (*Hordeum jubatum*), desert saltgrass (*Distichlis spicata*), tussocks sedge (*Carex stricta*), Nuttall’s Alkaligrass (*Puccinellia nuttalliana*), redtop (*Argostis gigantea*), and wheat sedge (*Carex atherodes*).

As noted in the 2019 Natural Resources Inventory Report (see appendix 2A), nine wetlands were identified as potentially alkaline and having potential suitable nesting habitat for piping plover, a protected species. Six of these nine features are within Project workspaces. Please refer to section 3.4.2.2 for more information.

2.3.2 Wetland Impacts and Mitigation Measures

Construction activities can disturb the surface soils and cause subsequent sedimentation from disturbed areas into wetlands. To minimize the potential for sedimentation of wetlands from Project construction activities, erosion and sediment control measures will be installed prior to or immediately following initial ground disturbance. Control devices will be installed in proximity to the wetland boundaries, maintained in working condition throughout construction, and remain in place until the adjacent upland areas are successfully revegetated.

Compaction of wetland soils and rutting within wetlands due to equipment operation can affect wetland hydrology and revegetation, and will be minimized by limiting equipment operation in wetlands and installing temporary equipment mats or bridging, as necessary. Impacts on wetlands within the pipeline travel lane will be temporary in nature.

To avoid rutting and mixing of wetland topsoil and subsoil, placement of equipment mats may be used when equipment must cross these features. Construction equipment operation may also compact saturated soils. WBI Energy will implement measures documented in the FERC's Procedures and Project-specific construction plans to minimize compaction during construction. All wetlands will be restored to pre-disturbance conditions following construction.

Permanent changes in surface and subsurface hydrology through a wetland can have a long-term impact on the habitat type and quality. The hydrology of wetlands crossed by travel lanes will be protected by use of equipment mats or bridging. There are no wetlands located within the footprint of the Frontier Laydown Yard or any of the aboveground facilities.

Wetland crossings will be completed as described in section 1.5.4.1 and in accordance with required permit conditions and the Procedures. Where required, EWS will be setback at least 50 feet from non-cultivated wetland boundaries. In addition, WBI Energy's SPCC Plan (see appendix 1E-1) provides restrictions and mitigation measures to limit potential impacts associated with the release of fuels, lubricants, or other potentially toxic materials used during routine construction. Refueling and storage of hazardous materials will be prohibited within 100 feet of wetlands during construction.

After the completion of construction, wetland areas along the pipeline will continue to be emergent wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation, resulting in no permanent impacts on these wetland types. The wetlands will not require any vegetative maintenance during operation of the pipeline.

Table 2.3.2-1 presents information about the individual wetlands within the footprint of Project facilities and the impacts resulting from the construction and operation of the Project. No wetlands are present within the Bear Creek Receipt Station, Frontier Laydown Yard, or Manning Compressor Station in North Dakota or within the Landeck Compressor Station or Big Horn Gas Interconnect in Wyoming; therefore, these facilities are not included in table 2.3.2-1. A discussion of wetland impacts follows the table.

State/County/Facility	Approx. MP	Wetland ID	Wetland Type ^a	Temporary Construction Impact (acres)	Operation Impact (acres)
North Dakota, Dunn County					
Pipeline Facilities					
	0.4	w-19081a-001	PEM	0.4	--
	2.7	w-19081a-002	PEM	< 0.1	--
	2.8	w-19081a-004	PEM	0.1	--
	2.9	w-19081a-005	PEM	< 0.1	--
	3.0	w-19081a-007	PEM	0.3	--
	3.1	w-19081a-008	PEM	0.3	--
	4.7	w-19081a-011	PEM	0.1	--
	6.7	w-19081a-012	PEM	< 0.1	--
	8.3	w-22081c-004	PEM	0.2	--
	9.1	w-19081-016	PEM	0.3	--
	9.2	w-19081a-015	PEM	0.5	--
	9.4	w-19081a-014	PEM	< 0.1	--

TABLE 2.3.2-1 Wetland Impacts Associated with the Project					
State/County/Facility	Approx. MP	Wetland ID	Wetland Type ^a	Temporary Construction Impact (acres)	Operation Impact (acres)
North Dakota, Dunn County					
	10.9	w-19081b-004	PEM	0.1	--
	12.4	w-19081a-019	PEM	< 0.1	--
	14.2	w-19081a-023	PEM	0.1	--
	14.3	w-19081a-022	PEM	0.1	--
	15.3	w-22091d-001	PEM	0.1	--
Access Roads					
AR2	0.4	w-19081a-001	PEM	< 0.1	--
AR19	9.5	w-19081-013	PEM	< 0.1	--
Total Wetland Impacts				2.6	0.0
^a Source: Cowardin, 1979.					

2.3.2.1 Pipeline

The pipeline route crosses 17 field-identified wetlands (two of the 17 are not directly crossed by the centerline but are within the Project workspace) and access roads cross 2 additional wetlands (see table 2.3.2-1). The pipeline route crosses 1,472 feet of PEM wetlands; of which 998 feet will be affected by open cut during construction. No PEM wetlands will be impacted by pipeline operation, as described below. As noted above, no palustrine scrub-shrub, palustrine forested, or palustrine unconsolidated bottom wetlands will be crossed by the pipeline route.

Six of the 17 wetlands along the pipeline route will be crossed using the guided bore method. Five of these wetlands will be crossed by an equipment travel lane, which will utilize equipment mats or bridging in accordance with the Procedures and as described in section 1.5.4.1. During operation, WBI Energy will not maintain vegetation along the guided bore drill paths; therefore, no conversion or permanent impact to PEM wetlands crossed by guided bore are anticipated.

2.3.2.2 Aboveground Facilities

No wetlands were delineated at any of the aboveground facilities in North Dakota or Wyoming.

2.3.3 Other Wetland Mitigation

WBI Energy has not identified the need for wetland mitigation above and beyond the measures described previously. Impacts on PEM wetlands will be temporary in nature. As the Project will be constructed under NWP 12, no mitigation is anticipated to be required for temporary impacts to PEM wetlands. Restoration and revegetation upon completion of construction are expected to meet permit conditions, and no required mitigation is anticipated for these impacts.

2.4 REQUESTED MODIFICATIONS TO FERC PROCEDURES

WBI Energy has adopted the May 2013 version of the Procedures as its own for the Project. As specified in the Procedures, EWS will be located at least 50 feet from waterbody and wetland boundaries except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. In addition, refueling and equipment parking will be kept at least 100 feet from wetlands and waterbody boundaries, topographic and other site-specific conditions permitting. WBI Energy is not requesting any variances from the FERC Procedures.

3.0 FISH, WILDLIFE, AND VEGETATION

Resource Report 3 provides information regarding fisheries, wildlife, and vegetation that may exist within the proposed Project workspaces. This information was developed through literature reviews, consultations with agency personnel, field survey data, and desktop assessments. Resource Report 3 discusses how the Project impacts fisheries, aquatic species, wildlife resources, and vegetation, and outlines the proposed measures to avoid, minimize, or mitigate these impacts. Table 3.0-1 summarizes FERC's filing requirements for Resource Report 3 and where each requirement is addressed.

TABLE 3.0-1 Summary of Filing Requirements for Resource Report 3	
MINIMUM FILING REQUIREMENTS:	LOCATION ADDRESSED
Classify the fishery type of each surface waterbody that would be crossed, including fisheries of special concern. (§ 380.12(e)(1)) <ul style="list-style-type: none"> This includes commercial and sport fisheries as well as coldwater and warmwater fishery designations and associated significant habitat. 	Sections 3.1.1, and 3.1.2
Describe terrestrial and wetland wildlife and habitats that would be affected by the project. (§ 380.12(e)(2)) <ul style="list-style-type: none"> Describe typical species with commercial, recreational or aesthetic value. 	Section 3.3
Describe the major vegetative cover types that would be crossed and provide the acreage of each vegetative cover type that would be affected by construction. (§ 380.12(e)(3)) <ul style="list-style-type: none"> Include unique species or individuals and species of special concern. Include nearshore habitats of concern. 	Section 3.2, and Table 3.2.4-1
Describe the effects of construction and operation procedures on the fishery resources and proposed mitigation measures. (§380.12(e)(4)) <ul style="list-style-type: none"> Be sure to include offshore effects, as needed. 	Section 3.1.3
Evaluate the potential for short-term, long-term, and permanent impact on the wildlife resources and state-listed endangered or threatened species caused by construction and operation of the project and proposed mitigation measures. (§ 380.12(e)(4))	Sections 3.3.4, and 3.4
Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the project and discuss the results of the consultations with other agencies. Include survey reports as specified in § 380.12(e)(5). <ul style="list-style-type: none"> See § 380.13(b) for consultation requirements. Any surveys required through § 380.13(b)(5)(i) must have been conducted and the results included in the application. 	Section 3.4, and Appendix 2A
Identify all federally listed essential fish habitat (EFH) that potentially occurs in the vicinity of the project and the results of abbreviated consultations with NMFS, and any resulting EFH assessment. (§ 380.12(e)(6)).	Section 3.1.2
Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact. (§ 380.12(e)(4&7)) <ul style="list-style-type: none"> For offshore species be sure to include effects of sedimentation, changes to substrate, effects of blasting, etc. This information is needed on a mile-by-mile basis and will require completion of geophysical and other surveys before filing. 	Sections 3.1.3, 3.2.4, 3.3.4, and 3.4.2
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Provide copies of correspondence from federal and state fish and wildlife agencies along with responses to their commendations to avoid or limit impact on wildlife, fisheries, and vegetation.	Appendix 1H
Provide a list of significant wildlife habitats crossed by the project. Specify locations by milepost, and include length and width of crossing at each significant wildlife habitat.	Sections 3.2.2, and 3.3.2
Provide a description of project-specific measures that would be implemented during construction and operation of the project to avoid or minimize impacts on migratory birds. Include comments from U.S. Fish and Wildlife Service on the proposed measures.	Section 3.3.3
For aquatic and marine species, be sure to include effects of sedimentation, changes to substrate, effects of blasting, etc. This information may be needed on a location-specific (i.e., milepost) basis and may require geophysical and other surveys. Results of such surveys and analyses should be included in the application.	Section 3.1

3.1 FISH

Game and non-game fish species in the Project area are regulated and protected by the U.S. Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911), the Endangered Species Act (ESA), and the U.S. Fish and Wildlife Coordination Act of 1958 (16 USC 1531-1544). Within the Project area these regulations are administered by the USFWS. In addition, the NDGF, NDPRD, and the Wyoming Game and Fish Department (WGFD), also have regulations to regulate and protect fishery resources. In North Dakota, fisheries are regulated by NDGF under North Dakota Century Code (NDCC) Title 20.1 and by NDAC Title 30, and by NDPRD under NDCC Title 55.11 and by NDAC Title 58. The WGFD Division of Fish and Wildlife Section of Fisheries manages a wide range of fishery resources throughout the state under Wyoming State Statutes and Constitution Title 23. The WGFD Division of Fish and Wildlife Section of Fisheries manages a wide range of fishery resources throughout the state under Wyoming State Statutes and Constitution Title 23.

3.1.1 Existing Fisheries Resources

Fisheries are generally classified according to type of use (commercial or recreational/sport fishing), water temperature (warmwater or coldwater), and flow regime (ephemeral, intermittent, or perennial). The Project pipeline will cross 8 waterbodies, including 5 ephemeral and 3 intermittent waterbodies (see appendix 2A). Of these, none are identified as National Wild and Scenic Rivers, or included as impaired and contaminated 303(d) waters (see section 2.2.3). Additionally, no waterbodies crossed are classified by NDGF as a state fishery. No waterbodies are crossed by the aboveground facilities in Wyoming. Section 2.2.2 and table 2.2.2-1 present details about the waterbodies crossed by the Project, including their flow regime and state water classification.

3.1.1.1 Pipeline

Construction and operation of the pipeline facilities will occur in the following watersheds: Lower Little Missouri and Knife River (see table 2.2.1-1). Within these watersheds, the pipeline route will cross three intermittent waterbodies that could support fish species seasonally. The existing fishery resources were characterized within these watersheds by reviewing publicly available data from NDGF such as channel catfish (*Ictalurus punctatus*), walleye (*Sander vitreus*), sauger (*Sander canadensis*), sand shiner (*Notropis stramineus*), creek chub (*Semotilus atromaculatus*), fathead chub (*Platygobio gracilis*) (NDGF, 2021).

3.1.1.2 Aboveground Facilities

Construction and operation of the aboveground facilities in North Dakota will occur in the Lower Little Missouri and Knife River watersheds as previously characterized in section 3.1.1.1 above. The construction and operation of the aboveground facilities associated with the Project in Wyoming will be located within the following watersheds: Upper Powder and Little Powder (see table 2.2.1-1). The species known to occur in the Upper Powder and Little Powder watersheds include catfish, walleye, sauger, and multiple minnows (*Notropis sp* and *Cyprilella sp*) and darters (*Etheostoma sp*) (WGFD, 2022a). However, no waterbodies are crossed by the aboveground facilities.

3.1.2 Fisheries of Special Concern

None of the waterbodies crossed by the Project contain federally listed threatened, endangered, or special concern fisheries or designated critical habitat. Essential Fish Habitat, as administered by the National Oceanic & Atmospheric Administration (NOAA) and National Marine Fisheries Service (NMFS), protects over 1,000 species of coastal and marine fish. Since all watersheds crossed by the Project are freshwater fisheries, consultations with NOAA and NMFS for Essential Fish Habitat are not required.

WBI Energy requested project review from multiple state and federal agencies regarding fisheries of concern within the Project area, including the USFWS, NDGF, NDPRD, and WGFD (see appendix 1H). Agencies did not express any concerns related to fisheries in their responses.

3.1.3 Construction and Operation Impacts and Mitigation

3.1.3.1 Pipeline

In general, construction of the pipeline across or near waterbodies has the potential to impact fisheries and other aquatic resources due to sedimentation and turbidity, loss of riparian vegetation, fuel and chemical spills, water withdrawals, instream trenching and blasting, and introduction of aquatic nuisance species (ANS) or aquatic invasive species (AIS). As described in the following subsections, the construction and operation of the Project will result in minimal impacts on fisheries and aquatic resources. WBI Energy will use the protocols in the current version of FERC's Procedures (FERC, 2013b) and conduct construction activities in accordance with federal, state, and local permits. As discussed in section 1.5.4.2 and denoted in table 2.2.2-1, WBI Energy will cross 7 of the 8 waterbodies along the pipeline route using bore techniques, the remaining waterbody will be crossed using open cut methods. The following subsections outline the potential construction impacts on fisheries and aquatic resources as well as the countermeasures to avoid, minimize, and mitigate impacts. As indicated, the Project will have no operational impacts on waterbodies because no disturbances will occur in any waterbodies after construction of the pipeline and no waterbodies are impacted by aboveground facilities.

3.1.3.2 Sedimentation and Turbidity

Increased sedimentation and turbidity from in-stream and adjacent construction activities could impact fisheries resources. Sedimentation could suffocate fish eggs and other benthic biota by clogging gills and by altering stream bottom characteristics, such as converting sand, gravel, or rock substrate to silt or mud substrate. These habitat alterations could reduce juvenile fish survival, spawning habitat, and benthic community diversity and health. Fish and other stream biota will be displaced to similar habitat upstream or downstream of the pipeline crossing, which could lead to increased competition for habitat and food sources, which could affect fish survival and health.

Increased turbidity could temporarily reduce dissolved oxygen levels in the water column and reduce respiratory functions in stream biota, which could temporarily displace fish to unaffected stream segments, reduce fish health, or cause fish mortality. Turbid conditions could also reduce the ability for biota to find food sources or avoid prey. The extent of impacts from sedimentation and turbidity will depend on sediment loads, stream flows, stream bank and stream bed composition, sediment particle size, and the duration of the disturbances.

To avoid sedimentation and turbidity impacts, WBI Energy will implement erosion and sediment control devices in accordance with the Project SWPPPs (see section 1.5.3.2) and as outlined in section 1.5.4. Furthermore, erosion and sediment control measures will be implemented in accordance with FERC's Plan and Procedures. These measures will minimize the potential for sedimentation and turbidity impacts on fisheries during construction; however, use of guided bore techniques could result in an inadvertent release of drilling fluid which contains bentonite, a naturally occurring material, into a waterbody. WBI Energy will implement its Guided Bore Drilling Fluid Monitoring and Operations Plan (see appendix 1E-3) to prevent, minimize, and mitigate inadvertent losses of drilling fluid. Based on these measures, WBI Energy believes impacts associated with sedimentation and turbidity will be avoided and minimized to the extent possible.

3.1.3.3 Loss of Stream Bank Cover

Stream bank vegetation and structures such as trees, logs, rocks, and undercut banks provide important habitat for fish and stream biota. Destruction of streambank vegetation during construction can temporarily expose streambanks to erosion, cause sedimentation, increase turbidity, reduce riparian habitat, and result in increased water temperatures if there is a loss of shade vegetation. Plow methods, open-ditch methods, or guided bore construction methods will be implemented for waterbody crossings, depending on conditions at the time of crossing. Guided bore methods may be implemented as an alternative to plowing or open-ditch methods if higher water levels exist at the time of crossing. Plowing or open-ditch methods may be implemented as an alternative to guided bore methods if water levels are low at the time of crossing. For plowed or open-ditch crossings, pipeline installation will be completed as described section 1.5.3. The guided bore method is further described in section 1.5.4.2. All wetland/waterbody crossings will be restored to original condition and function following construction.

Vegetation will be preserved to the greatest extent practicable at waterbody crossings and along stream banks. Upon installation of equipment bridges, WBI Energy will install erosion and sediment control devices and maintain them to prevent streambank erosion throughout the duration of construction. Once the bridges are no longer needed and removed, WBI Energy will reclaim and re-contour disturbed areas and maintain the erosion and sediment control devices until streambanks are revegetated and stabilized.

The use of guided bore methods will avoid removal of any such habitat, and will not result in the displacement of aquatic biota; however, installation of temporary equipment bridge crossings could impact streambank cover during installation or removal across waterbodies. To avoid and minimize impacts associated with equipment crossings of waterbodies, WBI Energy will move equipment around most waterbodies crossed by the guided bore methods using existing public roads and bridges. Where it is not practical to move around a waterbody, WBI Energy will implement the specifications in section V.B.5 of the Procedures relating to equipment bridge installation. WBI Energy has identified 4 locations where temporary equipment bridges will be required for crossing waterbodies located at MPs 0.4, 3.0, 4.7 and 6.5. Based on these measures, WBI Energy believes impacts on streambank habitat will be avoided and minimized to the extent possible.

3.1.3.4 Fuel and Chemical Spills

An inadvertent release of fuel- or equipment-related fluids could impact water quality. The chemicals released during spills could have acute fish impacts, such as altered behavior, changes in physiological processes, or changes in food sources. Fish also could experience greater mortality if a large volume of hazardous liquid is spilled into a waterbody. During operations, a release of natural gas from the pipeline will have no potential to affect fisheries or other aquatic resources because, if released, natural gas will disperse into the atmosphere and not affect water quality.

WBI Energy will require contractors to adhere to its SPCC Plan (see appendix 1E-1). The SPCC Plan includes preventive measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills, as well as mitigation measures such as maintaining containment and cleanup materials on site during construction to minimize potential impacts should a spill occur. Adherence to the SPCC Plan will also prevent a large spill from occurring near surface waters by prohibiting re-fueling activities to occur within 100 feet of the waterbody banks, and by prohibiting hazardous material storage within 100 feet of waterbodies. If a spill were to occur, adherence to measures in the SPCC Plan (e.g., maintaining adequate cleanup supplies) will decrease the response time for control and cleanup, thus minimizing the effects on aquatic resources. Additionally, WBI Energy's training and SPCC Plan communication protocols will facilitate the prevention, response, containment, and cleanup of spills during

construction activities. Based on these measures, WBI Energy believes impacts due to potential fuel and chemical spills will be avoided and minimized to the extent possible.

3.1.3.5 Hydrostatic Testing and Water Withdrawals

WBI Energy will use municipal sources for hydrostatic testing of the pipeline after it has been installed. Details on hydrostatic test water sources, discharge locations, volumes, avoidance, minimization, and potential impacts are presented in section 2.2.9, and the testing procedures are described in section 1.5.3.12. WBI Energy does not plan to withdraw hydrostatic test water from any surface waters. If deemed necessary, WBI Energy will apply for and abide by the requirements of any necessary permits to appropriate water.

The movement of water from one watershed into another during hydrostatic testing can result in flow alteration, changes to water levels, and transference of ANS/AIS, if present in the source water supply. To minimize these impacts, WBI Energy will direct discharge of hydrostatic test water into a dewatering structure located in a well-vegetated upland area. The dewatering structures will temporarily retain and filter the hydrostatic test water, and the flow rate will be regulated to maximize the infiltration of discharged water into the ground and minimize runoff to nearby waterbodies. Based on these measures, WBI Energy believes impacts due to hydrostatic testing and water withdrawals will be avoided and minimized to the extent possible.

3.1.3.6 Blasting

WBI Energy does not plan to conduct any blasting to complete Project activities.

3.1.3.7 Aquatic Nuisance Species/Aquatic Invasive Species

WBI Energy will avoid spreading ANS/AIS by bringing only clean equipment to the construction area and generally avoiding in-water work. In addition, most waterbodies will be crossed by guided bore methods, and any equipment bridges will be installed in accordance with the Procedures. Based on these measures, WBI Energy believes the potential for introducing or transferring ANS/AIS will be avoided and minimized to the extent practicable.

3.1.3.8 Aboveground and Other Project Facilities

The aboveground facilities do not intersect any waterbodies and no waterbodies are crossed by access roads or impacted by use of the Frontier Laydown Yard; therefore, these Project components will have no impact on fishery resources.

3.2 VEGETATION RESOURCES

This section describes the vegetation cover types that occur within the Project area, as well as potential impacts on vegetation from construction and operation of the Project. Vegetation communities of special concern and exotic or invasive species also are discussed. Information regarding vegetation types within the Project area were obtained using publicly available Geographic Information System (GIS) data from the USGS National Land Cover Database, review of aerial imagery, and observations made during field surveys for the Project.

3.2.1 Existing Vegetation Resources

Defining habitats is necessary to assess the potential presence of wildlife, threatened and endangered species and communities, and other ecologically sensitive areas. In North Dakota, the USGS Ecoregions

of North Dakota and South Dakota (Bryce et al. 1996) and the USGS Ecoregions of Wyoming (Chapman et al. 2004) classify the ecoregions, using patterns of geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.

Using these ecoregion classifications in North Dakota and Wyoming, the Project areas are located in the Northwestern Great Plains (Bryce et al. 1996 and Chapman et al. 2004). The Northwestern Great Plains are defined by semiarid rolling plains with native grasslands consisting of shortgrass prairies which have been largely replaced by spring wheat and alfalfa crops (Bryce et al. 1996) as well as cattle grazing and agriculture which are heavily influenced by erratic precipitation and limited irrigation (Chapman et al. 2004).

Field surveys revealed that the vegetation and habitat classifications in the Project areas can be categorized to include either agricultural, forest/woodland, developed land, and open land (herbaceous) (see table 3.2.4-1). The agricultural vegetation along the pipeline route consists primarily of corn (*Zea mays*). Common open vegetation includes emergent species observed in PEM wetlands, such as tussock sedge (*Carex stricta*), wheat sedge (*Carex atherodes*), desert saltgrass (*Distichlis spicata*), Nuttall's Alkaligrass (*Puccinellia nuttalliana*), foxtail barley (*Hordeum jubatum*), redtop (*Agrostis gigantea*), and spotted lady's thumb (*Persicaria maculosum*). Adjacent upland environments included dominant species such as brittle prickly pear (*Opuntia fragilis*), tall fescue (*Festuca arundinacea*), crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*Thinopyrum intermedium*), Little bluestem (*Schizachyrium scoparium*) is prevalent with purple coneflower (*Echinacea angustifolia*), dotted blazing star (*Liatris punctata*), purple prairie clover (*Dalea purpurea*), big bluestem (*Andropogon gerardii*), needle-and-thread grass (*Hesperostipa comata*), sideoats grama (*Bouteloua curtipendula*), prairie coneflower (*Ratibida columnifera*), prairie sagewort (*Artemisia frigida*), harebell (*Campanula rotundifolia*), and western wheatgrass (*Pascopyrum smithii*), and velvetleaf (*Abutilon theophrasti*). Trees and shrubs observed along riparian areas and planted for wind breaks include green ash (*Fraxinus pennsylvanica*) and boxelder (*Acer negundo*).

Vegetation and habitat classifications within the Bear Creek Receipt Station, Midpoint Valve, Manning Compressor Station, Landeck Compressor Station, and Big Horn Gas Interconnect consist of agriculture, developed land, and open land (herbaceous) vegetation communities similar to those described above. The land use at each site is described in detail in Resource Report 8, and the acreages of vegetation communities that would be affected are provided in table 3.2.4-1.

3.2.2 Unique, Sensitive, and Protected Vegetation Communities

3.2.2.1 Conservation Reserve Program

As described in section 8.5, WBI Energy conducted a desktop review of publicly available databases from the Natural Conservation Easement Database and Conservation Reserve Program to identify conservation easements within 0.25 mile of the Project facilities. No conservation easements were identified within 0.25 mile of the Project.

3.2.3 Noxious Weeds and Other Invasive Plants

Lists of noxious and invasive weeds were obtained by review of federal, state, and county sources. The U.S. Department of Agriculture (USDA) maintains a federal list of noxious weeds through their Animal and Plant Health Inspection Service (APHIS) program (USDA APHIS, 2010). The North Dakota Department of Agriculture (NDA) lists 13 noxious weed species, and all cities and counties in North Dakota are tasked with managing and controlling the spread of these species (NDA, 2022). In addition, county and city weed boards in North Dakota have the authority to enforce measures to control the spread of listed

weed species, Dunn County has added an additional species (black henbane) to the list, totaling 14 species in Dunn County. Field surveys conducted during 2019 and 2022 identified some weed species within the survey corridor (see appendix 2A). The dominant invasive species within the Project area is Canada thistle (*Cirsium arvense*), common wormwood (*Artemisia absinthium*), and leafy spurge (*Euphorbia esula*).

The Wyoming Weed and Pest Council (WWPC) lists 30 noxious weed species in the state; the WWPC has 23 weed and pest districts throughout the state responsible for management of noxious weeds and protection of Wyoming's economic and ecological resources (WWPC, 2019). Review of the WWPC township distribution maps did identify Canada thistle, leafy spurge, quackgrass (*Agropyron repens*), skeltonleaf bursage (*Ambrosia tomentosa*), and spotted knapweed (*Centaurea stoebe*) within the township and range for the Project areas in Wyoming; however, the results of the field surveys did not identify the presence of any noxious or invasive species. Results of the review of these databases are presented in table 2-1 in appendix 1E-4.

WBI Energy initiated consultation with the WGFD on October 18, 2022, to request their review of the project for potential impacts to sensitive resources under their purview. See appendix 1H for a copy of this correspondence. The WGFD noted that in in northeastern Wyoming, the most significant known threat is from cheatgrass, medusahead, and ventenata. To prevent the spread of noxious weeds and invasive annual grasses, the WGFD recommended the following measures:

- Prevent introduction and establishment by cleaning vehicles and equipment prior to movement to a new location in order to minimize the potential for transporting seeds.
- Work with land managers to develop and implement a plan to assess, treat, and monitor for noxious weeds and invasive plants at the project scale and in the adjacent landscape where they are present.

3.2.4 Construction and Operation Impacts and Mitigation

Table 3.2.4-1 identifies the vegetation types that will be affected by the Project. Primary impacts on vegetation include clearing activities associated with temporary ground disturbance. Secondary effects associated with vegetation disturbances are increased soil erosion, topsoil loss, invasive species promulgation, and changes to wildlife and agricultural activity.

About 24.9 acres of developed land would be impacted during construction of the Project. Developed land consists of residential, commercial, and industrial lands (including existing facilities), and roadways, all of which are generally devoid of native vegetation and provide little habitat value. Therefore, developed land is not included in table 3.2.4-1; developed land impacted by the Project is described in section 8.3.3. Installation of new equipment and facilities within the existing Manning and Landeck Compressor Stations would affect developed land only; therefore, these facilities are not included in table 3.2.4-1.

TABLE 3.2.4-1 Summary of Impacts on Vegetation Cover Types		
State/County/Facility/Vegetation Cover Type	Temporary Impacts (acres)	Operation Impacts (acres) ^a
North Dakota, Dunn County		
Pipeline Facilities ^b		
Agricultural	85.6	43.2
Forested Land	0.1 ^c	0.1 ^c
Open Land (herbaceous)	105.1	46.9
Pipeline Facilities Subtotal ^d	190.8	90.2
Aboveground Facilities		
Bear Creek Receipt Station		
Agricultural	1.0	0.7

TABLE 3.2.4-1
Summary of Impacts on Vegetation Cover Types

State/County/Facility/Vegetation Cover Type	Temporary Impacts (acres)	Operation Impacts (acres) ^a
Forested Land	--	--
Open Land (herbaceous)	--	--
Bear Creek Receipt Station Subtotal^d	1.0	0.7
Midpoint Valve^e		
Agricultural	--	--
Forested Land	--	--
Open Land (herbaceous)	0.2	0.2
Midpoint Valve^d	0.2	0.2
North Dakota Subtotal^d	192.9	91.1
Sheridan County, Wyoming		
Aboveground Facilities		
Big Horn Gas Interconnect		
Agricultural	3.6	1.4
Forested Land	--	--
Open Land (herbaceous)	1.6	0.4
Big Horn Gas Interconnect Subtotal^d	5.2	1.8
Wyoming Subtotal^d	5.2	1.8
Project Agricultural Total^d	90.2	45.3
Project Forested Land Total^d	0.1^c	0.1^c
Project Open Land (herbaceous) Total^d	106.9	47.5
Project Total^d	197.2	92.9
^a Assumes no vegetative maintenance will be necessary in agricultural, open, or in forested areas that are crossed by the guided bore method.		
^b Includes TWS, EWS, access roads, travel lanes, Frontier Laydown Yard, and permanent operational right-of-way for the pipeline. Acreage also includes temporary workspace for the Midpoint Valve and access road.		
^c Forested land is present within the permanent right-of-way along the margin of Murphy Creek (0.1 acre) but impacts on this land use type would be avoided by use of the guided bore technique; no trees or woody vegetation would be cleared. Section 8.3.2 provides a detailed discussion of how use of the guided bore technique would avoid impacts on forested land.		
^d Sum of addends may not total due to rounding.		
^e Where the Midpoint Valve overlaps with permanent right-of-way for the pipeline, acreage for permanent impacts is assigned to the Midpoint Valve only to avoid double counting.		

