Federal Energy Regulatory Commission
Office of Energy Projects

December 2020

WBI Energy Transmission, Inc.

Docket Nos. CP20-52-000
and CP20-52-001

North Bakken Expansion Project

Environmental Assessment



Washington, DC 20426

Cooperating Agencies:

U.S. Army
Corps of Engineers

U.S. Bureau of
Land Management

U.S. Forest
Service

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 204266

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas Branch 1
WBI Energy Transmission, Inc.
North Bakken Expansion Project
Docket Nos. CP20-52-000 and
CP20-52-001

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the North Bakken Expansion Project proposed by WBI Energy Transmission, Inc. (WBI Energy) in the above-referenced docket. WBI Energy requests authorization to construct, modify, operate, and maintain a new natural gas pipeline and associated facilities in McKenzie, Williams, Mountrail, and Burke Counties, North Dakota to transport up to 250,000 million cubic feet per day of natural gas from the Williston Basin in northwest North Dakota to a new interconnect with Northern Border Pipeline Company's existing mainline. The proposed facilities are collectively known as the North Bakken Expansion Project (Project).

The EA assesses the potential environmental effects of the construction and operation of the Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Land Management (BLM), and the U.S. Forest Service (USFS) participated as cooperating agencies in the preparation of this EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by WBI Energy's proposal and participate in the NEPA analysis. The USACE will use the EA and supporting documentation to consider the issuance of Clean Water Act Section 404, Section 408, and Rivers and Harbors Act Section 10 permits. The Project would also cross lands administered by the USACE and USFS. While the BLM does not have any BLM-administered lands identified as part of the proposed route alignment for this Project, the BLM will use the EA, along with other supporting documentation, in coordination with the USACE and USFS, in the issuance of a Mineral Leasing Act (MLA) right-of-way grant over federally administered lands (USACE and USFS). Although the cooperating agencies provided input to the conclusions and recommendations presented in the EA, the agencies will present their own conclusions and recommendations in their respective decision process for the Project.

The proposed North Bakken Expansion Project includes the following facilities in North Dakota:

- 62.8 miles of new 24-inch-diameter pipeline from WBI Energy's Tioga Compressor Station in Williams County to the proposed Elkhorn Creek Compressor Station in McKenzie County;
- 0.3 mile of new 24-inch-diameter pipeline between the proposed Elkhorn Creek Compressor Station and Northern Border Pipeline Company in McKenzie County;
- 20.3 miles of new 12-inch-diameter pipeline looping along WBI Energy's existing Line Section 25 between the Tioga Compressor Station and the proposed Norse Transfer Station in Burke County;[1]
- replacement of the existing 0.1 mile 6-inch-diameter Stoneview-Conoco Lateral with 0.1 mile of 8-inch-diameter natural gas pipeline from Line Section 25 to the proposed Norse Transfer Station in Burke County.
- 9.6 miles of new 12-inch-diameter natural gas pipeline looping along WBI Energy's Line Section 30 between the Nesson Valve Setting and the Tioga Compressor Station in Williams County;
- 0.5 mile of new 20-inch-diameter natural gas pipeline between the new Tioga Plant Receipt Station and new facilities at the Tioga Compressor Station in Williams County;
- uprates to WBI Energy's Line Section 25 in Burke County;
- one new 3,750 horsepower compressor station (Elkhorn Creek Compressor Station) in McKenzie County and the addition of 11,250 horsepower at the existing Tioga Compressor Station in Williams County;
- new, and modifications to, existing delivery, receipt, and transfer stations along WBI Energy's pipeline routes in Burke, McKenzie, Mountrail, and Williams Counties; and
- replacement of small segments of pipeline facilities and installation of block valves, pig[2] launcher/receiver stations, and associated appurtenances.

[1] A pipeline loop is a segment of pipe constructed parallel to an existing pipeline to increase capacity.

[2] A pipeline "pig" is a device used to clean or inspect the pipeline. A pig launcher/receiver is an aboveground facility where pigs are inserted or retrieved from the pipeline.

The Commission mailed a copy of the *Notice of Availability* to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners, and local libraries and newspapers. The EA is only available in electronic format. It may be viewed and downloaded from FERC's website (www.ferc.gov) on the natural gas environmental documents page (https://www.ferc.gov/industries-data/natural-gas/environmental-document). In addition, the EA may be accessed by using the eLibrary link on FERC's website. Click on the eLibrary link (https://www.ferc.gov/ferc-online/elibrary), select "General Search" and enter the docket number in the "Docket Number" field (i.e., CP20-52). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

The EA is not a decision document. It presents Commission staff's independent analysis of the environmental issues for the Commission to consider when addressing the merits of all issues in this proceeding. Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this Project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **January 18, 2021**.

For your convenience, there are three methods you can use to file your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

(1) You can file your comments electronically using the eComment feature on the Commission's website (www.ferc.gov) under the link FERC Online. This is an easy method for submitting brief, text-only comments on a project;

(2) You can also file your comments electronically using the eFiling feature on the Commission's website (www.ferc.gov) under the link to FERC Online. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or

(3) You can file a paper copy of your comments by mailing them to the Commission. Be sure to reference the project docket number (CP20-52-000) on your letter. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

Filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. At this point in this proceeding, the timeframe for filing timely intervention requests has expired. Any person seeking to become a party to the proceeding must file a motion to intervene out-of-time pursuant to Rule 214(b)(3) and (d) of the Commission's Rules of Practice and Procedures (18 CFR 385.214(b)(3) and (d)) and show good cause why the time limitation should be waived. Motions to intervene are more fully described at https://www.ferc.gov/ferc-online/ferc-online/how-guides.

Additional information about the Project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to https://www.ferc.gov/ferc-online/overview to register for eSubscription.

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing materials
APE	area of potential effects
AQCR	Air Quality Control Regions
ATWS	additional temporary workspace
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BLM	U.S. Bureau of Land Management
CAA	Clean Air Act of 1970
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent emissions
Commission	Federal Energy Regulatory Commission
CRP	Conservation Reserve Program
DASK	Dakota skipper
dBA	decibels on the A-weighted scale
EA	environmental assessment
EI	environmental inspector
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FR	*Federal Register*
USFWS	U.S. Fish and Wildlife Service
g	gravity
GHG	greenhouse gas
GIS	geographic information system
GWP	global warming potential
HAP	hazardous air pollutant
HCA	high consequence area
HDD	horizontal directional drill
HDD Plan	Horizontal Directional Drill/Guided Bore Drilling Fluid Monitoring and Operations Plan
hp	horsepower
HUC	Hydrologic Unit Code
km	kilometer
L_{dn}	average day-night ambient sound level
L_{eq}	24-hour equivalent sound level
LMNG	Little Missouri National Grassland
MAOP	maximum allowable operating pressure

MCA	moderate consequence area
MLA	Mineral Leasing Act
MMBtu/hr	million British thermal units per hour
MMcf/d	million cubic feet per day
MOU	Memorandum of Understanding
MP	milepost
NAAQS	National Ambient Air Quality Standards
NDAC	North Dakota Administrative Code
NDDMR	North Dakota Department of Mineral Resources
NDDOT	North Dakota Department of Transportation
NDDEQ	North Dakota Department of Environmental Quality
NDGFD	North Dakota Game and Fish Department
NDGS	North Dakota Geological Survey
NDPSC	North Dakota Public Service Commission
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLEB	northern long-eared bat
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Planned North Bakken Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Session*
Northern Border	Northern Border Pipeline Company
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
NWI	National Wetlands Inventory
OEP	Office of Energy Projects
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
PLOTS	Private Land Open to Sportsmen
$PM_{2.5}$	particulate matter sized 2.5 microns and smaller
PM_{10}	particulate matter sized 10 microns and smaller
PMR	passive magnetic ranging
Procedures	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Project	North Bakken Expansion Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Officer

SIP	State Implementation Plan
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SO_2	sulfur dioxide
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound
WAWSP	Western Area Water Supply Project
WBI Energy	WBI Energy Transmission Inc.
WPA	Waterfowl Production Area

A. PROPOSED ACTION

1. Introduction

On February 14, 2020, WBI Energy Transmission Inc. (WBI Energy) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP20-52-000 for a Certificate of Public Convenience and Necessity (Certificate) under section 7(c) of the Natural Gas Act (NGA) to construct, modify, operate, and maintain certain natural gas transmission facilities in McKenzie, Williams, Mountrail, and Burke Counties, North Dakota.

WBI Energy's proposed facilities, referred to as the North Bakken Expansion Project (Project), would include about 93.5 miles of new 24-, 20-, and 12-inch-diameter pipeline, pipeline looping,[1] and 0.1 mile of pipeline replacement; uprates to WBI Energy's existing Line Section 25; construction of one new compressor station and modifications to one existing compressor station; installation of new, and modifications to existing, delivery, receipt, and transfer stations; and installation of block valves, pig launcher/receiver stations, and other associated appurtenances.[2] More information regarding WBI Energy's specific proposed Project facilities is provided in section A.5.

On July 28, 2020, WBI Energy amended its application with FERC for the Project in order to: (1) provide incremental firm transportation design capacity of 250,000 million cubic feet per day (MMcf/d) of natural gas (a reduction of 100 MMcf/d from the original application); (2) update Project costs to reflect the proposed facilities changes, as well as a reduction in estimated Project costs related to the purchase of pipeline, construction of the proposed Elkhorn Creek Compressor Station, and construction of the WBI Energy interconnect facilities with Northern Border Pipeline Company (Northern Border); and (3) update certain appurtenant Project facilities. This environmental assessment (EA) discusses the currently proposed facilities.

FERC staff prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations for implementing NEPA (Title 40 of the Code of Federal Regulations Parts 1500-1508 [40 CFR 1500-1508])[3], and the Commission's implementing regulations under 18 CFR 380.

The EA is an integral part of the Commission's decision-making process on whether to issue WBI Energy a Certificate to construct, modify, operate, and maintain the proposed facilities. Our[4] principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that would result from the implementation of the proposed action;

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1 A pipeline loop is a segment of pipe constructed parallel to an existing pipeline to increase capacity.

2 A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes.

3 On July 16, 2020, CEQ issued a final rule, *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act* (Final Rule, 85 Fed. Reg. 43,304), which was effective as of September 14, 2020; however, the NEPA review of this project was in process at that time and was prepared pursuant to the 1978 regulations.

4 "We," "us," and "our" refer to the environmental staff of the Office of Energy Projects.

- identify and recommend reasonable alternatives to the proposed action and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and

- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

Under section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on both economic issues, including need, and environmental impacts. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public interest.

FERC is the lead federal agency for the preparation of this EA. The U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Land Management (BLM), and the U.S. Forest Service (USFS) participated as cooperating agencies in the preparation of this EA because they have jurisdiction by law or special expertise with respect to environmental impacts associated with this proposal. The federal cooperating agencies may adopt this EA per 40 CFR 1501.3 if, after an independent review of the document, they conclude that their requirements and/or regulatory responsibilities have been satisfied. However, these agencies would present their own conclusions and recommendations in their respective and applicable decisions and/or determinations. Otherwise, they may elect to conduct their own supplemental environmental analyses.

1.1 Federal Energy Regulatory Commission

FERC is an independent federal agency responsible for evaluating applications for authorization to construct and operate interstate natural gas pipeline facilities. If the Commission determines a project is required by the public convenience and necessity, a Certificate is issued under section 7(c) of the NGA and Part 157 of the Commission's regulations. As such, FERC is the lead federal agency for the preparation of the EA in compliance with the requirements of NEPA, the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR 1500-1508), and FERC's regulations implementing NEPA (18 CFR 380).

This EA presents our review of potential environmental impacts and recommendations to avoid or mitigate impacts. This EA will be used as an element in the Commission's review of the Project to determine whether a Certificate would be issued. FERC will also consider non-environmental issues in its review of WBI Energy's application. A Certificate will be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public interest.

1.2 U.S. Army Corps of Engineers

The USACE is a federal agency within the U.S. Department of Defense with jurisdictional authority pursuant to section 404 of the Clean Water Act (Title 33 of the United States Code [USC], section 1344), which governs the discharge of dredged or fill material into waters of the United States and section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody.

Section 401 of the Clean Water Act requires that proposed dredge or fill activities permitted under section 404 be reviewed and certified by the designated state agency (in this case, the North Dakota Department of Environmental Quality [NDDEQ], Division of Water Quality) to ensure the Project meets state water quality standards. The proposed Project is within the Omaha District of the USACE. The Project would require a section 404 permit for discharge of dredged or fill material into waters of the United States (including jurisdictional wetlands) and a section 10 permit for work in or affecting navigable waters of the United States.

Additionally, the Project involves a proposed horizontal directional drill (HDD) crossing of Lake Sakakawea and associated USACE-managed real estate. Lake Sakakawea is a reservoir created by the Garrison Dam/Lake Sakakawea Project as part of the Missouri River Mainstem Reservoir System authorized under the Flood Control Act of 1944 (Public Law 78-534) and managed by the USACE. The Garrison Dam/Lake Sakakawea Project provides for the following congressionally authorized purposes: flood control; navigation; irrigation; hydropower; water quality; municipal and industrial water supply; fish and wildlife; and recreation (USACE, 2018a).

Because the Project would cross Lake Sakakawea and the associated USACE-managed real estate, Section 408 permission and a USACE real estate easement would be required. Section 408, which is authorized in section 14 of the Rivers and Harbors Act (33 USC 408), allows the USACE to "grant permission for the alteration of a public work so long as that alteration is not injurious to the public interest and will not impair the usefulness of the work" (USACE, 2016). Pursuant to the Mineral Leasing Act, USACE will coordinate Real Estate Conditions of Easements with BLM for their Right of Way granted to WBI Energy.

Furthermore, as the USACE would need to evaluate and approve several aspects of the Project and must comply with the requirements of NEPA before issuing permits under the above statutes, it has elected to participate as a cooperating agency in the preparation of this EA. As an element of its review, the USACE must consider whether a proposed project avoids, minimizes, and compensates for impacts on existing aquatic resources, including wetlands, to strive to achieve a goal of no overall net loss of aquatic resource values and functions. The USACE would adopt the EA in compliance with 40 CFR 1506.3 if, after an independent review of the document, it concludes that the EA satisfies the USACE's comments and suggestions.

If the Project is authorized by the Commission, WBI Energy would not be allowed to commence construction until it receives all necessary federal authorizations including all authorizations under the jurisdiction of the USACE. Based on its participation as a cooperating agency and its consideration of the EA, the USACE would issue a Record of Decision to formally document its decision on the proposed action, including required environmental mitigation commitments.

1.3 U.S. Forest Service

The USFS is a civilian federal agency within the U.S. Department of Agriculture (USDA) that administers the nation's national forests and national grasslands. The mission of the USFS is to sustain the health, diversity, and productivity of the national forests and grasslands to meet the needs of present and future generations. It is the responsibility of the USFS to manage the national forests for multiple uses of resources such as water, forage,

wildlife, wood, recreation, minerals, and wilderness; and to provide products and benefits to the American people while ensuring the productivity of the land and protecting the quality of the environment.

Executive Order (EO) 13212, May 18, 2001, directed federal agencies to take appropriate actions, consistent with applicable law, to expedite reviews of authorizations for energy-related projects and to take other action necessary to accelerate the completion of such projects while maintaining safety, public health, and environmental protections. To facilitate EO 13212, the Secretaries of Agriculture, Interior, and Energy, and other federal agencies have agreed, through a formal Memorandum of Understanding (MOU), to coordinate their efforts and cooperate in the expeditious processing of authorizations for construction of natural gas pipelines. The Project would cross the USFS Little Missouri National Grassland (LMNG), a part of the Dakota Prairie Grasslands, in the northeast unit of the McKenzie Ranger District for approximately 2.1 miles between MPs 27.3 and 27.7 and MPs 28.2 and 29.9.

A proposed BLM right-of-way grant would be issued in lieu of a USFS special use permit to cross USFS lands, detailed below.

1.4 U.S. Bureau of Land Management

Though the Project would not cross federal lands under BLM jurisdiction, the BLM does have responsibility for certain land-use authorizations on federally managed lands. The BLM's purpose and need is to respond to WBI Energy's application under Section 28 of the Mineral Leasing Act (MLA), as amended, for a right-of-way grant to construct, operate, maintain, and (eventually) decommission a pipeline and related facilities on federal lands in compliance with the MLA, BLM right-of-way regulations, and other applicable federal laws. In coordination with the USACE and USFS, the BLM would adopt this EA in issuing a decision to respond to WBI Energy's proposed right-of-way application to cross federal lands in North Dakota. The proposed Project would cross 2.7 miles of federal lands managed by the USACE and 2.1 miles of federal lands managed by the USFS.

The right-of-way decision on the MLA Right-of-Way application would also require USACE permission under Section 14 of the Rivers and Harbors Act of 1899, 33 USC 408, to make alterations to federal property administered by the USACE, provided it is determined that the proposed alteration will not be injurious to the public interest and will not impair the usefulness of a Civil Works project. Under section 28 of the MLA and 43 CFR 2881.11, the BLM has the authority to issue rights-of-way grants to oil or gas pipelines or related facilities to cross federal lands under BLM jurisdiction or the jurisdiction of two or more federal agencies.

The BLM would consider adopting this EA for agency decisions pursuant to 40 CFR 1506.3(c) if, after an independent review of the document, the BLM, in coordination with the USACE and USFS, determines that the analysis and supporting information/documents and data relevant to the federally administered lands, provides sufficient evidence to support agency decisions.

The BLM's federal decision includes whether to approve, approve with modification, or deny issuance of a right-of-way grant to WBI Energy for the natural gas pipeline, and if approved, under what terms and conditions. The BLM's decision on WBI Energy's MLA Right-

of-Way application to cross federal land, administered by USFS and USACE in North Dakota, will rely on the analysis in this EA, as well as other supporting information or documents considered or included with the analysis. Therefore, in coordination and with concurrence from the USFS and the USACE, the BLM would issue a long-term right-of-way grant for the Project, pursuant to the MLA, as amended. Further, in addition to the 50-foot right-of-way, the BLM would issue a temporary use permit on behalf of the USFS to authorize use of USFS lands to accommodate construction. Lands affected by the temporary use permit would be subject to the same reclamation and rehabilitation requirements as the right-of-way grant.

2. Purpose and Need of the Project

WBI Energy states that the Project would provide 250,000 MMcf/d of incremental firm natural gas transportation capacity from natural gas processing plants in northwestern North Dakota to a proposed interconnect with Northern Border's[5] existing mainline for transit to Midwestern markets of the United States. WBI Energy notes that construction and operation of the Project would: 1) respond to market demand for additional firm take-away capacity for the increasing levels of associated natural gas production from the Bakken and Three Forks Formations in the Williston Basin, as evidenced by the significant long-term contractual commitments of the Project shippers; 2) connect associated natural gas production from the Bakken and Three Forks Formations to Midwestern markets via a new interconnect with Northern Border; 3) assist in the reduction of flaring of natural gas in the region in order to meet established state-mandated natural gas capture targets; and 4) create an additional outlet for the increasing volume of natural gas production in northwestern North Dakota which has resulted in increased transportation constraints on WBI Energy's existing Line Sections 7, 25, and 30 over the past few years. WBI Energy proposes to place the proposed facilities into service by November 1, 2021 (pending regulatory approvals) in accordance with its contractual commitments for the Project.

Some of the gas currently produced in the Williston Basin is flared because the producer focus has been on the higher value oil, and the economics have not historically supported gas-processing infrastructure. According to the North Dakota Department of Mineral Resources (NDDMR), 17 percent of the overall statewide volume of natural gas is being flared as of November 2019. The historical high of gas flared (36 percent) occurred in September 2011 (NDDMR, 2020).

The North Dakota Pipeline Authority has forecasted natural gas production to reach between 3.1 and 3.7 billion cubic feet per day in North Dakota by 2022, and natural gas processing capacity to increase to nearly 4.0 billion cubic feet per day by the end of 2021 (Kringstad, 2019). The six processing plants associated with this Project represent approximately 17 percent of the total natural gas processing capacity available in North Dakota today.

[5] Northern Border pipeline is a major natural gas pipeline system that links market demand in the Midwestern United States with natural gas production in the Western Canadian Sedimentary Basin, the Williston Basin, and the Powder River Basin in the United States.

3. Public Review and Comment

On July 3, 2019, the Commission granted WBI Energy's request to use FERC's Pre-filing Review Process in Docket No. PF19-7-000. The pre-filing process was established to encourage early involvement by citizens, governmental entities, non-governmental organizations, and other interested parties in the development of proposed natural gas transmission projects. During the pre-filing process, FERC staff worked with WBI Energy and interested stakeholders, including federal and state agencies, to identify and resolve Project-related issues. We participated in bi-weekly conference calls with WBI Energy to discuss relevant Project issues, and we encouraged WBI Energy to communicate frequently with the public throughout the pre-filing process.

WBI Energy hosted four private landowner meetings to introduce the Project and receive input: two meetings a day on May 8, 2019 in Tioga, North Dakota and on May 9, 2019 in Watford City, North Dakota. In total, 25 landowners attended the meetings. Discussion topics included the purpose of the Project, route siting, construction, and land use and restoration.

WBI Energy also hosted four open house meetings to inform stakeholders about the Project and provide an opportunity for stakeholders to ask questions and express comments and concerns: two on August 6, 2019 in Tioga, North Dakota and two on August 7, 2019 in Watford City, North Dakota. Attendees at the open houses included several affected landowners; a number of federal, state, and local elected officials or their representatives.[6] Additionally, FERC environmental staff attended the open house meetings. Questions or comments from stakeholders at the meetings generally concerned the purpose of the Project, the easement acquisition process, and private landowner impacts.

On September 13, 2019, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Planned North Bakken Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Session* (NOI). The NOI was published in the *Federal Register* (FR) and was mailed to 259 interested parties, including federal, state, and local officials; agency representatives; affected landowners; environmental and public interest groups; potentially interested Indian tribes; and local libraries. Comments were requested from the public on specific concerns about the Project or issues that should be considered during the preparation of the EA.

FERC environmental staff conducted two public scoping sessions on October 1 and 2, 2019 in Tioga and Watford City, North Dakota, respectively, to receive oral scoping comments on the Project. Attendees at the scoping sessions included several affected landowners, a representative of the USACE, a representative of the USFS, and WBI Energy personnel and their consultants. No formal comments were received during the scoping sessions. Four landowners, Justin and Angie Hartel and LeMoine and Clarice Hartel (collectively referred to as "the Hartels") provided written comments to the Commission. Written comments were also

[6] A representative from the USACE; representatives from the Three Affiliated Tribes Pipeline Authority; representatives from state and local agencies including the North Dakota Pipeline Authority, North Dakota Department of Commerce, NDDEQ, North Dakota State Water Commission (NDSWC), McKenzie County Road Department, and the City of Watford City Public Works Department; a representative of the Northwest Landowners Association; and WBI Energy personnel and their consultants attended the open houses.

submitted to the Commission by the NDDEQ. The scoping comments are addressed in relevant sections of this EA as indicated in table A-1. Additionally, FERC received letters from six individuals, one private organization, and one county office expressing their support of the Project.

Table A-1

Issues Identified During the Public Scoping Process

Issue	EA Section
Access roads	B.6.3
Construction traffic	B.6.3
Cumulative impacts	B.10
Dakota skipper habitat	B.4.1
Dust control and air quality impacts	B.1.2, B.8.1
Eminent domain, easement negotiations, and compensation	B.6.6
Erosion and sediment control	B.1.2
Fence/gate repair	B.5.2
Property/land values	B.6.6
Little Missouri National Grassland/Dakota Prairie Grasslands	B.5.6
Maintaining access to property	B.5.2
Minor route alternatives	C.4.
Noxious weeds	B.3.1
Pipeline engineering/placement	C.4.2
Placement of pipeline markers	B.9.7
Potential effects on Cherry Creek	B.2.2
Potential topsoil loss	B.5.1
Restoration/seeding	B.1.2
Right-of-way easement terms	B.5.6, B.6.6
Stormwater pollution prevention	B.2.2
Surface water resource protection	B.2.2
Trench dewatering	B.2.2
Wildlife	B.3.3

The Hartels commented that FERC should prepare an environmental impact statement (EIS) for the Project to assess all impacts from cumulative effects. The Commission's regulations under 18 CFR 306(b) state: "If the Commission believes that a proposed action…may not be a major federal action significantly affecting the quality of the human environment, an EA, rather than an EIS, will be prepared first. Depending on the outcome of the EA, an EIS may or may not be prepared." In preparing this EA, we are fulfilling our obligation

under NEPA to consider and disclose the environmental impacts of the Project. As noted above, this EA addresses the impacts that could occur on a wide range of resources should the Project be approved and constructed, including cumulative effects. Based on our analysis, and the extent and content of comments received during the scoping period, we conclude in section D that the impacts associated with this Project can be sufficiently mitigated to support a finding of no significant impact and, thus, an EA is warranted.

4. Scope of this Environmental Assessment

The resources and topics addressed in this EA include geology and soils; water resources and wetlands; vegetation, fisheries, and wildlife; threatened, endangered, and special status species; land use, recreation, and visual resources; socioeconomics; cultural resources; air quality and noise; reliability and safety; cumulative impacts; and alternatives. This EA describes the affected environment as it currently exists and the anticipated environmental consequences of the Project and compares the Project's potential impact with that of various alternatives. This EA also presents our recommended mitigation measures.

As the lead federal agency for the Project, FERC is required to comply with section 7 of the Endangered Species Act (ESA) and section 106 of the National Historic Preservation Act (NHPA). These statutes have been considered in the preparation of this EA. In addition to FERC, other federal, state, and local agencies may use this EA in approving or issuing any permits necessary for all or part of the proposed Project. Permits, approvals, and consultations for the Project are discussed in section A.10, below.

5. Proposed Facilities

The locations of the proposed Project facilities are illustrated on figure 1 and the topographic maps provided as appendix A. The alignment sheets for the Project are available on the FERC's eLibrary website.[7]

5.1 Pipeline Facilities

WBI Energy proposes to construct approximately 92.5 miles of new pipeline, pipeline looping, and pipeline replacement, as well as replacement of an additional 0.5 mile of pipeline replacement along a 28.3-mile segment of WBI Energy's existing Line Section 25 pipeline to increase the maximum allowable operating pressure (MAOP) of the pipeline segment. The proposed pipeline facilities are summarized in table A-2 and described in more detail below.

The Tioga-Elkhorn Creek pipeline would include about 62.8 miles of new 24-inch-diameter natural gas pipeline from new facilities at WBI Energy's Tioga Compressor Station near Tioga, North Dakota in Williams County to the proposed Elkhorn Creek Compressor Station southeast of Watford City, North Dakota in McKenzie County. The new pipeline would have bi-directional flow capabilities and an MAOP of 1,480 pounds per square inch gauge (psig).

[7] WBI Energy's alignment sheets are available on the FERC's eLibrary website. Search with accession number: 20200214-5292.

Table A-2

Proposed Pipeline Facilities

Pipeline Facilities	County	Approximate Mileposts		Length (miles) [a]
		Begin	End	
NEW PIPELINE				
Tioga-Elkhorn Creek	Williams	0.0	25.3	25.3
	McKenzie	25.3	62.8	37.5
Subtotal				**62.8**
Elkhorn Creek-Northern Border	McKenzie	0.0	0.3	0.3
Subtotal				**0.3**
Line Section 25 Loop [b]	Williams	0.0	6.7	6.7
	Mountrail	6.7	10.3	3.7
	Burke	10.3	20.3	10.0
Subtotal				**20.3**
Line Section 30 Loop	Williams	0.0	9.6	9.6
Subtotal				**9.6**
Tioga Compressor Lateral	Williams	0.0	0.5	0.5
Subtotal				**0.5**
New Pipeline Subtotal				**93.5**
MODIFICATIONS/UPRATES TO EXISTING PIPELINE				
Uprate Line Section 25 [c]	Burke	NA	NA	0.5
Modifications/Uprates Subtotal				0.5
TOTAL PIPELINE LENGTH				**94.0**

[a] The numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.

[b] Includes 20.3 miles of new Line Section 25 Loop pipeline in Williams, Mountrail, and Burke Counties and the replacement of 676 feet of 6-inch-diameter lateral pipeline with 665 feet of 8-inch-diameter pipeline in Burke County.