Construction of the Project will predominantly impact open land (herbaceous) vegetation (106.9 acres). Following construction, open land areas will be seeded and stabilized per the Plan and NRCS seeding recommendations. Open land (herbaceous) areas in North Dakota will be seeded pursuant to the North Dakota Herbaceous Vegetation Establishment Guide (USDA-NRCS, 2021). In Wyoming, open land (herbaceous) areas will be reseeded in accordance with the NRCS Perennial Vegetation Establishment Guide for Conservation Seedings in Wyoming: Species, Seeding Rates, and Selections (USDA-NRCS 2022a). WBI Energy will convert approximately 0.6 acre of open land (herbaceous) vegetation to developed land which will be maintained as graveled (non-vegetated) land for operation of the Midpoint Valve and Big Horn Gas Interconnect. All areas remaining within the pipeline facilities including temporary access roads will be allowed to revert back to previously existing vegetative conditions after construction is complete. Areas disturbed outside the operational footprint for the Project will be seeded and allowed to revert to open land vegetation. Therefore, impacts on open land (herbaceous) vegetation will be minimized to the extent practicable.

Approximately 90.2 acres of agricultural lands will be impacted by construction of the Project. After construction is complete, 43.2 acres of agricultural land will be within the permanent pipeline right-of-way. Operation of the Bear Creek Receipt Station, Midpoint Valve and permanent access road, and Big Horn

Gas Interconnect and permanent access road, will permanently convert 2.1 acres of agricultural land to developed land that will be maintained as graveled (non-vegetated) areas during operation. Areas outside of the fence lines of facilities and the footprint of permanent access roads will be allowed to revert to previous uses. Following construction of the pipeline, agricultural activities will be able to resume in the areas disturbed by construction along the pipeline, including the access roads, thereby minimizing impacts on agricultural lands to the extent practicable.

Approximately 0.1-acre of forested land will be crossed by the Project along Murphy Creek (MP 11.5). While this forested land is within the new permanent right-of-way for the pipeline, WBI Energy proposes to cross Murphy Creek using the guided bore method and does not propose to clear the trees to complete the crossing. Some hand clearing of smaller woody vegetation may be necessary to lay the directional cables between the guided bore entry and exit points, consisting of a small pathway approximately 2 to 3 feet wide in thickly vegetated areas, to lay the electric-grid guide wires resulting in minimal ground and vegetation disturbance. No large trees will be cut or removed as part of this process for the guided bore at Murphy Creek. Therefore, no impacts on the 0.1-acre area of forested land along the margin of Murphy Creek would occur from operation of the pipeline.

WBI Energy will minimize impacts on vegetation in the Project area by restoring disturbed areas in accordance with the Plan, NRCS seeding recommendations, and in accordance with the Project-specific SWPPP requirements. Long-term impacts on vegetation over ecologically sensitive areas such as riparian forested areas, will not occur as these areas will be crossed via guided bore and will not sustain maintenance mowing.

WBI Energy has developed a Project-specific Noxious Weed Management Plan to prevent, mitigate, and control the spread of noxious weeds during construction and operation of the Project (see appendix 1E-4). In addition, WBI Energy will control the introduction and spread of noxious weeds and invasive plants through implementation of the Plan. WBI Energy will monitor the construction corridor in accordance with the Plan and Noxious Weed Management Plan to ensure that noxious weeds do not spread outside of the areas where they have been identified. Based on these measures, impacts on vegetation in the Project area will be avoided and minimized to the extent practicable.

3.3 WILDLIFE RESOURCES

Vegetation type is an important component of wildlife habitat and often determines wildlife species distribution; therefore, the vegetation community types described in section 3.2 have been adapted to define wildlife habitat types in the following sections. A review of pertinent literature and biological surveys conducted for the Project in 2019 and 2022 were used to determine the spatial distribution, habitat requirements, and ecological status of wildlife species observed or known to occur in the Project vicinity.

3.3.1 Existing Wildlife Resources

The wildlife species that inhabit the proposed Project area are typical of those found in the Northwestern Great Plains ecoregion (EPA, 2013), specifically the Western Mixed-grass/Short-grass Prairie (Missouri Slope) habitat types in North Dakota, and Prairie Grasslands and Powder River Basin in Wyoming. These habitats are characterized by short- and mixed-grass prairies dissected by river and stream breaks as described in section 3.2.1 and in Resource Report 8. Table 3.3.1-1 below summarizes the common wildlife that may be present within the Project area. Species which have historically occurred in the Project area and are currently listed as threatened, endangered, or special concern species are discussed in section 3.4.

TABLE 3.3.1-1
Common Wildlife that Potentially Occur in the Vicinity of the Project Areas ^{a, b}

Class	Species Common Name	Species Scientific Name
Reptiles	Sagebrush Lizard	<i>Sceloporus graciosus</i>
	Woodhouse Toad	<i>Anaxyrus woodhousii</i>
	Northern Leopard Frog	<i>Lithobates pipiens</i>
	Common Garter Snake	<i>Thamnophis sirtalis</i>
	Plains Garter Snake	<i>Thamnophis radix</i>
	Bullsnake	<i>Pituophis catenifer sayi</i>
Birds	Prairie Rattlesnake	<i>Crotalus viridis</i>
	American Kestrel	<i>Falco sparverius</i>
	Sharp-Tailed Grouse	<i>Tympanuchus phasianellus</i>
	Rough-Legged Hawk	<i>Buteo lagopus</i>
	Hoary Redpoll	<i>Acanthis hornemanni</i>
	Lapland Longspur	<i>Calcarius lapponicus</i>
	Snow Bunting	<i>Plectrophenax nivalis</i>
	Sage Sparrow	<i>Artemisiospiza nevadensis</i>
	Brewer's Sparrow	<i>Spizella breweri</i>
	Sage Grouse	<i>Centrocercus urophasianus</i>
	Blue-Winged Teal	<i>Anas discors</i>
	Northern Shoveler	<i>Spatula clypeata</i>
	Gadwall	<i>Mareca strepera</i>
	American Crow	<i>Corvus brachyrhynchos</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Western Meadowlark	<i>Sturnella neglecta</i>
	Mourning Dove	<i>Zenaida macroura</i>
	Ring-Necked Pheasant	<i>Phasianus colchicus</i>
	Wild Turkey	<i>Meleagris gallopavo</i>
Mammals	Pygmy Rabbit	<i>Brachylagus idahoensis</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Thirteen-Lined Ground Squirrel	<i>ctidomys tridecemlineatus</i>
	Coyote	<i>Canis latrans</i>
	Red Fox	<i>Vulpes vulpes</i>
	Stripped Skunk	<i>Mephitis mephitis</i>
	Deer	Cervidae family
	Pronghorn Antelope	<i>Antilocapra americana</i>
	Raccoon	<i>Procyon lotor</i>
^a Source: NDGF, 2022.		
^b Source: WGFD, 2022b.		

3.3.2 Significant Wildlife Habitats

No National Park Service Wilderness Areas, National Wild and Scenic Rivers, National Forests, or USFWS conservation easements or management areas are crossed by the Project.

Most of the areas with open (herbaceous), forest/woodland, and agricultural vegetation in the Project areas provide suitable habitat for wildlife. Federal- and state-listed threatened, endangered, or candidate wildlife species and their habitats are described in section 3.4. Section 8.5 discusses the review conducted for federal, state, recreational, and conservation lands within 0.25 mile of the Project.

3.3.3 Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 USC 703-711), which prohibits the taking of any migratory bird, or a part, nest, or eggs of any such bird, except under the terms of a valid permit issued pursuant to federal regulations. Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 USC 668-668d). Executive Order (EO) 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse effects on migratory birds through enhanced collaboration with the USFWS. EO 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts. On March 30, 2011, the USFWS and the Commission entered into a Memorandum of Understanding (MOU) that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary MOU does not waive legal requirements under the MBTA, Bald and Golden Eagle Protection Act, ESA, Federal Power Act, Natural Gas Act, or any other statutes and does not authorize the take of migratory birds. The nesting season for migratory birds in North Dakota is generally from February 1 to July 15 and in Wyoming is generally from February 1 to August 31. On October 18, 2022, WBI contacted the USFWS North Dakota Ecological Services Field Office (ND ESFO) and the Wyoming Ecological Services Field Office (WY ESFO) for their review of the Project and any comments they may have regarding the MBTA. The ND ESFO noted in their response that while impacts to migratory birds is possible, the lack of wetlands and intact grassland habitat along the Project corridor reduces the concern. The USFWS recommends avoiding impacts to wetlands and intact grasslands to the maximum extent practicable, and recommends minimizing disturbance in areas in close proximity to wetlands and intact grassland during the spring and fall migration periods to avoid stressing migratory birds at those critical times of the year (see appendix 1H). Although the MBTA provides protection for all migratory birds, the USFWS has also developed lists of Birds of Conservation Concern (BCC) to foster proactive conservation actions by federal and state agencies and private parties by focusing first on species of concern (USFWS, 2021). In addition, the U.S. North American Bird Conservation Initiative (NABCI) has developed Bird Conservation Regions (BCRs) to “facilitate domestic and international cooperation in bird conservation” (NABCI, 2022); each BCR has a list of birds present or possibly present within the region that are considered BCC. The entire footprint of the Project falls within the Badlands and Prairies BCR (BCR 17).

In accordance with EO 13186 and the MOU, WBI identified BCC in the Project area. The species listed as BCC, according to the most recent list from 2021 are listed in table 3.3.3-1 and identify bird species of concern including those protected under the MBTA (and some non-MBTA-protected species) that represent the USFWS’ highest conservation priorities that can be found in the Badlands and Prairies BCR (BCR 17).

WBI Energy also reviewed the Project area for intersection with Important Bird Areas (IBAs). IBAs are discrete sites that provide essential habitat for one or more bird species and include habitat for breeding, wintering, and/or migrating birds (National Audubon Society, 2022). The Project activities will not occur within any IBAs.

TABLE 3.3.3-1 Birds of Conservation Concern that Potentially Occur in Badlands and Prairies BCR (BCR 17) ^a	
Common Name	Scientific Name
Western Grebe	<i>Aechmophorus occidentalis</i>
Lesser Yellowlegs (non-breeding)	<i>Tringa flavipes</i>
Willet	<i>Tringa semipalmata</i>
Franklin’s Gull	<i>Leucophaeus pipixcan</i>
California Gull	<i>Larus californicus</i>
Northern Harrier	<i>Circus hudsonius</i>
Ferruginous Hawk	<i>Buteo regalis</i>

TABLE 3.3.3-1
Birds of Conservation Concern that Potentially Occur in Badlands and Prairies BCR (BCR 17)^a

Common Name	Scientific Name
Burrowing Owl (Northern)	<i>Athene cunicularia</i>
Long-eared Owl	<i>Asio otus</i>
Lewis's Woodpecker	<i>Melanerpes lewis</i>
Prairie Falcon	<i>Falco mexicanus</i>
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
American Dipper	<i>Cinclus mexicanus</i>
Lark Bunting	<i>Calamospiza melanocorys</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Mountain Plover	<i>Charadrius montanus</i>
Marbled Godwit	<i>Limosa fedoa</i>
Black Tern	<i>Chlidonias niger</i>
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
Short-eared Owl	<i>Asio flammeus</i>
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Sprague's Pipit	<i>Anthus spragueii</i>
Baird's Sparrow	<i>Ammodramus bairdii</i>
Thick-billed Longspur	<i>Rhynchophanes mccownii</i>
Chestnut-collared Longspur	<i>Calcarius ornatus</i>
Grasshopper Sparrow	<i>Ammodramus savannarum ammodramus</i>

^a Source: USFWS, 2021

3.3.4 Bald and Golden Eagle Protection Act

Bald and golden eagles are protected by both the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits the take of a bald or golden eagle adults, juveniles, or chicks including their parts, nests, or eggs without a permit. Take is defined by the BGEPA as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The BGEPA also addresses impacts resulting from human-induced alterations occurring around previously used nesting sites. Work conducted within 660 feet of an active eagle nest during the nesting season (generally, January 15 – July 31 in North Dakota and January 15 – August 15 in Wyoming) may disturb nesting eagles to such a degree that adults abandon the nest, resulting in take of eggs and/or chicks.

A review of aerial imagery determined that suitable nesting habitat for bald and golden eagles is not present within 0.5 mile of the Project area. In addition, in their responses to the Project notification letters, the NDGF and USFWS ND ESFO confirmed that there are no known or historic nests within 0.25 mile of the Project area in North Dakota. The ND ESFO also noted that suitable nesting habitat does not appear to be present and that impacts to eagles are unlikely (see appendix 1H). As of this report, no response has been received from WY ESFO.

3.3.5 Construction and Operation Impacts and Mitigation

3.3.5.1 Pipeline Facilities

The impact of the Project on wildlife habits and species will vary depending on the habitat requirements of the particular species, and the existing habitat within the Project area. Construction activities like vegetation clearing and noise will reduce feeding, nesting, and cover habitats until vegetation re-establishes. Mobile species may become disturbed or displaced temporarily from portions of their habitats but will likely return following the completion of construction. Small mammals, insects, amphibians, and reptiles may have a

greater risk of mortality as they are less mobile, and less likely to be able to avoid the Project area during active construction.

Impacts on wildlife are expected to be minimal; however, there is the potential for construction to cause unexpected injury or mortality to wildlife. For example, open trenches and welded pipeline sections could temporarily block wildlife movements across the construction right-of-way, and livestock or other animals could become trapped or injured upon falling into open trenches.

To protect wildlife injury from the open trench, WBI Energy's contractor and EI will be instructed to inspect daily, prior to the day's construction, for wildlife (or livestock) in the trench. Additionally, in locations where wildlife activity is anticipated, WBI Energy may install ramps in the trench at regular intervals to provide an exit for wildlife that may fall into the trench and will provide gaps in spoil piles and pipe stringing to allow wildlife to cross the construction corridor.

Impacts on non-forested upland habitat disturbed by construction will be temporary, and these areas are expected to recover quickly once construction is completed. Similarly, Project-related impacts on emergent wetland habitats will be short term, and the temporary effects on these habitats should have little or no significant impact on their importance to wildlife. A discussion of Project impacts on wetlands is presented in section 2.3.

A variety of migratory birds may occur seasonally along the Project route. Temporary impacts may include avoidance and a temporary loss of foraging and nesting habitat or brooding grounds. The species most likely to be affected are those that are sensitive to forest fragmentation; however, due to a general lack of forested or other habitats in the Project area, permanent habitat fragmentation will be negligible. The Project also has the potential to temporarily alter or otherwise affect other (e.g., open vegetation) foraging habitat; however, such impacts will be minimal since pre-construction conditions will be restored and revegetated within the construction workspaces and construction right-of-way.

Pipeline construction during the migratory bird nesting season (see section 3.3.3) could prevent migratory birds from establishing nests in the Project area and cause them to nest in other locations. To avoid the potential for impacts on birds that have already established nests, WBI Energy's EI(s) will inspect all construction areas immediately prior to construction for the presence of any bird nests. If any nests are observed, WBI Energy will voluntarily suspend ground-disturbing activities (i.e., grading, trenching) within 100 feet of the nest while the USFWS is contacted to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing ground-disturbing activities in the vicinity of an active nest. Furthermore, as specified in the Plan, routine vegetation maintenance will not occur between February 1 and August 31 of any year to minimize the potential for impacts on migratory bird species that may use the permanent right-of-way for nesting. Based on these measures, WBI Energy believes the potential for impacts on migratory birds will be avoided and minimized to the extent possible.

To assess the potential for impact on raptors, WBI Energy's field surveys for the Project in 2019 and 2022 included a 0.5-mile line of sight raptor nest surveys. No raptor, bald eagle, or golden eagle nests were observed during these surveys. WBI Energy understands that raptors often establish new nests and proposes to conduct follow-up surveys immediately prior to construction as part of the migratory bird nest inspections described previously. If active nests are observed, WBI Energy will voluntarily suspend ground-disturbing activities (i.e., grading, trenching) within 0.5 mile of the nest while the USFWS is contacted to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing ground-disturbing activities in the vicinity of an active nest. Based on these measures, WBI Energy believes the Project will not affect raptors.

3.4 THREATENED AND ENDANGERED SPECIES

3.4.1 Existing Resources

Section 7 of the ESA requires federal agencies, in coordination with the USFWS Division of Ecological Services, to verify that actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat for a federally listed species. FERC, as the lead federal agency, is required to coordinate with the USFWS to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the Project, and to evaluate the potential effects of the proposed action on listed species and/or designated critical habitat.

For projects with the potential to affect listed species or designated critical habitat, the FERC must report its findings to the USFWS for those species that may be affected. If it is determined that the proposed action is likely to adversely affect listed species or designated critical habitat, the FERC is required to initiate formal consultation with the USFWS.

WBI Energy submitted Project Notification Letters to both the USFWS ND ESFO and the WY ESFO in October 2022 requesting a review of the Project and comments related to impacts on threatened and endangered species. The ND ESFO noted some concerns regarding Project impacts on whooping cranes and Dakota skipper; these issues are discussed in each species' section below (see appendix 1H).

WBI Energy also conducted a review using the USFWS Information for Planning and Consultation (IPaC) website (USFWS, 2022a) for a list of federally listed species and designated critical habitat that may be present in the proposed Project areas (see table 3.4.1-1). Designated critical habitat is not present in the proposed Project areas; official species lists from the USFWS ND ESFO and the WY ESFO can be found in appendix 1H. An effects analysis of Project impacts on federally listed species is provided in section 3.4.2.

TABLE 3.4.1-1 USFWS Federally Listed Species Potentially Present in Grasslands South Expansion Project Areas ^a			
Scientific Name	Common Name	Status	County/Project Area
<i>Myotis septentrionalis</i>	Northern long-eared bat	Threatened	Dunn County
<i>Charadrius melodus</i>	Piping plover	Threatened	Dunn County
<i>Calidris canutus rufa</i>	Rufa red knot	Threatened	Dunn County
<i>Grus americana</i>	Whooping crane	Endangered	Dunn County
<i>Hesperia dacotae</i>	Dakota skipper	Threatened	Dunn County
<i>Spiranthes diluvialis</i>	Ute's Ladies'-tresses	Threatened	Landeck Compressor Station
<i>Danaus plexippus</i>	Monarch butterfly	Candidate	All
^a USFWS, 2022a.			

WBI Energy initiated consultation with the North Dakota Parks and Recreation Department (NDPRD) on October 18, 2022 to obtain state-listed species of special concern that may occur within the North Dakota portion of the Project area. The NDPRD responded on October 26, 2022 indicating no known plant and animal species of concern or significant ecological communities are documented within or immediately adjacent to the Project (see appendix 1H). An evaluation of the potential for the Project to have an impact on these species is provided in section 3.4.2.

WBI Energy initiated consultation with the Wyoming Game and Fish Department on October 18, 2022, to request their review of the Project for potential impacts to sensitive resources under their purview. The WGFD responded on November 14, 2022 confirming that the Landeck Compressor Station site is located

outside of big game crucial ranges and migration corridors, greater sage-grouse core area habitat, and the 2-mile Timing Limitation Stipulation buffers associated with occupied non-core area sage-grouse leks. The review also noted that known raptor nests are located in the vicinity of the Landeck Compressor Station project area, and recommended conducting surveys to determine the activity status of any raptor nests near the site. If active nests are identified and Project activities will overlap with the raptor nesting season, the WGFD recommends consulting with the USFWS on nest activity buffers. In addition, the WGFD made recommendations regarding use of Best Management Practices for erosion and sediment control including:

- Locating staging sites at least 300 feet from any aquatic or riparian habitat.
- Properly containing stockpiles of materials and locating them away from waterways or areas of potential storm water concentrated flow.
- Cleaning, fueling, and maintaining vehicles and equipment at designated off-site areas.
- Preserving existing vegetation wherever possible.
- Stabilizing all exposed surfaces with vegetation, mulch, and/or soil binders.
- Utilizing rolled erosion control products, temporary slope drains, fiber rolls, compost socks, and/or silt fences where appropriate.

WBI Energy also requested a Natural Heritage Review utilizing the Wyoming Natural Diversity Database (UWYO, 2022). While Wyoming does not have a state statute against incidental take of state-listed species, the state does maintain a list of species of concern (SOC) which are either “rare, endemic, disjunct, threatened, or otherwise biologically sensitive” and are considered SOC if they are “vulnerable to extirpation at the global or state level due to their rarity (e.g., restricted distribution, small population size, low population density); inherent vulnerability (e.g., specialized habitat requirements, restrictive life history); and/or threats (e.g., significant loss of habitat, sensitivity to disturbances)” (UWYO, 2022).

SOC are ranked using a standardized ranking system developed by NatureServe (NatureServe, 2022) to identify the level of risk the population currently faces. At the state level, the rankings are defined as:

- 1 = critically imperiled
- 2 = imperiled
- 3 = vulnerable
- 4 = apparently secure
- 5 = secure

The Natural Heritage review identified a number of SOC which are predicted to be within 1 mile of the Big Horn Gas Interconnect and Landeck Compressor Station sites (see appendix 1H). For the purposes of this analysis, only species ranked S1-S3 were considered (see table 3.4.1-2) and only those species whose occurrence is considered regular, meaning they are known or strongly suspected to commonly occur.

TABLE 3.4.1-2 Wyoming Species of Concern Potentially Present within 1 Mile of the Grasslands South Expansion Wyoming Landeck Compressor Station and Big Horn Gas Interconnect Sites			
Scientific Name	Common Name	State Rank ^a	County/Project Area
<i>Botaurus lentiginosus</i>	American Bittern	S2S3	Landeck
<i>Chlidonias niger</i>	Black Tern	S1	Both
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S2S3	Both
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	S2S3	Both
<i>Dolichonyx oryzivorus</i>	Bobolink	S2S3	Both
<i>Athene cunicularia</i>	Burrowing Owl	S3	Both
<i>Calcarius ornatus</i>	Chestnut-collared Longspur	S3	Both
<i>Aechmophorus clarkii</i>	Clark's Grebe	S2S3	Both
<i>Sterna forsteri</i>	Forster's Tern	S1	Big Horn
<i>Hiodon alosoides</i>	Goldeye	S2	Big Horn
<i>Melanerpes lewis</i>	Lewis's Woodpecker	S3	Both
<i>Numenius americanus</i>	Long-billed Curlew	S3S4	Big Horn
<i>Charadrius montanus</i>	Mountain Plover	S3	Both
<i>Lithobates pipiens</i>	Northern Leopard Frog	S3	Both
<i>Lontra canadensis</i>	Northern River Otter	S3S4	Big Horn
<i>Scolochloa festuacea</i>	Rivergrass	S1	Big Horn
<i>Asio flammeus</i>	Short-eared Owl	S1S2	Both
<i>Scaphirhynchus platyrhynchus</i>	Shovelnose Sturgeon	S1	Big Horn
<i>Schoenoplectus heterochaetus</i>	Slender bulrush	S1	Big Horn
<i>Macrhybopsis gelida</i>	Sturgeon Chub	S1	Big Horn
<i>Hybognathus argyritis</i>	Western Silvery Minnow	S2	Big Horn
^a NatureServe, 2022.			

Suitable habitat for Wyoming SOC may be present in the Big Horn Interconnect Project area. However, there is no prohibition against incidental take of SOC. Methods associated with construction of aboveground facilities as described in section 1.5.5 will minimize impacts on sensitive resources, and are not anticipated to have significant impacts to SOC.

WBI Energy conducted a desktop analysis and completed field-based habitat assessments to determine the presence of potentially suitable habitat for federally listed species that may be present within the Project area. Field-based general habitat assessments were conducted in summer 2019 and summer and fall 2022. The following sections discuss the potential for protected species to be present in the Project areas and discuss the avoidance and minimization measures WBI Energy will implement to ensure Project activities do not result in unauthorized take of said species.

3.4.2 Federally Listed Threatened and Endangered Species

WBI Energy, as the designated ESA Section 7 representative for informal consultation, initiated informal consultation with the USFWS ND ESFO on November 17, 2022. WBI Energy determined that Project activities *may affect, but are not likely to adversely affect* piping plovers, rufa red knots, whooping cranes, and Dakota skippers. The ND ESFO concurred with these determinations in their November 22, 2022 concurrence letter (appendix 1H).

In Wyoming, WBI Energy determined that Project activities would have *no effect* on the Ute's Ladies'-tresses. In a December 21, 2022 response, WY ESFO agreed that there no suitable habitat for Ute's Ladies'-tresses within the Project area and stating the Project is in compliance with the ESA (appendix 1H).

3.4.2.1 Northern Long-eared Bat

The northern long-eared bat is a medium-sized bat of the Vespertilionidae family. Approximately 3.0 to 3.7 inches in length with a wingspan of 9 to 10 inches, the species derives its name from oversized ears relative to other members of the genus *Myotis*. The species overwinters in small crevices or cracks in hibernacula, such as caves and mines. In summer, the species roosts either singly or in colonies under loose bark or in crevices and hollows in both live trees and snags. A habitat generalist, roost tree selection appears also to be opportunistic; the species uses a variety of tree sizes and species. Migration to summer habitat occurs between mid-March and mid-May (USFWS, 2015). In North Dakota, the species is most likely to be found in forested wetlands and riparian areas. The primary threats to the northern long-eared bat are white-nose syndrome, alteration/loss of habitat, and mortality from wind energy.

Potential impacts on individual northern long-eared bats may occur if clearing or construction takes place when the species is breeding, foraging, or raising pups during summer months. Bats may be injured or killed if occupied trees are cleared during this time, and the species may be disturbed during clearing or construction activities due to noise or human presence.

Per the USFWS, suitable habitat for northern long-eared bats is defined as a tract of wooded habitat over 10 acres in size which contains traditional uneven-aged forest structure with understory and trees with loose or flaking bark that can provide roosting habitat, and which is connected by wooded travel corridor to larger tract of roosting or foraging habitat.

Unsuitable northern long-eared bat habitat includes areas with individual trees, fence rows, or small wooded lots (less than 10 acres) that are greater than 1,000 feet from forested/wooded areas; trees found in highly developed urban areas (e.g., street trees, trees in someone yard or business); and a pure stand of less than 3-inch diameter at breast height trees that are not mixed with larger trees (USFWS, 2022b).

Trees found in the Project area in North Dakota are associated with planted windbreaks and wooded stream corridors. In their response to the Project Notification letter, the USFWS ND ESFO noted the lack of potentially suitable habitat for this species in the vicinity of the Project. As such, we believe that Project activities will have *no effect* on northern long-eared bats.

3.4.2.2 Piping Plover

The piping plover (*Charadrius melodus*) is a small (6.5-7 inch) bird, one of several North American plover species but the only one to breed in the Great Plains besides the killdeer (*Charadrius vociferus*). Piping plovers feed on freshwater and marine invertebrates that wash ashore as well as terrestrial and benthic invertebrates. They migrate between breeding grounds in the mid-latitudes of North America and wintering sites along the Gulf and Atlantic coasts in the southeast United States and Mexico (Elliott-Smith and Haig, 2004). Piping plovers arrive on breeding grounds between early April and mid-May and remain for three to four months (USFWS, 2022c).

In the Northern Great Plains, piping plovers use shorelines of prairie lakes and major river systems, including the Missouri River in North Dakota, as breeding habitat; however, over 70 percent of non-riverine habitat use by piping plovers in North Dakota occurred at wetland sites classified as lacustrine/aquatic bed/intermittently exposed (National Wetlands Inventory code L2ABG) with the wetlands ranging in size from 7.4 to 6,360 acres (mean size 370 to 430 acres) (Licht, 2001). Although piping plovers will

occasionally select atypical sites for nesting in the Great Plains, most individuals nesting outside of riverine habitat use the un-vegetated shorelines of alkali lakes (USFWS, 2022c).

Construction activities associated with the proposed Project in North Dakota have the potential to impact individual piping plovers migrating or passing near the Project area. Specifically, noise or presence of humans and equipment involved in construction activities within 0.5 mile of nesting and foraging areas may cause piping plovers to startle and flush from shorelines or avoid the area. Construction activities also have the potential to impact individuals breeding in the vicinity of the Project area in North Dakota. Noise or presence of humans and equipment too close to nesting areas has the potential to prevent breeding pairs from establishing or maintaining a nest or rearing a brood where construction occurs in suitable habitat in North Dakota. In addition, piping plover individuals may be killed or injured, and eggs and nests may be crushed if construction begins in a wetland where piping plovers are breeding. Field-based habitat assessments conducted in 2019 identified nine wetlands with potential alkaline features; an additional saline wetland was identified in 2022. However, none of the features are over 3 acres in size, and therefore would not be considered highly suitable for piping plovers.

Due to high inter-annual variability in water levels and habitat quality at mid-continental wetlands, suitable habitat for breeding piping plovers may or may not be present within 0.5 mile of the Project area in the year of construction. However, piping plovers are uncommon in Dunn County. Data from the International Piping Plover Census conducted in 2011 identified 623 adult piping plovers and 255 breeding pairs in North Dakota; no individuals or breeding pairs were identified in Dunn County (Elliot-Smith et al., 2015). A review of the eBird database of sightings by private individuals identified two records of piping plover from 2011, both located on the shores of the Missouri River (eBird, 2022).