[c] Includes the replacement of about 0.4 mile of existing pipeline via the guided bore method at four county road crossings and one state highway crossing (92nd Street NW; 93rd Street NW/89th Avenue NW [both crossed by the same bore]; 86th Street NW, and Highway 40) and replacing and rerouting about 0.1 mile of existing 8-inch-diameter pipeline from the 86th Street NW bore to the proposed Norse Transfer Station.

This pipeline route is bisected by Lake Sakakawea at approximately the border of Williams and McKenzie Counties.

The Elkhorn Creek-Northern Border pipeline would include about 0.3 mile of new 24-inch-diameter natural gas pipeline between the proposed Elkhorn Creek Compressor Station and the new interconnect with Northern Border in McKenzie County. The pipeline would have an MAOP of 1,480 psig.

The Line Section 25 Loop would include approximately 20.3 miles of new 12-inch-diameter natural gas pipeline looping on WBI Energy's existing Line Section 25 between the Tioga Compressor Station and the proposed Norse Transfer Station in Burke County. The

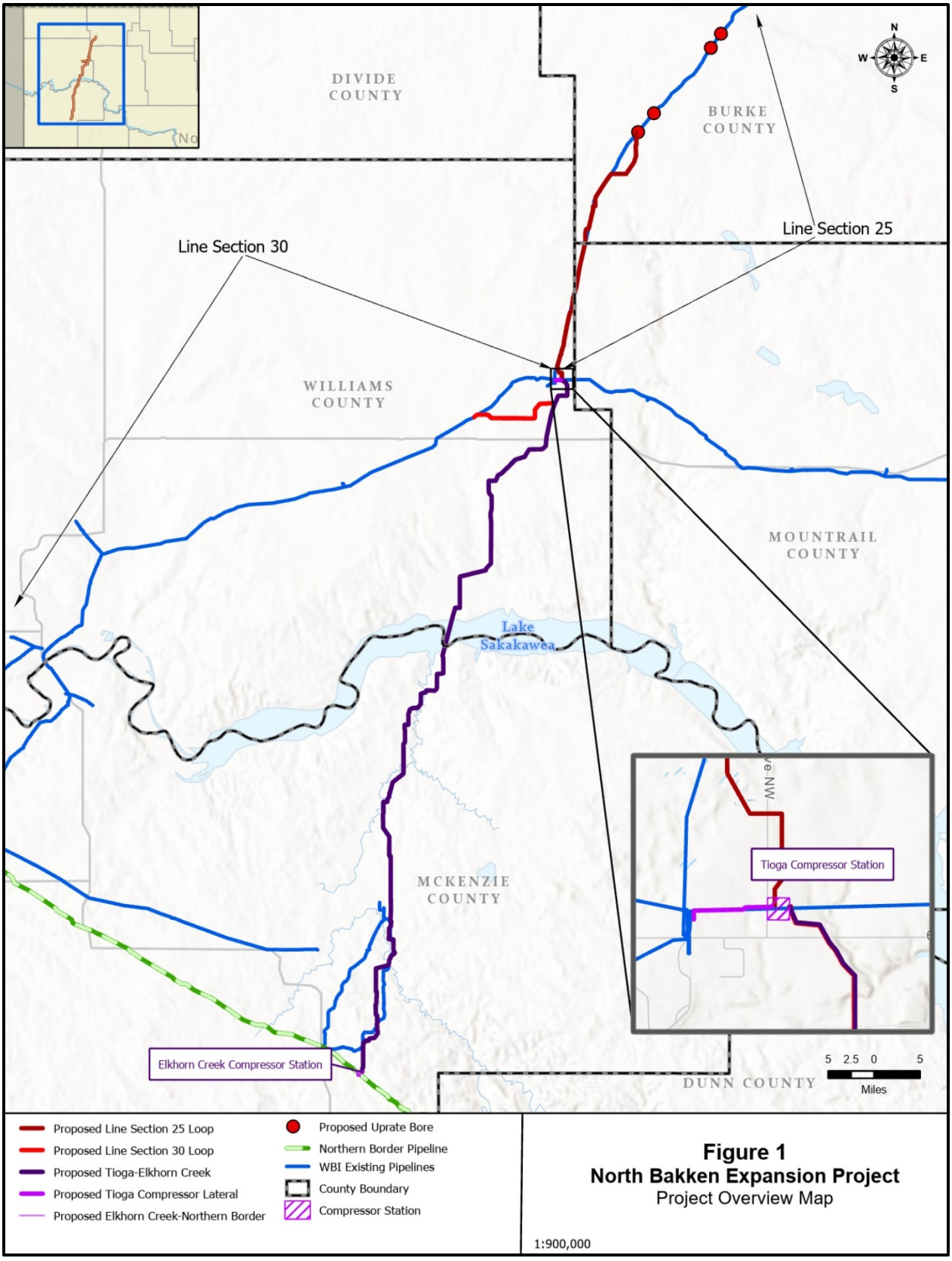


Figure 1
North Bakken Expansion Project
Project Overview Map

pipeline would have bi-directional flow capabilities and an MAOP of 1,098 psig. The new pipeline would serve to loop the existing 8-inch-diameter pipeline, which has an existing MAOP of 700 psig. In conjunction with the Line Section 25 Loop, WBI Energy would remove about 0.1 mile (676 feet) of the existing 6-inch-diameter Stoneview-Conoco Lateral that originates at WBI Energy's existing 8-inch-diameter Line Section 25 and traverses north to the existing Norse Plant Receipt Station in Burke County, and construct about 665 feet of new 8-inch-diameter mainline to parallel the proposed Line Section 25 Loop starting at about milepost (MP) 20.2 and terminating at the proposed Norse Transfer Station.

The Line Section 30 Loop would include approximately 9.6 miles of new 12-inch-diameter natural gas pipeline looping on WBI Energy's existing Line Section 30 between the existing Nesson Valve Setting and the Tioga Compressor Station in Williams County. The pipeline would have bi-directional flow capabilities and an MAOP of 700 psig. The new pipeline would traverse east to approximately MP 4.5, then north and northeast to approximately MP 5.8, and continue east until paralleling the proposed Tioga-Elkhorn Creek pipeline (approximately MPs 6.9 to 9.6), ending at the Tioga Compressor Station.

The Tioga Compressor Lateral would include approximately 0.5 mile of new 20-inch-diameter natural gas pipeline between the Tioga Plant Receipt Station and the new facilities at the Tioga Compressor Station in Williams County. The pipeline would have an MAOP of 1,480 psig. WBI Energy would uprate about 28.3 miles of its existing 8-inch-diameter Line Section 25 from an MAOP of 700 psig to an MAOP of 1,098 psig between the proposed Norse Transfer Station and WBI Energy's MIPL-Portal interconnect in Burke County. This would be accomplished by replacing about 0.4 mile of existing pipeline via the guided bore method at four county road crossings and one state highway crossing (92nd Street NW, 93rd Street NW/89th Avenue NW [both crossed by the same bore], 86th Street NW, and Highway 40) and replacing and rerouting about 0.1 mile (about 700 feet) of existing 8-inch-diameter pipeline with new 8-inch-diameter pipeline from the 86th Street NW bore to the proposed Norse Transfer Station to provide required overpressure protection. An approximately 9.6-mile segment of pipeline would require an uprate hydrotest as part of the Project (see section A.8.1 for information on hydrostatic testing).

The Hartels provided comments about the routing of the Project specific to collocation with other existing pipelines. To minimize the Project footprint, WBI Energy collocated new pipeline facilities with existing pipeline, utility, and road corridors to the extent practicable. As shown in the table provided in appendix B, the new pipelines would be collocated along 43.8 miles (or 47 percent) of the pipeline routes, including:

- 23.6 miles (38 percent) of the Tioga-Elkhorn Creek pipeline;
- 0.2 mile (67 percent) of the Elkhorn Creek-Northern Border pipeline;
- 14.8 miles (73 percent) of the Line Section 25 Loop;
- 4.7 miles (49 percent) of the Line Section 30 Loop; and
- 0.5 mile (100 percent) of the Tioga Compressor Lateral.

The proposed pipelines would cross approximately 1.0 mile of state lands, all of which are Surface Trust Lands administered by the North Dakota Department of Trust Lands (see

section B.5.6 for more information). The proposed pipelines would cross 4.8 miles of federal lands, including 2.7 miles of USACE lands and 2.1 miles of USFS lands. The remainder of the proposed routes cross privately owned lands, including about 3.6 miles of private lands subject to conservation easements held by the U.S. Fish and Wildlife Service (USFWS).

5.2 Aboveground and Appurtenant Facilities

In addition to the new pipeline facilities, the Project would require construction of one new compressor station (Elkhorn Creek Compressor Station); modifications to the existing Tioga Compressor Station; construction of, and modifications to, existing delivery, receipt, and transfer stations; and installation of block valves, pig launcher, and receiver facilities, and associated appurtenances. The new and modified aboveground facilities are summarized in table A-3 and described in more detail below.

Compressor Stations

Tioga Compressor Station Modification

WBI Energy would install 11,250 horsepower (hp) of additional compression and new equipment/facilities to meet Project design specifications at the existing Tioga Compressor Station about 0.5 mile east of Tioga, North Dakota in Williams County. WBI Energy would install a new transfer grid to tie in WBI Energy's existing Line Sections 7, 25, and 30 as well as the new Tioga-Elkhorn Creek pipeline, the Line Section 25 and 30 Loops, and the Tioga Compressor Lateral. WBI Energy would extend the existing station fencing to accommodate the station expansion and construct a new permanent access road in the northwest corner of the site. All facility additions would be within the existing property boundaries.

The new equipment and facilities at the Tioga Compressor Station would include:

- three new compressor units, each consisting of a skid-mounted 3,750 hp natural gas-fired Caterpillar G3612 engine coupled to a KBZ-4 compressor unit;
- two new compressor buildings (one building housing two compressor units; one building housing one compressor unit);
- a combination gas and engine auxiliary cooler for each new compressor unit (three total);
- a 592-kilowatt backup power generator driven by a natural gas-fired 840 hp Waukesha F3524GSI engine;
- two 2.47 million British thermal units per hour (MMBtu/hr) gas boilers for building heating and one 0.25 MMBtu/hr building unit heater;
- one underground 3,000-gallon pipeline liquids storage tank;

Table A-3

Proposed New and Modified Aboveground Facilities

Facility	Approximate Location	County	Description
Compressor Stations			
Tioga Compressor Station (modifications to existing compressor station)	MP 0.0 of the Tioga-Elkhorn Creek pipeline	Williams	Installation of 11,250 additional horsepower (hp) of compression and new equipment/ facilities at the existing compressor station
Elkhorn Creek Compressor Station (new compressor station)	MP 61.9 of the Tioga-Elkhorn Creek pipeline	McKenzie	Construction of a 3,750 hp greenfield compressor station
Delivery, Receipt, and Transfer Stations			
Lignite Plant Receipt Station and Lignite Town Border Station (replace)	Offline (along Line Section 25)	Burke	Replacement of existing Lignite Plant Receipt Station and Lignite Town Border Station at the same location to accommodate incremental volumes
Norse Plant Receipt Station (upgrade)	MP 20.4 of the Line Section 25 Loop	Burke	Upgrade meter, station piping, and associated facilities to accommodate incremental volumes
Norse Transfer Station (new)	MP 20.4 of the Line Section 25 Loop	Burke	Construction of new transfer station to protect facilities operated at a MAOP of 700 psig from the 1,098 psig MAOP of the Line Section 25 Loop
Northern Border Interconnect (new)	Offline (west of the Elkhorn Creek Compressor Station)	McKenzie	Construction of new interconnect facilities with Northern Border to accommodate incremental volumes
Robinson Lake Plant Receipt Station (upgrade)	Offline (on Line Section 7)	Mountrail	Upgrade meter, station piping, and associated facilities to accommodate incremental volumes
Springbrook Plant Receipt Station (upgrade)	Offline (along Line Section 30 pipeline)	Williams	Upgrade meter, station piping, and associated facilities to accommodate incremental volumes
Tioga Plant Receipt Station (replace)	MP 0.0 of the Tioga Compressor Lateral	Williams	Replacement of existing station to a new location to accommodate incremental volumes
Block Valves [a]			
56th Avenue NW Block Valve [b]	MP 16.2 of the Tioga-Elkhorn Creek pipeline	Williams	New block valve along Tioga-Elkhorn Creek pipeline
South Lake Block Valve [c]	MP 26.2 of the Tioga-Elkhorn Creek pipeline	McKenzie	New block valve along Tioga-Elkhorn Creek pipeline
Highway 10 Block Valve [c]	MP 37.0 of the Tioga-Elkhorn Creek pipeline	McKenzie	New block valve along Tioga-Elkhorn Creek pipeline
Cherry Creek Block Valve [c]	MP 51.4 of the Tioga-Elkhorn Creek pipeline	McKenzie	New block valve along Tioga-Elkhorn Creek pipeline
Valve No. 6.8 [c]	MP 6.9 of the Line Section 25 Loop	Mountrail	New valve site east of 102nd Road along Line Section 25 Loop pipeline
Valve No. 13.6 [c]	MP 13.6 of the Line Section 25 Loop	Burke	New valve site south of 81st Street along Line Section 25 Loop pipeline

Table A-3

Proposed New and Modified Aboveground Facilities

Facility	Approximate Location	County	Description
Pig Launchers/Receivers [a]			
Pig launcher/receiver 1	MP 0.0 of the Tioga-Elkhorn Creek pipeline	Williams	New pig launcher/receiver within the Tioga Compressor Station
Pig launcher/receiver 2 [c]	MP 6.2 of the Tioga-Elkhorn Creek pipeline	Williams	New pig launcher/receiver at 104th Avenue NW
Pig launcher/receiver 3	MP 62.8 of the Tioga-Elkhorn Creek pipeline	McKenzie	New pig launcher/receiver within the new Elkhorn Creek Compressor Station
Pig launcher/receiver 4	MP 0.0 of the Line Section 25 Loop	Williams	New pig launcher/receiver within the Tioga Compressor Station
Pig launcher/receiver 5 and 6	MP 20.3 of the Line Section 25 Loop	Burke	New pig launcher/receivers at the new Norse Transfer Station (one for the Line Section 25 Loop and one for the 665 feet of 8-inch-diameter pipeline replacement)
Pig launcher/receiver 7	MP 0.0 of the Line Section 30 Loop	Williams	New pig launcher/receiver at the Nesson Valve Setting
Pig launcher/receiver 8	MP 9.6 of the Line Section 30 Loop	Williams	New pig launcher/receiver within the Tioga Compressor Station
Pig launcher/receiver 9	MP 0.0 of the Tioga Compressor Lateral	Williams	New pig launcher/receiver within the Tioga Plant Receipt Station
Pig launcher/receiver 10	MP 0.5 of the Tioga Compressor Lateral	Williams	New pig launcher/receiver within the Tioga Compressor Station
Pig launcher/receiver 11	N/A	Burke	New pig launcher/receiver at the new Norse Transfer Station
Pig launcher/receiver 12	N/A	Burke	New pig launcher/receiver at the Lignite Border Station

[a] No new block valves or pig launcher/receivers would be installed along the Elkhorn Creek-Northern Border pipeline.