The following species-specific conservation measures will be implemented during the species' nesting period (April 1 – August 15):

- All construction personnel will be trained on the proper identification of the species. If a piping plover is sighted by WBI Energy's contractor or EI(s) within 1 mile of the construction workspace during construction, or if the USFWS notifies WBI Energy of a piping plover sighting within 1 mile of the construction workspace, construction activities will cease until the individual(s) have left the area. Any sightings by WBI Energy's contractor or EI(s) within the construction workspace will be immediately reported to the USFWS and the NDGF.

With these measures in place, we believe Project impacts on the species will be insignificant and/or discountable, and Project activities *may affect, but are not likely to adversely affect* piping plovers.

3.4.2.3 Red Knot

The red knot (*Calidris canutus*) is a large sandpiper measuring 9-10 inches in length noted for its long-distance migration between breeding grounds in the Arctic and wintering areas in high latitudes of the Southern Hemisphere (Baker et al., 2013). Three of the six red knot subspecies occur in the Western Hemisphere. One of these three subspecies – the rufa red knot (*C. canutus rufa*) – may travel as far south as Tierra del Fuego after breeding in the central Canadian Arctic (USFWS, 2020a). Newstead et al. (2013) used geolocation to determine that at least some rufa red knots wintering in the northwestern Gulf of Mexico migrate through the interior of North America and use stopover sites in the Northern Great Plains. Little is known about red knots that migrate through the interior of North America. In the Prairie Provinces of Canada, they are seen much more frequently during spring than fall, and they utilize a variety of foraging habitats including seiche shorelines (wind tide/wave action affected zones of large wetlands), small shallow wetlands, and cultivated fields (Gratto-Trevor et al., 2001).

Construction activities associated with the proposed Project in North Dakota have the potential to impact individual red knots migrating or passing near the Project area. Specifically, noise or presence of humans and equipment involved in construction activities near foraging areas may cause the birds to startle and flush from stopover sites or avoid the area.

Generally speaking, there is minimal suitable stopover habitat along the Project corridor, and it is unlikely that red knots would utilize Project areas. However, due to high inter-annual variability in water levels and habitat quality at mid-continental, suitable stopover habitat for red knots may or may not be present in the vicinity of the Project area in the year of construction. As such, the following species-specific conservation measures will be implemented during the species' migration period (May 15 – June 15 and September 15 – October 15):

- All construction personnel will be trained on the proper identification of the species. If a red knot is sighted by WBI Energy's contractor or EI(s) within 1 mile of the construction workspace during construction, or if the USFWS notifies WBI Energy of a red knot sighting within 1 mile of the construction workspace, construction activities will cease until the individual(s) have left the area. Any sightings by WBI Energy's contractor or EI(s) within the construction workspace will be immediately reported to the USFWS and the NDGF.

With these avoidance and minimization measures in place, we believe Project impacts on the species will be insignificant and/or discountable, and Project activities *may affect, but are not likely to adversely affect* rufa red knots.

3.4.2.4 Whooping Crane

The whooping crane (*Grus americana*) is the tallest bird in North America; adults stand nearly 5 feet tall. Males are larger than females and weigh; captive males and females weigh an average of 16 pounds and 14 pounds, respectively. Adult plumage is primarily white with black primary feathers on the wings, with a red crown and red facial skin often apparent. Adult wing-span averages 7.5 feet. Juvenile plumage is brown or cinnamon throughout with short facial feathers (USFWS, 2022d).

Whooping cranes embark on a bi-annual migration from summer nesting and breeding grounds in Wood Buffalo National Park in northern Alberta to the barrier islands and coastal marshes of the Aransas National Wildlife Refuge on the Gulf Coast of Texas. Cranes assemble in a staging area in north-central Saskatchewan on the second day of fall migration, typically in mid-September. They remain at the staging ground for two to four weeks feeding on waste grain in agricultural fields before beginning the journey south. The migratory corridor is approximately 2,400 miles in length, 220 miles wide, and includes eastern Montana and portions of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and eastern Texas (USFWS, 2022e). The birds arrive in Texas in the weeks between late October and mid-November and remain in the wintering grounds until late March. Spring migration begins between March 25 and April 15, with the last birds leaving the Texas coast by May 1 and arriving in the Wood Buffalo nesting grounds a few weeks later (USFWS, 2022e).

Suitable migratory stopover habitat is present in the vicinity of the Project area and whooping cranes may be present during migration in Dunn County, North Dakota. Although whooping cranes do not breed in North Dakota, construction activities associated with the proposed Project have the potential to impact individual whooping cranes migrating through the area. Specifically, noise and the presence of humans and equipment involved in construction activities may cause migrating whooping cranes (foraging or roosting in stopover habitat) to become more vigilant, startle and/or flush from wetlands or fields or to divert from the area.

Generally speaking, there is minimal suitable stopover habitat along the Project corridor, and it is unlikely that whooping cranes would utilize Project areas. However, to ensure Project activities do not result in unauthorized take of whooping cranes, the following species-specific conservation measures will be implemented during the species' migration periods (April 1 – May 15 and September 10 – October 31):

- All construction personnel will be trained on the proper identification of the species. If a whooping crane is sighted by WBI Energy's contractor or EI within 1 mile of the construction workspace during construction, or if the USFWS notifies WBI Energy of a whooping crane sighting within 1 mile of the construction workspace, construction activities will cease until the individual(s) have left the area. Any sightings by WBI Energy's contractor or EI within the construction workspace will be immediately reported to the USFWS and the NDGF.

With these avoidance and minimization measures in place, we believe Project impacts on the species will be insignificant and/or discountable, and Project activities *may affect, but are not likely to adversely affect* whooping cranes.

3.4.2.5 Dakota Skipper

The Dakota skipper (*Hesperia dacotae*) is an obligate of high-quality untilled prairie habitat that is dominated by native species; it uses dry-mesic mixed grass and wet-mesic tallgrass prairie remnants characterized by alkaline and composite soils (McCabe, 1981; Royer and Marrone, 1992). Soil conditions (e.g., moisture, humidity, pH, surface temperature, near-surface humidity, compaction) are elements in skipper habitat suitability and influence larval survival (Cochrane and Delphey, 2002).

The species composition associated with wet-mesic tallgrass differs from that of dry-mesic mixed grass habitats. Big and little bluestem (*Andropogon gerardii* and *Schizachyrium scoparium*) predominate wet-mesic sites (these habitat patches typically contain three nectar plants that bloom synchronously with the adult skipper flight period), including the wood lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and smooth camus (*Zigadenus elegans*). Dry-mesic upland sites are typically found in rolling terrain and are characterized by the bluestems and needle grasses (*Heterostipa* spp.). *L. philadelphicum* and *C. rotundifolia* are also found in these areas, as well as purple coneflower (*Echinacea angustifolia*) and other nectar-producing aster family species (e.g., *Ratibida columnifera* and *Gaillardia* spp.) (USFWS, 2013). Field-based habitat assessments conducted in 2019 and 2022 determined that suitable habitat for the Dakota skipper is present in the southern portion of the Project area in North Dakota; presence/absence surveys for individuals were not conducted and as such, presence of Dakota skippers is assumed. WBI Energy received technical assistance from the USFWS in summer 2022 regarding the extent of suitable Dakota skipper habitat in the Project area. Upon review of the route and habitat assessment results, it was determined that while some of the smaller patches appeared to contain suitable vegetation, given skipper ecology and the isolated nature of these areas, these smaller patches would not likely provide suitable habitat for Dakota skippers. As such, habitat suitable for all life stages is only present in the southern portion of the Project area.

WBI Energy will avoid impacts on delineated suitable habitat by employing guided bore techniques to install the pipeline in these areas. The following measures will be included as part of the construction, operation, and maintenance of the Project to avoid direct and indirect effects of the Project on Dakota skippers and their habitat in locations where they have been assumed to occur:

1. All assumed occupied habitat (as determined by 2019 and 2022 field surveys) has been avoided through the use of route adjustments and guided bore.

2. All construction activities in the guided bore workspaces associated with Dakota skipper habitat avoidance will be conducted outside the species flight period (generally occurs for 2-3 weeks between June 15 – July 31; 2023 dates to be confirmed by USFWS in summer 2023).
3. WBI Energy will erect fencing and signage along the boundaries of the guided bore workspaces associated with Dakota skipper habitat avoidance to ensure the adjacent delineated habitat will be avoided by all aspects of construction (see sheet 7 of the aerial-photo based alignment sheets in appendix 1B).
4. Ground disturbing activities will not be conducted in the area over the guided bore associated with Dakota skipper habitat avoidance and only foot traffic will be permitted.
5. To minimize the risk of Dakota skipper exposure to fugitive dust from soil disturbance, dust abatement measures will be deployed as defined in the Fugitive Dust Control Plan for the Project.
6. To minimize the risk of Dakota skipper exposure to chemicals at all sites where the control of invasive plants (including noxious weeds) will occur and where equipment is staged adjacent to any suitable habitat polygons the following measures will apply:
 - a. Herbicides will be applied using spot treatment methods only (no broadcast application with boom or aerial sprayers) and all applications will occur outside of the Dakota skipper flight period (determined in accordance with item 2 above) and in accordance with label restrictions.
 - b. WBI Energy will restrict aerial application of herbicides within 1 mile of suitable habitat throughout the entire Project area.

With these avoidance and minimization measures in place, we believe Project impacts on the species will be insignificant and/or discountable, and Project activities *may affect, but are not likely to adversely affect* Dakota skippers.

3.4.2.6 Ute's Ladies'-tresses

Ute ladies'-tresses (*Spiranthes diluvialis*) is a federally threatened perennial herb that grows in moist, seasonally flooded soils near wetland meadows, springs, lakes, and streams typically found at elevations between 4,300-6,850 feet. Plants typically inhabit point bars, floodplains, and streambanks with low-growing, relatively sparse grass or forbs. Survey efforts since the species' listing in 1992 have identified the species in disturbed areas including in gravel pits, along irrigation canals, berms, levees, irrigated meadows, roadside barrow pits, reservoirs, and other human-modified wetlands, and have also expanded the elevational range of the species from 720-1,830 feet (220-558 meters) in Washington to 7,000 feet in northern Utah. Ute ladies'-tresses also occur in parts of southwestern Wyoming, western Utah, and extreme eastern Nevada (USFWS 2022f).

All work at the Landeck Compressor Station will be constrained to areas previously disturbed by construction of the station. Suitable habitat for the species is not present within the existing compressor station facility, and Project activities will have *no effect* on Ute's Ladies'-tresses.

3.4.2.7 Monarch Butterfly

The monarch butterfly is a large butterfly with an approximate 3-4-inch wingspan and characterized by bright orange coloring on the wings, with distinctive black borders and veining. The species can be found

in a wide variety of habitats including prairies, grasslands, urban gardens, road ditches, and agricultural fields, provided a supply of nectaring plants are available for adult foraging and milkweed plants are present for laying eggs and as a food source for caterpillars (USFWS, 2022g).

On December 17, 2020, the USFWS published the result of its 12-month review of the monarch butterfly and determined that listing the species under the ESA was warranted but precluded. The species meets the criteria for listing as an endangered or threatened species, but the USFWS cannot currently implement the listing due to limited staff and/or funding, and because there are other listing actions with a higher priority. The species is now a candidate for listing; however, candidate species are not protected under the ESA, and as such, an impact analysis and effects determination are not appropriate at this time (USFWS, 2020b). The USFWS has added the monarch to the updated national listing workplan. Based on its listing priorities and workload, USFWS intends to propose listing the monarch in Fiscal Year 2024, if listing is still warranted at that time (USFWS, 2022h). The USFWS will also conduct an annual status review to determine if changes in prioritization are necessary.

Suitable habitat for monarchs is likely present within the proposed pipeline right-of-way and Big Horn Gas Interconnect. If during the course of this Project the USFWS determines the species should be listed, WBI Energy will review Project activities for potential impacts to the species, develop appropriate avoidance and minimization measures, and consult with the USFWS as appropriate.

4.0 CULTURAL RESOURCES

Resource Report 4 describes the known cultural resources in the Project area, along with the results of cultural resources surveys and related agency consultations for the Project. In accordance with Title 18 CFR Part 380.12(f), Resource Report 4 addresses the nature and extent of cultural resources within the area of potential effects (APE) for the Project. This report includes:

- a description of the APE for the Project and summary of the status of cultural resources investigations undertaken to date;
- an evaluation of potential impacts on identified cultural resources in the APE;
- a summary of consultations between WBI Energy and the North Dakota and Wyoming State Historic Preservation Offices (SHPOs);
- plans for responding to unanticipated discoveries of historic properties or human remains during construction.

The information provided in Resource Report 4 is intended to assist the FERC in complying with Section 106 of the National Historic Preservation Act of 1966 (NHPA). Resource Report 4 describes the potential Project construction and operation impacts on cultural resources and summarizes the results of consultation with federal and state agencies, and other interested parties, as appropriate. Table 4.0-1 summarizes the FERC filing requirements for Resource Report 4 and where each requirement is addressed.

TABLE 4.0-1 Summary of Filing Requirements for Resource Report 4	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Initial cultural resources consultation and documentation, and documentation of consultation with Native Americans (§ 380.12(f) (1) (i) & (2).	Section 4.5.3
Overview / Survey Reports (§ 380.12(f) (1) (ii) & (2).	Appendix 4B
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Identify the project APE in terms of direct or indirect effects to known cultural resources.	Section 4.2, Appendix 4A
Provide a project map with mileposts, clearly showing boundaries of all areas surveyed (ROW, extra work areas, access roads, etc.) and to be surveyed with corridor widths clearly specified.	Appendix 4A
Provide documentation of consultation with SHPOs, THPOs, and applicable land-managing agencies regarding the need for and required extent of cultural resource surveys.	Section 4.5 and Appendix 1H
Provide a narrative summary of overview results, cultural resource surveys completed, identified cultural resources and any cultural resource issues.	Section 4.3 and Appendix 4A
Provide a project specific Ethnographic Analysis (can be part of Overview/Survey Report).	Appendix 4B
Identify by mileposts any areas requiring survey for which the landowner denied access.	Not applicable
Provide written comments on the Overview and Survey Reports, if available, from the SHPOs or THPOs, as appropriate, and applicable land-managing agencies.	Section 4.2 and Appendix 1H
Provide a Summary Table of completion status of cultural resource surveys, and SHPO or THPO and land-managing agency comments on the reports.	Section 4.3.4 and Appendix 1H
Provide a Summary Table of identified cultural resources, and SHPO or THPO and land managing agency comments on the eligibility recommendations for those resources.	Section 4.3.2 and Appendix 1H
Provide a brief summary of the status of Native American consultation, including copies of all related correspondence and records of verbal communications.	Not applicable
Provide a schedule for completing any outstanding cultural resource studies.	Not applicable
Provide an Unanticipated Discoveries Plan for the project area, referencing appropriate state statutes.	Section 4.6 and Appendix 1E-5

4.1 REGULATORY FRAMEWORK

Section 106 of the NHPA, as amended (54 USC 306108), requires federal agencies such as FERC to take into account the effects of an undertaking on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment if historic properties would be adversely affected. Historic properties are defined as cultural resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP). Because the Project is under FERC jurisdiction, it is subject to review under Section 106 of the NHPA, and the implementing regulations found in 36 CFR 800.

The regulations for implementing Section 106 (36 CFR 800) require federal agencies to:

- consult with SHPOs, federally recognized Native American tribes, and other consulting parties for undertakings with the potential to affect historic properties;
- identify any historic properties that may be affected by an undertaking; and
- avoid, minimize, or mitigate adverse effects on historic properties.

To assist FERC in meeting its obligations under the NHPA, WBI Energy conducted Class III archaeological and aboveground resources surveys to identify cultural resource sites, including archaeological sites, architectural properties, and cemetery/burial areas, that may be affected by the proposed Project (see sections 4.3). All materials containing location, character, or ownership information on cultural resources have been filed under separate cover as “CUI//PRIV – DO NOT RELEASE.”

4.2 AREA OF POTENTIAL EFFECTS

The APE is the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character of or use of historic properties, if any such properties exist” (36 CFR 800.16[d]). The APE includes the area that may be affected by construction, operation, and maintenance of proposed facilities and associated activities. It may also extend beyond the limits of the Project’s construction. The APE is defined based upon the potential for effect, which may differ for aboveground resources (historic structures and landscapes) and subsurface resources (archaeological sites). The APE includes all areas where the ground may be disturbed (e.g., TWS, temporary access routes, and staging areas), where land use (e.g., traffic patterns, drainages) may change, or any locations from which historic properties may be affected by visual, auditory, or physical (e.g., emissions) impacts (FERC, 2017).

4.2.1 Area of Potential Effect for Archaeological Resources

For archaeological resources, the APE includes all new permanent right-of-way, TWS, EWS, the Frontier Laydown Yard, and temporary and permanent access roads. The APE encompasses a total of 222.1 acres. The APE is described by state and facility in table 4.2.1-1 and shown in appendix 4A.

TABLE 4.2.1-1 Area of Potential Effects for the Grasslands South Expansion Project	
State/County/Facility	APE (acres)
North Dakota, Dunn County	
Pipeline Facilities	
Temporary Workspace	136.7
Extra Temporary Workspace	26.1
Access Roads	24.7
Frontier Laydown Yard	20.0
Pipeline Facilities Subtotal	207.5

TABLE 4.2.1-1 Area of Potential Effects for the Grasslands South Expansion Project	
State/County/Facility	APE (acres)
Aboveground Facilities	
Bear Creek Receipt Station ^a	3.7
Midpoint Valve	0.2
Manning Compressor Station ^b	4.3
North Dakota Subtotal	215.7
Wyoming, Campbell and Sheridan Counties	
Landeck Compressor Station ^b	1.2
Big Horn Gas Interconnect ^a	5.2
Wyoming Subtotal	6.4
Project Total	222.1
^a Acreage includes temporary and permanent access roads/approaches that will be constructed at this aboveground facility. ^b Temporary workspace required for installation of new equipment and facilities within the existing Manning and Landeck Compressor Stations is fully located within the permanent easement of the facilities.	

4.2.2 Area of Potential Effect for Historic Architectural/Industrial Properties

The APE for indirect effects to historic architectural properties includes areas where Project impacts have the potential to alter character-defining features of an applicable property's significance and through visual, auditory, or physical effects, such as emissions or vibration arising from construction. The APE for indirect effects to architectural properties is limited to Project components that have the potential for permanent impacts to the nature of the aboveground environment. Impacts from the pipeline facilities will be below ground or temporary in nature. Except for the new Midpoint Valve and Bear Creek Receipt Station, permanent impacts from construction planned at the aboveground facilities in North Dakota will be within existing facility fence lines, in areas already containing natural gas facilities. The new Midpoint Valve in Dunn County, North Dakota will be located in an area that already contains multiple oil well pads and related infrastructure, and the Bear Creek Receipt Station in Dunn County, North Dakota will be adjacent to the existing ONEOK Bear Creek Plant. The Big Horn Gas Interconnect in Sheridan County, Wyoming will be in an area with numerous oil and gas facilities, in addition to a railroad and gravel roads, and work at the Landeck Compressor Station in Campbell County, Wyoming will be within the existing facility fence line in a previously graded and graveled area. Project construction in these areas will not result in appreciable changes to the nature of the aboveground environment; therefore, the APE for architectural resources is the same as the APE for archaeological resources described in section 4.2.1. No buildings or structures will be impacted by Project construction.

4.3 CULTURAL RESOURCE INVESTIGATIONS

WBI Energy's cultural resources review has been conducted in accordance with Section 106 of the NHPA. The inventories were conducted in accordance with the U.S. Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44716) and with the state-mandated guidelines for cultural resources investigations in North Dakota (SHSND, 2020) and Wyoming (Wyoming SHPO, 2022). Technical reports associated with the Class III inventories are included in appendix 4B. Due to the sensitive nature regarding the location of archaeological resources, the reports in appendix 4B are filed separately in Volume IV and labeled "CUI//PRIV – DO NOT RELEASE."

4.3.1 Overview Results

The initial phase of the archaeological and architectural investigations involved background research to gather information from previous cultural resource investigations and on known archaeological sites and

historic architectural or industrial properties within 1 mile of the Project APE. The following methodology was used to complete the overview:

- Identification of any known archaeological sites and previously recorded historic architectural/industrial properties through background research and state site file searches. Data pertaining to the known sites, including their locational, functional, and temporal characteristics, and current NRHP status were reviewed where applicable.
- Review of recent cultural resource management surveys performed where the proposed Project is located.
- Review of primary and secondary historic information (e.g., maps, county histories) to learn of areas where previous structures and landscapes were potentially located.

WBI Energy initially conducted background research using information on file at the State Historical Society of North Dakota and through the Wyoming Cultural Records Office (WYCRO) at the Wyoming SHPO and the online WyoTrack database. Research was completed to identify previously documented archaeological sites, cemetery/burial sites, historic architectural properties, and previously completed cultural resources surveys within 1 mile of the pipeline route. Background research also included a review of published historic documents and maps available through online sources, and an examination of current topographic maps and aerial photographs to understand modern land use and provide a baseline for examining historic maps and documents. A list of previously reported cultural resources within the APE is presented in table 4.3.2-1. Detailed information on the frequency and type of previously documented cultural resources in the vicinity of the Project and a more detailed description of the environmental, prehistoric, and historic settings for the Project are presented in the technical reports in appendix 4B.

WBI Energy conducted North Dakota and Wyoming Class III cultural resources surveys of the APE following the North Dakota SHPO Guidelines Manual for Cultural Resource Inventory Projects (SHSND, 2020), the published Wyoming state guidelines for Class I and Class III inventories and reporting (Wyoming SHPO, 2022). The initial surveys consisted of a systematic surface survey augmented by the excavation of shovel test pits. Pedestrian surface survey was conducted in 15-meter transects. Ground surface visibility was good (70 percent) in the Wyoming APE, and no subsurface testing was warranted. In North Dakota, surface survey was augmented by shovel testing in areas with low (less than 25 percent) ground surface visibility and within identified sites to characterize soils and determine the potential for intact, subsurface cultural resource deposits. Areas that were covered by standing water, pavement, obvious prior disturbance, or excessive slope (more than 15 degrees) were not tested. Excavated soils were hand screened through a 0.25-inch hardware mesh and soil profiles were recorded for each test pit on standardized forms. All test pits were filled following excavation to restore the ground surface to its original contour. Digital photographs were taken of the general survey area and recorded on standardized logs. Locations of test pits, archaeological sites, and surface features were documented using Global Positioning System (GPS) data and photographs.

Where necessary, site evaluations were completed using 1 × 1 meter test units. Units were excavated in 10-centimeter levels until one or more sterile levels, or strata, were encountered, depending on soil characteristics. Vertical control was maintained using a datum placed at the highest corner of the test unit. Recovered cultural material was bagged by lot and identified by excavation level. Excavated soils were hand screened through 0.25-inch hardware mesh. Sediments and soil horizons were described using industry standard scales and color terminology. Upon completion of each unit, a representative profile wall was photographed, and the unit was backfilled.

Identified resources were evaluated for significance using the National Register Criteria for Evaluation found in 36 CFR 60.4 and the National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation (National Park Service, 2005)

4.3.2 North Dakota Cultural Resources Survey Results

The initial Class I literature search was completed in 2019 and updated in 2022, and Class III inventories were completed for the Project in 2019 and 2022. To allow for flexibility during Project planning stages and accommodate Project design changes, surveys covered a larger area than the final Project footprint. The following discussion is limited to survey results and resources relevant to the APE.

The 2019 survey resulted in the updates to three previously reported archaeological sites within the APE (32DU01940, 32DU01950, 21DU01967), and the documentation of five new archaeological sites (32DU02432, 32DU02433, 32DUx0102, 32DUx1550, 32DUx1552, and 32DUx1554). WBI Energy was unable to relocate one previously reported site (32DUx0102) and recommended no further work. Formal evaluations were performed at the three revisited sites within the APE. Following the evaluations, sites 32DU1940 and 32DU1950 were recommended as not eligible for listing in the NRHP. Observations made at the third site (32DU1967) suggest that while the overall site would remain unevaluated, construction for the Project would not likely represent an adverse effect to the site should it be determined eligible at a later date. No historical architecture sites were revisited or documented during the 2019 survey. The 2019 Class III survey results and recommendations were submitted to North Dakota SHPO on March 4, 2022. In a May 16, 2022 letter, North Dakota SHPO responded that they found the report acceptable but did not offer specific comment on the NRHP eligibility findings.

Additional Class III survey was completed for the Project in spring 2022 and fall 2022. During the spring 2022 survey, two new archaeological sites (32DU2530 and 32DU2531) were documented in the APE. A formal testing plan including these two sites was provided to North Dakota SHPO on June 3, 2022, and North Dakota SHPO responded that the plan was acceptable on June 10, 2022. Following formal evaluations, the two sites were recommended not eligible for listing in the NRHP. The spring 2022 survey results and recommendations were submitted to North Dakota SHPO on August 16, 2022. In a response dated September 16, 2022, the North Dakota SHPO concurred that sites 32DU02530, 32DU02531, and 32DU02432 are not eligible for the NRHP, and further concurred that no historic properties would be affected by the Project. During the fall 2022 survey, no previously reported sites were revisited and no new sites were identified. On October 20, 2022, WBI Energy submitted the final negative survey report for the Project, along with a letter summarizing all Class III work to date on the Project. The final SHPO submittal included all NRHP eligibility recommendations for sites identified, revisited, or evaluated for the Project, and provided management recommendations for sites whose currently mapped boundaries intersect the APE but for which no evidence was found during any surveys for the Project (sites 32DU00053, 32DUx0103, 32DUx0104, 32DUx0111, 32DUx0112, 32DUx0113, 32DUx0336, 32DUx1143). On November 7, 2022 the North Dakota SHPO asked that the Class III report be submitted in a different format, and on November 12, 2022 WBI Energy resubmitted the report as requested. In a December 12, 2022 letter, the North Dakota SHPO requested additional information on the submission. On December 13, 2022 WBI Energy provided a revised final copy of the second addendum report that addressed the North Dakota SHPO requests. In a December 19, 2022 response, the North Dakota SHPO concurred with all recommendations.

A summary of the survey results is provided in table 4.3.2-1 and shown on the maps in appendix 4A. Detailed reports on the survey results for the Project are in appendix 4B.

Site Number	Site Type	Previously Reported/New Site	NRHP Recommendation	Recommended Actions
32DU00053	Archaeology, multicomponent, historic dump, cultural material scatter	Previously reported	Not Eligible	No further work
32DU01008	Archaeology, historic quarry/mine	Previously reported	Not Eligible	No further work
32DU01940	Archaeology, precontact cultural material scatter	Previously reported	Not Eligible	No further work
32DU01950	Archaeology, precontact	Previously reported	Not Eligible	No further work
32DU01967	Archaeology, precontact cultural material scatter	Previously reported	Unevaluated	No further work within APE
32DU02432	Archaeology, precontact isolated find	New	Not Eligible	No further work
32DU02433	Archaeology, precontact isolated find	New	Not Eligible	No further work
32DU02530	Archaeology, historic farmstead	New	Not Eligible	No further work
32DU02531	Archaeology, precontact cultural material scatter	New	Not Eligible	No further work
32DUx0102	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0103	Archaeology, precontact site lead	Previously reported	Unevaluated	No further work
32DUx0104	Archaeology, precontact isolated find	Previously reported	Unevaluated	No further work
32DUx0110	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0111	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0112	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0113	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0334	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx0336	Archaeology, precontact isolated find	Previously reported	Not Eligible	No further work
32DUx1143	Archaeology, precontact site lead	Previously reported	Unevaluated	No further work
32DUx1550	Archaeology, precontact isolated find	New	Not Eligible	No further work
32DUx1552	Archaeology, precontact cultural material scatter	New	Not Eligible	No further work
32DUx1554	Archaeology, precontact isolated find	New	Not Eligible	No further work

NRHP = National Register of Historic Places

4.3.3 Wyoming Cultural Resources Survey Results

Background research identified no previously reported cultural resources intersecting the APE in Wyoming. A Class III inventory was conducted in July 2022 for the Big Horn Gas Interconnect. During the survey, no new archaeological sites or architectural properties were identified in the APE. The Class III inventory report for the Big Horn Gas Interconnect was submitted to the Wyoming SHPO on August 16, 2022. The Wyoming SHPO responded on August 25, 2022 and concurred with the recommendation that no historic properties would be affected.

A Class I desktop review was completed for the Landeck Compressor Station and submitted to the Wyoming SHPO for comment on October 20, 2022. A field survey was not conducted at the Landeck Compressor Station because new equipment will be installed within a previously disturbed area inside the fence line of the facility. The Wyoming SHPO responded on October 26, 2022 and concurred with the recommendation that no historic properties would be affected by the Project.

The survey results for Wyoming are shown on the maps in appendix 4A. A copy of the survey report for the Big Horn Gas Interconnect and a copy of the Class I report for the Landeck Compressor Station are presented in appendix 4B.

4.3.4 Status of Surveys/Survey Completion

The Project APE is 222.1 acres. Of this acreage, WBI Energy has completed surveys on 193.3 acres (86.7 percent) and 29.8 acres (13.3 percent) were covered by previous surveys. All necessary surveys have been completed for the Project. Table 4.3.4-1 shows the status of surveys completed for the Project to date.

State/County/Facility	APE (acres)	Surveyed (acres)	Previously Surveyed	Survey Remaining (acres)	Percent Complete
North Dakota, Dunn County					
Pipeline Facilities					
Temporary Workspace	136.7	131.5	5.3	--	100
Extra Temporary Workspace	26.1	25.1	2.1	--	100
Access Roads	24.7	23.0	1.7	--	100
Frontier Laydown Yard	20.0	--	20.0	--	100
Pipeline Facilities Subtotal	207.5	179.5	29.1	--	100
Aboveground Facilities				--	
Bear Creek Receipt Station ^a	3.7	3.2	0.6	--	100
Midpoint Valve ^a	0.2	0.2	--	--	100
Manning Compressor Station ^b	4.3	4.1	0.2	--	100 ^c
Wyoming, Campbell and Sheridan Counties					
Landeck Compressor Station ^c	1.2	1.2	--	--	100
Big Horn Gas Interconnect ^a	5.2	5.2	--	--	100
Project Total	222.1	193.5	29.9	--	100
^a Acreage includes temporary or permanent access roads/approaches that will be constructed at this aboveground facility. ^b 100 percent of the Manning Compressor Station was covered by previous surveys. ^c Temporary workspace required for installation of new equipment and facilities within the existing Manning and Landeck Compressor Stations is fully located within the permanent easement of the facilities.					

4.4 IMPACTS AND AVOIDANCE

The North Dakota and Wyoming Class III archaeological and aboveground resources surveys have not identified any historic properties in the Project APE. Because the North Dakota SHPO and Wyoming SHPO agree with all survey results and recommendations, the Project will have no effect on historic properties.

4.5 STATUS OF CONSULTATIONS AND COMMUNICATIONS

4.5.1 Consultation with North Dakota State Historic Preservation Office

On March 4, 2022, WBI Energy submitted a letter to the North Dakota SHPO introducing the Project and providing the initial Class III survey report for review and comment. On May 16, 2022, the North Dakota SHPO responded that the survey report was acceptable and did not offer specific comment on the NRHP eligibility recommendations. On June 3, 2022, WBI Energy drafted a testing plan for multiple sites identified during Class III surveys, and on June 10, 2022, the North Dakota SHPO responded via email that the plan was acceptable. On August 16, 2022, WBI Energy submitted the Class III addendum report. On September 16, 2022, the North Dakota SHPO agreed with all recommendations in the addendum report and concurred that no historic properties would be affected by the Project. On October 20, 2022, WBI Energy submitted a second Class III addendum report to the North Dakota SHPO, along with a copy of the UDP

for the Project. In a November 7, 2022 response letter, the North Dakota SHPO requested that the Class III be resubmitted in a long format report, including maps clearly showing the most recently surveyed areas. WBI Energy provided the requested materials on November 12, 2022. In a December 12, 2022 letter and email exchange, the North Dakota SHPO requested additional information to confirm the survey area and also asked for clarification on the NRHP eligibility recommendation for site 32DUx0113. WBI Energy provided the additional information and a final revised copy of the second addendum survey report on December 13, 2022. In a December 19, 2022 response, the North Dakota SHPO concurred with the results of the second addendum report and also concurred that no historic properties would be affected by the Project. Copies of correspondence between WBI Energy and the North Dakota SHPO are provided in appendix 1H.

4.5.2 Consultation with Wyoming State Historic Preservation Office

On August 16, 2022, WBI Energy submitted a letter to the Wyoming SHPO introducing the Project and providing the Class III survey report for review and comment. On August 25, 2022, the Wyoming SHPO concurred with the results and recommendations of the Class III survey. A Class I desktop review for the Landeck Compressor Station was submitted to the Wyoming SHPO on October 20, 2022. On October 26, 2022, the Wyoming SHPO concurred that no survey was necessary for the Landeck Compressor Station and that no historic properties would be affected by the Project. On November 23, 2022, WBI Energy provided a copy of the UDP to the Wyoming SHPO. In a November 29, 2022 response, the Wyoming SHPO concurred that the submitted UDP is adequate for the treatment of inadvertent discoveries. Copies of correspondence between WBI Energy and the Wyoming SHPO are provided in appendix 1H.

4.5.3 Communications with Native American Tribes

WBI Energy, as a non-federal party, is assisting the FERC in meeting its obligations under Section 106 of the NHPA, as amended (16 USC § 470[f]) and the implementing regulations at 36 CFR Part 800 by following the procedures at 18 CFR §380.12(f). As stipulated in 18 CFR appendix II of subpart F of Part 157 of the FERC regulations, and discussed in FERC's guidelines (FERC, 2017), consultation with Native American tribes is not required for activities eligible under FERC's blanket certificate program, unless tribal lands are within a project area, in which case, the project sponsor must communicate with those landowner tribes and document any tribal comments. Because the Project falls under the FERC's blanket certificate program and it will not be located on or near designated tribal lands, WBI Energy has not consulted with federally listed Native American tribes for the proposed undertaking.

4.6 UNANTICIPATED DISCOVERIES PLAN

WBI Energy prepared a UDP for construction activities to address the unforeseen discovery of cultural resources or human remains during construction. The plan describes the process of notifying FERC and applicable state and local agencies of the unforeseen discovery of cultural resources or human remains during construction. Copies will be on site during construction, and construction field management and EIs will be trained in its contents. A copy of the UDP is provided in appendix 1E-5.

As mentioned in sections 4.5.1 and 4.5.2, the UDP was provided to the North Dakota SHPO on October 20, 2022 and the Wyoming SHPO on November 23, 2022. In a November 29, 2022 response, the Wyoming SHPO concurred that the UDP is adequate. North Dakota SHPO did not provide any comment on the UDP.

5.0 SOCIOECONOMICS

Based on the scope of the Project, and in accordance with 18 CFR § 380.12(g), Resource Report 5 (Socioeconomics) is not required. Resource Report 5 is required only for applications involving significant aboveground facilities (e.g., compressor stations). The Project does not include major aboveground facilities. For these reasons, Resource Report 5 is not provided in WBI Energy's environmental report.

6.0 GEOLOGICAL RESOURCES

Resource Report 6 describes the geologic resources crossed by the Project facilities. This report identifies potential impacts of the Project on geologic resources, geologic hazards that may potentially affect construction and operation of the facilities, and geologic hazards that may place the facilities and/or public at risk. Where appropriate, mitigation measures are described that are intended to reduce the impact of the Project on geological resources and/or reduce the impact of geological hazards on the facilities. Information contained in this resource report was obtained from desktop analysis and review of available literature. Table 6.0-1 summarizes the FERC filing requirements for Resource Report 6 and where each requirement is addressed.

TABLE 6.0-1 Summary of Minimum Filing Requirements for Resource Report 6	
Minimum Requirement	Location Addressed
Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities. (§ 380.12(h) (1 & 2)) <ul style="list-style-type: none"> Describe hazards to the facilities from mining activities, including subsidence, blasting, slumping or landsliding or other ground failure. 	Section 6.1.4
Identify any geologic hazards to the proposed facilities. (§ 380.12(h)(2)) <ul style="list-style-type: none"> For the offshore this information is needed on a mile-by-mile basis and will require completion of geophysical and other surveys before filing. 	Section 6.1.6
Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities. (§ 380.12(h)(3))	Section 6.1.5
For LNG projects in seismic areas, the materials required by "Data Requirements for the Seismic Review of LNG Facilities," NBSIR84- 2833. (§ 380.12(h)(5))	Not applicable
For underground storage facilities, how drilling activity by others within or adjacent to the facilities would be monitored, and how old wells would be located and monitored within the facility boundaries. (§ 380.12(h)(6))	Not applicable
Additional Information Often Missing and Resulting in Data Requests	
Identify any sensitive paleontological resource areas crossed by the proposed facilities. (Usually only if raised in scoping or if the project affects federal lands.)	Section 6.1.8
Briefly summarize the physiography and bedrock geology of the project.	Sections 6.1.1, 6.1.2, and 6.1.3
If proposed pipeline crosses active drilling areas, describe plan for coordinating with drillers to ensure early identification of other companies' planned new wells, gathering lines, and aboveground facilities.	Section 6.2
If the application is for underground storage facilities: <ul style="list-style-type: none"> Describe monitoring of potential effects of the operation of adjacent storage or production facilities on the proposed facility, and vice versa; Describe measures taken to locate and determine the condition of old wells within the field and buffer zone and how the applicant would reduce risk from failure of known and undiscovered wells; and Identify and discuss safety and environmental safeguards Identify and discuss safety and environmental safeguards required by state and federal drilling regulations. 	Not applicable

6.1 GEOLOGIC SETTING

6.1.1 Physiography and Topography

Project facilities in North Dakota are located within the Rolling Soft Shale Plaine Major Land Resource Area (MLRA) of the Northern Great Plains Spring Wheat Region (USGS, 2022b). The geologic terrain of this MLRA is characterized by old, moderately dissected rolling plains with some local badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most major drainages. Elevation within this MLRA ranges from 1,650 feet in the east to 3,600 feet in the west. Maximum local relief is roughly 330 feet, though relief is considerably lower in most areas. The Knife, Heart, Cannonball, and Cedar Rivers,

which are major tributaries of the Missouri River in North Dakota, drain this area. In addition, the Grand and Moreau Rivers in South Dakota drain the southern part of the area (USGS, 2022b).

Project facilities in Wyoming are in the Northern Rolling High Plains, Southern Part MLRA which covers most of the Powder River Basin. This MLRA is in the Missouri Plateau, unglaciated section of the Great Plains province of the Interior Plains. It is an area characterized by old plateaus and terraces that have been deeply eroded. Elevation within the MLRA generally ranges from 2,950 to 5,900 feet, increasing gradually from north to south; a few buttes are as high as 6,890 feet. Generally, local relief is about 150 to 250 feet. Slopes are typically gently rolling to steep, and wide belts of steeply sloping badlands border a few of the larger river valleys. Terraces are common along most of the major river systems in the area. In places flat-topped, steep-sided buttes rise sharply above the general level of the plains (USGS, 2022b). Local topography of the Project area is illustrated in the topographic maps provided in appendix 1A.

6.1.2 Surficial Geology

In North Dakota, surficial geology at the Project facilities is largely associated with the Sentinel Butte Formation (NDGS, 2003; NDSG, 2022a). The Sentinel Butte Formation generally consists of lithologies similar to the underlying Bullion Creek Formation, which consists of brightly colored (yellows and tans) and poorly lithified claystones, mudstones, and siltstones with subordinate amounts of fine-grained sandstones and lignite, but usually exhibits somber gray to brown colors. Both formations were deposited in similar Paleocene settings. The Sentinel Butte Formation can be over 700 feet thick in the northern extent and 300 feet thick in southern areas (NDGS, n.d.[a]); state data indicates the average thickness of this formation is 200 meters (656 feet) (NDSG, 2022a).

The Project also traverses proglacial geologic channels associated with the Oahe formation (NDSG, 2022a). The Oahe formation largely consists of unlithified silt, with the proglacial channels generally containing sand and gravel, silt, clay, and till (meltwater-channel fill) overlain by recent alluvium of variable thickness (Clayton et al., 1976; NDGS, 2003). State data indicates that the Oahe formation is, on average, 10 meters thick (33 feet) (NDSG, 2022a). Some modern rivers and creeks, such as Branch Knife River and the eastern segments of Deep Creek and Knife River, flow entirely within the course of these proglacial channels. Others, such as the Knife River and Deep Creek, intercept them at right angles, carving more recent channels. Both the Branch Knife River and Deep Creek flow north within proglacial channels that were originally carved by south-flowing water (NDGS, 2003).

North Dakota state data also indicates the presence of a confined surficial aquifer known as the Killdeer aquifer that meanders along the Oahe formation (NDSG, 2022a). These aquifer materials consist of gravels and sands that were deposited by streams in ancient river valleys carved in the region's bedrock. Layers of silt and clay are typically found throughout the aquifer, which on average is 0.75 mile wide. Aquifer deposits range from 3 to 390 feet thick and average around 75 feet thick (NDDEQ, 2021). Additional information about the Killdeer aquifer and consultation with NDDEQ is provided in section 2.1.

In Wyoming, the Wyoming State Geological Survey (WSGS) describes the area around the Landeck Compressor Station as composed of Clinker mixed with scattered residuum, slope wash, and alluvium deposits, and/or bedrock outcrops (WSGS, 1998). The Big Horn Interconnect is located in an area characterized by alluvial fan and gradational fan deposits mixed with scattered slope wash, residuum, and eolian deposits (WSGS, 1998).

6.1.3 Bedrock Geology

The State of North Dakota notes that the bedrock underlying the Project is associated with the Sentinel Butte Formation, which is described above in section 6.1.2 (NDSG, 2022a). According to the Depth to

Bedrock Map of North Dakota, the Project is located in an area of varying bedrock terrain where depth to bedrock may be greater than 250 feet in some places while in others present at the surface (NDGS, 1986). According to the NDDWR, based on available drilling logs, bedrock depths within 1-mile of the North Dakota facilities range from (NDDWR, 2022):

- Location 14609521BB: Completion report notes sands and clays to 110 feet, at which point rock was encountered
- Location 14609528DB: Completion report notes clay and sand up to 110 feet
- Location 14509504BBA: Completion report notes clay and sand up to 60 feet, at which point shale was encountered
- Location 14509516CC: Completion report notes sand and clay up to 54 feet, at which point coal was encountered; the coal encountered at 54 feet, however, was underlaid by clay
- Location 14509528BBB: Completion report notes sand and clay up to 170 feet
- Location 14409506BB: Completion report notes sand can clay up to 84 feet, at which point rock was encountered; the rock encountered at 84 feet however was underlaid by clay and coal
- Location 14409518DB: Completion report notes sand, coal and clay up to 109 feet at which point rock was encountered; the rock encountered at 109 feet, however, was underlaid by clay and additional rock layers
- Location 14409521CD: Completion report notes clay, sand, and coal up to 200 feet

In Wyoming, both Project facilities are in the Powder River Basin. This basin contains the largest deposits of coal in the U.S., as well as important petroleum and uranium deposits (USGS, 2022a). Bedrock geology in this area is associated with the Wasatch Formation (UWYO, 2022b). The main body of the Wasatch Formation (thrust belt) is comprised of variegated red to gray, brown, and gray mudstone and sandstone with conglomerate lenses (UWYO, 2022b). This main body was derived from tectonically active areas to the west of the basin and was deposited in alluvial, fluvial, and lacustrine environments comprised of sandstones, siltstones, mudstones and shales with lignite or coal beds representing wet floodplain settings (Lawrence, 1963). According to the WOGCC based on available drilling logs, bedrock depths within 1-mile of the Wyoming facilities are as follows (WOGCC, 2022b):

- Landeck Compressor Station
 - API 49-005-38624: Completion report notes unconsolidated sandstone to 35 feet, at which point hard shale/coals are encountered
 - API 49-005-33713: Completion report notes shale at 20 feet
 - API 49-005-35501: Completion report's shallowest geologic marker is the Ft. Union at 37 feet measured depth, followed by the Anderson Coal at 148 feet; the report does not specify individual lithology depths above the Ft. Union (which is typically considered to be consolidated sandstones and shales in Wyoming)
 - API 49-005-31744: Completion report's shallowest geologic marker is the Anderson Coal at 182 feet measured depth; however, this report does not specify individual lithology depths above the Anderson Coal
- Big Horn Gas Interconnect
 - API 49-033-20337: Completion report's shallowest geologic marker is the Upper Smith Coal at 180 feet measured depth; mud log indicates clay above the Upper Smith Coal
 - API 49-033-20650: Completion report's shallowest geologic marker is the Upper Smith Coal at 185 feet measured depth; mud log indicates clay, coal, and conglomerate lithologies above the Upper Smith Coal
 - API 49-033-21479: Completion report's shallowest geologic marker is the Upper Smith Coal at 134 feet measured depth (no mud log available)

- API 49-033-20336: Completion report's shallowest geologic marker is the Upper Smith Coal at 225 feet measured depth; mud log indicates clay, coal, and conglomerate lithologies above the Upper Smith Coal

Test borings performed as part of a geotechnical investigation near the Project indicate that claystone sedimentary rock layers—which may present difficulties with respect to relatively hard drilling conditions—are present at depths of 70 feet, 71 feet, and 60 feet based on three separate test bores. For additional information on geotechnical findings, see appendix 1G Geotechnical Assessment Report.

6.1.4 Mineral Resources

In North Dakota, mineral resources in the vicinity of the Project area include aggregate (sand and gravel), coal, clay, and petroleum.

Three-fourths of the state is covered in glacial sediment, which contains sand and gravel as either outwash or as isolated lenses of sand and gravel within till. Beach ridges and deltas that formed along glacial lakes Agassiz and Souris are also important sources of sand and gravel within the state. Sand and gravel deposits from Pliocene to Holocene ages also occur as terrace deposits, and less commonly as pediments, in the western part of the state (NDGS, n.d.[b]). Visual inspection of aerial photography did not indicate the presence of mining or quarrying activities for sand and gravel deposits within 0.25 mile of the Project facilities in North Dakota. Data provided by North Dakota Public Service Commission indicates that there are two abandoned mine lands located in between MPs 14 and 15 and roughly 0.25-mile southeast of MP 15; however, limited details are provided (NDPSC, 2022a). These potential abandoned mine lands are located outside of proposed construction footprints, and therefore would not be impacted by Project-related activities, if present.

Western North Dakota encompasses the largest known lignite deposit in the world, which is estimated to contain more than 350 billion tons of lignite (NDGS, n.d.[c]). All of the economic (or mineable) coal in North Dakota is found within the lower Fort Union Group in western and central North Dakota and dates to the Paleocene age. Active and recently closed lignite mines include the Beulah Mine (Mercer County), Freedom Mine (Mercer County), Falkirk Mine (McClean County), Coyote Creek Mine (Mercer), and the BNI Mine (Oliver County). None of these mines are located within 0.25 mile of the Project facilities in North Dakota. Correspondence with NDGS on October 27, 2022 confirms that there are no economically mineable deposits of coal occurring beneath the Project corridor. Any future lignite mines proposed in North Dakota will be subject to review by the North Dakota Public Service Commission and any potential lead federal agencies.

North Dakota includes bedrock clays, lacustrine clays, and glacial clays. Bedrock clays, especially the kaolinitic-rich, have proven to be the most useful for commercial and industrial uses and are located closest to the Project in the Golden Valley Formation in southern Dunn County. Clays are used for a variety of purposes, including brick making, sewer pipe, drain tile, lightweight aggregate, soaps and cleansers, kitty litter, floor adsorption material, and as a source of alumina. There are no clay mines located within 0.25 mile of the Project facilities in North Dakota (NDGS, 2013).

Hydrocarbons have been produced in North Dakota for decades. The Project facilities in North Dakota are in the Chimney Butte, Killdeer, and Murphy Creek oil fields. In Dunn County, there were 173 operating (productive) oil and gas wells in 2021 (NDSG, 2022b). According to State of North Dakota data (NDSG, 2022a), there are 13 active wells, three wells that had permits which are now canceled, and one well that has been temporarily abandoned within 0.25 mile of Project facilities (see table 6.1.4-1). There are currently no proposed mineral activities near the Project (NDPSC, 2022b).

TABLE 6.1.4-1
Oil and Gas Wells within 0.25 Mile of the Project (North Dakota)

County, State	Well Type	Well Status*	Distance (feet) / Direction	Nearest Milepost
Dunn County, ND	Oil and gas	A	905 / North	0.0
Dunn County, ND	Oil and gas	A	643 / East	0.0
Dunn County, ND	Oil and gas	A	1,144 / Northwest	0.0
Dunn County, ND	Oil and gas	A	936 / West	0.0
Dunn County, ND	Oil and gas	A	981 / West	0.0
Dunn County, ND	Oil and gas	PNC	939 / North	0.0
Dunn County, ND	Oil and gas	A	903 / East	4.7
Dunn County, ND	Oil and gas	A	680 / West	4.7
Dunn County, ND	Oil and gas	A	238 / East	4.8
Dunn County, ND	Oil and gas	A	1,129 / East	4.9
Dunn County, ND	Oil and gas	A	408 / East	4.9
Dunn County, ND	Oil and gas	A	294 / North	9.5
Dunn County, ND	Oil and gas	PNC	500 / Southeast	10.7
Dunn County, ND	Oil and gas	TA	924 / Northeast	11.7
Dunn County, ND	Oil and gas	A	281 / North	11.7
Dunn County, ND	Oil and gas	A	441 / South	11.8
Dunn County, ND	Oil and gas	PNC	587 / West	14.1

Note: A = Active; TA = Temporarily abandoned; PNC = Permit now canceled

In Wyoming, the Project facilities are in the Powder River Basin. The Powder River Basin and the adjoining uplifts in northeastern Wyoming contain significant resources of aggregate, bentonite, subbituminous coal, gypsum, limestone, crude oil, natural gas, and uranium. Major oil and gas fields and extensive surface mines for coal and bentonite are common in this region. For aggregate, the resources of gravel and limestone within the basin are roughly 6 billion short tons and 68 billion short tons, respectively. The total resource of minable bentonite near the margins of the basin is about 193 million short tons. Total reserves of strippable coal in the basin at the beginning of 1990 were approximately 23 billion tons. Minal resources of gypsum in the region total about 888 million short tons. The estimated mean amounts of undiscovered hydrocarbons in the basin are 2.25 billion barrels of recoverable oil and 2.76 trillion cubic feet of gas. The estimated additional resources of uranium in the region are 170 million pounds of U3O8 at \$30 per pound (Harris et al., 1992).

According to WSGS (WSGS, 2022b), there is one coal bed methane well owned by Patriot Energy Resources, LLC within 0.25 mile of the Landeck Compressor Station and three coal bed methane wells owned by Edwards Operating Company, LLC and High Plains Gas, LLC within 0.25 mile of the Big Horn Gas Interconnect. There are no oil wells located within 0.25 mile of the Project in Wyoming (WSGS, 2022b). The closest open pit coal mine, known as the Buckskin Mine, is located roughly 5 miles southeast of the Landeck Compressor Station (WYDEQ, 2022b). WYDEQ does not report any new notices for proposed surface mines near the Project area.

6.1.5 Blasting

Given that the typical thickness of unconsolidated deposits beneath the Project facilities is greater than 50 feet (see section 6.1.2), the need for blasting of shallow bedrock for construction of most of the Project facilities is not anticipated.

6.1.6 Geologic Hazards

6.1.6.1 Seismic Hazards and Faults

The area crossed by the Project in both North Dakota and Wyoming has been tectonically stable for more than 500 million years as evidenced by the lack of recently (less than 1.6 million years old) active faults in the vicinity of the Project area (USGS, 2022c). In addition, the risk of seismic-related events in or near the Project areas is very low according to the USGS National Seismic Hazards mapping program (USGS, 2018). According to USGS, there is a less than 1% chance of seismic activity occurring at all Project facility locations according to short-term induced seismic modeling; long-term seismic activity ratings are very low for Project facilities in North Dakota and low for Project facilities in Wyoming, as further discussed below.

The latest update of the USGS National Seismic Hazard Model defines the potential for earthquake ground shaking for various probability levels across the conterminous U.S. and is applied in seismic provisions for various purposes including building codes, insurance rate structures, risk assessments, and other public policy (USGS, 2018). The output from the National Seismic Hazard Model is a suite of seismic hazard curves calculated on a grid of latitude/longitude locations across the conterminous U.S. that describe the annual frequency of exceeding a set of ground motions (USGS, 2018). The earthquake hazard map illustrating peak ground accelerations having a 2 percent probability of being exceeded in 50 years portray the Project to be located in an area designated as *Lowest Hazard Rating in North Dakota* and *Low Hazard Rating in Wyoming* (USGS, 2018).

In general, North Dakota continues to be in one of the most geologically stable areas of the North American Continent (NDGS, 2016). Earthquakes that have occurred in the state are generally of magnitude (M) 3.0 or less and may occur about once per decade. The largest earthquake to have occurred in the state remains to be the Huff earthquake (July 8, 1968 M 4.4) which is also the first earthquake in the state to have had an instrumentally located epicenter. Prior to this event, the locations of earthquakes in North Dakota were more likely to have been determined by individual reports of observed earthquake intensity effects such as ground shaking (NDGS, 2016). The most recent seismic activity reports in Dunn County were related to a M 1.9 earthquake recorded 25 miles south/southeast of New Town on August 30, 2009, at an estimated depth of 3.1 miles. This earthquake was reported from an earthquake relocation study of seismological data collected during the 2008 to 2012 pass of the EarthScope Transportable Seismic Array through the state. No felt reports were reported (NDGS, 2016).

The Powder River Basin in Wyoming where the Project facilities are located is also classified as belonging to a region of low seismic risk where naturally occurring earthquakes are mainly of scientific interest (Miller et al., 1980). Four M 3.0 or intensity III and greater earthquakes have been recorded in Sheridan County. In 1923, an intensity III earthquake occurred 6.5 miles southwest of Sheridan. An intensity IV earthquake occurred 3 miles east/northeast of Sheridan in 1953. In 1977, a M 3.6 earthquake occurred roughly 6 miles south/southwest of Big Horn. Most recently, a M 3.9 earthquake occurred in northeastern Sheridan County in 1993; no damage was reported (Sheridan County, 2019). In Campbell County, the latest earthquake to occur was in 2020 roughly 9 miles east of Wright (M 3.6). The earthquake was the 12th recorded in Campbell County since records began to be kept in 1967. The largest earthquake in Campbell County was a M 5.1 that was centered 27 miles west of Gillette in 1984; no damage was reported (Gillette News Record, 2020).

Overall, the Project facilities are in low-risk areas regarding seismic hazards and active faults.

6.1.6.2 Liquefaction

Liquefaction is a phenomenon in which saturated or partially saturated soil loses strength and stiffness in response to an applied stress, such as an earthquake or other rapid loading event, causing it to behave like a liquid. Soil liquefaction occurs in loose, granular soils when excess pore pressure generated by earthquake shaking reaches or exceeds the effective stress. Susceptible areas are found along rivers, streams, lake shorelines, and in areas with relatively shallow groundwater (i.e., less than 30 feet from the ground surface). Due to the low potential for earthquakes or other rapid loading events to occur in the vicinity of the Project facilities, as well as the lack of saturated granular soils (see Resource Report 7 for more information on soils), the potential for soil liquefaction to occur in Project areas is low.

6.1.6.3 Landslides

Landslides refer to the gravity-induced downward and outward movement of slope-forming materials and pose the greatest risk to facilities on or near steep slopes or on soil materials that are susceptible to failure, particularly in response to earthquakes, heavy precipitation, or soil saturation.

In the geographic range of North Dakota, landslides are most prevalent within the Little Missouri River Badlands and the slopes of the Killdeer Mountains (NDGS, n.d.[d]). The NDGS indicates there are no landslides that have occurred near the Project (NDGS, n.d.[d]). A map developed by the USGS, however, indicates that a landslide occurred north of the City of Killdeer along Highway 22 on July 21, 2011 (USGS, 2022d). On a scale of 1 (possible), 2 (probable), 3 (likely), 5 (confident), and 8 (high confidence), USGS reports a confidence rating for landslides to occur in the North Dakota Project area of 2 (probable). Due to the Project being located along transportation corridors that are generally of somewhat moderate relief, though, NDGS concluded on October 20, 2022 that the Project's location is consequently free of any mapped landslide areas.

No landslides have been reported to occur near the Project facilities in Wyoming according to the WSGS (WSGS, 2019).

Topographic relief in the Project area is relatively low which further corroborates the USGS map (see appendix 1A).

6.1.6.4 Subsidence

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst dissolution, sediment compaction, oil and gas extraction, underground mines, and groundwater pumping, with groundwater pumping being the main cause of subsidence (USGS, 1999).

The USGS produced a karst map of the continental U.S. depicting sinkhole hotspots and areas having sinkholes in soluble rocks (carbonates and evaporites). These USGS maps do not indicate degrees of karst hazards within the areas depicted, such as susceptibility for sinkhole collapse or flooding. Rather, these maps depict areas containing rock types that, under a very broad definition, have developed or have the potential for developing karst features. Ground collapse potential within these areas varies greatly, and areas having significant karst hazards are only a small subset of the areas delineated (USGS, 2014).

In North Dakota, all Project facilities are in the Williston Basin (USGS, 2014). In the Project area, the Williston Basin does not exhibit carbonate or evaporative rock near the land surface (USGS, 2014).

In Wyoming, all Project facilities are in the Powder River Evaporite Basin (USGS, 2014). In the Project area, the Powder River Basin does not exhibit carbonate or evaporative rock near the land surface (USGS, 2014).

Based on review of the North Dakota Industrial Commission (NDIC) Oil and Gas web viewer, there are no sites classified as an injection well within 10 miles of the Project; the nearest site associated with disposal of produced water is a saltwater disposal well owned by Aqua Terra Water Management USA, LLC that is located 166 feet from MP 11.8; there are no other injection wells located within 10 miles of the Project (NDIC, 2022). In Wyoming, the nearest underground injection well is located roughly 8 miles from the Landeck Compressor Station.

Because no hazardous karst terrain is present within the Project area, and activities such as underground mining are limited or non-existent in the Project area, the potential for subsidence in the Project area is negligible. Oil and gas extraction is present within the Project area, though there are no underground injection wells of any source (e.g., gas, water, slurry) located near Project facilities. There are also no abandoned mine lands located within proposed Project-related construction areas (NDPSC, 2022a). In Wyoming, there may be risk of subsidence associated with the abundance of coalbed methane wells located near Project facilities, as studies have previously documented a correlation of subsidence to coalbed methane production in the Powder River Basin (Grigg et al., 2013). Data collected from 1997 to 2000 and 2004 to 2007 indicate 47 and 83 millimeters of subsidence, respectively, with the major subsidence signals correlating spatially with the areas of greatest groundwater drawdown (Grigg et al., 2013). However, existing facilities associated with the Project in Wyoming and nearby infrastructure not associated with the Project are not known to experience subsidence issues; therefore, subsidence issues are not expected for existing and new facilities associated with the Project.

6.1.7 Flash Flooding

The pipeline route crosses two Zone A (100-year) and Zone B (500-year) floodplains near MP 6.5 (Spring Creek) and MP 6.8 (Unnamed Tributary to Spring Creek) (see figure 2.2.4-1). Zone A floodplains are areas subject to inundation by a 1 percent annual chance flood event (100-year flood), generally determined using approximate methodologies. Zone B floodplains are subject to inundation by a 0.2 percent annual chance flood (500-year flood). The Project aboveground facilities in Wyoming and their associated workspace are not located in floodplains. Soil data obtained from the NRCS supports these findings, with only 3 percent of soils being designated as poorly drained (USDA-NRCS, 2022b).