[b] 56th Street NW would be used to access this facility during operation.

[c] New permanent access roads would be constructed to provide access to these facilities during operation as shown in the maps in appendix A and the access road table in appendix C.

- one underground 3,000-gallon used oil storage tank;
- one underground 3,000-gallon floor drain tank to collect wastewater;
- relocation of an existing stormwater retention pond;
- one transfer building and one auxiliary building to house the new equipment; and
- four pig launcher/receivers (one 24 inches in diameter for the Tioga-Elkhorn Creek pipeline, one 20 inches in diameter for the Tioga Compressor Lateral, and two 12 inches in diameter for the Line Sections 25 and 30 Loop pipeline).

Elkhorn Creek Compressor Station

WBI Energy would construct one new 3,750 hp greenfield compressor station with associated equipment and facilities on a 10.9-acre site about 8 miles southeast of Watford City, North Dakota in McKenzie County. The new compressor station would be tied into the Tioga-Elkhorn Creek pipeline at about MP 62.8 and the Elkhorn Creek-Northern Border pipeline. WBI Energy would install a new access road to the facility from County Road 34/18th Street NW. WBI Energy has signed a purchase agreement to acquire the compressor station property in fee.

The new compressor station facilities would include:

- one skid-mounted 3,750 hp Caterpillar G3612 natural gas-fired engine coupled to a KBZ- 4 compressor unit within a new compressor building;
- a combination gas and engine auxiliary cooler;
- one 1.69 MMBtu/hr gas boiler for building heating, one 0.2 MMBtu/hr water heater, one0.25 MMBtu/hr building unit heater, and one 0.12 MMBtu/hr fuel gas preheater;
- one underground 2,000-gallon pipeline liquids storage tank;
- one underground 2,000-gallon waste oil storage tank;
- one underground 2,000-gallon floor drain tank to collect wastewater;
- one transfer building to house the transfer grid piping, gas cleaning equipment, and gas measurement and regulation equipment;
- one auxiliary building to house the motor control center, the station and fire/gas programmable logic controller and human-machine interface, and an office/shop area; and
- a 24-inch-diameter pig launcher/receiver, associated piping and valves, and septic system.

Delivery, Receipt, and Transfer Stations

Lignite Plant Receipt Station and Lignite Town Border Station

WBI Energy would rebuild the existing Lignite Plant Receipt Station along Line Section 25 to accommodate incremental volumes associated with the Project. The new station would include a building with telemetry and gas quality instruments; a second building with high-pressure metering, an odorant system, and station piping with overpressure protection equipment; and an 8-inch-diameter pig launcher/receiver for Line Section 25. WBI Energy would also rebuild the existing Lignite Town Border Station to meet the uprated Line Section 25 MAOP design of 1,098 psig. The new Lignite Town Border Station would include a new

building with regulation, overpressure protection, and measurement equipment; filtration equipment; new valves; aboveground piping; and fittings. WBI Energy previously obtained an easement for the existing stations and is in the process of obtaining an adjoining easement.

Norse Plant Receipt Station

WBI Energy proposes to rebuild the Norse Plant Receipt Station at the existing location at about MP 20.3 of the proposed Line Section 25 Loop. These modifications are necessary to accommodate incremental volumes associated with the Project. The new station would include a new building with telemetry and gas quality instrumentation and a second building with high-pressure metering, an odorant system, and station piping with overpressure protection equipment. WBI Energy would access the station using an existing entrance off of 86th Street NW within the permanent facility workspace. WBI Energy previously obtained an easement for the existing station; no additional land would be required.

Norse Transfer Station

WBI I Energy proposes to construct a new transfer station on a tract adjacent to and south of the Norse Plant Receipt Station near MP 20.3 of the proposed Line Section 25 Loop. The new station would include a new building with regulation and overpressure protection equipment to provide overpressure protection to facilities operated at a MAOP of 700 psig. The transfer station's telemetry equipment would be housed in the Norse Plant Receipt Station. WBI Energy is in the process of obtaining the easement.

Northern Border Interconnect

WBI Energy would construct new facilities to connect with Northern Border west of the new Elkhorn Creek Compressor Station in McKenzie County to accommodate the incremental volumes associated with the Project. The facilities would include a new building with remote telemetry unit and telemetry equipment. Additionally, WBI Energy would reimburse Northern Border for the cost of a tap and measurement facilities it would construct, own, and operate. WBI Energy has signed an easement agreement with a third-party landowner for the Northern Border facilities. WBI Energy would access the interconnect using a new permanent access road from 18th Street NW.

Robinson Lake Plant Receipt Station

WBI Energy would upgrade the meter, station piping, and associated facilities at the existing Robinson Lake Plant Receipt Station along Line Section 7 about 1.5 miles southeast of Stanley, North Dakota. The upgrades would be required to accommodate incremental volumes associated with the Project. WBI Energy would access the station using an existing entrance/access road from 61st Street NW. WBI Energy previously obtained an easement for the existing station and is in the process of obtaining an adjoining easement.

Springbrook Plant Receipt Station

WBI Energy would upgrade the meter, station piping, and associated facilities at the existing Springbrook Plant Receipt Station about 25 miles west-southwest of Tioga, North Dakota on WBI Energy's existing Line Section 30 to accommodate incremental volumes associated with the Project. WBI Energy would access the facility using an existing entrance off 131st Avenue NW. WBI Energy plans to expand its current easement for the existing station. The producer is responsible for acquiring the easement and is currently working with the landowner.

Tioga Plant Receipt Station

WBI Energy would remove the existing Tioga Plant Receipt Station and construct a new station at MP 0.0 of the Tioga Compressor Lateral. This modification is required to accommodate incremental volumes associated with the Project. The new station would include a new building with telemetry and gas quality instrumentation and a second building with high-pressure metering, an odorant system, and station piping with overpressure protection equipment. WBI Energy would construct a new permanent access road to provide access to the facility. WBI Energy has acquired an easement and executed a surface agreement to construct the new station.

Block Valves and Pig Launchers/Receivers

WBI Energy would install six new mainline block valves, four along the Tioga-Elkhorn Creek pipeline and two along the Line Section 25 Loop, and 12 new pig launcher/receivers associated with the Tioga Elkhorn Creek pipeline, Line Section 25 Loop, Line Section 30 Loop, Tioga Compressor Lateral, and uprates to Line Section 25. Table A-3 provides the specific location of these facilities and a more detailed description. WBI Energy would not install any new block valves or pig launcher/receivers along the Elkhorn Creek-Northern Border pipeline.

6. Land Requirements

Construction of the Project would affect 1,469.5 acres of land, including the pipeline construction rights-of-way, additional temporary workspace (ATWS), staging areas, temporary and permanent access roads, and aboveground facilities. Following construction, 874.6 acres, including the temporary construction right-of-way, ATWS, staging areas, temporary access roads, and temporary workspace at aboveground facility sites, would be restored and revert to preconstruction land uses. The remaining 594.9 acres, including the permanent pipeline easements, permanent aboveground facility sites, and permanent access roads, would be retained for operation of the pipeline system. Table A-4 summarizes the land requirements for the Project.

Table A-4

Summary of Land Requirements [a]

Facility	County	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Rights-of-Way [b]			
Tioga-Elkhorn Creek [c]	Williams, McKenzie	724.3	380.1
Elkhorn Creek-Northern Border	McKenzie	2.7	1.4
Line Section 25 Loop	Williams, Mountrail, and Burke	183.8	123.0
Line Section 30 Loop [c]	Williams	86.8	57.9
Tioga Compressor Lateral	Williams	3.9	2.8
Uprate Line Section 25	Burke	3.8	3.0
Subtotal		**1,005.3**	**568.1**
ATWS			
Tioga-Elkhorn Creek	Williams, McKenzie	78.0	0.0
Line Section 25 Loop	Williams, Mountrail, and Burke	27.0	0.0
Line Section 30 Loop	Williams	10.1	0.0
Tioga Compressor Lateral	Williams	0.5	0.0
Uprate Line Section 25	Burke	11.5	0.0
Subtotal		**127.0**	**0.0**
Staging Areas			
68th Street Yard	Williams	20.4	0.0
Boehm Staging Yard	McKenzie	6.2	0.0
CRS Yard	Williams	22.8	0.0
Delta Contractors Yard	McKenzie	23.6	0.0
Enget Yard	Mountrail	39.8	0.0
Flatlands Yard 1	McKenzie	4.9	0.0
Flatlands Yard 2	McKenzie	6.1	0.0
Lobell Yard	Williams	39.5	0.0
Schmidt Yard	Williams	8.4	0.0
Weflen Staging Yard	Williams	17.7	0.0
Franz Yard	McKenzie	22.2	0.0
Aux Sable Yard	Williams	46.2	0.0
Subtotal		**257.8**	**0.0**
Access Roads			
Temporary access roads	Multiple	43.4	0.0
Permanent access roads	Williams	2.6	2.6

Table A-4

Summary of Land Requirements [a]

Facility	County	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Subtotal		**46.0**	**2.6**
Aboveground Facilities			
Elkhorn Creek Compressor Station (new)	McKenzie	13.1	10.9
Tioga Compressor Station (existing)	Williams	8.0	4.4 [d]
Lignite Town Border and Lignite Plant Receipt Station (existing)	Burke	0.6	0.6
Norse Plant Receipt Station (existing)	Burke	0.6	0.6
Norse Transfer Station (new)	Burke	1.5	0.3
Northern Border Interconnect (new)	McKenzie	4.2	3.2
Robinson Lake Plant Receipt Station (existing)	Mountrail	1.4	0.6
Springbrook Plant Receipt Station (existing)	Williams	1.0	0.4
Tioga Plant Receipt Station (existing)	Williams	1.1	1.1
Block valves (new) [e]	Burke, McKenzie, Mountrail, and Williams	1.7	1.7
Pig launchers/receivers (new) [f]	Burke, McKenzie, and Williams	0.2	0.2
Subtotal		**33.4**	**24.1**
PROJECT TOTAL		**1,469.5** [h]	**594.9**

a The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

b Based on a 100-foot-wide construction right-of-way for the 24-inch-diameter pipelines, a 75-foot-wide construction right-of-way for the 20-, 12-, and 8-inch-diameter pipelines, and a 50-foot-wide permanent right-of-way for all new pipeline facilities. Includes the appurtenant facilities within the pipeline right-of-way (i.e., block valves, cathodic protection facilities).

c The Tioga-Elkhorn Creek and Line Section 30 Loop pipelines would be collocated from the Tioga Compressor Station to approximately MP 2.8 of the Tioga-Elkhorn Creek pipeline (MPs 6.8 to 9.6 of the Line Section 30 Loop). Portions of the temporary and permanent right-of-way that overlap along the collocated portion would be used during construction and/or operation of both pipelines.

d All 4.4 acres are within WBI Energy's Tioga Compressor Station owned property boundaries; however, 2.2 acres are outside of the existing chain-linked fenced facility. The fence will be extended to encompass the compressor station expansion.

e Four of the six proposed block valves (Valve No. 13.6, 56th Avenue NW Block Valve, Highway 10 Block Valve, and South Lake Block Valve) would be constructed entirely within the permanent pipeline rights-of-way and no additional land would be required for their construction or operation. However, the Cherry Creek Block Valve and Valve No. 6.8 would require an additional 0.9 and less than 0.1 acre of land, respectively, outside the existing permanent pipeline right-of-way for construction and operation.

f All but one of the pig launcher/receiver sites would be constructed and operated within a compressor, receipt, and /or transfer station or valve setting sites; no additional land would be required for construction and operation of these facilities. The remaining pig launcher/receiver (MP 6.2) would affect 0.2 acre outside the existing permanent pipeline right-of-way during construction and operation.

h Acreages do not include impacts due to two minor route changes filed by WBI Energy on December 4, 2020 (accession number 20201204-5043), which would impact less than 3 acres total and would not impact any additional resources.

6.1 Pipeline Facilities

Construction of the proposed 12-inch-diameter Line Section 25 and Line Section 30 Loops and the 20-inch-diameter Tioga Compressor Lateral would require a 75-foot-wide construction right-of-way. Except through wetlands[8] and across USFS land,[9] construction of the proposed 24-inch-diameter Tioga-Elkhorn Creek and Elkhorn Creek-Northern Border pipelines would require a 100-foot-wide construction right-of-way to accommodate increased amounts of topsoil and subsoil storage while allowing safe passage of construction equipment and material along the working side of the right-of-way during construction.

The construction right-of-way would typically consist of a 50-foot-wide working side and a 25-foot-wide spoil side for the 75-foot-wide construction right-of-way and a 70-foot-wide working side and a 30-foot-wide spoil side for the 100-foot-wide construction right-of-way.[10] Following construction, WBI Energy would retain a 50-foot-wide permanent easement for all pipeline operations; the remainder of the construction right-of-way would be restored and allowed to revert to pre-existing land use. In total, the pipeline construction-right-of-way would require approximately 996.4 acres, of which 563.2 acres would be retained as permanent easement. ATWS outside of the 75- and 100-foot-wide construction right-of-way would be required at certain waterbody and wetland crossings, road and railroad crossings, points of inflection along the route, areas where special construction methods would be implemented (e.g., the HDD and guided bore methods), and areas where additional space is needed for storage of stripped topsoil. In total, use of ATWS during construction would affect about 127.0 acres, all of which would be restored and allowed to revert to previous uses following construction. A table of ATWS areas is provided in appendix D.

6.2 Aboveground Facilities

Construction and operation of the proposed modifications to the Tioga Compressor Station at MP 0.0 of the Tioga-Elkhorn Creek pipeline would affect about 8.0 acres. About 4.4 acres would be retained for operation of the facility.[11]

Construction and operation of the new Elkhorn Creek Compressor Station at MP 62.8 of the Tioga-Elkhorn Creek pipeline would affect about 13.1 acres, including 10.9 acres that would be fenced and maintained for operation of the compressor station.

Construction of the new and modifications to the existing delivery, receipt, and transfer stations would affect about 10.4 acres of land, including 6.8 acres that would be retained for operation of the facilities.

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8 In accordance with the FERC *Wetland and Waterbody Construction and Mitigation Procedures*, wetland crossings would typically be 75 feet wide.

9 The construction right-of-way width across USFS land would be reduced to 50 feet (with an additional 25 feet of ATWS as needed).

10 Typical construction right-of-way diagrams for the Project can be found in FERC docket CP20-52-000 with accession number 20200911-5292.

11 This would include 4.4 acres within the Tioga Compressor Station site property boundaries. About 2.2 acres are outside the existing chain-linked fenced facility, but within the existing property boundaries.

WBI Energy would construct six block valves, four of which would be entirely within the permanent pipeline rights-of-way. The remaining two block valves (the Cherry Creek Block Valve and Valve No. 6.8) would affect 1.7 acres outside the permanent right-of-way, all of which would be retained during operations. WBI Energy would construct 12 pig launcher/receivers, 11 of which would be constructed and operated within the boundaries of a compressor, receipt, and transfer station or valve setting site. The remaining pig launcher/receiver site (104th Avenue NW pig launcher/receiver near MP 6.1 of the Tioga-Elkhorn Creek pipeline) would affect 0.2 acre outside the permanent pipeline right-of-way, which would be retained during operations. Following construction, WBI Energy would restore all temporary workspace in accordance with FERC's requirements.

6.3 Staging Areas

WBI Energy has identified 12 staging areas to serve as the bases of operation during construction. These staging areas are depicted on the Project route maps in appendix A. Activities in these areas would include site preparation (e.g., topsoil segregation and minor grading), pipe and equipment storage, vehicle/equipment maintenance, and vehicle and equipment parking. Additionally, Project construction trailers would be placed on the sites as offices. Use of the staging areas collectively would affect about 257.8 acres during construction. Following construction, WBI Energy would restore these areas and allow them to revert to preconstruction uses.

6.4 Access Roads

WBI Energy would use existing public and private roads to provide temporary access to the construction right-of-way and aboveground facility sites during construction. Standard-maintenance public roads would be used for access without modification or improvement. Some minimum-maintenance public roads and private roads would require improvement (such as grading; placement of gravel, crushed rock, or scoria for stability and surface improvement; replacing or installing culverts; and clearing of overhead vegetation, if present) to safely accommodate Project equipment and vehicles. A table listing the Project access roads is provided as appendix C.

Use of temporary access roads would affect approximately 43.4 acres. If any of the temporary access roads are damaged by the Project, WBI Energy would restore the roads to pre-existing condition or better. As a result, the Project would have no permanent impact on these roads**.**

WBI Energy would construct 10 new permanent access roads to provide access to the proposed aboveground facilities. Construction and use of the permanent access roads would permanently affect about 2.6 acres.

7. Construction Schedule and Workforce

WBI Energy anticipates that construction of the Project would commence in March 2021 for aboveground facilities and May 2021 for the pipeline facilities, subject to receipt of necessary permits and regulatory approvals. WBI Energy anticipates that construction of the Project facilities would be completed in October 2021 and that all facilities would be placed in service by November 1, 2021. Based on the current construction schedule, WBI Energy anticipates that

construction during winter conditions would not be necessary. Construction activities would generally occur Monday through Saturday from 7:00 a.m. to 7:00 p.m.; however, certain activities would occur up to 24 hours per day, including Sundays and holidays. WBI Energy anticipates that these activities would include HDD and guided bore crossings, hydrostatic testing and associated activities, critical tie-ins, operation of pumps associated with a dam-and-pump crossing (if necessary), aboveground facility building construction, installation of compressor units, and aboveground facility commissioning. Additionally, certain unforeseen circumstances may require unplanned construction activities outside the typical work hours, which may include, but are not limited to, completing in-progress construction activities and wetland/waterbody crossings delayed by an unanticipated event (e.g., severe weather, constructability issues), incident response procedures/measures, and emergency equipment repairs/maintenance. WBI Energy has committed to notify affected landowners in the event of unforeseen activities requiring work outside of the typical 7:00 a.m. to 7:00 p.m. construction hours.

WBI Energy anticipates that construction of the proposed Project would be accomplished using a peak construction workforce of about 450 people and an average workforce of about 350 people, including inspection crews. Construction of the pipeline facilities would occur using three construction spreads with an average temporary workforce of 250 people. Construction of the aboveground facilities would require an average of about 95 additional people, including 75 for the compressor stations and 20 for the delivery, receipt, and transfer stations. Once construction of the Project is complete, WBI Energy would hire four new permanent employees to assist in operation and maintenance of the new facilities.

8. Construction, Operations, and Maintenance Procedures

WBI Energy would design, construct, operate, and maintain the Project in accordance with applicable requirements defined by the U.S. Department of Transportation's (USDOT) regulations in 49 CFR 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; by 18 CFR 380.15, *Siting and Maintenance Requirements*; and by other applicable federal and state safety regulations. Additionally, WBI Energy would construct, operate, and maintain the proposed pipelines and other facilities in accordance with the requirements of permits issued to the Project. WBI Energy would implement the construction techniques and mitigation measures identified in the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures)[12] as modified by the alternative measures identified in table A-5.

[12] The FERC Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan and Procedures can be viewed on the FERC Internet website at www.ferc.gov/industries/gas/enviro/plan.pdf and http://www.ferc.gov/industries/gas/enviro/procedures.pdf.

Table A-5

Proposed Modifications to the FERC Wetland and Waterbody Construction and Mitigation Procedures

Procedures Section No. and Measure	Proposed Modification	WBI Energy's Justification for Proposed Modification	Protection Measure
V.B.2.[a] Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.	Locate workspace at MP 30.2 of the Tioga-Elkhorn Creek pipeline is about 34 feet of the water's edge.	The workspace on the northeast side of Tobacco Garden Creek is necessary to cross the waterbody by guided bore; cannot be set back further given the angle of the crossing and two points of intersect (PIs) in close proximity. The requested workspace is necessary to safely complete the bore crossing.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the waterbody. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect waterbodies from potential spills.
VI.B.1. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.	Locate workspace at MP 52.5 of the Tioga-Elkhorn Creek pipeline is about 27 feet from an emergent wetland.	This workspace on the south side of Cherry Creek is necessary to facilitate a guided bore crossing of this waterbody. In this instance, a further off set of temporary workspaces from the emergent wetland would not provide any further protection, given that the wetland is located within the temporary right-of-way and will be temporarily impacted during construction.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills.
"	Locate two workspaces at MP 0.8 of the Line Section 25 Loop is about 33 and 39 feet from an emergent wetland.	These workspaces are necessary to facilitate a guided bore crossing of the wetland. Space is limited in this area due to engineering and environmental constraints.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills. Use of the guided bore crossing method would minimize impacts on the wetland.
"	Locate workspace at MP 1.0 of the Line Section 25 Loop is about 4 feet from an emergent wetland.	This workspace on the north side of 69th Street NW is necessary to facilitate a guided bore crossing of this road. Three emergent wetlands are located in proximity to this road crossing, one of which has an additional temporary workspace located within 50 feet. Shifting the workspace to the north would bring the workspace within 50 feet of a different wetland. Given the location of the road and PIs the proposed workspace location is necessary to safely complete this bore.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills.
"	Locate workspace at MP 14.8 of the Line Section 25 Loop is about 29 feet from an emergent wetland.	The workspaces on the east side of the wetland and 100th Avenue NW are necessary to facilitate the guided bore crossing of this road and wetland; the workspace is about 29 feet from the wetland. Given the location of the road and wetland, attempting to minimize the length of the bore while maintaining colocation, and PIs associated with the bore, the proposed workspace location is necessary to safely complete this bore.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills. Use of the guided bore crossing method would minimize impacts on the wetland.

Table A-5

Proposed Modifications to the FERC Wetland and Waterbody Construction and Mitigation Procedures

Procedures Section No. and Measure	Proposed Modification	WBI Energy's Justification for Proposed Modification	Protection Measure
"	Locate workspace at MP 16.2 of the Line Section 25 Loop within 50 feet of an emergent wetland.	The workspaces on the west side of the wetland and 99th Avenue NW are necessary to facilitate the guided bore crossing of this road and wetland; the workspace is about 39 feet from the wetland. Use of the guided bore crossing method would minimize impacts on the wetland.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and Horizontal Directional Drill/Guided Bore Drilling Fluid Monitoring and Operations Plan to protect wetlands from potential spills.
"	Locate workspace at MP 0.4 of the Tioga Compressor Lateral about 5 feet from an emergent wetland.	The workspace on the west side of 103rd Avenue NW is necessary to cross the road by guided bore. As work will be ongoing within the Tioga Compressor Station on the east side of the road, temporary workspaces on the west side of the road are needed to complete the bore. Given the location of the wetland to the road crossing, shifting the workspace to be 50 feet from the wetland would not be possible while maintaining the space needed to safely complete this road crossing.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills.
"	Locate workspace at uprate bore site 3 is about 45 feet from an emergent wetland.	The workspace on the south side of 92nd Street NW is necessary to cross the road by guided bore. The bore has been designed to have most workspaces on the north side of the road away from the majority of wetlands. The portion of the additional temporary workspace that is within 50 feet of an emergent wetland is necessary to be able to safely complete this uprate bore.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills.
"	Locate workspace at uprate bore site 4 is about 33 feet from an emergent wetland.	The workspace on the north side of 93rd Street NW is necessary to cross the road by guided bore. This road crossing is surrounded by wetlands. The bore has been designed to have the majority of workspaces on the north side of the road away from the majority of wetlands. The portion of the additional temporary workspace that is within 50 feet of an emergent wetland is necessary for the bore pullback.	WBI Energy would install erosion and sediment control devices in accordance with the FERC Plan and Procedures to prevent sediment from entering the wetland. Additionally, WBI Energy would implement the measures outlined in the Project SPCC Plan and HDD Plan to protect wetlands from potential spills.

[a] There are three waterbodies (MPs 12.2, 30.3, and 44.8) where workspaces are currently between 47 and 49 feet from the waterbody. WBI Energy would fence off and not use the portion of the workspaces within 50 feet of these waterbodies.

WBI Energy would implement additional construction, restoration, and mitigation plans that it prepared for the Project. These include the following:

- Spill Prevention, Control, and Countermeasure Plan (SPCC Plan);
- Plan for Unanticipated Discovery of Contaminated Environmental Media;
- Noxious Weeds Management Plan;
- Blasting Plan;
- Fugitive Dust Control Plan;
- Plan for Unanticipated Discovery of Historic Properties or Human Remains during Construction;
- Plan for Unanticipated Discovery of Paleontological Resources during Construction; and
- Horizontal Directional Drill/Guided Bore Drilling Fluid Monitoring and Operations Plan (HDD Plan).

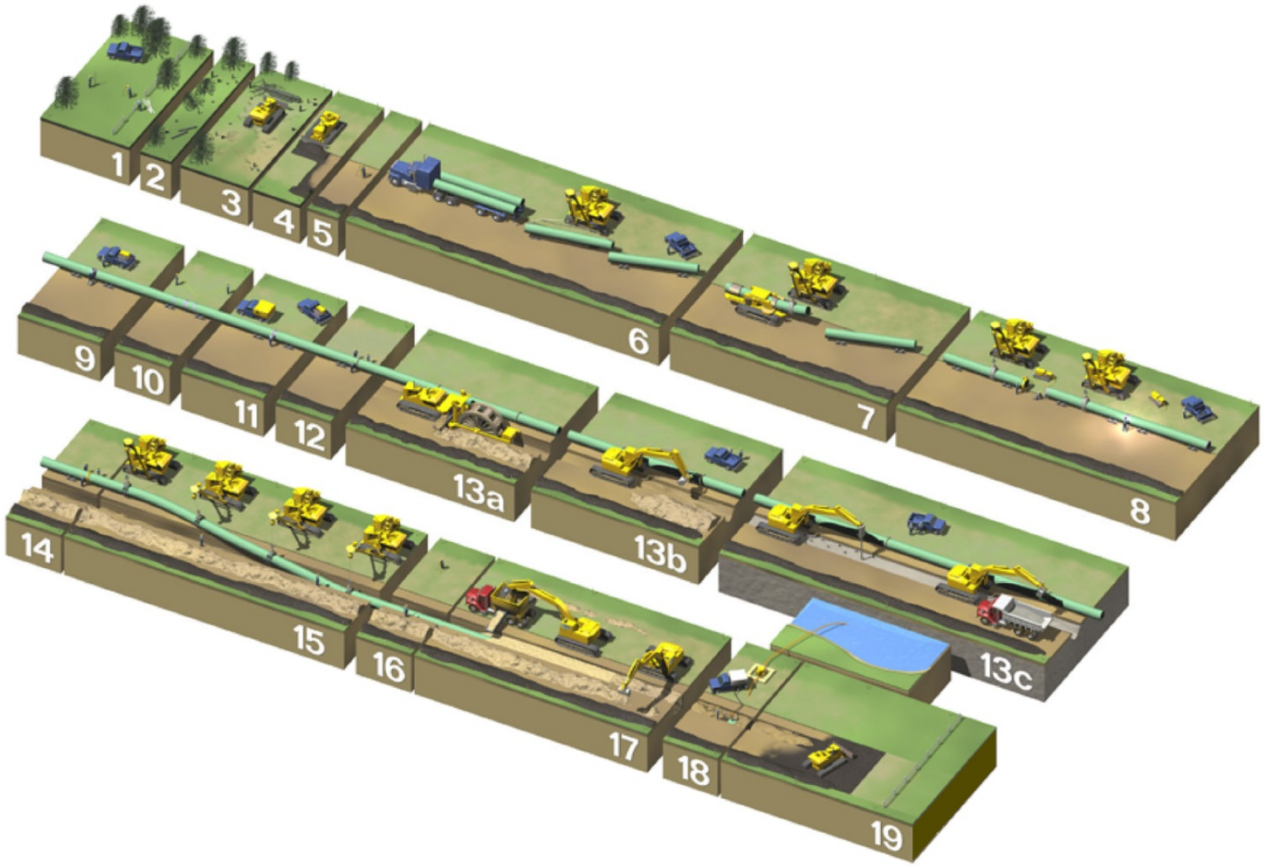
We have reviewed WBI Energy's construction, restoration, and mitigation plans, and the proposed alternative measures to the FERC Plan and Procedures and have found them acceptable with the exception of the wetland at MP 16.2 discussed in our recommendation below in section B.2.3.