6.1.8 Paleontological Resources

The surficial and bedrock geology in North Dakota is associated fluvial and lacustrine systems deposited during the Paleocene Epoch between about 60-55 million years ago. Paleocene age continental rock formations in North Dakota have generally been considered sparsely fossiliferous (NDGS, n.d.[a]). The Paleontology Department of the North Dakota Mineral Resources also reports zero fossils in collection for Dunn County, North Dakota (North Dakota Department of Paleontology, 2022). Therefore, the potential for the Project to impact paleontological resources is considered minimal. Paleontological resources on land owned by the State of North Dakota and its political subdivisions are protected and managed under Chapter 54-17.3 of the NDCC and Chapter 43-04 of the NDAC. A permit is required to investigate, excavate, collect, or otherwise record paleontological resources on these lands (NDSG, 2011).

Geologic formations in Wyoming bear a wide range of fossils, representing life forms from nearly every geologic time period (WSGS, 2022c). Of the Precambrian, Paleozoic, Mesozoic and Cenozoic Eras, only the Cenozoic Era has potential to yield fossils in Wyoming where the Project is located (WSGS, 2022c). All fossils and paleontological deposits on state lands are the property of the State of Wyoming and removal

of specimens from these lands shall not be allowed unless authorized by the Board of Land Commissioners through Commercial or Non-Exclusive Scientific Fossil Removal Permits.

6.2 IMPACTS AND MITIGATION

The overall effects of construction and operation of the Project facilities on topography and geology will be temporary and minor. Primary impacts will be limited to construction activities and include temporary disturbance to slopes within the pipeline right-of-way resulting from grading and trenching operations. WBI Energy will minimize impacts by using BMPs during construction that are in accordance with the FERC Plan (FERC, 2013a) including returning surface contours to preconstruction conditions to the extent practicable with the exception of the compressor station and aboveground facilities, where grading and filling will be required to create a safe and stable land surface, and to support facility drainage.

According to State of North Dakota data (NDSG, 2022a), there are 12 active wells within 0.25 mile of Project facilities (see table 6.1.4-1). Prior to construction, WBI Energy will coordinate with each respective drilling operator to communicate planned activities and ensure that any potential conflicts are avoided. Although there are no oil wells located within 0.25 mile of the Project in Wyoming (WSGS, 2022b), WBI Energy will also coordinate with coal bed methane drilling operators located near Project facilities (see Section 6.1.4) prior to construction to avoid any potential interferences.

Data provided by North Dakota Public Service Commission indicates that there are two abandoned mine lands located between MPs 14 and 15 and roughly 0.25 mile southeast of MP 15; however, review of aerial imagery did not indicate the presence of mining or quarrying activities for sand and gravel deposits in these areas. If present, these abandoned mine lands are located a sufficient distance from the Project that they would not be impacted by construction of the proposed pipeline. Therefore, construction and operation of the Project will not impact mineral resources. The use of guided bore methods will minimize potential for slope failures at river crossings.

Paleontological resources on land owned by the State of North Dakota and its political subdivisions are protected and managed under Chapters 54-17.3 and 43-04 of the North Dakota Century Code and North Dakota Administrative Code, respectively. All fossils and paleontological deposits on state lands in Wyoming are the property of the State as specified in the Board of Land Commissioners Rules and Regulations (Chapter 11). In situations where the surface is privately owned and the subsurface (mineral estate) is owned by the State or its political subdivisions (i.e., split estate), there is no necessity or regulatory trigger to enforce protection of paleontological resources; in these instances, WBI Energy will adhere to the stipulations established in applicable surface use agreements. WBI Energy will utilize the guided bore technique to install the pipeline at all state highway right-of-way crossings to avoid surface impacts on paleontological resources. In addition, WBI Energy's EI(s) will be instructed to watch for paleontological materials in the unlikely event that they may be encountered during clearing, grading, or trenching operations, and WBI Energy will notify FERC and other required agencies if fossil materials are encountered.

The Project will be designed and installed in accordance with the DOT's standards found in Title 49 CFR Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, to provide adequate protection from hazards that could cause the pipe and facilities to move or to sustain abnormal loads such as washouts, floods, subsidence, landslides, and earthquakes. Maintained pipeline facilities constructed using modern arcwelding techniques have performed well in seismically active areas of the United States, such as California (O'Rourke and Palmer, 1996). Given the very low potential for seismically induced ground movements in the Project area, there is little risk of earthquake-related impacts on the Project facilities.

7.0 SOILS

Resource Report 7 identifies, describes, lists by milepost, and quantifies by acreage the soils traversed by the Project and activities to manage and mitigate soil impacts during and after construction. Soil characterization information provided is based on review and analysis of the USDA NRCS Soil Survey Geographic Database (SSURGO), which was obtained from the NRCS Web Soil Survey (USDA-NRCS, 2022b). Table 7.0-1 summarizes the FERC filing requirements for Resource Report 7 and where each requirement is addressed.

TABLE 7.0-1 Summary of FERC Filing Requirements for Resource Report 7	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Identify, describe, and group by milepost the soils affected by the proposed pipeline and aboveground facilities. (§ 380.12(l)(1)) <ul style="list-style-type: none"> List the soil associations by milepost and describe their characteristics. 	Section 7.1.1 and Appendix 7A
For aboveground facilities that would occupy sites over 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. (§ 380.12(l)(2)) <ul style="list-style-type: none"> List the soil series, describe their characteristics and percentages within the site. Indicate the onsite percentage of each series that would be permanently affected. Indicate which series are considered "prime or unique farmland". 	Sections 7.1.2.1 and 7.2.2 and Appendix 7A
Describe by milepost potential impacts on soils. (§ 380.12(l)(3,4))	Section 7.1, Appendix 7A
Identify proposed mitigation to minimize impact on soils and compare with the staff's Upland Erosion Control, Revegetation, and Maintenance Plan. (§380.12(l)(5)) <ul style="list-style-type: none"> Identify any measures of the Plan that are deemed unnecessary, technically infeasible, or unsuitable and describe alternative measures that will ensure an equal or greater level of protection. 	Sections 7.2 and 7.3
Additional Information Often Missing and Resulting in Data Requests	
If the applicant generally proposes to adopt the Federal Energy Regulatory Commission staff's Upland Erosion Control, Revegetation, and Maintenance Plan except at certain locations, identify on a site-specific basis locations where alternative measures are proposed, and describe the alternative measures that will ensure an equal or greater level of protection.	Not applicable
Identify invasive species and/or noxious weeds that occur in the area and measure to prevent the introduction and/or spread of these species (if not addressed in Resource Report 3).	Section 3.2.3
Provide documentation of consultation with the U.S. Department of Agriculture's Natural Resources Conservation Service or other applicable agencies regarding seed mixes, erosion control, and invasive species/noxious weeds.	Sections 3.2.3 and 3.2.4

7.1 SOIL RESOURCES

Soil characteristics along the pipeline route and at the associated aboveground facility sites were identified and assessed using the SSURGO database (USDA-NRCS, 2022b). The SSURGO database is a digital version of the original county soil surveys developed by the NRCS for use with GIS. It provides the most detailed level of soils information for natural resource planning and management. SSURGO is linked to an attribute database that gives the proportionate extent of the component soils and their properties for each soil map unit. Soil data derived from the SSURGO database as cited throughout this report were identified from the NRCS soil surveys for Dunn County, North Dakota, and Campbell and Sheridan Counties, Wyoming (USDA-NRCS, 2022b).

SSURGO attribute data consist of physical and chemical soil properties, and interpretive groupings. Some generalized attribute data apply to the whole soil map unit (e.g., prime farmland), whereas more specific data apply to major components (e.g., land capability classification, hydric soil status, or slope class) or layer data for soil horizons (e.g., organic matter, texture, or permeability). The soil attribute data can be used in conjunction with spatial data to describe soil characteristics and limitations for use in a particular area.

Soil series, as established by the NRCS, are soils that are grouped together based on similar soil chemistry and physical properties. One or more dominant soil series compromise a single map unit and represent dominant soil patterns or characteristics that can be mapped on the landscape. Map units can be further differentiated into consociations, complexes, and associations, or undifferentiated groups. In a consociation, delineated areas use a single name from the dominant component in the map unit. Complexes and associations consist of two or more dissimilar components that occur in a regularly repeating pattern. Undifferentiated groups consist of two or more components that are not consistently associated geographically and, therefore, do not always occur together in the same map delineation. These components are included in the same named map unit because their use and management are the same or very similar for common uses. Generally, they are grouped together because some common feature, such as steepness, stoniness, or flooding, determines their use and management (USDA-NRCS, 2022b). The Project crosses both consociations and complexes as outlined in table 7A-1 in appendix 7A.

For purpose of the analyses in this resource report, the dominant soil series within each soil complex was used to infer the overall soil characteristics discussed throughout this report. In all soil surveys, virtually every delineation of a map unit includes areas of soil components or miscellaneous areas that are not identified in the name of the map unit. These areas are called inclusions and are too small to be delineated separately.

Geographically referenced map unit polygons obtained from the NRCS were merged with the digitized Project footprint to provide crossing lengths and acreages of specific soil map units within the Project boundary. The SSURGO database was then queried for attribute data pertaining to prime farmland and hydric soils, water and wind erodible soils, compaction prone soils, rutting potential, soils with revegetation concerns, stony/rocky soils, shallow bedrock, corrosion prone soils, topsoil depth, slope class, and soil chemistry (salinity and pH), as described below.

In most cases, SSURGO soil data are of sufficient accuracy to generally evaluate soil properties, characteristics, and use limitations applicable to pipeline construction. However, SSURGO data are based on averages that may not represent values found at specific locations along the Project. SSURGO data also do not include soils of minor extent that may be found in anomalous but significant amounts at specific locations along the Project.

7.1.1 Existing Soil Resources and Descriptions

All Project facilities within North Dakota are located within the Rolling Soft Shale Plaine MLRA of the Northern Great Plains Spring Wheat Region (USGS, 2022b). The geologic terrain of this MLRA is characterized by old, moderately dissected rolling plains with some local badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most major drainages. Elevation within this MLRA ranges from 1,650 feet in the east to 3,600 feet in the west. Maximum local relief is roughly 330 feet, though relief is considerably lower in most areas. The dominant soil orders in this MLRA are Entisols (e.g., dark colored surface horizon relatively high in organic matter) and Entisols (e.g., little to no horizon development). Soils within this area predominantly have a frigid soil temperature regime, an ustic soil moisture regime (e.g., moisture that is limited but present at a time when conditions are suitable for plant growth), and mixed or smectitic mineralogy. Soils can range from shallow to very deep in this region, and are generally somewhat excessively drained to moderately well drained with predominant loamy or clayey textures (USGS, 2022b).

In Wyoming, the Project facilities are located in the Northern Rolling High Plains, Southern Part MLRA which covers most of the Powder River Basin. This MLRA is characterized by old plateaus and terraces that have been deeply eroded. Elevation within the MLRA generally ranges from 2,950 to 5,900 feet, increasing gradually from north to south; a few buttes are as high as 6,890 feet. Generally, local relief is

about 150 to 250 feet. The dominant soil orders in this MLRA are Aridisols (e.g., soils of arid regions) and Entisols. Soils in this area dominantly have a mesic temperature regime, an aridic moisture regime that borders on ustic, and mixed or smectitic mineralogy. Soils range from shallow to very deep, and are generally well drained with predominant loamy or clayey textures (USGS, 2022b).

Based on review of the SSURGO data, approximately 34 percent of the soils crossed by the Project are soil series complexes consisting of mostly fine soil particles, 30 percent are silty loams, 17 percent are fine sandy loams, 14 percent are loams, and 4 percent are clay loams (USDA-NRCS 2022b). A detailed listing of soil map unit types by MP crossed or within each facility site is provided in table 7A-1 in appendix 7A. A detailed listing of soil characteristics affected by the Project is provided in table 7A-2 appendix 7A.

7.1.2 Standard Soil Limitations

The following subsections discuss the existing soil classifications and potential limitations based on review of the SSURGO data, which specifies soil characteristics related to designations as prime farmland and farmland of statewide importance, and for hydric, water and wind erodibility, compaction prone, revegetation concerns, shallow bedrock, and corrosion prone characteristics. Soils within the Project construction footprint may have more than one limitation associated within a given map unit. The existing soil limitations identified for the pipeline, access roads, Frontier Laydown Yard, and aboveground facilities are summarized below in table 7.1.2-1 followed by supporting context. For a detailed listing of selected physical, chemical, and interpretative characteristics see table 7A-2 in appendix 7A.

7.1.2.1 Prime Farmland and Farmland of Statewide Importance

Prime farmland is defined 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. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding (USDA-NRCS, n.d.).

Farmland of statewide importance is land other than prime or unique farmland that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops. The appropriate state or local government determines statewide important farmland with concurrence from the state conservationist. Generally, these farmlands include areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. In some states or localities, farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law or local ordinance (USDA-NRCS, n.d.).

Based on a query of the SSURGO database, a total of 5.4 acres (roughly 2 percent of total Project footprint) of the soils crossed by the Project are classified as *prime farmland*. Soils classified as *farmland of statewide importance* underlie 70.6 acres of Project facilities (roughly 32 percent of total Project footprint). The remaining 146.1 acres of soils underlying Project facilities (66 percent) are classified as *not prime farmland*, or *prime farmland* or *farmland of statewide importance, if irrigated*. See table 7.1.2-1 and table 7A-2 in appendix 7A for supporting details.

TABLE 7.1.2-1

Summary of Soil Characteristics in the Project Areas (acres) ^a

State/County/Facility	Total Acres	Prime Farmland ^b	Farmland of Statewide Importance ^c	Hydric ^d	Water Erodible ^e	Wind Erodible ^f	Compaction Prone ^g	Revegetation Concerns ^h	Shallow Bedrock ⁱ	Corrosion Prone ^j
North Dakota, Dunn County										
Pipeline ROW	136.7	3.6	41.4	10.6	25.7	0.5	10.6	69.8	17.6	77.1
EWS	26.1	0.6	8.3	0.9	4.3	--	0.9	12.4	4.5	13.7
Access Roads	24.7	0.9	6.5	2.1	3.7	--	2.1	12.0	3.1	15.1
Frontier Laydown Yard	20.0	--	2.6	3.5	--	--	3.5	16.6	--	15.7
Aboveground Facilities										
Manning Compressor Station	4.3	--	4.3	--	--	--	--	--	--	--
Receipt Station	3.7	0.3	2.7	--	--	--	--	0.1	0.1	0.3
Midpoint Valve	0.2	--	0.1	--	<0.1	--	--	0.2	0.05	--
Wyoming, Campbell County										
Landeck Compressor Station	1.2	--	--	--	--	--	--	--	--	1.2
Wyoming, Sheridan County										
Big Horn Gas Interconnect	5.2	--	4.7	--	5.2	--	--	5.2	0.5	--
Total	222.1	5.4	70.6	17.1	38.9	0.5	17.1	116.3	25.9	123.1

^a Soil map units analyzed have multiple characteristics. As a result, the sum of the rows will not equal the total acreages presented in this table. Values provided herein are also subject to rounding.

^b Includes soils classified in the U.S. Department of Agriculture Soil Survey Geographic Database (SSURGO) database as prime farmland

^c Includes soils classified in the SSURGO database as farmland of statewide importance

^d Includes soils that are classified in the SSURGO database as hydric

^e Includes soils with a non-irrigated land capability classification of 4e through 8e or a slope class of 8 percent or greater

^f Includes soils in wind erodibility groups 1 and 2

^g Includes soils that have a loam or finer surface texture and somewhat poor, poor, or very poor drainage class

^h Includes soils with a non-irrigated land capability classification of 4 or greater

ⁱ Includes soils that have bedrock within 60 inches of the soil surface

^j Includes soils classified in the SSURGO database as "high" for the risk of corrosion for uncoated steel

^k Includes compressor stations, interconnect, receipt station and Midpoint Valve

Source: USDA-NRCS, 2022b.

Note: The sum of addends may not total due to rounding.

7.1.2.2 Hydric Soils

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands (USDA-NRCS, 2022b).

Based on a query of the SSURGO database, a total of 17.1 acres (roughly 8 percent of total Project footprint) of the soils crossed by the Project are classified as hydric. The remaining 92 percent of soils crossed by Project facilities (205.0 acres) are classified as non-hydric soils. See table 7.1.2-1 and table 7A-2 in appendix 7A for more details.

7.1.2.3 Erosion Hazards

Soil erosion is the removal of material from the surface soils, which is the part of the soil having an abundance of nutrients and organic matter vital to plant growth. The most common forces causing soil erosion are water (e.g., rainfall, runoff) and wind. Water and wind erosion can be very slow and even hard to detect, or it can be rapid and very apparent. Left without protection such as vegetation or temporary mulch, soil surfaces can be exposed to the full force of wind and water and can be eroded in a short time (Muckel, 2004). Additional details about the soils crossed can be found in table 7.1.2-1 and table 7A-2 in appendix 7A.

Water Erodibility

Map units with a land capability subclass designation of 4e through 8e, which are considered to have severe to extreme erosion limitations for agricultural use and/or an average slope greater than 8 percent, are considered susceptible to water erosion. Approximately 18 percent (38.9 acres) of soils crossed by Project facilities are classified as highly water erodible.

Wind Erodibility

A wind erodibility group (WEG) is a grouping of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to blowing. Soils are placed into WEGs ranging from 1 to 8 on the basis of the properties of the soil surface layer, which correlate to an estimate of potential soil loss ranging from 310 to 38 tons per acre per year, respectively. Wind erodible soils were identified by querying the SSURGO database for soils that have a WEG rating of 1 or 2, or which are highly wind erodible.

Almost 99 percent (222.6) of soils in the Project area are not susceptible to wind erosion. Less than 1 percent (0.5 acres) of soils underlying the Project are classified as highly wind erodible.

7.1.2.4 Compaction Potential

Compaction occurs when moist or wet soil particles are pressed together and the pore spaces between them are reduced. Adequate pore space is essential for the movement of water, air, and soil fauna through the soil. Restricted infiltration results in excessive runoff, erosion, nutrient loss, and potential water-quality problems. Compaction restricts penetration by plant roots and thus inhibits plant growth. Also, it can significantly reduce the rate of rainwater infiltration in urban areas, thus increasing the volume of storm water runoff (Muckel, 2004).

Compaction-prone soils were identified by querying the SSURGO database for component soil series that have: 1) a surface texture of loam with a soil particle size class of fine; and 2) a drainage class of somewhat

poorly, poorly, or very poorly drained. Of the total Project footprint, 17.1 acres (roughly 8 percent) of the soils crossed by the Project are classified as compaction prone.

7.1.2.5 Revegetation Concerns

Successful restoration and revegetation is important for maintaining agricultural productivity and to protect the underlying soil from potential damage, such as erosion. Droughty soils which have a coarse surface texture and are somewhat excessively or excessively drained could prove difficult to revegetate. Drier soils have less water to aid in the germination and eventual establishment of new vegetation. Coarse-textured soils also have a lower water holding capacity following precipitation, which can result in moisture deficiencies in the root zone creating unfavorable conditions for many plants. Additionally, steep slopes and highly acidic or highly alkaline soils could make the establishment of vegetation difficult.

Soils with revegetation concerns can be identified by querying the SSURGO database for soils with a non-irrigated land capability classification of 4 or greater. A total of 116.3 acres (roughly 52 percent of total Project footprint) of the soils crossed by the Project are classified as having revegetation concerns. See table 7.1.2-1 and table 7A-2 in appendix 7A for additional details.

7.1.2.6 Shallow-to-Bedrock Soils

Construction through soils with shallow bedrock could result in the incorporation of bedrock fragments into surface soils. Shallow-to-bedrock soils were identified by querying the SSURGO database for component soil series that have a bedrock contact within 60 inches of the soil surface. Based on SSURGO data, roughly 12 percent (25.9 acres) of soils underlying the Project have a depth to bedrock of less than 60 inches. Based on well driller logs made available by state departments, however, depth to bedrock—that is, geological layers that could act as a restriction to footings and foundation equipment or require blasting to establish a pipeline trench—is much greater than 60 inches in most of the Project area. See sections 6.1.2 and 6.1.3 for more information on surficial and bedrock geography.

7.1.2.7 Corrosion Potential

Corrosion potential is based on the corrosion of steel rating class. Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, pH, and electrical conductivity (EC) of the soil. The risk of corrosion for uncoated steel, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and EC of the saturation extract. A total of 123.1 acres (roughly 55 percent of total Project footprint) of the soils crossed by the Project are classified as prone to steel corrosion. See table 7.1.2-1 and table 7A-2 in appendix 7A for more details.

7.1.2.8 Contaminated Soils

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination typically are minor, because of the low frequency and volumes of equipment spills and leaks. Soil contamination could also occur if hazardous waste is encountered during construction. This could involve septic systems from prior residences, underground storage tanks, buried trash, unidentified oil or gas lines, etc.

A review of the NDDEQ website indicates that there are no brownfield sites located within Dunn County (NDDEQ, 2022b). According to NDDEQ (NDDEQ, 2022c), the following underground storage tank

(USTs) and leaking UST (LUST) are located within 0.25 mile of the Project. No USTs or LUSTs are located within 0.25 mile of the Project facilities in Wyoming (EPA, 2022b).

- Koch Service Inc. UST (Inactive): 0.1 mile east to southeast of MP 7.0.
- S Curves Auto Repair LUST (Inactive): 0.2 mile west of MP 2.1. Cleaned up 5/11/1994.

A review of the EPA's listing of contaminated sites indicates that there are no National Priority List or Superfund Alternative Sites located near the Project area (EPA, 2022c).

The contaminated sites identified within 0.25 mile of the Project are not located within the area that will be disturbed by construction of the Project. For this reason, direct or indirect impacts on these features are not anticipated from construction or operation of the Project. Additional discussion of potential contamination sources can be found in section 2.1.5 and section 8.5.3.

7.2 GENERAL CONSTRUCTION AND OPERATIONAL IMPACTS

Typical soil impacts that may occur during construction include mixing of layers within the soil profile, compaction, rutting, erosion, and alteration of drainage characteristics. Impacts on soil resources will depend on several factors including: the types of soil present, topsoil stripping and segregation from subsoils, and implementation of the restoration procedures, soil compaction mitigation, and revegetation guidelines referenced in the Plan.

7.2.1 Pipeline Construction and Operation Impacts

Construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration along the construction right-of-way have the potential to adversely affect natural soil characteristics (i.e., infiltration, water storage and routing, and nutrient levels), thus reducing soil productivity. Clearing of vegetative cover exposes soil to the effects of wind, sun, and precipitation, which potentially increases soil erosion and the transport of sediment to sensitive resource areas.

During construction, temporary compaction of soils can occur by grading and heavy equipment traffic over the soil surface. Compaction reduces porosity and percolation rates, which can increase runoff potential. Additionally, grading has the potential to mix topsoil with subsoil, potentially resulting in long-term reduction of agricultural productivity. Trench excavation and backfilling also have the potential to cause the mixing of topsoil and subsoil, and to bring rock and/or gravel into the soil surface (where present in the subsoil). These potential impacts can result in an increase in operating and labor costs, decreased agricultural productivity, and potential damage to agricultural field equipment.

Areas of active cropland are present within the Project area and will be affected by Project construction. Potential impacts on cropland may include the following:

- Mixing of topsoil with subsoil, resulting in loss of fertility and productivity
- Rutting and compaction caused by movement of construction equipment
- Interfering with or damaging agricultural drainage or irrigation systems
- Introducing noxious weeds from construction equipment

7.2.2 Aboveground Facility Construction and Operation Impacts

Project construction and operation of the aboveground facilities will result in temporary and permanent impacts on soils. Construction of aboveground facilities will temporarily impact 14.6 acres of soils and permanently impact 2.8 acres (see appendix 7A). Roughly 0.3 acre of aboveground facilities will impact

prime farmland and 11.8 acres will impact farmlands of statewide importance; however, 4.3 of the 11.8 acres are associated with the existing Manning Compressor Station. Construction activities at these sites may result in the loss of soil due to water or wind erosion; however, soils mapped at the proposed sites are not particularly susceptible to erosion when properly vegetated or stabilized.

7.2.3 Access Road Construction/Operation Impacts

Use of the temporary access roads described in section 1.4.1 will affect approximately 24.7 acres. The soils crossed by permanent access roads are identified in appendix 7A as part of the impacts associated with the aboveground facilities.

7.3 SPECIFIC SOIL IMPACTS AND MITIGATION MEASURES

In general, WBI Energy will implement measures in the Plan to avoid, minimize, or mitigate potential effects of pipeline construction on soils. The Plan specifies BMPs that will be used to protect soil productivity and water quality by controlling soil erosion and the loss of topsoil and surface organic matter. This includes stripping topsoil and keeping it segregated from subsoil for use in restoration of the workspaces. Further, WBI Energy will decompact soils, as necessary, upon conclusion of construction to ensure vegetation can be re-established and to protect agricultural productivity.

The Plan outlines the measures WBI Energy will implement to revegetate portions of the right-of-way that are not actively cultivated to a condition that supports the preconstruction land use. A description of specific mitigation measures that will be implemented to address specific soil limitations are provided in the following subsections.

7.3.1 Agricultural Land

Construction in agricultural areas will disrupt ongoing agricultural activities and eliminate use of the land for the duration of construction. Agricultural land and pasture areas will be unavailable within the construction footprint during construction; however, following construction, agricultural activities will be allowed to resume without restrictions. Potential impacts on agricultural soils will be minimized and mitigated in accordance with the Plan and the construction procedures described in section 1.5.4.5. These include measures to conserve and segregate topsoil, alleviate soil compaction, protect existing drainage tile and irrigation systems (if identified), prevent the introduction of weeds, retain existing soil productivity, and replace fencing that is damaged.

7.3.1.1 Topsoil Stripping and Soil Handling

Topsoil mixing with subsoil during construction, backfill, and restoration can affect soil productivity because the mixed topsoil and subsoil can result in lower soil nutrient value, organic matter, and unfavorable soil structure and moisture characteristics. For construction of the Project, topsoil will be segregated in accordance with the Plan to preserve soil productivity.

WBI Energy is proposing to segregate up to 12 inches of topsoil to minimize the potential for impacts on agricultural lands. At a minimum, WBI Energy will strip topsoil from the trench and spoil side along the pipeline alignment, but may also strip topsoil from the working side of the trench line in areas where the potential for mixing surface and subsoils or compaction of topsoil could occur.

Topsoil that has been removed or stripped will typically be stored on the spoil side of the TWS during construction; however, some circumstances may require the topsoil be stored or placed on the working side adjacent to the ditch or at the edge of the TWS. Typical drawings depicting topsoil segregation are provided

in appendix 1D. Implementation of these topsoil segregation measures will help ensure post-construction soil productivity, thereby minimizing the potential for long-term impacts on agricultural lands.

Topsoil stripping protocols will be adjusted as appropriate to minimize potential impacts on agricultural productivity. The following subsections describe the topsoil stripping that will or may be used by WBI Energy during construction depending on existing, known soil conditions and/or conditions at the time of construction.

Trench Plus Spoil-side Topsoil Stripping

Trench plus spoil-side topsoil stripping will remove and reserve the topsoil over the trench and the area used for trench subsoil storage when topsoils are thick, grading of the construction right-of-way is minimal, and moisture conditions are favorable for construction.

Full Right-of-Way Topsoil Stripping

Full right-of-way topsoil stripping may be used in areas where topsoil is thin and there is a potential for mixing topsoil and subsoil due to construction traffic and grading activities. Full right-of-way topsoil stripping may also be used where the potential exists for mixing of topsoil and subsoil when constructing under wet conditions.¹

7.3.2 Erosion

WBI Energy will utilize erosion and sedimentation control devices in accordance with the Plan. Temporary erosion controls (e.g., silt fences, straw bales, or straw logs) will be installed, where appropriate, during clearing to prevent the movement of disturbed soils off the right-of-way or other work areas. As necessary, trench breakers (e.g., stacked sandbags or foam) will be installed in the trench around the pipe to prevent movement of subsurface water along the pipeline. Additionally, temporary slope breakers consisting of mounded and compacted soil will be installed across the right-of-way in areas required by the Plan and Procedures (FERC, 2013a and FERC, 2013b).

Sedimentation and erosion control devices will be inspected on a regular basis by WBI Energy's EI(s) as specified in the Plan and Procedures. As indicated in section 7.1.2.3, wind erosion of topsoil storage piles is not expected to be a concern during construction due to the small amount of wind-erodible soils in the Project area; however, if necessary, WBI Energy will prevent dry topsoil from eroding by installing mulch or tackifier over the piles or by implementing other methods of topsoil conservation.

During construction and restoration, the effectiveness of temporary erosion control devices will be monitored by WBI Energy's EI(s). The effectiveness of revegetation and permanent erosion control devices will be monitored by WBI Energy operating personnel during the long-term operation and maintenance of the pipeline system. Erosion control devices will be maintained in areas that are not actively cultivated until revegetation is successful. Following successful revegetation, the temporary erosion control devices will be removed.

The Plan includes restoration and revegetation measures that include seedbed preparation, fertilization, and seeding to actively promote revegetation. While no seeding of actively cultivated agricultural land is planned, in those locations where seeding is required (e.g., pastureland), WBI Energy will use seed mixes and soil amendments requested by the landowner or the NRCS, and will monitor revegetation after the first

¹ Wet Weather Shutdown. Environmental Inspector (EI) will be trained to observe construction before, during, and after constructing in wet conditions to ensure that impacts to the soils are minimal. When conditions become wet such that safety and soil integrity are compromised, the EI will be able to recommend that construction cease until conditions improve.

and second growing seasons. In agricultural areas, revegetation will be considered successful if crop yields are similar to adjacent undisturbed portions of the cropland. If necessary, WBI Energy will compensate landowners for damaged crops and lost soil productivity. Based on these measures, WBI Energy believes agricultural soils will be restored to agricultural production (where not permanently impacted by aboveground facilities) after construction is complete.

7.3.3 Soil Contamination

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and small volumes of spills and leaks. WBI Energy's SPCC Plan specifies cleanup procedures in the event of soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents. The SPCC Plan is provided as appendix 1E-1. WBI Energy and its contractor will follow the SPCC Plan to prevent and contain, if necessary, accidental spills of any material that may contaminate soils, and to ensure that inadvertent spills of fuels, lubricants, or solvents are contained, cleaned up, and disposed of in an appropriate manner.