8.1 General Pipeline Construction Procedures

Construction of the proposed pipelines would follow industry-standard practices and procedures, which involve a series of discrete activities generally conducted in a linear sequence. Figure 2 illustrates each of the steps in a typical construction scenario. Crews working on each stage of construction generally proceed along the pipeline right-of-way in one continuous operation; however, multiple factors including the need for specialized construction techniques, tie-in locations, required access for commissioning activities, and soil conditions may affect the construction sequencing.

Prior to construction, WBI Energy's survey contractor would stake the pipeline centerlines and the limits of the construction right-of-way and ATWS areas. Wetland boundaries and other environmentally sensitive areas also would be marked at this time. WBI Energy's construction contractor additionally would cut and brace fences along the right-of-way, if necessary, for preconstruction survey.

Prior to ground-disturbing activities, WBI Energy's construction contractor would coordinate with the North Dakota One-Call system to have existing underground utilities identified and flagged, and would use locating equipment to identify other infrastructure in areas where existing lines are thought to exist but were not identified by other means. A clearing crew then would clear the work area of vegetation and other obstacles, including trees (as necessary), stumps, logs, brush, and rocks. To the extent feasible, WBI Energy would minimize tree removal during construction. Cleared vegetation and stumps would be chipped (except in



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1. Survey and Staking
2. Clearing
3. Front-End Grading
4. ROW Topsoil Stripping
5. Restaking Centerline of Trench
6. Stringing Pipe
7. Field Bending Pipe
8. Line-Up, Initial Weld
9. Fill & Cap, Final Weld
10. As-Built Footage
11. X-Ray Inspection, Weld Repair
12. Coating Field Welds
13a. Trenching (wheel ditcher)
13b. Trenching (backhoe)
13c. Trenching (rock)
14. Inspection & Repair of Coating
15. Lowering Pipe into Trench
16. As-Built Survey
17. Pad, Backfill, Rough Grade
18. Hydrostatic Testing, Final Tie-in
19. Replace Topsoil, Final Clean-Up, Full Restoration

Figure 2
Typical Pipeline Construction Sequence
North Bakken Expansion Project
WBI Energy Transmission, Inc.

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wetlands), put to beneficial use such as mulch for erosion control, or hauled offsite to a commercial disposal facility. As required, snow would be plowed to the edge of the construction right-of-way and stockpiled within the corridor.

Following clearing (and snow removal as necessary), the construction right-of-way and ATWS areas would be graded where necessary to provide a level work surface. In accordance with the FERC Plan and Procedures, topsoil would be segregated in agricultural areas and over the ditch line in unsaturated wetlands. Additionally, WBI Energy proposes to segregate topsoil in all unsaturated areas affected by standard pipeline construction to aid in successful revegetation. Topsoil would be segregated, as appropriate, from the subsoil and would be replaced in the proper order during backfilling and final grading. Implementation of proper topsoil segregation would help promote postconstruction revegetation success, thereby minimizing loss of crop productivity and the potential for long-term problems with erosion. If the ground is relatively flat and does not require grading, rootstock would be left in the ground to facilitate revegetation of the right-of-way. In areas disturbed by grading, and as required by the FERC Plan and Procedures, temporary erosion and sediment controls would be installed within the right-of-way to minimize erosion. WBI Energy would ensure that these erosion and sediment controls would be inspected and maintained throughout the construction and restoration phases of the Project, as required by the FERC Plan and Procedures.

Where portions of the temporary and permanent rights-of-way overlap along the collocated segments of the Tioga-Elkhorn Creek pipeline (MPs 0.0 to 2.8) and the Line Section 30 Loop (MPs 6.8 to 9.6), WBI Energy anticipates that topsoil would be segregated across the entire width of both rights-of-way. Construction of the pipelines would then be staggered so that one pipeline is in place and backfilled prior to construction of the other pipeline to allow sufficient workspace for construction of each pipeline.

WBI Energy would truck individual joints of pipe to the construction right-of-way and strung along the trenchline in a single, continuous line. Typically, a track-mounted, hydraulic pipe-bending machine would bend the pipe to conform to the contours of the terrain. After the pipe sections are bent, they would be welded together into long sections and placed on temporary supports. WBI Energy would weldthe pipe sections in compliance with 49 CFR 192 and American Petroleum Institute Standard 1104 *Welding of Pipelines and Related Facilities*. Completed welds would be visually and non-destructively inspected, and all pipe welds would be coated in accordance with required specifications. WBI Energy would inspect the coating for defects, and repair the coating, if necessary, prior to lowering the pipe into the trench.

Prior to crossing any marked utility lines or pipeline infrastructure, WBI Energy would use a hydrovac excavator to expose the lines and verify depth. Crossings of third-party lines or pipeline infrastructure would be conducted according to any agreements between WBI Energy and the third-party utility. WBI Energy would use rotary trenching machines, track-mounted backhoes, or other similar equipment to excavate the trench to a typical depth of 6 feet to allow for a normal depth of cover of 4 feet over the pipeline. Trench spoil would be deposited adjacent to the trench within the construction right-of-way, and adjacent to the topsoil pile. Additional cover would be provided at road crossings for a minimum depth of cover of 5 feet. The bottom width of the trench would be sufficient to accommodate the pipeline. The width at the top of the trench would vary to allow the side slopes to be adapted to local soil conditions at the time of

construction. If trench dewatering is required within or off the construction right-of-way, it would be conducted in a manner that would not cause erosion or result in silt-laden water flowing into any waterbody or wetland. Water pumped from the trench or excavated areas would be discharged in accordance with the FERC Procedures and applicable permits. The potential impact of dewatering would be minimized by discharging the pumped water to well-vegetated areas or properly constructed temporary retention structures that would promote infiltration and minimize or eliminate runoff.

Prior to lowering-in, WBI Energy would inspect the trench to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. The pipe would then be lifted from the temporary supports and lowered into the trench using side-boom tractors. As necessary, WBI Energy would install trench breakers (stacked sand bags or foam) in the trench around the pipe in steeply sloped areas and at waterbody and wetland boundaries to prevent movement of subsurface water along the pipeline. After lowering-in, the trench would be backfilled with previously excavated materials using bladed equipment or backhoes. If the excavated material is rocky, the pipeline would be protected with a rock shield or covered with more suitable fill. Clean fill would be obtained by removing rock from the excavated spoil. Topsoil would not be used to pad the pipe.

After backfilling, the entire pipeline would be hydrostatically tested in sections to ensure that the system is free from leaks and would provide the required margin of safety at operating pressures. Individual sections of pipeline to be tested would be determined by terrain conditions. Depending on the source of water, dichlorination tablets may be used to treat water prior to testing. Internal test pressures and durations would be in accordance with 49 CFR 192 and applicable permit conditions. If leaks are found, WBI Energy would repair the defect, and retest the section of pipe until all required specifications are met. After testing, WBI Energy would discharge the water to an approved well-vegetated upland area(s) in accordance with permit conditions and the FERC Plan.

After hydrostatic testing, the final pipeline tie-in would be completed, and commissioning would commence. Commissioning would involve activities to verify that equipment is properly installed and working, controls and communications systems are functional, and the pipeline is ready for service. WBI Energy would clean, dry, and inspect the pipeline using in-line inspection tools (pigs) to detect anomalies in the pipe that may have been introduced during construction, and prepare the pipe for service by purging the line of air and loading the line with natural gas.

WBI Energy would begin final cleanup after backfilling and as soon as weather and site conditions permit. Efforts would be made to complete final cleanup (including final grading and installation of permanent erosion control devices) within timeframes required by permits, in accordance with landowner requests, or as required by the FERC Plan and Procedures. A travel lane may be left open temporarily to allow access by construction traffic for activities such as tie-in locations, hydrostatic testing and other commissioning activities; when access is no longer required, the travel lane would be removed, and the right-of-way restored.

During cleanup, WBI Energy would collect construction debris for disposal. Preconstruction contours along the right-of-way would be restored to pre-existing condition as

closely as practicable, and in a manner to restore appropriate drainage and ensure stability of the operational right-of-way. WBI Energy would return segregated topsoil to the stripped area and install permanent erosion controls. Revegetation measures would be implemented in accordance with the FERC Plan and Procedures.

WBI Energy would install markers showing the location of the pipeline at fence crossings, road crossings, points of inflection, and other areas as necessary to identify WBI Energy as the owner of the pipeline and convey emergency information in accordance with applicable government regulations, including USDOT safety requirements.

8.2 Special Pipeline Construction Procedures

WBI Energy would use special construction techniques where warranted by site-specific conditions (e.g., when constructing across waterbodies, wetlands, roads and railroads, agricultural areas, and steep side slopes) as described below. The Project would not require construction in residential areas, and WBI Energy does not anticipate blasting. As discussed in section B.1.2 of this EA, hard bedrock is not expected to be present along the proposed pipeline routes.

WBI Energy would construct across oil and gas fields and gathering pipelines using the same general pipeline construction techniques described in section A.7.1. Crossings of gathering pipelines would be completed as shown in the typical construction right-of-way cross-section diagrams for foreign pipeline crossings.[15]

Waterbody Crossings

For flowing waterbodies, WBI Energy proposes to cross flowing waterbodies using trenchless HDD or guided bore methods. For non-flowing waterbodies, WBI Energy proposes to use conventional upland (open-cut) techniques if no flow is present at the time of the crossing. Based on site conditions at the time of construction, WBI Energy may use the guided bore crossing method to cross waterbodies currently proposed as open-cut crossings. Although dry crossing methods, such as the flume and dam-and-pump methods, are not proposed for the Project, they may be considered if warranted by site-specific conditions at the time of construction. In each case and for each method, WBI Energy would adhere to the measures specified in the FERC Procedures and any additional requirements specified in federal or state waterbody crossing permits. See section B.2.2 for a list of waterbodies crossed by the Project and the proposed crossing methods.

Open-Cut Method

WBI Energy would cross non-flowing waterbodies using the open-cut method. In these cases, backhoe-type excavators operating from the banks of the drainage would be used to open a trench. Spoil excavated from the trench would be placed on the bank above the high water mark for use as backfill. A prefabricated segment of pipeline would then be placed into the trench using side-boom tractors. WBI Energy would use concrete coating or set-on weights, as

[15] See the Project's typical construction drawings in FERC's eLibrary, accession number 20200911-5292.

necessary, to provide negative buoyancy for the pipeline. Once the trench is backfilled, WBI Energy would restore the banks as near as practicable to preconstruction contours. Stabilization measures would include seeding, installation of erosion control blankets, or installation of riprap materials, as appropriate. Excavated material not required for backfill would be removed and disposed of at upland disposal sites.

Throughout the construction process, WBI Energy would follow the FERC Procedures to avoid or minimize impacts on water quality. WBI Energy would schedule construction activities so that the trench is not excavated across the waterbody until immediately prior to pipe laying activities. Excavated spoil would be stockpiled at least 10 feet from the edge of the drainage, and appropriate erosion control devices would be installed.

Horizontal Directional Drill and Guided Bore Methods

The HDD and guided bore crossing methods are both trenchless methods used to install pipelines across sensitive areas such as waterbodies and wetlands, roads, and other utility crossings to avoid direct impacts on those features. See appendix E for a list of guided bore crossings.

The HDD method is a trenchless crossing method that involves establishing land-based staging areas on both sides of a proposed crossing, drilling a hole, and installing the pipeline underneath a sensitive area while avoiding disturbance to surface and shallow subsurface features. The HDD method is typically used for longer (i.e., greater than 1,000 feet) and deeper crossings that require use of much larger stationary equipment that is assembled on site.

WBI Energy proposes to use the HDD intersect method to construct its pipeline across Lake Sakakawea (and a natural pond). The HDD intersect method involves using two drill rigs, one on each side of the resource, and drilling two pilot holes towards each other until they intersect at a predetermined point. Unless unforeseen events occur, such as inadvertent releases of drilling fluid, use of the HDD method typically avoids impacts on water quality by precluding disturbance of the waterbody bed and banks.

WBI Energy proposes to use either the Para-Track System or the Gyroscope System to complete the HDD intersect crossing.[16] Both systems involve using a directional jetting bottom-hole assembly or a mud motor with a bit and bottom-hole assembly to advance a 12.25-inch-diameter drill bit from each of the HDD entry sites (one at the drill rig entry side and one at the pipe entry side). Although the HDD intersect point is predetermined, conditions encountered during drilling the pilot holes may dictate the exact location of the final intersect point. The two drill crews would maintain constant communication as the HDD pilot holes progress.

Once the pilot hole is completed, the pilot hole would be enlarged using one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline. Once the reaming process is complete, a prefabricated segment of pipe would be attached to the drill string on one side of the crossing and pulled back through the hole toward the drill rig. WBI Energy would hydrostatically test the pipe segment prior to its installation, and

[16] See the HDD intersect typical construction drawing in FERC's eLibrary, accession number 20200911-5292

once installed, connected on either side of the crossing to adjoining sections of pipe. The pipe segment would be hydrostatically tested a second time with the remainder of the pipeline system.

In the process of drilling and/or reaming the hole, WBI Energy would circulate a slurry of drilling fluid (or drilling mud) through the drilling tools to lubricate the drill bit, remove drill cuttings, and promote drill hole stability. Drilling fluid primarily consists of water mixed with in-situ material or bentonite, which is a non-toxic, naturally occurring sedimentary clay. WBI Energy's HDD Plan includes potential drilling fluid additives and Safety Data Sheets for the HDD crossing of Lake Sakakawea. If drilling fluid additives are deemed necessary for any guided bore crossings, this information would be provided to the appropriate agencies (e.g., NDDEQ and FERC) for approval prior to use.[17] WBI Energy is coordinating with landowners on potential locations within agricultural areas for the beneficial reuse of HDD drilling mud. All Project drilling fluid would be disposed of in accordance with federal, state, and local regulations.