WBI Energy reviewed several sources for information regarding the potential for encountering soil and groundwater contamination within or near the Project area (see section 2.1.5 and section 8.5.3). Data provided by North Dakota Public Service Commission indicates that there are two abandoned mine lands located in between MPs 14 and 15 and roughly 0.25 mile southeast of MP 15; however, limited details are provided (NDPSC, 2022c). These potential abandoned mine lands are located outside of proposed construction footprints, and therefore would not be impacted by Project-related activities, if present (visual inspection of these lands do not indicate the presence of past mining activities). There is one UST and one LUST located within 0.25 mile of the Project, though both are inactive and not located within Project work areas. For these reasons, direct or indirect impacts on these features are not anticipated from construction or operation of the Project.

It is possible that unknown sites could be encountered along the pipeline route during construction. If contaminated soils or groundwater are encountered, WBI Energy will implement measures identified in its CEMP (see appendix 1E-2). This plan describes measures for containing and characterizing contaminated media, notifying the landowner and appropriate regulatory agencies of the contamination, and responding to the contaminated media.

7.3.4 Consistency with the FERC Upland Erosion Control, Revegetation, and Maintenance Plan

WBI Energy proposes to follow the requirements in the current Plan.

8.0 LAND USE, RECREATION, AND AESTHETICS

Resource Report 8 describes the potential Project construction and operation impacts on existing and proposed land uses, as well as recreational and visual resources in the surrounding area, and summarizes the results of consultation with federal, state, municipal, and other local agencies, as appropriate. A variety of publicly available information was reviewed to identify and assess the potential impacts the Project may have on land use in the Project area, such as USGS quadrangle maps, aerial imagery and online sources (e.g., Google Earth, Google Maps), and GIS data layers from agencies such as the USGS, USFWS, NDDPR, and NDDWR, among others. Table 8.0-1 summarizes the FERC filing requirements for Resource Report 8 and where each requirement is addressed.

TABLE 8.0-1 Summary of FERC Filing Requirements for Resource Report 8	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Classify and quantify land use affected by: (§ 380.12(j)(1)) <ul style="list-style-type: none"> • Pipeline construction and permanent rights-of-way (§ 380.12(j)(1)); • Extra work/staging areas (§ 380.12(j)(1)); • Access roads (§ 380.12(j)(1)); • Pipe and contractor yards (§ 380.12(j)(1)); and • Aboveground facilities (§ 380.12(j)(1)). For aboveground facilities provide the acreage affected by construction and operation, acreage leased or purchased, and describe the use of the land not required for operation.	Sections 8.1, 8.2, and 8.3; Appendix 8A
Identify by milepost all locations where the pipeline right-of-way would at least partially coincide with existing right-of-way, where it would be adjacent to existing rights-of-way, and where it would be outside of existing right-of-way. (§ 380.12(j)(1)) <ul style="list-style-type: none"> • This may apply to the offshore as well. 	Section 8.3.3
Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent right-of-way and temporary construction right-of-way. (§ 380.12(j)(1))	Appendix 1D
Summarize the total acreage of land affected by construction and operation of the project. (§ 380.12(j)(1)) <ul style="list-style-type: none"> • This applies to the offshore as well. 	Table 8.1-1
Identify by milepost all planned residential or commercial/business development and the time frame for construction. (§ 380.12(j)(3)) <ul style="list-style-type: none"> • Identify all planned development crossed or within 0.25 mile of proposed facilities. 	Section 8.4
Identify by milepost special land uses (e.g., maple sugar stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§ 380.12(j)(4)) <ul style="list-style-type: none"> • This applies to the offshore as well, where it may include oyster and other shellfish beds, special anchoring or lightering areas, and shipping lanes. 	Sections 8.3.1 and 8.5
Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations. (§ 380.12(j)(4)) <ul style="list-style-type: none"> • This applies to the offshore as well. 	Section 8.5
Identify by milepost all natural, recreational, or scenic areas and all registered natural landmarks crossed by the project. (§ 380.12(j)(4&6)) <ul style="list-style-type: none"> • This applies to the offshore as well. • Identify areas within 0.25 mile of any proposed facility. 	Section 8.5
Identify all facilities that would be within designated coastal zone management areas. Provide a consistency determination or evidence that a request for a consistency determination has been filed with the appropriate state agency. (§ 380.12(j)(4&7))	Section 8.5.4
Identify by milepost all residence that would be within 50 feet of the construction right-of-way or extra work area. (§ 380.12(j)(5))	Not applicable
Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project. (§ 380.12(j)(6))	Section 8.5
Describe any measures to visually screen aboveground facilities, such as compressor stations. (§ 380.12(j)(11))	Section 8.6.2

TABLE 8.0-1 Summary of FERC Filing Requirements for Resource Report 8	
Demonstrate that applications for rights-of-way or other proposed land use have been or soon will be filed with Federal land-managing agencies with jurisdiction over land that would be affected by the project. (§ 380.12(j)(12))	Section 8.5
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN A DATA REQUEST	
Identify all buildings within 50 feet of the construction right-of-way or extra work areas.	Not applicable
Describe the management and use of all public lands that would be crossed.	Section 8.5
Provide a list of landowners by milepost or tract number that corresponds to information on alignment sheets.	Appendix 11 (Privileged and Confidential - Volume IV)
Provide a site-specific construction plan for residences within 25 feet of construction or as requested by Federal Energy Regulatory Commission staff.	Not applicable

8.1 EXISTING LAND USE

Land use classification in the Project area was completed using publicly available GIS data from the USGS National Land Cover Database, review of aerial imagery, and observations made during field surveys for the Project (MRLC, 2019). Land use categories within the Project area include the following:

- Agricultural: actively cultivated crop land and hayfield/pasture.
- Forested land: deciduous woody vegetation totaling greater than 20 percent of cover.
- Developed land: aboveground utilities and stations and paved roadways, driveways, gravel, and two-track roads.
- Open land: utility rights-of-way, herbaceous and scrub-shrub uplands.

Project impacts on these land use categories are discussed in the following sections by Project facility (section 8.2) and by land use category (section 8.3); proposed mitigation measures for each land use category are discussed in section 8.3. A summary of the land use categories affected by construction and operation of the Project is provided in table 8.1-1.

Resource Report 1 summarizes the Project's overall land requirements in section 1.4 and table 1.4-1. Wetlands, waterbodies, and floodplains are discussed in Resource Report 2, and Resource Report 3 discusses the vegetation cover types and wildlife habitat that may be affected by the Project.

TABLE 8.1-1 Land Uses Affected by Construction and Operation of the Project (acres)										
State/County/Facility	Agricultural		Forested Land		Developed Land		Open Land		Total ^a	
	Const	Oper.	Const	Oper.	Const	Oper.	Const	Oper.	Const	Oper.
North Dakota, Dunn County										
Pipeline Facilities										
Pipeline Right-of-Way ^b	63.5	43.2	0.1 ^f	0.1 ^f	3.7	2.3	69.4	46.9	136.7	92.5
Extra Temporary Workspace	8.5	--	--	--	0.5	--	17.1	--	26.1	--
Access Roads	5.4	--	--	--	8.5	--	10.8	--	24.7	--
Frontier Laydown Yard	8.2	--	--	--	4.0	--	7.7	--	20.0	--
Pipeline Facilities Subtotal	85.6	43.2	0.1 ^f	0.1 ^f	16.7	2.3	105.1	46.9	207.5	92.5
Aboveground Facilities										
Bear Creek Receipt Station ^c	1.0	0.7	--	--	2.7	--	--	--	3.7	0.7
Midpoint Valve ^d	--	--	--	--	--	--	0.2	0.2	0.2	0.2
Manning Compressor Station	--	--	--	--	4.3	0.1	--	--	4.3	0.1

TABLE 8.1-1
Land Uses Affected by Construction and Operation of the Project (acres)

State/County/Facility	Agricultural		Forested Land		Developed Land		Open Land		Total ^a	
	Const	Oper.	Const	Oper.	Const	Oper.	Const	Oper.	Const	Oper.
Aboveground Facility Subtotal	1.0	0.7	--	--	7.0	0.1	0.2	0.2	8.2	1.0
North Dakota Subtotal	86.6	43.9	0.1 ^f	0.1 ^f	23.7	2.4	105.3	47.1	215.7	93.5
Wyoming, Campbell County										
Landeck Compressor Station ^e	--	--	--	--	1.2	--	--	--	1.2	--
Wyoming, Sheridan County										
Big Horn Gas Interconnect	3.6	1.4	--	--	--	--	1.6	0.4	5.2	1.8
Wyoming Subtotal	3.6	1.4	--	--	1.2	--	1.6	0.4	6.4	1.8
Project Total	90.2	45.3	0.1 ^f	0.1 ^f	24.9	2.4	106.9	47.5	222.1	95.3

^a The sum of addends may not total due to rounding.

^b Temporary workspace will not extend across sensitive features such as waterbodies and roads that will be crossed via guided bores unless a travel lane will be used to cross the feature. Travel lanes will be used for equipment to cross some features (e.g., ditches, waterbodies) that are otherwise avoided by use of the guided bore crossing technique. Travel lanes are shown as TWS on the construction alignment sheets included in appendix 1B and described in section 1.5.3.3. Construction acreage provided reflects all planned crossings of sensitive features.

^c Includes temporary access road AR1.

^d Temporary impacts associated with installation of the Midpoint Valve are included in the acreages for the pipeline. Where the permanent footprint of the Midpoint Valve overlaps with the permanent right-of-way for the pipeline corridor, acreage is assigned to the Midpoint Valve only to avoid double counting.

^e Temporary workspace required for installation of new equipment within the existing Landeck Compressor Station is fully located within a graveled area within the permanent facility site. After installation of the new equipment is complete, gravel will be replaced. No new easement is required and land use would remain the same after construction (graveled, impervious surface); therefore, no new permanent impacts are calculated.

^f Forested land is present within the 50-foot permanent right-of-way of the pipeline along the southern margin of Murphy Creek, but impacts on this land use type would be avoided by use of the guided bore technique; no trees or woody vegetation would be cleared. Section 8.3.2 provides a detailed discussion of how use of the guided bore technique would avoid impacts on forested land.

Source: MRLC, 2019

8.2 LAND USE IMPACTS BY PROJECT FACILITY

The total acreage that will be temporarily impacted during construction of the Project is 222.1 acres, including 207.5 acres for construction of the pipeline and 14.6 acres for construction of the aboveground facilities and installation of new equipment within existing facilities (see table 8.1-1). The total acreage for operation of all Project facilities is 95.3 acres, including 92.5 acres for the pipeline, and 2.8 acres for the new aboveground facilities. The following subsections present a discussion of land use impacts related to construction and operation of the pipeline, EWS, access roads, Frontier Laydown Yard, and aboveground facilities and installation of new equipment within existing facilities. A discussion of impacts and proposed mitigation measures specific to each land use category is presented in section 8.3.

8.2.1 Pipeline Facilities

WBI Energy will use a 75-foot-wide TWS corridor for conventional construction procedures in all areas along the pipeline route. EWS of varying widths will be required adjacent to the TWS in certain locations for specialized construction methods such as guided bore crossings, wetland and waterbody crossings, at the beginning and end of the pipeline, pipeline crossovers, and road crossings. WBI Energy also proposes to install travel lanes within the TWS to cross ditches and other features intersected by the pipeline route. Travel lanes are shown as TWS on the construction alignment sheets included in appendix 1B. Construction and operation impacts associated with the use of travel lanes during construction are accounted for under the TWS acreages for the pipeline in table 8.1-1. In addition, the Frontier Laydown Yard will be used

during pipeline construction and temporary access roads will also be needed to access the TWS and EWS from nearby public roads.

Typical cross-section drawings of the TWS for construction of the Project are provided in appendix 1D. The drawings show the proposed pipeline centerline, topsoil segregation, typical guided bore method, widths and relative locations of new permanent right-of-way boundaries, and temporary construction right-of-way boundaries for each proposed right-of-way configuration, including locations where the proposed pipeline is collocated with or overlapping existing rights-of-way.

TWS for pipeline construction will temporarily impact 136.7 acres of land. The majority of the proposed route is characterized as open land (51 percent) and agricultural land (47 percent). About 3 percent of the pipeline route consists of developed lands and less than 1 percent of the pipeline route is categorized as forested land. WBI Energy will retain a 50-foot-wide permanent easement for operation of the pipeline, which equates to about 92.5 acres of land. After construction, open land, agricultural land, and developed land will be restored and pre-construction land uses will continue. Forested land within the permanent right-of-way (0.1 acre) is located along the southern margin of Murphy Creek; WBI Energy will avoid impacting forested land in this location by using a guided bore to complete the crossing of Murphy Creek. Section 8.3.2 provides additional details about how impacts on forested land will be avoided during construction and operation of the Project. A detailed listing of land use categories crossed by the pipeline centerline is provided in table 8A-1 in appendix 8A.

8.2.1.1 Extra Temporary Workspaces

The total area required for EWS along the pipeline route is 26.1 acres (see table 8.1-1). Of this amount, the land use types affected are open land (66 percent), agricultural land (32 percent), and developed land (2 percent). Following the completion of construction, all land use types affected by EWS will be restored to pre-construction conditions and uses; no permanent impacts on existing land uses will occur from use of EWS for construction of the Project. Table 8A-2, available in appendix 8A, itemizes the land use acreage affected by each EWS by milepost.

8.2.1.2 Access Roads

During construction, temporary access roads will be needed to access the TWS and EWS areas from nearby public roads, and to move equipment along the pipeline corridor. Topographic maps provided in appendix 1A show the location of temporary access roads that will be used during construction of the Project. Table 8.2.1-1 provides a list of access roads that will be used for pipeline construction and quantifies the temporary and permanent acres of impact that proposed access roads would have on existing land uses.

A total of 24.7 acres will be temporarily impacted by the use of access roads during construction of the pipeline (see table 8.1-1). The use of temporary access roads during construction will impact open land (44 percent), developed land (34 percent), and agricultural land (22 percent). Access roads include newly constructed temporary roads, existing roads, driveways, and field access points. No modifications are currently planned for use of the existing paved or gravel access roads; however, improvements (e.g., grading, adding gravel) may be completed where necessary to facilitate ingress and egress of equipment and vehicles, and widening up to 30 feet may be necessary to accommodate the turning radius of some trucks, although no specific locations where existing roads need to be widened have been identified at this time.

Access roads that will be used during construction and operation of aboveground facilities are accounted for in the construction and operation acreage provided for each aboveground facility in table 8.1-1 and

described in section 8.2.2; these roads are not included in table 8.2.1-1. Construction and operation impacts from access roads to aboveground facilities on existing land uses are described in section 8.2.2.

Rock installed for new temporary access roads will be underlain by a geotextile fabric to facilitate removal after construction. WBI Energy also will build temporary approaches from public and/or private roads to gain access to the workspace areas. WBI Energy will employ standard pipeline construction practices to maintain and protect roadside ditches and water flow, if present, including installation of culverts as needed, pursuant to state and county specifications. If necessary, the culverts will be covered with environmentally friendly geotechnical fabric, rock, and dirt. These materials will be removed following construction, resulting in the preservation of the original contours of the ditch. If any existing access roads are damaged as part of the Project, WBI Energy will restore the roads to pre-existing condition or better.

8.2.1.3 Frontier Laydown Yard

WBI Energy has identified the Frontier Laydown Yard (20.0 acres) that will be utilized near the mid-point of the pipeline route (see mapping provided in appendices 1A and 1B). Laydown yards will not be required for the Big Horn Gas Interconnect or installation of new equipment within the Landeck Compressor Station. The Frontier Laydown Yard will be used for pipe and material storage as well as equipment staging and maintenance. The laydown yard will primarily impact agricultural land (41 percent), followed by open land and developed land (39 and 20 percent, respectively). The Frontier Laydown Yard is an existing storage yard located on the west side of 109th Avenue SW. The entire 20-acre yard has previously been disturbed and most of the area is graveled, though some vegetated areas are present on the outer fringes of the yard. Prior to use of the Frontier Laydown Yard for the Project, WBI Energy plans to grade and gravel the entire 20-acre parcel to create a safe working surface for construction equipment and vehicles. The landowner of the yard has requested that WBI Energy leave the improvements in place following construction.

8.2.2 Aboveground Facilities

Construction of aboveground facilities for the Project will primarily impact agricultural, developed, and open land (see table 8.1-1). A discussion of the temporary and permanent impacts related to the construction of or within each aboveground facility is presented below. The specific locations and dimensions of aboveground facilities associated with the Project are shown on the topographic maps and aerial photo-based alignment sheets provided in appendices 1A and 1B, respectively.

TABLE 8.2.1-1
Land Use Impacts from Temporary Access Roads Required for the Project

Facility/ Access Road Number	Approx. MP	Length (feet)	Planned Width (feet)	Existing Road Conditions	Planned Use ^a	Planned Modification	Acres of Impact ^b	Temporary or Permanent	Existing Land Use(s)
Pipeline									
AR2	0.7	1,792	30	New	Pipeline Right-of-Way Access	None	1.2	Temporary	Agricultural, Developed, Open Land
AR3	0.7	206	30	New	Pipeline Right-of-Way Access	None	0.1	Temporary	Developed, Open Land
AR4	1.1	97	30	Field Approach (Dirt/Grass)	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.1	Temporary	Agricultural, Developed
AR5	2.5	810	30	Gravel (Main St.)	Pipeline Right-of-Way Access	None	0.6	Temporary	Developed
AR6	2.8	871	30	New	Pipeline Right-of-Way Access	Use existing approach. Blade to clear vegetation up to workspace.	0.6	Temporary	Developed, Open Land
AR7	3.2	256	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.2	Temporary	Agricultural, Developed, Open Land
AR8	3.4	290	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.2	Temporary	Agricultural, Developed
AR9	3.7	361	30	New	Pipeline Right-of-Way Access	Build temporary approach. Potentially blade to clear vegetation up to workspace (if planted).	0.3	Temporary	Agricultural, Developed
AR10	3.7	4,848	30	Gravel (106 th Ave.)	Pipeline Right-of-Way Access	None	3.2	Temporary	Agricultural, Developed, Open Land
AR12	4.2	345	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.2	Temporary	Developed, Open Land
AR13	5.9	2,200	30	3 rd Street SW	Pipeline Right-of-Way Access	None	1.5	Temporary	Agricultural, Open Land
AR14	6.8	4,138	30	Gravel (3T St.)	Pipeline Right-of-Way Access	None	2.9	Temporary	Agricultural, Developed

TABLE 8.2.1-1
Land Use Impacts from Temporary Access Roads Required for the Project

Facility/ Access Road Number	Approx. MP	Length (feet)	Planned Width (feet)	Existing Road Conditions	Planned Use ^a	Planned Modification	Acres of Impact ^b	Temporary or Permanent	Existing Land Use(s)
Pipeline									
AR15	6.9	452	30	Field Approach and Gravel Lot	Pipeline Right-of-Way Access	None	0.3	Temporary	Agricultural, Developed
AR16	6.9	878	30	Gravel (3 rd St.), Gravel Lot, Grass	Pipeline Right-of-Way Access	None	0.6	Temporary	Agricultural, Developed
AR17	7.2	877	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.6	Temporary	Agricultural, Developed, Open Land
AR19	9.5	2,229	30	Gravel (6 th St. SW)	Pipeline Right-of-Way Access	None	1.5	Temporary	Developed, Open Land
AR20	10.7	2,551	30	Gravel (7 th St. SW)	Pipeline Right-of-Way Access	None	1.8	Temporary	Agricultural, Developed, Open Land
AR22	11.6	1,606	30	New	Pipeline Right-of-Way Access	Blade to clear vegetation up to workspace.	1.1	Temporary	Agricultural, Open Land
AR23	11.7	2,539	30	Gravel (8 th St.)	Pipeline Right-of-Way Access	None	1.8	Temporary	Agricultural, Developed, Open Land
AR26-A	12.5	803	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.6	Temporary	Developed, Open Land
AR26-B	13.1	188	30	Gravel (9 th St.)	Pipeline Right-of-Way Access	None	0.1	Temporary	Developed, Open Land
AR27	13.5	237	30	Gravel	Pipeline Right-of-Way Access	None	0.2	Temporary	Developed, Open Land
AR28	14.1	509	30	Gravel	Pipeline Right-of-Way Access	None	0.4	Temporary	Developed, Open Land
AR29	14.4	543	30	New	Pipeline Right-of-Way Access	Use existing approach. Potentially blade to clear vegetation up to workspace (if planted).	0.4	Temporary	Developed, Open Land
AR30	15.2	86	30	New	Pipeline Right-of-Way Access	Build temporary approach/May need to blade clear of vegetation (if planted) to ROW	0.1	Temporary	Developed, Open Land

TABLE 8.2.1-1 Land Use Impacts from Temporary Access Roads Required for the Project									
Facility/ Access Road Number	Approx. MP	Length (feet)	Planned Width (feet)	Existing Road Conditions	Planned Use ^a	Planned Modification	Acres of Impact ^b	Temporary or Permanent	Existing Land Use(s)
Pipeline									
AR32	15.3	6,077	30	Asphalt (11 th St. SW)	Pipeline Right-of-Way & Manning Compressor Station Access	None	4.2	Temporary	Developed
Pipeline Total		35,789					24.7		
^a Existing road conditions listed as "New" indicate that the proposed access road will be constructed within an area where no road currently exists. ^b Acreage reflects the area temporarily needed for construction, unless noted otherwise. Note: The sum of addends may not total due to rounding. MP = Milepost Source: MRLC, 2019									

8.2.2.1 Bear Creek Receipt Station

Approximately 3.7 acres of land will be needed to construct the Bear Creek Receipt Station. The Bear Creek Receipt Station will be constructed within an approximately 0.8-acre area directly adjacent to the southeastern corner of the Bear Creek Plant. This area is currently categorized as agricultural land in the NLCD data. To access the Bear Creek Receipt Station during construction, WBI Energy will use a 2.9-acre temporary access road (AR1) that is predominantly located within the Bear Creek Plant; this road is not included in table 8.2.1-1. Use of AR1 during construction will temporarily impact 2.7 acres of developed land and 0.2 acre of agricultural land. Following the completion of construction, a 0.7-acre area will be graveled, fenced with chain-link, and maintained for operation of the receipt station, resulting in a permanent conversion of agricultural land to industrial use. The area beyond the fence line of the receipt station (0.1 acre) will be restored to preconstruction condition. AR1 will continue to be used by ONEOK for operation of the Bear Creek Plant. Following construction, AR1 will be returned to ONEOK who will design and construct a permanent access road to the Bear Creek Receipt station from existing plant roads; additional details about the permanent access road are provided in section 1.10 Non-jurisdictional Facilities.

8.2.2.2 Midpoint Valve

The Midpoint Valve will be constructed within the TWS for the pipeline route and, as such, construction impacts for the Midpoint Valve are included in the acreage provided for the pipeline (see table 8.1-1). Following construction, the operational footprint of the Midpoint Valve will be a 50-foot by 50-foot area within the 50-foot-wide permanent right-of-way for the pipeline; this area will be graveled, fenced, and maintained for operation of the valve. WBI Energy will also construct a 30-foot by 178-foot (0.1-acre) permanent access road to the Midpoint Valve; this road is not included in table 8.2.1-1. In total, the operation of the Midpoint Valve and permanent access road will permanently convert 0.2 acre of open land to industrial use.

8.2.2.3 New Equipment within Existing Facilities

Installation of new equipment and facilities at the Manning Compressor Station will impact 4.3 acres of developed land within the existing facility. Following installation of the new equipment, a 50-foot by 50-foot (0.1-acre) area at the end of the pipeline will be graveled for operation of the new pig launcher/receiver, resulting in approximately 0.1 acre of new permanent impacts within the operational footprint of the existing compressor station.

Installation of new equipment at the Landeck Compressor Station will impact 1.2 acres of developed land within the existing facility. After installation of the equipment is complete, gravel will be replaced and the 1.2-acre area will continue to be maintained as developed land. In addition, no new easement is required; therefore, no new permanent impacts would occur.

8.2.2.4 Big Horn Gas Interconnect

The Big Horn Gas Interconnect will be constructed within a 5.2-acre area that is a mix of agricultural (69 percent) and open land (31 percent) (see table 8.1-1). Following the completion of construction, 1.8 acres area will be maintained for operation of the interconnect facility, which will result in a permanent conversion of agricultural and open land to industrial use.

Permanent facilities for the interconnect will include a 0.3-acre area for the valve setting and a 0.7-acre area for the measurement facilities. Both of these areas will be graveled and fenced with chain-link for operation and an approximately 0.6-acre area will be maintained as a permanent gravel access road to the facility. The 50-foot permanent easement (0.2 acre) over the interconnecting pipeline will be maintained in an

herbaceous state. The remaining 3.4 acres that were used as TWS during construction will be restored to preconstruction condition.

WBI Energy will use an existing gravel road that runs perpendicular to Wild Horse Road to access the Big Horn Gas Interconnect during construction of the facility. The road falls entirely within the TWS for the Big Horn Gas Interconnect and, as such, temporary and permanent impacts related to use of this road are accounted for in the construction and operation acreage provided for the Big Horn Gas Interconnect in table 8.1-1; this road is not included in table 8.2.1-1.

8.3 LAND USE IMPACTS AND MITIGATION

Operation of the pipeline may entail vegetative maintenance of the permanent right-of-way and inspection, repair, and cleaning of the pipeline. The land associated with the temporary and permanent right-of-way will be allowed to return to its original condition, and no vegetative maintenance is anticipated to be required in agricultural, open, or developed areas. In addition, WBI Energy is not planning to maintain vegetation where sensitive areas, such as riparian areas, are crossed by the guided bore method (e.g., Jim Creek, Murphy Creek). Where routine vegetative maintenance is conducted within the permanent pipeline easement, large brush may be periodically removed to maintain pipeline integrity and to facilitate aerial surveillance and potential repairs of the pipeline. If conducted, routine vegetation maintenance will be conducted on the pipeline easement in upland areas with a frequency of not more than once every 3 years.

8.3.1 Agricultural Land

Agricultural land is the second most common land use category that will be affected by the Project (see table 8.1-1). A total of 85.6 acres of agricultural land will be temporarily impacted by pipeline construction activities, and 4.6 acres will be temporarily impacted by construction of new aboveground facilities.

WBI Energy will maintain landowner access to fields, storage areas, structures, and other agricultural facilities during construction to the extent practicable. To date, no drain tile or irrigation systems have been identified in the Project area. If irrigation systems or drain tile are present, WBI Energy will work with landowners to minimize or mitigate impacts on these systems.

Crop production on some agricultural lands will be temporarily interrupted for one growing season while pipeline facilities are constructed. In accordance with 49 CFR Part 192.327, pipelines are typically installed with a minimum of 36 inches of cover in normal soils, which should not inhibit future tilling practices. Landowners will be compensated for any temporary or permanent crop loss resulting from construction and operation of the Project. WBI Energy will employ the erosion and sediment control and restoration measures (e.g., soil stabilization, topsoil segregation, compaction avoidance) detailed in the Plan to minimize and mitigate impacts on agricultural lands. Additional descriptions of the construction methods and mitigation measures WBI Energy will implement on agricultural lands are provided in section 1.5.4.5 and section 7.3.1. Crop yields are expected to return to normal after construction and WBI Energy believes impacts on agricultural areas will be minimized to the extent practicable. Agricultural activities will be allowed to continue over the permanent pipeline right-of-way and on land outside of the fence line of WBI Energy's new aboveground facility sites following restoration.

To date, no organic farms or specialty crops have been identified within the Project Area; therefore, no impacts on these resources are anticipated. WBI Energy will continue to work with individual landowners through the easement process to identify organic farms or specialty crops that could be impacted by the Project. If organic farms or specialty crops are identified, WBI Energy will work with landowners to determine measures to avoid and minimize impacts to these resources.

8.3.1.1 Prime Farmland

Prime farmland is defined 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. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. Of the 222.1 acres of land impacted by construction of the Project, 5.4 acres are characterized as prime farmland (about 2.0 percent; see table 7.1.2-1). A detailed discussion of the potential impacts of construction and operation of the Project on prime farmland and the mitigation measures that will be implemented to minimize these impacts is presented in section 7.3.1.

8.3.2 Forested Land

Forested land located within the pipeline route is limited to a 0.1-acre area of trees along the southern margin of Murphy Creek near MP 11.5 that is within the new permanent pipeline right-of-way. While this forested land is within the new permanent right-of-way, WBI Energy proposes to cross Murphy Creek using the guided bore method and does not propose to clear the trees within this area to complete the crossing. Some hand clearing of smaller woody vegetation may be necessary to lay the directional cables between the guided bore entry and exit points, consisting of a small pathway approximately 2 to 3 feet wide in thickly vegetated areas, to lay the electric-grid guide wires resulting in minimal ground and vegetation disturbance. No large trees will be cut or removed along the southern margin of Murphy Creek as part of this process. Refer to section 3.2 for additional discussion about forested vegetation impacts.

8.3.3 Developed Land

Construction of the Project will temporarily impact approximately 16.7 acres of developed land for pipeline construction activities and 8.2 acres for aboveground facilities. WBI Energy will minimize impacts on developed land in the Project area by timing of construction to avoid peak road use periods, maintaining access to private drives at all times, and expediting construction through these areas. WBI Energy will coordinate with affected landowners to further reduce potential adverse impacts when using or crossing private roads.

WBI Energy will utilize North Dakota's One Call system and One Call of Wyoming to locate existing utilities (e.g., cables, conduit, and pipelines) within the construction workspace and flag them appropriately to alert crews working in the area. The flags will be removed from the construction workspace following the completion of construction. WBI Energy will safely expose or "daylight" existing utilities as necessary to identify the exact locations of utilities and/or for performing crossovers. Where excavations and crossovers are required, WBI Energy will work with utility companies to ensure the safety standards of all parties involved are met.

Public roads that will be crossed by the pipeline route are listed by milepost in table 1.5.4-2, along with the existing road surface type and proposed and secondary crossing methods. The Project will cross 5 paved roads, 10 gravel roads, and one dirt road. Potential temporary impacts associated with crossing paved and gravel roads will be largely avoided by using the guided bore method, as described in section 1.5.4.2; therefore, no temporary or permanent impacts on existing use of paved and gravel roadways is expected to occur due to construction or operation of the Project.

Two gravel roads and one dirt road will be crossed using open-cut construction techniques. The impact upon traffic and public inconvenience at these crossings will be minimized to the extent practicable. Appropriate safety procedures will be implemented to protect workers and the public. Traffic warning signs, detour signs, and other traffic control devices will be used as required by federal, state, and local

Departments of Transportation and other regulating bodies. In addition, crossings will be completed in accordance with the requirements of road crossing permits or approvals. Section 1.5.4.3 provides additional details about the specialized construction techniques and mitigation measures that will be implemented at road crossings. Public use of existing dirt roads will be temporarily impacted by construction; however, implementation of the mitigation measures outlined above will minimize impacts to the extent practicable. Following the completion of construction, dirt roads will be restored to preconstruction conditions and public use of the roads will be allowed to resume as before.

WBI Energy has chosen a route that is collocated with existing rights-of-way to the extent practicable. Approximately 8.3 miles (54.2 percent) of the pipeline route is collocated with existing utility corridors and road rights-of-way based on desktop review and civil survey efforts for the Project (see table 8.3.4-1).

Existing Right-of-Way Ownership and Description	MP Start	MP End	Length (miles)	Distance / Direction from TWS (feet)	Distance / Direction from Pipeline Centerline (feet)
1 st Street NW	0.7	1.5	0.8	115 / North	160 / North
Overhead Powerline	1.2	1.5	0.3	26 / North	76 / North
ONEOK Pipeline	1.5	4.4	2.9	6 / West	56 / West
Killdeer Bypass	2.9	3.0	0.1	223 / Northwest	275 / Northwest
Killdeer Bypass	3.2	3.3	0.1	119 / Northwest	226 / Northwest
Overhead Powerline / 106 th Avenue	3.6	4.7	1.1	42 / West	93 / West
Killdeer Bypass	5.1	5.2	0.1	158 / West	258 / West
3T Street	6.8	6.9	0.1	100 / South	150 / South
6 th Street SW	9.5	9.6	0.1	75 / Northwest	150 / Northwest
Field Road (Unnamed)	9.7	10.6	0.9	34 / West	84 / West
Northern Border Pipeline	12.1	12.1	<0.1	196 / Northeast	226 / Northeast
State Highway 22	12.5	14.0	1.5	227 / West	277 / West
Private Drive	14.0	14.2	0.2	86 / West then East	102 / West then East
Overhead Powerline / 11 th Street SW	15.2	15.3	0.1	94 / East	118 / East
Total Length of Collocation			8.3		
Notes: TWS = temporary workspace MP = milepost					
Source: Geographic information system desktop review of civil survey data.					

8.3.4 Open Land

Open land is the predominant land use category that will be affected by the Project (see table 8.1-1). Construction of the Project will temporarily impact approximately 105.1 acres of open land for pipeline construction activities and 1.8 acres for aboveground facilities. Construction activities in open land will include vegetation clearing and grading, as needed, within TWS, EWS, and access roads. After construction is complete, 46.9 acres of open land within the permanent right-of-way for the pipeline will be maintained in an herbaceous state. Open land within TWS, EWS, and access roads will be restored and allowed to revert to previous uses. Approximately 0.6 acre of open land will be converted to developed land for operation of the Midpoint Valve, Big Horn Gas Interconnect, and the permanent access roads to these facilities.

8.3.5 Residential Land

No residential land is crossed by or within 50 feet of the proposed pipeline route, TWS, EWS, access roads, or aboveground facilities. The nearest residence to the Project is about 831 feet south of Project workspace at MP 8.1.

8.4 PLANNED RESIDENTIAL OR COMMERCIAL AREAS

WBI Energy contacted the planning and zoning departments for Dunn County, North Dakota and Campbell and Sheridan Counties, Wyoming via email on October 17, 2022, to identify known residential or commercial developments that are planned or will be affected within 0.25 mile of the Project (see appendix 1H).

The Sheridan County Planning and Zoning Department responded to WBI Energy's request for information and noted that no known planned developments are within 0.25 mile of the new Big Horn Gas Interconnect. The Planner and Zoning Administrator from Campbell County responded to WBI Energy's request for information and identified no planned developments within 0.25 mile of the Landeck Compressor Station. The Dunn County Planning and Zoning Department did not respond to WBI Energy's request for information about planned developments.

8.5 PUBLIC LAND, RECREATION, AND OTHER DESIGNATED AREAS

WBI Energy reviewed a 0.25-mile study area around the Project for public lands, recreational areas, and other designated or special use areas, including:

- lands administered by federal, state, county, or local agencies or private conservation organizations, including publicly funded conservation easements;
- natural, recreational, or scenic areas;
- registered national landmarks;
- designated or proposed candidate national or state wild and scenic rivers;
- sensitive receptors such as cemeteries, churches, or schools;
- landfills, hazardous waste sites, quarries, mines, and other special uses; and
- Coastal Zone Management Areas.

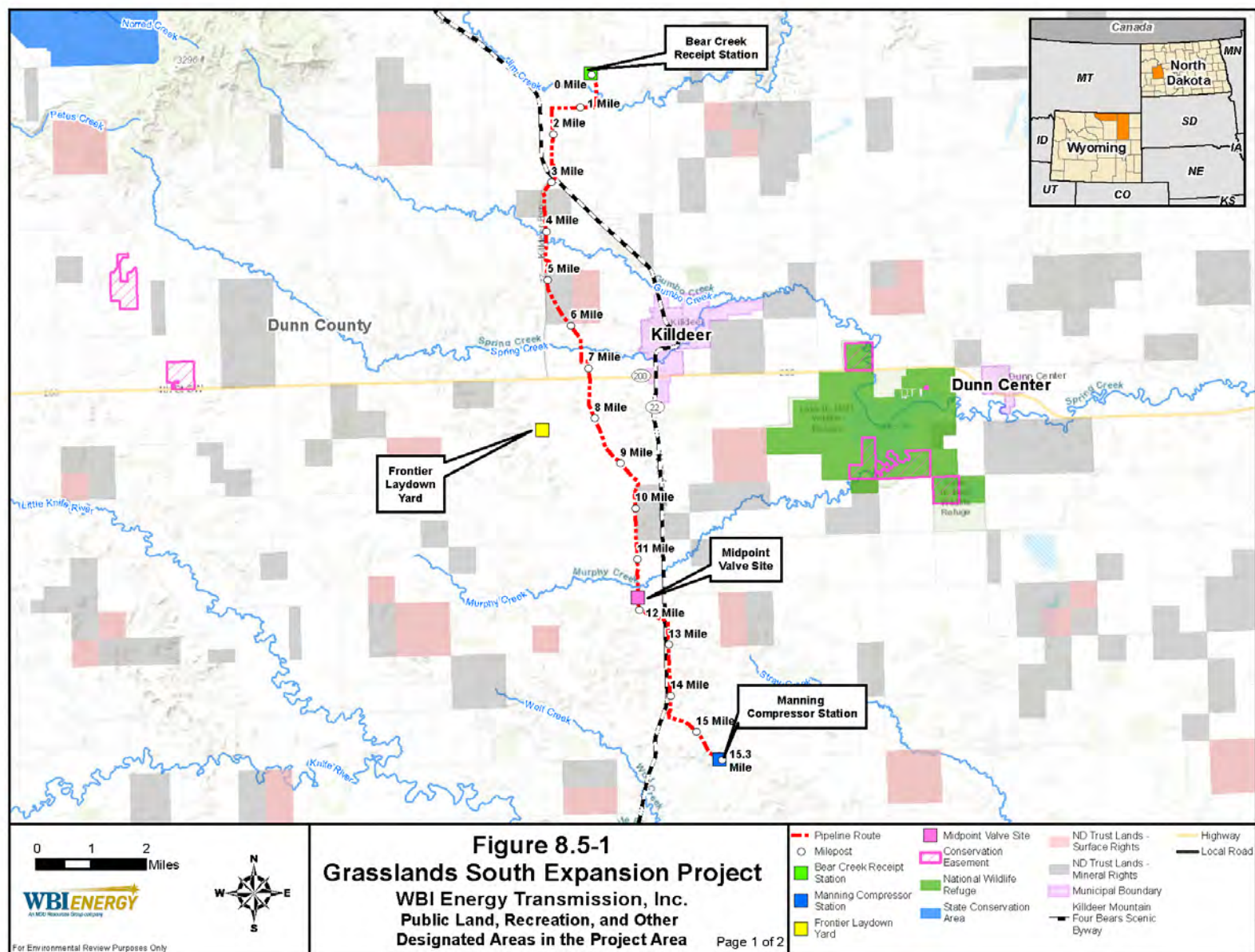
To assess the Project areas for these resources, WBI Energy reviewed publicly available GIS databases, USGS topographic maps, aerial photographs, and the internet (i.e., Google Earth, Google Maps) to identify public lands, recreational sites, and other special use areas within 0.25-mile of the Project. WBI Energy also consulted with the USFWS, USDA-NRCS, USDA-Farm Service Agency (FSA), and NDGF to identify federal, state, or county-owned and administered lands and conservation easements, such as wetland easements or Conservation Reserve Enhancement Program lands. Copies of agency correspondence are provided in appendix 1H. Figure 8.5-1 presents the results of WBI Energy's review.

Information regarding designated FEMA flood zones that are crossed by the Project is presented in section 2.2.4. Information regarding the potential for the Project to affect local historical or culturally significant lands is presented in Resource Report 4.

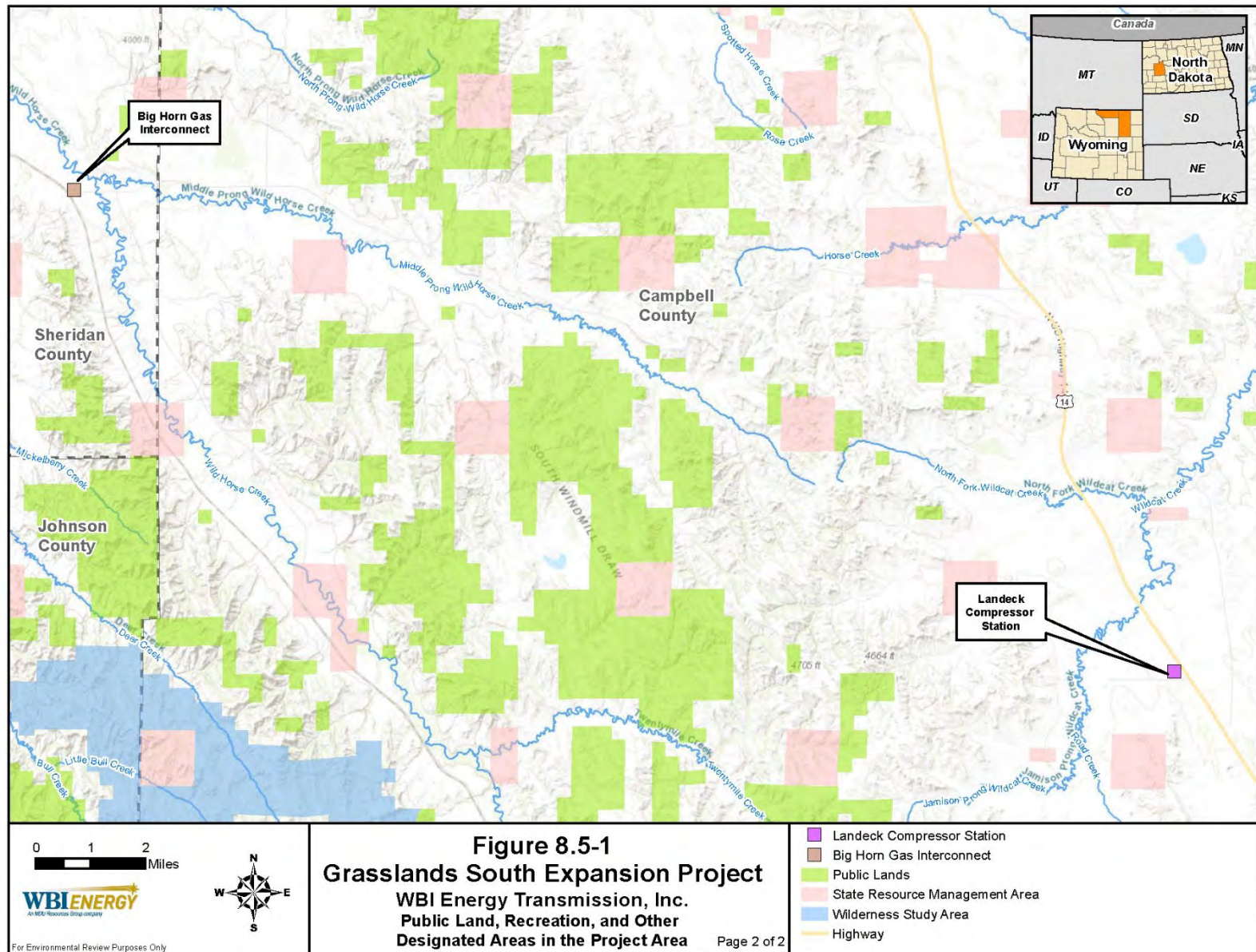
Based on a review of publicly available information and agency consultations, the Project will not cross or be located within 0.25-mile of any federal- or county-owned or administered lands in North Dakota or

Wyoming. The Project will not cross or be located within 0.25 mile of any national or state forests, trails, or parks; federally designated or managed lands; registered national landmarks; designated or proposed candidate national or state wild and scenic rivers; sensitive receptors such as cemeteries, churches, or schools; snowmobile trails; landfills; or quarries.

WBI Energy conducted a desktop review of available GIS data from the Natural Conservation Easement Database to identify conservation easements within 0.25 mile of the Project facilities. Based on the review of available GIS data, no conservation easements are crossed by or within 0.25 mile of the Project. To confirm the results of the desktop analysis, WBI Energy requested information on NRCS- or FSA-owned or -administered lands within 0.25-mile of the Project from the USDA-NRCS state offices in North Dakota and Wyoming, and the FSAs in Dunn County, North Dakota and Sheridan County, Wyoming; the intent of these requests was to confirm the results of the desktop analysis. On October 5, 2022, the USDA-NRCS North Dakota State Office confirmed that no NRCS-owned or -administered lands are crossed by the Project. To date, WBI Energy has not received responses from the USDA-NRCS Wyoming State Office or from the Dunn County and Sheridan County FSA offices. Copies of all agency correspondence are provided in appendix 1H. WBI Energy will continue to coordinate with affected landowners to identify conservation easements in the Project area.



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8.5.1 Killdeer Mountain Four Bears Scenic Byway

The proposed pipeline crosses the state-designated Killdeer Mountain Four Bears Scenic Byway (State Highway 22) in two locations: at MP 2.9 and MP 12.5 in Dunn County, North Dakota (see figure 8.5-1). The pipeline route is also within 0.25 mile of the scenic byway from MPs 1.5 to 3.2 and from MP 12.2 to 14.5. Designated scenic byways are transportation corridors that are of particular national or statewide interest. They are representative of a region's scenic, recreational, cultural, natural, historic, or archaeological significance. The Killdeer Mountain Four Bears Scenic Byway (State Highway 22) stretches for 64 miles from the Town of Manning and through the Town of Killdeer in Dunn County, continuing north to New Town in Mountrail County (North Dakota Tourism, n.d.). The byway passes through the scenic Badlands of North Dakota. Points of interest along this scenic byway include the Killdeer Battlefield State Historic Site, Little Missouri Station Park, Lake Ilo National Wildlife Refuge, and the Four Bears Museum, amongst others. None of these points of interest are within 0.25 mile of the Project.

The pipeline route crosses the Killdeer Mountain Four Bears Scenic Byway at MP 2.9, just south of the roundabout intersection where the Highway 22 Killdeer Bypass diverges from the scenic byway. The terrain surrounding this crossing is open herbaceous land. Existing electric transmission lines parallel the roadways in this area and an existing oil well pad is about 580 feet south of the location where the Project crosses the scenic byway. The pipeline route crosses the scenic byway again at MP 12.5 about 0.5 mile south of the intersection of 8th Street and the scenic byway. Surrounding terrain is open herbaceous land with existing aboveground electric transmission lines paralleling both sides of the scenic byway in this area. 8th Street is used as an access road to multiple oil well pads on the west and east sides of the scenic byway.

WBI Energy will use the guided bore technique to install the pipeline beneath the byway in both locations, which will avoid directly impacting the roadway and no interference to public use of the scenic byway is anticipated. Indirect impacts on the byway could include temporary increases in noise and dust during construction; however, these impacts will resolve with the completion of construction and operational impacts are not anticipated. No clearing of vegetation along the margin of the byway will be required to install the pipeline using the guided bore method and following the completion of construction, WBI Energy will restore construction workspaces and the permanent right-of-way to an herbaceous state. No impacts on the scenic quality of the surrounding area will occur from construction or operation of the Project.

8.5.2 North Dakota State Trust Lands

The proposed pipeline crosses and is within 0.25-mile of multiple North Dakota State Trust Land (NDTL) parcels in Dunn County, North Dakota. Trust lands are managed by the NDTL on behalf of the Board of University and School Lands for both surface and mineral interests (NDTL, 2019). Surface trust lands typically generate income through leasing these parcels for grazing or other agricultural uses. Leases for rights-of-way and mining uses are also common on surface trust lands. Mineral rights trust lands typically generate income through leases for oil and gas, coal, potash, and other mineral extraction. One surface trust land parcel is about 276 feet northeast of the Project near MP 6.0. Construction and operation of the Project is not anticipated to impact this surface interest trust land parcel. Mineral rights trust land parcels will be crossed by the pipeline between MP 3.2 to 3.7, MP 4.8 to 6.0, and MP 9.6 to 10.6 (see figure 8.5-1). Construction of the pipeline will temporarily impact 19.8 acres and the permanent right-of-way will impact 15.6 acres of NDTL mineral rights parcels. Following the completion of construction WBI Energy will restore temporary construction workspaces to pre-construction conditions and previous land uses will be allowed to resume. The permanent right-of-way will be restored and maintained in an herbaceous state, with the exception of cultivated cropland.

8.5.3 Landfills, Hazardous Waste Sites, Quarries and Mines

WBI Energy evaluated publicly available agency databases to identify hazardous waste sites in the Project area. The results of WBI Energy's review to identify hazardous waste sites within 0.25 mile of the Project is provided below along with a description of the measures that will be implemented throughout Project construction to prevent and avoid the release of hazardous substances into the environment. Discussions of potential sources of groundwater and soil contamination are presented in sections 2.1.5 and 7.3.3.

WBI Energy reviewed EPA's FRS map service for sites that are listed on the Comprehensive Environmental Response, Compensation, and Liability Information System (also known as Superfund sites); RCRA Treatment, Storage, and Disposal; RCRA hazardous waste generators; the Assessment, Cleanup, and Redevelopment Exchange System; Leaking Underground Storage Tank—American Recovery and Reinvestment Act database; and EPA's Community Cleanup Mapper (EPA, 2022a). In addition, the search was expanded by reviewing state-specific databases maintained by and the NDDEQ and WYDEQ including the NDDEQ Brownfields and Leaking Underground Storage Tanks and the WYDEQ Storage Tank – Contaminated Sites.

The following types of sites/facilities listed in the FRS database are not considered potential sources of contamination in the Project area: sites permitted for construction or industrial stormwater discharge, feedlots, wastewater dischargers, and small to minimal hazardous waste generators regulated under RCRA. Additionally, tank sites (active and inactive) with no reported releases were eliminated from further review because the presence of tanks alone is not indicative of a release.

A search of the databases discussed above identified one reported spill site that is approximately 0.2 mile southeast of the Landeck Compressor Station. Installation of new equipment at the Landeck Compressor Station will not extend outside of the existing fence line of the facility; therefore, no potential exists for disturbing this recorded spill site.

According to NDDEQ (NDDEQ, 2022c), one LUST is located within 0.25 mile of the Project in North Dakota. The LUST is about 0.2 mile west of MP 2.1 and was cleaned up in May of 1994. Due to the distance between the LUST site and Project workspaces, no potential exists for disturbing this LUST. No LUSTs were identified within 0.25 mile of the Project facilities in Wyoming (EPA, 2022c).

If any contaminated soils or groundwater are encountered during construction, they would be handled and disposed of in accordance with applicable regulations and WBI Energy's CEMP (see appendix 1E-2).

WBI Energy will minimize the potential impact of spills of hazardous materials during construction by adhering to its SPCC Plan presented in appendix 1E-1. The SPCC Plan describes preventative measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills, as well as mitigation measures such as containment and cleanup, to minimize potential impacts should a spill occur.

Visual inspection of aerial photography did not indicate the presence of mining or quarrying activities for sand and gravel deposits within 0.25 mile of the Project facilities in North Dakota. However, data provided by North Dakota Public Service Commission indicates that there are two abandoned mine lands located in between MPs 14 and 15 and roughly 0.25-miles southeast of MP 15; however, limited details are provided about these abandoned mines (NDPSC, 2022c). The potential abandoned mine lands are located outside of proposed construction footprints, and therefore would not be impacted by Project-related activities, if present. No landfills were identified within 0.25 mile of the Project.

8.5.4 Coastal Zone Management Areas

The states of North Dakota and Wyoming are inland states that do not have coastal areas as defined by the Coastal Zone Management Act of 1972 (16 U.S. Code § 1453). Therefore, the Project facilities are not located in Coastal Zone Management Areas.

8.6 VISUAL RESOURCES

WBI Energy evaluated whether any unique or sensitive visual resources are within the Project area. No special or unique features, designated scenic areas, or view sheds are located in or near the Project area other than the Killdeer Mountain Four Bears Scenic Byway (State Highway 22), as discussed in section 8.5.1. Lands crossed by the Project are areas of open and agricultural land interspersed by rural development, operating oil and gas wells, paved and gravel roadways, and existing aboveground utility corridors. The Project would be built on private lands where federal or state visual management standards do not apply. A description of the potential for visual impacts from the pipeline and the aboveground facilities is provided in the following subsections.

8.6.1 Pipeline

The pipeline crosses predominantly open and agricultural lands interspersed by areas of commercial and industrial development. Visual impacts will be greatest where construction workspaces are adjacent to roads and may be seen by passersby. Temporary visual impacts will occur during construction of the pipeline, but these impacts are anticipated to be minor and will resolve with the completion of construction.

When construction is complete, construction workspaces will be restored to original contours and disturbed areas will be reseeded according to the FERC Plan and Procedures. The duration of visual impacts following construction will be relatively short. In open areas the re-establishment of vegetation following construction will be relatively rapid (generally within one growing season) and agricultural and developed lands will be returned to pre-construction conditions following the completion of construction.

Construction activities will be visible from the Killdeer Mountain Four Bears Scenic Byway and temporary increases in dust could occur during construction; however, these impacts will resolve with the completion of construction and operational impacts are not anticipated. No clearing of vegetation along the margins of the roadway will be required to install the pipeline using the guided bore method and following the completion of construction, WBI Energy will restore construction workspaces and the permanent right-of-way to an herbaceous state. No impacts on the scenic quality of the surrounding the byway will occur from construction or operation of the Project.

For these reasons, no significant impacts on visual resources are anticipated from construction and operation of the Project.

8.6.2 Aboveground Facilities

Construction and operation of the new aboveground facilities for the Project will affect rural open, agricultural, and developed land that is directly adjacent to roadways or other industrial facilities. No residences are located within the immediate vicinity of the new aboveground facilities, and they are not located within any designated scenic areas. Visual impacts from construction of the Project would be minor and temporary and would resolve when construction is complete.

The Bear Creek Receipt Station will be installed directly adjacent to the southeast corner of the existing Bear Creek Plant in an area of agricultural land. The nearest public roadway is 2nd Street NW, which is

about 0.4 mile north of the receipt station. The Bear Creek Plant is located between the roadway and the Bear Creek Receipt Station and, as such, the receipt station would likely not be visible from the roadway. Numerous oil and gas well pads are also present along both sides of 2nd Street NW. Construction activities may be visible to passersby on 2nd Street NW, but any visual impacts would be temporary and similar to existing activities within the Bear Creek Plant. Although agricultural land would be permanently converted to industrial use for operation of the Bear Creek Receipt Station, the facility would be similar to surrounding industrial development.

The area surrounding the Big Horn Gas Interconnect is a rural area of agricultural and open land that is adjacent to minimally traveled gravel roads and the Burlington-Northern-Santa Fe Railroad. Existing oil and gas facilities, aboveground electric transmission lines, and agricultural outbuildings are present within 0.25-mile of the proposed facility; no residences or farmsteads are located within the immediate vicinity of the Big Horn Gas Interconnect. Construction activities will be visible to passersby and temporary increases in dust could occur; however, visual impacts from construction would be minor and temporary and would resolve with the completion of construction. The Big Horn Gas Interconnect will be visible to passersby on Wild Horse Road during operation, which is a minimally travelled rural road. The facility will include relatively minor aboveground piping facilities and buildings that will not require any additional screening as visual impacts are expected to be minor.

Installation of new facilities and equipment within the existing Manning and Landeck Compressor Stations will not create a substantial change in the long-term visible impact of these facilities. The installations will be within the existing fence line of each facility and painted to match the existing facilities. No changes to existing outdoor lighting will be required for the installations. For these reasons, no significant impact on visual resources will occur at the Manning or Landeck Compressor Stations.

The new Midpoint Valve that will be installed at MP 11.7 along the pipeline route will be permanently visible from 8th Street, but will be similar to existing oil and gas well pads in this area. 8th Street is an east-west access road off of State Highway 22 to oil well pads located on the north and south sides of the road. Due to the relatively flat topography in the area, the new valve also may be visible from State Highway 22 (i.e., Killdeer Mountain Four Bears Scenic Byway) which is about 0.5-mile east of the valve site. However, three existing oil well pads are located between the new valve site and the highway. Numerous oil well pads are present along the length of the Killdeer Mountain Four Bears Scenic Byway; therefore, the new Midpoint Valve for the Project will be similar in nature to the existing visual environment and any visual impacts will be minor.

9.0 AIR AND NOISE QUALITY

In accordance with 18 CFR § 380.12(k), Resource Report 9 is not applicable because the Project will not involve installation of new compression or modification to existing compression and no new liquefied natural gas facilities are proposed as part of the Project. However, as recommended by FERC in its February 2017 *Guidance for Environmental Report Preparation for Applications Filed Under the Natural Gas Act (Volume 1)*, WBI Energy is providing a brief assessment of air and noise impacts from construction activities (e.g., air emissions from construction equipment exhaust, fugitive dust emissions, general conformity applicability, and noise from construction equipment), and operating activities (e.g., aboveground facility fugitive gas emissions) to assist FERC with its responsibilities under the National Environmental Policy Act, the EPA's general conformity regulations and the Clean Air Act (CAA).

Resource Report 9 addresses air quality (section 9.1) and noise impacts (section 9.2) associated with the construction and operation of the Project. The report addresses potential impacts of the Project on the existing air and noise environment and measures that will be implemented to mitigate these impacts. Table 9.0-1 summarizes the FERC filing requirements for Resource Report 9 and where each requirement is addressed.

Table 9.0-1 Summary of FERC Minimum Filing Requirements for Resource Report 9	
MINIMUM REQUIREMENT	LOCATION ADDRESSED
Describe existing air quality in the vicinity of the project. (§ 380.12(k)(1)) <ul style="list-style-type: none"> Identify criteria pollutants that may be emitted above EPA-identified significance levels. 	Section 9.1.1
Quantify the existing noise levels (day-night sound level (L_{dn}) and other applicable noise parameters) at noise sensitive areas and at other areas covered by relevant state and local noise ordinances. (§ 380.12(k)(2)) <ul style="list-style-type: none"> If new compressor station sites are proposed, measure or estimate the existing ambient sound environment based on current land uses and activities. For existing compressor stations (operated at full load), include the results of a sound level survey at the site property line and nearby noise-sensitive areas. Include a plot plan that identifies the locations and duration of noise measurements. All surveys must identify the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement. 	Not applicable
Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO_x) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project. (§ 380.12(k)(3)) <ul style="list-style-type: none"> Provide the emission rate of NO_x from existing and proposed facilities, expressed in pounds per hour and tons per year for maximum operating conditions, include supporting calculations, emission factors, fuel consumption rate, and annual hours of operation. 	Section 9.1.3 Appendices 9A and 9B
Describe the existing compressor units at each station where new, additional, or modified compressor units are proposed, including the manufacturer, model number, and horsepower of the compressor units. For proposed new, additional, or modified compressor units include the horsepower, type, and energy source. (§ 380.12(k)(4))	Not applicable
Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure. (§ 380.12(k)(4))	Not applicable
Identify any applicable state or local noise regulations. (§ 380.12(k)(4)) <ul style="list-style-type: none"> Specify how the facility will meet the regulations. 	Section 9.2.1
Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment. (§ 380.12(k)(4))	Not applicable
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Air Quality Information:	
Include climate information as part of the air quality information provided for the project area.	Section 9.1.1
Identify potentially applicable federal and state air quality regulations.	Section 9.1.2

Table 9.0-1 Summary of FERC Minimum Filing Requirements for Resource Report 9	
Provide construction emissions (criteria pollutants, hazardous air pollutants, greenhouse gases) for proposed pipelines and aboveground facilities.	Section 9.1.3.1
Provide copies of state and federal applications for air permits.	Not applicable
Provide operation and fugitive emissions (criteria pollutants, hazardous air pollutants, greenhouse gases) for proposed pipelines and aboveground facilities.	Section 9.1.3.2
Provide air quality modeling for entire compressor stations.	Not applicable
Identify temporary and permanent emissions sources that may have cumulative air quality effects in addition to those resulting from the project.	Not applicable
For major sources of air emissions (as defined by the EPA), provide copies of applications for permits to construct (and operate, if applicable) or for applicability determinations under regulations for the prevention of significant air quality deterioration and subsequent determinations.	Not applicable
Describe measures and manufacturer's specifications for equipment proposed to mitigate impact to air and noise quality, including emission control systems, installation of filters, mufflers, or insulation of piping and building, and orientation of equipment away from noise-sensitive areas.	Sections 9.1.4, 9.2.2 and 9.2.3
Provide greenhouse gas emission estimates for both construction and operation activities associated with the project.	Sections 9.1.3.1 and 9.1.3.2, Appendices 9A and 9B
Provide construction emission estimates resulting from all construction activities associated with the project.	Sections 9.1.3.1 and Appendix 9B
Noise and Vibration	
Describe the existing noise environment and ambient noise surveys for compressor stations, liquefied natural gas facilities, meter and regulation facilities, and drilling locations.	Not applicable
Identify any state or local noise regulations applicable to construction and operation of the project.	Section 9.2.1
Indicate whether construction activities would occur over 24-hour periods.	Section 9.2.2
Discuss construction noise impacts and quantify construction noise impacts from drilling, pile driving, dredging, etc.	Not applicable
Quantify operation noise from aboveground facilities, including blowdowns.	Section 9.2.3
Describe the potential for the operation of the proposed facilities to result in an increase in perceptible vibration and how this would be prevented.	Section 9.2.3
Identify temporary and permanent noise sources that may have cumulative noise effects in addition to those resulting from the project.	Not applicable

9.1 AIR QUALITY

9.1.1 Existing Air Quality

9.1.1.1 Local Climate

The climate in the Project area is primarily semi-arid or continental in character. For Dunn County, North Dakota, normal annual rainfall (1991 to 2020) for the Project area averages 18.1 inches, while annual snowfall (1991 to 2020) averages 39.2 inches (NCEI, 2022). Winters are cold and summers are mild to hot in the Project area. January is the coldest month, with normal average temperatures of 15.3 degrees Fahrenheit (°F). July is the warmest month with normal average temperatures of approximately 68.9°F.