The guided bore method is very similar to that described for the HDD but is typically used for relatively short crossings (i.e., less than 1,000 feet) that are relatively shallow with a small arc bore path. Additionally, guided bores typically use self-contained mobile equipment with a smaller footprint. WBI Energy proposes to use the guided bore method to install the pipeline beneath Beaver Creek, Tobacco Garden Creek (two crossings), Northfork Creek, Cherry Creek, and White Earth Creek (see section B.2.2 for more information).

WBI Energy's use of the HDD and guided bore methods would avoid disturbing surface and shallow subsurface features (e.g., waterbodies, wetlands, vegetation) between the HDD and guided bore entry and/or exit workspaces. However, it may be necessary to hand-clear vegetation along the pipeline centerline between the entry and exit workspaces at some locations to facilitate laying the electric-grid guide wires used to steer the drill heads. Additionally, a travel lane would be required between the entry and exit workspaces at four of the guided bore crossings as there are either no access roads at these locations or the travel distance is too great from the bore location to expedite the construction of the waterbody crossing.[18] Construction matting and temporary bridging installations would minimize impacts at these crossings.

An unintended release of drilling fluid (referred to as an inadvertent return) could occur if drilling fluids escape the drill hole and are forced through the substrate to the ground surface. To minimize potential impacts of inadvertent releases of drilling fluids, WBI Energy would implement the measures identified in its HDD Plan. This plan describes procedures WBI Energy would implement to monitor, contain, and clean up any potential releases of drilling fluid. It also

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[17] Drilling contractors would be limited to use of drilling fluid additives that are non-petrochemical based, non-hazardous, and currently certified to the American National Standards Institute/National Sanitation Foundation International Standard 60 at the time of construction. Any additives used would comply with permit requirements and environmental regulations applicable to the Project. Additives other than those certified to the standard would not be allowed unless approval by appropriate regulatory authorities is granted. Contractors would be required to maintain safety data sheets on location for all additives used for HDD and guided bore operations and keep records of the types and amounts of additives used.

[18] A travel lane would be required between the entry and exit workspaces at the following guided bore crossings: Beaver Creek (s-wm-eb-002), wetland w-mk-ea-004e, Northfork Creek (s-mk-eb-005), and Cherry Creek (s-1bt-001a).

identifies contingency measures to be implemented in the event that an HDD or guided bore is unsuccessful.

Wetlands

WBI Energy would install the pipeline across wetlands in accordance with the FERC Procedures, site-specific modifications to the FERC Procedures as requested by WBI Energy and deemed acceptable by FERC staff in this EA, and the requirements of federal or state water crossing permits. WBI Energy would delineate and mark wetland boundaries in the field prior to construction activities. Temporary erosion control devices would be installed as necessary after initial disturbance of wetlands or adjacent upland areas and maintained until revegetation is complete to prevent sediment flow into wetlands in accordance with the FERC Procedures. WBI Energy would install trench plugs as necessary to maintain wetland hydrology. Construction equipment operating in wetland areas would be limited to that needed to clear the right-of-way, dig the trench, install the pipeline, backfill the trench, and restore the right-of-way.

WBI Energy would strip the top 12 inches of topsoil from the area directly over the trench line (except in areas of standing water or in saturated conditions) and stockpile it separately from the subsoil. The segregated topsoil would be restored following installation of the pipe and backfilling of the trench in accordance with the FERC Procedures. WBI Energy would remove all construction materials, such as timber mats placed in wetlands, during rough grading and final cleanup, and the contours of the wetland would be restored to a condition that promotes restoration of wetland functions. Permanent erosion control measures would be installed in accordance with the FERC Procedures, and disturbed areas within wetlands would be stabilized temporarily with a cover species, such as annual ryegrass as soon as weather conditions permit. Wetland areas would then be allowed to revegetate using the original seed stock contained in the conserved topsoil layer.

The specific crossing procedures used to install the pipeline across wetlands would depend on the level of soil stability and saturation encountered during construction. In areas that are proposed for conventional open trench construction, but where soil conditions may not support the weight of equipment, timber mats would be used to minimize disturbance to wetland hydrology and maintain soil structure.

WBI Energy may use the pull method of construction in inundated or saturated conditions where wetland soils and hydrology cannot support conventional pipe laying equipment, or in areas that have significant quantities of water that would allow the pipe to be floated over the open trench. With this method, construction and excavation equipment would work from temporary work surfaces and a prefabricated pipeline segment would be pulled or floated into position, then sunk with buoyancy control devices.

Road and Railroad Crossings

Construction across paved roads, highways, and railroads would be conducted in accordance with the FERC Plan and requirements identified in road and railroad crossing permits or approvals. Most paved roads, highways, and railroads would be crossed using the guided bore

method, described above. Typically, there would be little or no disruption to traffic at the road, highway, or railroad crossings during boring operations.

WBI Energy would cross unpaved roads, two-tracks, trails, and driveways using the open-cut method and then restore the road surface to preconstruction condition. Most open-cut road crossings would be completed, and the road restored in a few days. For all road and railroad crossings, WBI Energy has designed the pipelines in accordance with the USDOT regulations at 49 CFR 192 and the American Society of Mechanical Engineers' code (B31.8) for gas transmission and distribution piping systems. WBI Energy prefers uncased crossings over cased crossings due to the increased potential for problems with installation, the cathodic protection system, and corrosion on cased crossings. Therefore, WBI Energy would utilize uncased crossings for all road and railroad crossings, unless required otherwise by the appropriate regulatory authority with jurisdiction over a road or railroad crossing. A list of road and railroad crossings along the pipeline routes is included in appendix F.

Agricultural Areas

In active croplands, pastures, or hayfields, the topsoil layer would be removed and segregated from the subsoil in accordance with the FERC Plan. Typically, topsoil would be stripped over the proposed right-of-way. Following pipeline installation, the subsoil would be returned to the trench and the topsoil replaced in the area from which it was stripped. As necessary, the working side of the right-of-way would be de-compacted prior to final grading and restoration.

Where WBI Energy would cross livestock fences (including electric fences) , a fencing crew would cut, brace, and secure the fencing prior to construction, and would repair the fences to preconstruction condition or better during the restoration phase of the Project. WBI Energy may install temporary gates in accordance with individual landowner requests. WBI Energy would work with landowners to either remove livestock to alternate fields during construction or maintain adequate fencing in grazing areas. If cattle are present during construction, WBI Energy would install temporary construction fencing around the right-of-way in areas where the pipe trench is left open overnight if requested by the landowner. WBI Energy would also negotiate with landowners regarding a potential grazing deferment to allow vegetation to establish within the right-of-way after construction is complete.

To date, WBI Energy has not identified any drainage or irrigation facilities along the proposed pipeline routes. Prior to construction, WBI Energy would contact landowners to determine whether the pipelines would cross any unknown permanent drainage or irrigation facilities. If any such facilities are discovered and disturbed during construction, WBI Energy would restore them to preconstruction condition in accordance with the FERC Plan.

Encountering drain tiles during construction is not expected. However, if drain tiles are identified and/or encountered, WBI Energy would take precautions to maintain flow during construction to avoid ponding in nearby areas. Following construction, WBI Energy would restore impacted drain tiles to preconstruction conditions in accordance with the FERC Plan.

Side Slopes

Portions of the pipelines would cross areas of steep side slope or rolling terrain that may require the use of cut-and-fill grading to provide for safe working conditions. In these areas, grading activities would cut down the upslope side of the construction right-of-way. Material from the cutting would be used to fill the downslope side of the construction right-of-way to create a safe and level surface for travel lanes and equipment operation. The trench would be excavated from the newly graded right-of-way. Following pipeline installation and backfilling, WBI Energy would place the excavated material back on the area of the cut, compact to restore the surface of the right-of-way to a stable contour in accordance with the FERC Plan.

In areas of steep side slope or rolling terrain, WBI Energy would install temporary sediment barriers such as silt fences and straw bales to prevent the movement of disturbed soil off the right-of-way. Temporary slope breakers consisting of mounded and compacted soil would be installed across the right-of-way during construction in accordance with the FERC Plan. WBI Energy would install permanent slope breakers during final cleanup or as soon as weather conditions permit. Following construction, restoration would be completed in accordance with the FERC Plan.

8.3 Aboveground Facility Construction Procedures

Construction of the proposed aboveground facilities would include a standard sequence of events. Construction would begin with clearing (or snow removal, as necessary) and grading of the sites to establish suitable grades for the facilities. Subsequent activities would include preparing foundations, installing underground piping, erecting and installing buildings, installing aboveground piping and equipment, testing the piping, testing the control equipment, cleaning up the work area, and graveling access roads and parking areas. Once construction is complete, WBI Energy would cover areas within the fence line with gravel or maintained in an herbaceous state. Each station site would be fenced for security. WBI would install and test safety and control devices prior to operation.

Construction of block valves would include grading, installing the underground assembly, testing the control equipment, cleaning up the work area, and graveling the site area. Block valve construction would be concurrent with the construction of the pipeline, with installation of the block valves occurring prior to hydrostatic testing of the pipeline. At each site, WBI Energy would stabilize the disturbed area with gravel. Outside of the fenced area, revegetation would be conducted in accordance with the FERC Plan.

None of the existing facilities that WBI Energy would replace or modify has known asbestos-containing materials (ACM). Per Chapter 33.1-15-13 of the North Dakota Administrative Code (NDAC), an inspector certified in North Dakota to identify all ACM would conduct a thorough asbestos inspection prior to the replacement/removal of Project facilities. If ACM is identified, WBI Energy would notify NDDEQ's Asbestos Control Program of asbestos removal activities for all removal activities and any renovation activity that requires removal or disturbance of 160 square feet or more of regulated ACM on facility components, or 260 linear feet or more of regulated ACM on pipes. Appropriately trained and certified individuals would remove any ACM in accordance with applicable requirements. ACM would be transported from

Project facilities in accordance with applicable regulations and disposed at a facility permitted to manage asbestos waste.

8.4 Environmental Compliance, Training, and Inspection and Post-Construction Monitoring and Reporting

WBI Energy states that it would minimize environmental impacts by complying with applicable permits and approvals; the FERC Plan and Procedures; and other construction, restoration, or mitigation plans identified in this EA. WBI Energy has committed to training company and contractor personnel to familiarize them with environmental requirements, and would provide environmental inspectors (EI) to monitor compliance during construction.

Prior to construction, WBI Energy would conduct environmental training for company and contractor supervisory personnel. The training program would focus on the FERC Plan and Procedures, Project-specific Certificate and permit conditions, and Project-specific mitigation plans. In addition, WBI Energy would provide large-group training sessions before each work crew begins construction. Periodic follow-up training for groups of newly assigned personnel would be provided as necessary by the EIs.

WBI Energy's EIs would have peer status with other inspectors and would report directly to the WBI Energy environmental personnel. The EIs' responsibilities would be as specified in the FERC Plan, and would include the following: 1) monitoring the contractor's compliance with environmental measures required by the Certificate, and other environmental permits or approvals, the FERC Plan and Procedures, and all other construction, restoration, and mitigation plans; 2) requiring corrective actions, including issuing stop-activity orders; 3) documenting compliance with environmental requirements; and 4) preparing status reports for submittal to the Commission's environmental staff. The EIs would also act as liaisons between WBI Energy and representatives of environmental regulatory agencies that may visit the Project during construction. Additionally, FERC staff would conduct periodic inspections of Project activities during construction and restoration of the Project to confirm compliance with the Commission Order and our Plan and Procedures.

WBI Energy would conduct post-construction monitoring to document restoration and revegetation of the right-of-way and other disturbed areas. WBI Energy would monitor wetlands for a period of 3 years or until revegetation is successful in accordance with the FERC Procedures and file the results of those surveys with the Commission. WBI Energy would monitor upland areas after the first and second growing seasons following restoration or until revegetation is successful in accordance with the FERC Plan. After construction, WBI Energy would submit quarterly monitoring reports to FERC to document the status of revegetation in disturbed areas. The reports would describe the composition of developing plant communities, identify areas meeting performance standards, identify any landowner concerns and planned or completed remediation, and provide recommendations for any additional remedial measures, if warranted. WBI Energy would continue to submit quarterly reports until restoration activities are complete.

8.5 Operations and Maintenance

WBI Energy would operate and maintain the new pipeline and aboveground facilities in accordance with all applicable federal and state requirements, including the minimum federal safety standards identified in *Transportation of Natural and Other Gas by Pipeline*, Title 49 CFR 192.

WBI Energy would periodically inspect the pipelines on foot or by all-terrain vehicle or other vehicle as required by applicable regulatory requirements to identify potential concerns that may affect the safety and operation of the pipeline. Pipeline markers and signs would be inspected and maintained or replaced, as necessary, to ensure that pipeline locations are clearly identified. Field personnel would advise the appropriate operations personnel of new construction along or near the pipeline system. Line patrol of highway and railroad crossings would be completed as required by the USDOT. If pipeline patrols or vegetation maintenance identify areas on the right-of-way where erosion is occurring, WBI Energy would repair existing erosion control devices or install additional devices as necessary to stabilize the area and prevent future erosion.

Vegetation along the pipeline rights-of-way would be cleared periodically (not more frequently than once every three years in upland areas), and where necessary, in accordance with the FERC Plan and Procedures (except in areas crossed by HDD or guided bore, where vegetation maintenance would not be conducted) to maintain accessibility to the right-of-way and accommodate pipeline integrity surveys. Active cropland would be allowed to revert to preconstruction use for the full width of the right-of-way. In non-cultivated uplands, the entire 50-foot-wide permanent easement would be maintained in an herbaceous state. In wetlands, a 10-foot-wide corridor centered over the pipelines would be maintained in an herbaceous state, and trees within 15 feet of the pipelines with roots that could compromise the integrity of the pipeline would be selectively cut and removed from the right-of-way. WBI Energy typically would use mechanical mowing or cutting along its right-of-way for normal vegetation maintenance.

WBI Energy personnel also would perform regular operation and maintenance activities on equipment at the proposed compressor stations and delivery, receipt, and transfer stations. These activities would include calibration, inspection, and scheduled routine maintenance. Operational testing would be performed on safety equipment to ensure proper functioning, and problems would be corrected. Operation and maintenance of block valves would be performed in accordance with information provided by the valve manufacturers.