Sheridan County, Wyoming has a normal annual rainfall (1991-2020) averaging 18.6 inches, while annual snowfall (1991-2020) averages 81.4 inches (NCEI, 2022). Winters are cold and summers are mild to hot in the Project area. December is the coldest month, with normal average temperatures of 25.7°F. July is the warmest month with normal average temperatures of approximately 69.2°F.

Campbell County, Wyoming has a normal annual rainfall (1991-2020) averaging 17.6 inches, while annual snowfall (1991-2020) averages 55.7 inches (NCEI, 2022). Winters are cold and summers are mild to hot

in the Project area. December is the coldest month, with normal average temperatures of 25.9°F. July is the warmest month with normal average temperatures of approximately 71.7°F.

Both North Dakota and Wyoming experience a wide range of weather events, including blizzards, thunderstorms, and tornadoes.

9.1.1.2 National Ambient Air Quality Standards

The EPA has promulgated National Ambient Air Quality Standards (NAAQS) to protect human health and welfare. The NAAQS include primary standards, which are designed to protect human health, including the health of sensitive subpopulations such as children and individuals with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including protection against visibility impairment and damage to vegetation, animals, and buildings.

The EPA established NAAQS for the following “criteria” pollutants: nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), particulate matter (PM) with a nominal aerodynamic diameter of 10 microns or less (PM₁₀) and PM with a nominal aerodynamic diameter of 2.5 microns or less (PM_{2.5}), sulfur dioxide (SO₂), and lead. Lead emissions were not addressed since they are not expected from Project activities. Each NAAQS is expressed in terms of a concentration level and an associated averaging period. The current NAAQS for these criteria pollutants are summarized in table 9.1.1-1 (EPA, 2022d).

TABLE 9.1.1-1 National Ambient Air Quality Standards			
Pollutant	Averaging Period	Standards	
		Primary	Secondary
SO ₂	3-hour ^b	--	0.5 ppm
	1-hour ^c	75 ppb	--
PM ₁₀	24-hour ^d	150 µg/m ³	same as primary
PM _{2.5}	24-hour ^e	35 µg/m ³	35 µg/m ³
	Annual ^f	15 µg/m ³	12 µg/m ³
NO ₂	Annual ^a	53 ppb	same as primary
	1-hour ^g	100 ppb	--
CO	8-hour ^b	9 ppm	--
	1-hour ^b	35 ppm	--
Ozone	8-hour ^h	0.07 ppm	0.07 ppm
Lead	Rolling 3 Month Average ^a	0.15 µg/m ³	same as primary
^a Not to be exceeded. ^b Not to be exceeded more than once per year. ^c Compliance based on 3-year average of 99 th percentile of the daily maximum 1-hour concentration. ^d Not to be exceeded more than once per year on average over 3 years. ^e Compliance based on 3-year average of 98 th percentile of 24-hour concentrations. ^f Compliance based on 3-year average. ^g Compliance based on 3-year average of the 98 th percentile of the daily maximum 1-hour concentration. ^h Compliance based on 3-year average of the annual fourth-highest daily maximum 8-hour concentration. ppm = parts per million by volume ppb = parts per billion by volume µg/m ³ = micrograms per cubic meter			

The NDDEQ and WYDEQ have adopted the NAAQS. The NDDEQ and WYDEQ have established state ambient air quality standards (SAAQS) in addition to the NAAQS. Specifically, the NDDEQ has an SAAQS for hydrogen sulfide, and the WYDEQ has SAAQS for hydrogen sulfide, suspended sulfates, fluorides, and lead. Hydrogen sulfide, suspended sulfate, fluoride, and lead emissions are not expected

from the Project activities; therefore, we believe the NAAQS are adequately protective, and these SAAQS are not addressed further. SAAQS can be found in the NDAC Article 33.1 Part 15-02 and Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 2, Sections 1-10 (Reference Number: 020.0002.2.02052018).

The Project will involve construction in Dunn County, North Dakota, and Sheridan and Campbell Counties, Wyoming. Ambient air quality data for all criteria pollutants were reviewed from the EPA AirData database in order to characterize existing concentrations in the vicinity of the Project area. Ambient air quality monitoring data from 2019-2021 is summarized in table 9.1.1-2 (EPA, 2022e).

Pollutant	Averaging Period	Rank	NAAQS	2019	2020	2021	Units	Monitor Number
North Dakota, Dunn County								
SO ₂	1-Hour	99%	75	7.2	5.3	6.9	ppb	38-025-0004
SO ₂	3-hour	2nd	500	5.8	4.1	10.3	Ppb	38-025-0004
PM ₁₀	24-Hour	2nd	150	18	20	91	µg/m ³	38-025-0004
PM _{2.5}	24-Hour	98%	35	10.9	10.4	38.4	µg/m ³	38-025-0004
PM _{2.5}	Annual	Mean	12	4.1	3.6	8.0	µg/m ³	38-025-0004
NO ₂	Annual	Maximum	53	5.6	1.9	2.3	ppb	38-025-0004
NO ₂	1-Hour	98%	100	17.0	9.6	12.9	ppb	38-025-0004
CO	8-Hour	2nd	9	0.6	0.5	0.8	ppm	38-015-0003
CO	1-Hour	2nd	35	1.0	0.624	1.354	ppm	38-015-0003
O ₃	8-Hour	4th	0.070	0.063	0.054	0.068	ppm	38-014-0004
Wyoming, Campbell and Sheridan Counties								
SO ₂	1-Hour	99%	75	3.5	5.5	3.3	ppb	56-045-0800
SO ₂	3-hour	2nd	500	3.0	5.1	3.1	ppb	56-045-0800
PM ₁₀	24-Hour	2nd	150	52.0	70.0	154.0	µg/m ³	56-0405-6666
PM _{2.5}	24-Hour	98%	35	14.1	29.8	37.8	µg/m ³	30-075-0001
PM _{2.5}	Annual	Mean	12	5.3	7.6	9.2	µg/m ³	30-075-0001
NO ₂	Annual	Maximum	53	1.2	1.1	1.4	ppb	56-005-0123
NO ₂	1-Hour	98%	100	6.7	5.5	8.0	ppb	56-005-0123
CO	8-Hour	2nd	9	0.2	0.4	0.4	ppm	56-009-0010
CO	1-Hour	2nd	35	0.2	0.5	0.5	ppm	56-009-0010
O ₃	8-Hour	4th	0.070	0.055	0.062	0.075	ppm	56-005-0123

The CAA requires states and the EPA to identify areas of the country which meet and do not meet the NAAQS. Areas meeting the NAAQS are called “attainment areas,” areas not meeting the NAAQS are called “nonattainment areas,” and areas previously designated as nonattainment and upgraded to attainment based on a State Implementation Plan are called “maintenance areas.” The designation of an area is made on a pollutant-by-pollutant basis. The EPA maintains a list of attainment and nonattainment designations areas for all criteria pollutants on their “Green Book” website (EPA, 2022f).

Dunn County, North Dakota and Campbell County, Wyoming are considered to be in attainment or unclassified for all criteria pollutants. Sheridan County, Wyoming has been designated as a Maintenance Area for the 1987 PM₁₀ NAAQS and is in attainment or unclassified for all other criteria pollutants and standards (EPA, 2022f).

9.1.2 Air Quality and Permitting Requirements

In addition to the NAAQS, air emissions and equipment will be subject to various other federal and state air quality regulations. Federal air quality requirements are contained in 40 CFR Parts 50 through 99. The following sections briefly discuss air regulations that potentially apply to the Project.

9.1.2.1 New Source Review (State and Federal)

There are three types of new source review (NSR) permitting requirements, of which a source may have to meet one or more of the requirements. The three types are:

- Prevention of Significant Deterioration (PSD) permits, which are required for new major sources or an existing source making a major modification in an attainment area;
- Nonattainment NSR permits, which are required for new major sources or an existing source making a major modification in a nonattainment area; and
- Minor NSR permits.

PSD is intended to keep new air emission sources from causing the existing air quality to deteriorate beyond acceptable levels. The Project will not trigger any requirements under PSD.

9.1.2.2 Federal Class I Areas

The CAA designated certain areas (e.g., wilderness areas, national parks) of the U.S. as Mandatory Federal Class I areas, based on their air quality being considered a special feature. Class I areas are protected against several types of pollution, including elevated levels of criteria pollutant concentrations, visibility degradation, and acid deposition. If a PSD project is located within 62 miles (i.e., 100 kilometers [km]) of a Class I area, the project is required to notify the appropriate Federal Land Manager and to assess potential impacts of that project on the nearby Class I area. For PSD projects that are located within 6.2 miles (10 km) of a Class I area, ambient air pollutant impacts must be assessed for any project emission increase. There are currently 156 protected areas nationwide designated as Class I areas.

As there are no PSD sources associated with this Project, no further analysis regarding Class I areas nor correspondence with the Federal Land Manager is necessary. However, Class I areas and their distance to the Project area are listed in table 9.1.2-1.

TABLE 9.1.2-1 Nearest Class I Areas to the Project		
Class I Area	Proximity to Project Site	County of Closest Project Site
T Roosevelt National Park - North	15 km NW	Dunn County, ND
T Roosevelt National Park – South	55 km SW	Dunn County, ND
Yellowstone National Park	220 km W	Sheridan County, WY
Grand Teton National Park	300 km SW	Sheridan County, WY
Shoshone National Forest	200 km W	Sheridan County, WY
Bridger – Teton National Forest	260 km SW	Sheridan County, WY
Badlands National Park	220 km SE	Campbell County, WY
Wind Cave National Park	180 km SE	Campbell County, WY

9.1.2.3 Title V Operating Permit Programs

The Title V permit program in 40 CFR Part 70 requires major sources of air pollutants to obtain operating permits. The major source thresholds under the Title V program, as defined in 40 CFR Part 70.2 and which are different from the federal NSR major source thresholds, are 100 tons per year (tpy) of any air pollutant, 10 tpy of any single hazardous air pollutant (HAP), or 25 tpy of any combination of HAPs. Stationary sources will not be required to obtain a Title V permit on the sole basis of greenhouse gas (GHG) emissions levels (i.e., exceeding the Title V major source threshold for GHG only). The authority to issue Title V operating permits has been delegated to the NDDEQ and the WYDEQ. The NDDEQ administers the Title V operating permit program through NDAC 33.1-15-14-06 and the WYDEQ administers the Title V operating permit program through WAQSR Chapter 6, Section 3.

The Project will not include new or modified stationary sources of air emissions which will trigger Title V permitting.

9.1.2.4 Greenhouse Gas Reporting Rule

On November 8, 2010, the EPA signed a rule that finalized reporting requirements for the petroleum and natural gas industry under 40 CFR Part 98. Subpart W of 40 CFR Part 98 requires petroleum and natural gas facilities that emit 25,000 metric tons or more of carbon dioxide equivalent (CO₂e) per year to report annual emissions of specified GHGs from various processes within the facility. Stationary combustion sources as well as natural gas and petroleum systems are considered source categories subject to 40 CFR Part 98.

If actual GHG emissions exceed 25,000 metric tons of CO₂e per year at any facility associated with the Project, GHG emissions will be required to be reported per 40 CFR Part 98.

9.1.2.5 General Conformity

General conformity regulations in 40 CFR Part 93, Subpart B, are designed to ensure that federal actions that occur in nonattainment and maintenance areas do not interfere with a state's ability to attain or maintain compliance with NAAQS. The Project is considered a federal action because a federal agency (i.e., FERC) will be licensing, permitting, or otherwise approving the Project.

As discussed previously, a portion of the Project will be constructed in Sheridan County, WY, which has been designated as a Maintenance Area for the 1987 PM₁₀ NAAQS. General conformity must be analyzed for construction emissions in non-attainment maintenance areas as well as operational emissions not subject to major or minor NSR permitting. Ongoing operational emissions from the Project that are not subject to NSR permitting are limited to minor fugitive releases that would not exceed general conformity applicability thresholds. Therefore, a general conformity determination is not required. Detailed construction emissions for the Project are presented in appendix 9A.

9.1.2.6 New Source Performance Standards

New Source Performance Standards (NSPS) in 40 CFR Part 60 regulate emissions from specific source categories and requires new sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. The Project will not include equipment that could be subject to NSPS requirements.

40 CFR Part 60, Subpart OOOOa (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

On June 3, 2016, EPA issued a final rule for NSPS Subpart OOOOa to reduce GHGs and volatile organic compounds (VOCs) from affected facilities in the crude oil and natural gas source category. The reciprocating compressor and the collection of fugitive emissions components at a compressor station are both considered affected facilities. WBI Energy will comply with the applicable requirements of this subpart.

9.1.2.7 National Emission Standards for Hazardous Air Pollutants

The EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAP) for specific pollutants and industries in 40 CFR Part 61. The Project does not include any of the specific sources for which NESHAP have been established in Part 61; therefore, Part 61 NESHAP requirements will not apply to the Project.

9.1.2.8 State Air Permitting Regulations

NDDEQ administers the Title V operating permit program and the Title V thresholds are the same as the federal standards. North Dakota and Wyoming also have state air operating permits program for which sources below the Title V major source thresholds may be required to obtain an operating permit. These programs are listed in NDAC Title 33.1-15-14, Section 2-3, and WAQSR Chapter 6, Section 3. However, the Project facilities are not required to obtain air operating permits.

9.1.3 Anticipated Air Quality Impacts and Mitigation

9.1.3.1 Construction Emissions

The Project will result in air quality impacts associated with construction including emissions from fossil-fueled construction equipment and fugitive dust. The emissions will be temporary and localized and are not expected to independently cause or significantly contribute to an emission level that results in a violation of NAAQS.

Large earth-moving equipment and other mobile sources are sources of combustion-related emissions, including criteria pollutants (i.e., NO₂, CO, VOCs, SO₂, and PM₁₀), small amounts of HAPs and fugitive dust. Air pollutants from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary.

Construction-related emission estimates are based on typical diesel-fueled construction equipment, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each Project component. The data presented here is a conservative estimate, based on worst-case assumptions and EPA emission factors. The estimated air emissions from construction will be transient in nature with negligible impact on regional air quality.

The EPA requires manufacturers of on- and off-road engines to certify their products to engine emission standards based on the year of manufacture. For diesel engines, the emission standards have been phased in over the past two decades in four steps, referred to as Tier 1 to Tier 4. In this analysis, it was assumed that the engines, on average, would comply with Tier 2 standards.

Additionally, WBI Energy will need to conduct pipeline blowdowns during construction. These blowdown events will be temporary in nature.

Table 9.1.3-1 summarizes the estimated emissions of criteria pollutants, total HAPs and GHGs from construction equipment. Detailed calculations are provided in appendix 9A.

TABLE 9.1.3-1 Construction-Related Emissions for the Project								
Construction Activity	NO _x (tpy)	CO (tpy)	VOC (tpy)	SO ₂ (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	CO ₂ e (tpy)	HAP (tpy)
Off-Road Engine Emissions	10.42	2.31	0.67	0.00	0.41	0.41	466	0.12
Unpaved Road Emissions	N/A	N/A	N/A	N/A	1.35	0.13	N/A	N/A
Earthmoving Fugitive Dust	N/A	N/A	N/A	N/A	17.64	1.86	N/A	N/A
Pipeline Blowdown	N/A	N/A	10.85	N/A	N/A	N/A	626	N/A
Project Total	10.42	2.31	11.52	0.00	19.39	2.40	1,092	0.12

Fugitive dust emissions will result from vehicular traffic and from soil disruption associated with land clearing, grading, excavation, and backfilling. The amount of fugitive dust generated will depend on a variety of factors including the duration and type of construction activity, moisture content and type of soils that will be disturbed, wind speed, frequency of precipitation, and the number and types of vehicles traveling over the construction areas. Fugitive dust control measures are included in WBI Energy's Fugitive Dust Control Plan in appendix 1E-6.

9.1.3.2 Operational Emissions

The Project will only include minor fugitive VOC and greenhouse gas emissions from aboveground valves and blowdowns for launching and receiving. Table 9.1.3-2 provides the operational emissions associated with the Project. Detailed calculations are provided in appendix 9B.

TABLE 9.1.3-2 Operational Emissions from the Project				
State/County/Facility	VOC (tpy)	CH ₄ (tpy)	CO ₂ (tpy)	CO ₂ e (tpy)
North Dakota, Dunn County				
Bear Creek Receipt Station	0.048	0.78	0.01	19.43
Midpoint Valve	0.012	0.12	0.00	3.03
New Equipment at Manning Compressor Station	0.013	0.21	0.00	5.23
Wyoming, Campbell County				
New Equipment at Landeck Compressor Station	0.020	0.33	0.00	8.14
Wyoming, Sheridan County				
Big Horn Gas Interconnect	0.048	0.78	0.01	19.38
Total Project Emissions	0.142	2.21	0.01	55.21

9.1.4 Air Quality Mitigation Measures

Fugitive dust emissions during construction will be mitigated, as necessary, by spraying water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic in accordance with the Fugitive Dust Plan for the Project, provided in appendix 1E-6. In addition, construction equipment will be properly tuned and operated only on an as-needed basis to minimize the combustion emissions from diesel and gasoline engines.

9.2 NOISE QUALITY

Construction of the Project will result in noise impacts on the Project area. Construction will involve the use of construction equipment and noise will occur during the installation of the Project facilities. Construction noise is highly variable, as the types of equipment in use at a construction site change with the construction phase and the type of activities. Noise from construction activities may be noticeable at nearby residences; however, because of the temporary nature of construction noise, no long-term effects are anticipated.

No change to the existing compression at the Manning and Landeck Compressor Stations will occur due to the Project; therefore, the operation of these stations will not result in an increase in noise levels in the Project vicinity.

9.2.1 Applicable Noise Guidelines

The unit of noise measurement is the decibel (dB), which measures the energy of noise. Because the human ear is not uniformly sensitive to all noise frequencies, the A-weighted (A-wt.) frequency scale (dBA) was devised to correspond with the sensitivity of the human ear.

The equivalent sound level (L_{eq}) is considered an average A-wt. sound level measured during a period of time, including any fluctuating sound levels during that period. The concept of the measuring L_{eq} has been used broadly to relate individual and community reaction to aircraft and other environmental noises.

The daytime sound level (L_d) is the equivalent dBA for the time period between 7 a.m. and 10 p.m. The nighttime sound level (L_n) is the equivalent dBA for the time period between 10 p.m. and 7 a.m. The day-night level (L_{dn}) is a 24-hour average A-wt. L_{eq} of the measured L_d and L_n with 10 dB added to the nighttime sound level to compensate for enhanced receptor sensitivity at night. For a source that operates at a continuous sound level over a 24-hour period, such as a compressor station, the L_{dn} is approximately 6.4 dB above the measured L_{eq} . Consequently, an L_{dn} of 55 dBA corresponds to an L_{eq} of 48.6 dBA.

9.2.1.1 Federal Energy Regulatory Commission Guidelines

FERC requires that noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station must not exceed an L_{dn} of 55 dBA at any pre-existing noise sensitive area (NSA). In addition, FERC guidelines require that the operation of a new compressor station or modifications to an existing compressor station should not result in a perceptible increase in vibration at any nearby NSA. The sound level of 55 dBA L_{dn} can also be used as a conservative (i.e., protective) sound criterion/guideline for assessing the noise impact of temporary or intermittent noise such as construction noise at a compressor station.

9.2.1.2 State and Local Noise Regulations

In addition to federal standards, Dunn County, North Dakota has established a quantitative noise standard in the 2022 Dunn County Land Development Code, Section IV, Part H. The requirements of the Dunn County Land Development Code, Section IV, Part H state that “sustained noise of over 80 dB during the day and 70 dB at night is not allowed. Therefore, if the Project meets the FERC guideline of 55dBA L_{dn} , it will also meet the requirement stated in the Dunn County Land Development Code. No other state or local noise ordinances in North Dakota or Wyoming establish quantitative noise standards that apply to the Project.

9.2.2 Construction Noise Impacts and Mitigation

Noise-generating-activities associated with pipeline construction are expected to be short-term and transient at any given location and will vary depending on the phase of construction in progress at any one time (see Resource Report 1). These construction phases include site grading, clearing/grubbing, trenching, backfilling, etc. For typical pipeline construction, the highest level of construction noise is assumed to occur during earth work.

Construction activities will be performed with standard heavy equipment such as track-excavators, backhoes, bulldozers, pipe layers, dump trucks, welding trucks, and pick-up trucks. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating at full load. People at nearby residences and buildings will hear the construction noise but the overall impact will be short-term. Pipeline construction will also involve several guided bores. These guided bores will be minor in scale but will involve noise-generating equipment such as the drilling rig, mud mixing system and generator, a small backhoe/front loader/side boom, and welding equipment. Boring and hydrostatic testing activities may extend into nighttime hours; however, impacts would be very short term and are not expected to have a significant impact on noise levels.

Because of the temporary nature of construction noise, no adverse or long-term effects are anticipated. WBI Energy will take steps to minimize engine idling, ensuring that sound muffling devices that are provided as standard equipment by the construction equipment manufacturer are kept in good working order, and reduce other non-essential noise impacts. WBI Energy will inform nearby residents of the Project and the upcoming construction activities and will respond to and investigate concerns. In addition, construction will be primarily limited to daytime hours and will not have an impact on nighttime sounds levels; however, some activities like hydrostatic testing, line drying, tie-ins, and guided bores may be carried out continuously until completed.

Construction noise, while varying according to equipment use, will be mitigated by the attenuating effect of distance and the intermittent and short-lived character of the noise. Further, the nature of construction of a pipeline dictates that construction activities and associated noise levels will move along the corridor and that no single NSA will be exposed to significant noise levels for an extended period.

9.2.3 Operational Noise Impacts and Mitigation

The Project does not include any significant noise-generating equipment such as a new compressor. Noise from unit blowdown events would be audible, but are typically infrequent, of short duration, and occur during daytime hours. Therefore, the operational noise impacts from the Project will be minimal and are not calculated. Because there are no new or modified compressor units associated with this Project, there is no anticipated increase in vibration at any NSA.

10.0 ALTERNATIVES

Resource Report 10 presents a description of the alternatives that were evaluated by WBI Energy for the Project. Two major types of alternatives were evaluated: the no-action alternative and system alternatives. The alternatives were evaluated to the extent they: 1) meet the Project purpose and need; 2) are technically and economically feasible and practical; and 3) provide a significant environmental advantage over the proposed Project. In the absence of meeting any of those three criteria, the alternative is not considered further. Table 10.0-1 summarizes the FERC filing requirements for Resource Report 10 and where each requirement is addressed.

TABLE 10.0-1 Summary of FERC Minimum Filing Requirements for Resource Report 10	
MINIMUM REQUIREMENTS	LOCATION ADDRESSED
Address the “no action” alternative. (§ 380.12(l)(1)) <ul style="list-style-type: none"> Discuss the costs and benefits associated with the alternative 	Section 10.1
For large projects, address the effect of energy conservation or energy alternatives to the project. (§ 380.12(l)(1)).	Not applicable
Identify system alternatives considered during the identification of the project and provide the rationale for rejecting each alternative. (§ 380.12(l)(1)) <ul style="list-style-type: none"> Discuss the costs and benefits associated with each alternative. 	Section 10.2
Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (e.g., wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route. (§ 380.12(l)(2)(ii))	Not applicable
Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site. (§ 380.12(l)(2)(ii))	Not applicable
ADDITIONAL INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS	
Ensure that project objectives that serve as the basis for evaluating alternatives are consistent with the purpose and need discussion in Resource Report 1.	Section 10.2
Identify and evaluate alternatives identified by stakeholders.	Not applicable
Clearly identify and compare the corresponding segments of route alternatives and route variations with the segments of the proposed route that they would replace if adopted.	Not applicable

10.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, WBI Energy would not construct any part of the proposed Project and no environmental impacts associated with the construction and operation of the proposed facilities would occur. However, WBI Energy would consequently not be able to satisfy the incremental firm transportation capacity requested by the shipper and the customer would be unable to reach their desired market. The Bear Creek Plant would also not be connected to WBI Energy’s existing system and would not have access to storage services. Because the no-action alternative does not create the requested firm transportation capacity from the Bear Creek Plant to the desired market in Wyoming, and does not provide increased transportation diversity, this alternative was not selected.

10.2 SYSTEM ALTERNATIVES

System alternatives are those alternatives that consider using existing, modified, or new systems to meet the purpose and need of the Project. WBI Energy considered three system alternatives, as described in the following subsections.

10.2.1 8-inch Diameter Bear Creek to Manning Pipeline Alternative

As an alternative to the proposed Project, WBI Energy also considered installing a smaller diameter pipeline between the Manning Compressor Station and the Bear Creek Plant. This alternative would involve installing an 8-inch diameter pipeline from the Bear Creek Plant to the Manning Compressor Station instead of the 12-inch diameter pipeline that is proposed for the Project. The smaller diameter pipeline would reduce the total project costs; however, it would have a maximum firm transportation capacity of approximately 75 million cubic feet per day, and therefore, would not be capable of transporting the requested volume. Other required modifications to WBI Energy's system would be the same as the proposed Project. Although the actual run time at the Golva and Willow Creek compressor stations may be reduced due to the reduced volume, the run time at the Manning Compressor Station would be increased due to the additional pressure drop associated with the smaller diameter pipeline. The route for an 8-inch diameter pipeline would be the same as the proposed Project, and environmental impacts for the 8-inch diameter pipeline construction would be approximately equal. This alternative does not meet the capacity requirements requested by the customer; therefore, this alternative was not selected.

10.2.2 Bear Creek to Bison Pipeline

As an alternative to the proposed Project, WBI Energy also considered installing a 12-inch diameter pipeline from the Bear Creek Plant to a new interconnect with the Bison Pipeline near Glen Ullin, North Dakota. Approximately 72.5 miles of new 12-inch diameter pipeline would be required, as well as additional compression of approximately 3,000 horsepower at the existing Glen Ullin Compressor Station. The natural gas would then be transported toward the desired Wyoming market via the Bison Pipeline. It is not known what modifications may be required on the Bison Pipeline system to reverse flow direction. The additional length of greenfield pipeline as well as the additional compressor horsepower required at the Glen Ullin Compressor Station would greatly increase the cost and environmental impact of this alternative when compared to the proposed Project. Due to the additional environmental impact and increased costs, this alternative was not selected.

10.2.3 Bear Creek to Little Knife/Killdeer Lateral

As an alternative to the proposed project, WBI Energy examined connecting to its existing system via the Little Knife / Killdeer laterals. This alternative would require approximately 5 miles of new 12" diameter pipeline from the Bear Creek Plant to the Killdeer lateral. Due to the small diameter and low MAOP of the existing Killdeer and Little Knife laterals, approximately 27.8 miles of 12" diameter loop is required along the existing Killdeer and Little Knife laterals. In addition, a new 5600 horsepower compressor station would also be required at the crossing of the Little Knife lateral and WBI Energy's Line Section 26. This alternative would also require the installation of the receipt station at the Bear Creek Plant and the new interconnect with Big Horn Gas. The much greater total length of pipeline as well as the installation of significant new compressor horsepower at a greenfield location would result in greater environmental impact and cost than the proposed project. For these reasons this alternative was not selected.

11.0 RELIABILITY AND SAFETY

In accordance with 18 CFR § 380.12(m), Resource Report 11 (Reliability and Safety) is not applicable because the Project will not involve construction or the recommissioning of liquefied natural gas facilities. For this reason, Resource Report 11 is not provided in WBI Energy's environmental report.

12.0 PCB CONTAMINATION

Resource Report 12 (PCB Contamination) is required for applications involving the replacement, abandonment by removal, or abandonment in place of pipeline facilities determined to have polychlorinated biphenyls (PCBs) in excess of 50 parts per million in pipeline liquids or modifications of compressor station sites that have been determined to have soils contaminated with PCBs. The Project will not involve any facilities containing PCBs; therefore, Resource Report 12 is not required and is not provided in WBI Energy's environmental report.

13.0 ENGINEERING AND DESIGN MATERIAL

In accordance with 18 CFR § 380.12(o), Resource Report 13 (Engineering and Design Material) is not applicable because the Project will not involve construction of new liquefied natural gas facilities. Therefore, Resource Report 13 is not provided in WBI Energy's environmental report.

14.0 REFERENCES

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