9. Non-jurisdictional Facilities

Non-jurisdictional facilities are those associated facilities related to a proposed project that are constructed, owned, and operated by other entities that do not come under the jurisdiction of FERC. These non-jurisdictional facilities may be integral to the project objective (e.g., a new or expanded power plant that is not under the jurisdiction of FERC at the end of a pipeline) or they may be merely associated as minor, non-integral components of the jurisdictional facilities that would be constructed and operated with the proposed facilities (e.g., a meter station constructed by a customer of the pipeline to measure gas off-take).

At the Elkhorn Creek Compressor Station, WBI Energy would obtain electric service from McKenzie Electric Cooperative via an overhead powerline that crosses the southern portion of the tract; all associated ground disturbance would be within the facility workspace. WBI Energy anticipates obtaining water for potable water and cleaning needs from the McKenzie County Water Resource District via a 2-inch-diameter poly line leading from the new compressor station to an existing 6-inch-diameter water line in an easement that abuts the southern portion of the station tract.

Only one aboveground facility has planned interconnect facilities that could be considered non- jurisdictional. In order to connect to the proposed Tioga Plant Receipt Station, Hess would build an approximately 900-foot-long, 20-inch-diameter pipeline lateral from its existing plant in Tioga, across 68th Street NW, to WBI Energy's proposed Tioga Plant Receipt Station. Cumulative impacts regarding non-jurisdictional facilities are discussed in section B.10.

Existing third-party utility services would be used at the existing delivery, receipt, and transfer stations. At the new Norse Transfer Station and Northern Border Interconnect, taps would be installed to connect to the existing utilities. No new non-jurisdictional service lines would be required to bring utilities to these areas.

10. Permits and Approvals

WBI Energy has committed to obtaining applicable permits and regulatory approvals relating to construction and operation of the proposed facilities. Table A-6 provides a list of the federal and state permits required for the Project and identifies the status of each permit.

Table A-6

North Bakken Expansion Project Environmental Permits, Approvals, and Consultations

Agency	Permit/Approval/Consultation	Status
Federal		
FERC	Certificate under Section 7(c) of the Natural Gas Act	Application submitted February 2020; Amended application submitted July 2020.
U.S. Army Corps of Engineers – North Dakota Regulatory Office and	Issuance of a Section 404-Section10 permit for discharges of dredged or fill material into waters of the United States, including jurisdictional wetlands	Initial 408 and 404 Applications submitted February 2020.
U.S. Army Corps of Engineers – Omaha District Office	Issuance of a Section 408 permit for projects that impact (i.e., modify of occupy) any U.S. Army Corps of Engineers-constructed public works projects that include dams, basins, levees, channels, navigational channels, or other local flood protection works	Revised Applications August 2020 (408) and September 2020 (404).
U.S. Fish and Wildlife Service – Region 6 – North Dakota Field Office and	Consultations for impacts on federally listed threatened and endangered species and critical habitat under Section 7 of the Endangered Species Act, the Migratory Bird Treaty Act, the Bald and Gold Eagle Protection Act, and the Fish and Wildlife Coordination Act	Consultation initiated February 2020. Received concurrence November 17, 2020. Consultation complete.
U.S. Fish and Wildlife Service Crosby Wetland Management District	Consultation for impacts on federal conservation easements for grasslands and wetlands	Consultation ongoing.

Table A-6

North Bakken Expansion Project Environmental Permits, Approvals, and Consultations

Agency	Permit/Approval/Consultation	Status
U.S. Department of the Interior, Bureau of Land Management - Eastern Montana/Dakotas District Office	Coordination of National Environmental Policy Act process when more than one federal land management agency's lands are crossed. The U.S. Bureau of Land Management is responsible for issuing right-of-way over lands managed by two or more federal agencies.	Consultation initiated February 2020. Revised September 2020 Received concurrence November 17, 2020.
U.S. Forest Service – Dakota Prairie Grasslands Little Missouri National Grassland	Consultation to cross USFS Lands and issuance of a right-of-way grant through the U.S. Bureau of Land Management right-of-way process.	Consultation initiated February 2020. Revised September 2020
U.S. Department of Agriculture, Natural Resources Conservation Service – North Dakota	Consultations regarding erosion and sedimentation controls and seed mixes, and Agricultural Conservation Easement Program	Consultation ongoing.
North Dakota		
North Dakota Department of Health, Division of Air Quality	Permits to Construct an Air Contaminant Source –Tioga Compressor Station and Elkhorn Creek Compressor Station	Permit to Construct for Elkhorn Creek Compressor Station Received March 2020. Revised Application for Tioga Compressor Station submitted July 2020.
	Permits to Operate – Tioga Compressor Station and Elkhorn Creek Compressor Station	Applications to be submitted between October 2021 and October 2022.
North Dakota Department of Health, Division of Water Quality	General Permit for Construction Stormwater Discharge under the National Pollutant Discharge Elimination System	Application to be submitted in January 2021.
	General Permit for Construction Dewatering and Discharge of Hydrostatic Test Water under the National Pollutant Discharge Elimination System	Application to be submitted in January 2021.
	Water Quality Certificate under Section 401 of the Clean Water Act	Application submitted February 2020. Revised Application submitted September 2020.
North Dakota State Water Commission	Navigable Water Crossing Permit under North Dakota Century Code Chapter 61-33 (Sovereign Lands)	Application submitted February 2020. Revised Application submitted August 2020.
North Dakota Department of Game and Fish	Consultation for impacts on fisheries and wildlife	Consultation initiated February 2020. Approved in March 2020.
North Dakota Parks and Recreation Department	Consultation under the North Dakota Natural Heritage Program	Consultation initiated June 2019. Approved in May 2020.
State Historical Society of North Dakota	Consultation for impacts on historic properties under Section 106 of the National Historic Preservation Act	Consultation initiated in April 2019. Draft cultural reports, Unanticipated Discoveries Plan, and Cultural Avoidance and Monitoring Plan submitted to the State Historic Preservation Officer in February, September, and November 2020. Consultation is ongoing.
North Dakota State Lands Board	Right-of-Way Grant to cross state lands	Application to be submitted December 2020.

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Project's potential direct and indirect impacts on environmental resources. When considering the environmental consequences of the Project, the duration and significance of any potential impacts are described according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to preconstruction conditions almost immediately. Short-term impacts could continue for up to 3 years following construction. Long-term impacts would require more than 3 years to recover, but eventually would recover to preconstruction conditions. Permanent impacts are defined as activities that modify resources to the extent that they may not return to preconstruction conditions during the life of the Project, such as with the construction of an aboveground facility. An impact would be considered significant if it would result in a substantial adverse change in the physical environment. Our analysis also addresses direct and indirect effects collectively by resource.

The analysis contained in this EA is based upon WBI Energy's application and supplemental filings and our experience with the construction and operation of natural gas infrastructure. However, if the Project is approved and proceeds to the construction phase, it is not uncommon for a project proponent to require modifications (e.g., minor changes in workspace configurations). These changes are often identified by a company once on-the-ground implementation work is initiated. Any Project modifications would be subject to review and approval from FERC's Director of the Office of Energy Projects (OEP), or the Director's designee, and any other permitting/authorizing agencies with jurisdiction.

1. Geology and Soils

1.1 Geology

The Project would be within the Great Plains physiographic province, which is separated from the Central Lowlands province to the east by a linear topographic boundary referred to as the Missouri Escarpment (Keefer, 1974). Project area elevations range from approximately 1,850 feet above mean sea level at the Lake Sakakawea crossing (MPs 23.2 and 25.5 of the Tioga-Elkhorn Creek pipeline) to approximately 2,450 feet above mean sea level near MP 6.0 of the Line Section 25 Loop.

The Project area is underlain by Precambrian age basement rock overlain by sedimentary rocks of Paleozoic, Mesozoic, and Cenozoic age that range in thickness up to about 15,000 feet, and generally dip gently to the south (Freers, 1970). The surficial geology underlying the Project area north of Lake Sakakawea in Burke, Mountrail, and Williams Counties consists primarily of Pleistocene age glacial sediments (North Dakota Geological Survey [NDGS], 2015). These surficial deposits, referred to as the Coleharbor Group, predominantly consist of till and glaciofluvial deposits, with some lake sediments, colluvium, and recent alluvium and landslide deposits (NDGS, 2015). In addition to glacial deposits, portions of the Project area are underlain by fluvial sediments including sand, silt, and clay of late Quaternary age referred to as the Oahe Formation (Freers, 1973).

Paleontological Resources

Paleontological resources are the fossilized remains of prehistoric plants and animals, as well as the impressions left in rock or other materials. 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 and Administrative Codes, respectively. The Project would cross North Dakota state lands between MPs 4.1 and 5.2 and MPs 14.7 and 14.9 of the Line Section 25 Loop. Century Code Chapter 54-17.3-05 requires the reporting of all Quaternary age paleontological finds that potentially or actually contain cultural resources to the State Historical Society of North Dakota and to the State Geologist (State of North Dakota, 2019). Furthermore, a permit is required to investigate, excavate, collect, or otherwise record paleontological resources on these lands (NDGS, 2019a).

The Paleontological Resources Preservation Act (36 CFR 291.1) protects paleontological resources on USACE and USFS lands. The Project would cross USFS lands between MPs 27.3 to 27.7 and MPs 28.2 to 29.9 of the Tioga-Elkhorn Creek pipeline. The Project would cross USACE-administered land between MPs 23.1 and 25.8 of the Tioga-Elkhorn Creek pipeline; however, all of the USACE land would be encompassed within the proposed HDD crossing of Lake Sakakawea. WBI Energy obtained an Archaeological Resources Protection Act permit from each agency and completed paleontological surveys in October 2019. WBI Energy did not identify any fossil localities during the field survey; however, WBI Energy did identify multiple isolated, poorly preserved fossils.

WBI Energy states that if paleontological resources are discovered during construction of the Project, they would be treated similarly to cultural resources in accordance with WBI Energy's Plan for Unanticipated Discovery of Paleontological Resources during Construction. Therefore, we conclude there would be no significant impacts on paleontological resources.

Mineral Resources

North Dakota's primary mineral resources include fuel (coal, oil, and gas production) and non-fuel mineral resources (sand and gravel, and salt). The entire Project is within NDDMR-mapped oil and natural gas fields (refer to table B-1).

The Project would be within 0.25 mile of 306 oil and natural gas wells, the closest of which is a plugged and abandoned well approximately 67 feet from the workspace near MP 6.1 of the Line Section 25 Loop. Of the identified wells, 116 are plugged and abandoned, abandoned, temporarily abandoned, or inactive. The status of an additional 87 wells is listed as confidential, dry, permit cancelled, or permitted location to drill. The remaining 103 wells are currently active or drilling, the closest of which is about 226 feet from the Line Section 30 Loop pipeline right-of-way at MP 0.1 (NDDMR, 2019).[19]

[19] A detailed list of oil and natural gas wells within 0.25 mile of the Project area is within resource report 6, accession number 20200911-5167

Table B-1

Oil and Natural Gas Fields Crossed by the Project

Facility	Start Milepost	End Milepost	Oil and Natural Gas Field
Tioga-Elkhorn Creek			
	0.0	3.2	Tioga
	3.2	16.2	Beaver Lodge
	16.2	21.8	West Capa
	21.8	26.3	Grinnell
	26.3	33.4	Sand Creek
	33.4	41.8	Banks
	41.8	43.9	Garden
	43.9	55.5	Siverston
	55.5	62.8	Pembroke
Elkhorn Creek-Northern Border			
	0.0	0.3	Pembroke
Line Section 25 Loop			
	0.0	11.4	Tioga
	11.4	20.3	North Tioga
Line Section 30 Loop			
	0.0	5.2	West Bank
	5.2	9.6	Tioga
Tioga Compressor Lateral			
	0.0	0.5	Tioga
Uprate Line Section 25	N/A	N/A	North Tioga, Foothills, and Black Slough

Source: NDDMR, 2019

WBI Energy has consulted with landowners to determine if there are any additional oil or natural gas wells in the area of the route, and requested landowners to let WBI Energy know if any new wells are being proposed. These communications with landowners would continue until construction to verify the absence of oil and natural gas wells within construction workspaces. During construction, WBI Energy would utilize the One-Call System, which notifies third-party utilities of a potential crossing. WBI Energy's contractor would discuss any agreements, special crossing criteria, and avoidance measures with the third-party utility. Prior to crossing the marked line, a hydrovac excavator would be used to expose the line and verify the crossing depth.

Approximately 38 oil and natural gas wells are within 500 feet of proposed guided bore sites. Of these 38 wells, the closest is an oil and natural gas well (plugged and abandoned) 67 feet from the guided bore across 74th Street NW near MP 6.1 of the Line Section 25 Loop pipeline. In the event of communication between drilling fluid and oil and natural gas wells during guided bore installation that results in an inadvertent return of drilling fluid to the ground surface, WBI Energy would implement the measures in its HDD Plan and SPCC Plan to contain, cleanup, and dispose of any contaminated drilling fluid.

The Hartels commented that there is a multi-well pad that has been constructed for 4 years and not drilled in the SWSW of Section 23 of their property. According to the Hartels, the operator stated that the main reason for not drilling the wells on this pad is because there is not

enough infrastructure in the area for natural gas capture. The Hartels want to reserve any future impacts on this land for pipelines that would help take product away from this multi-well pad instead of granting access to this Project for a line that does not benefit the land it crosses or the individual landowners. The multi-well pad is over 0.6 mile north of Project workspace near MP 53.6 of the Tioga-Elkhorn Creek pipeline. Due to the distance between the Project workspace and the multi-well pad, the Project would not impact the multi-well pad or any associated infrastructure at, or connecting to, the well pad. If any future facilities associated with the multi-well pad are identified with potential to be affected by the Project, WBI Energy would work with the owner of the facility to minimize Project-related impacts.

In addition to abundant petroleum resources, lignite coal and industrial sand and gravel are the predominant exploitable mineral resources in the Project area (Murphy, 2019a, 2019b; U.S. Geological Survey [USGS], 2019a). The area also hosts exploitable deposits of salt. However, there are no commercial halite or potash mines near the Project area, and the Project does not cross any significant natural pothole lakes. Any impacts on smaller, seasonally flooded wetlands from which salts might be harvested would be temporary and localized. As a result, the Project would not significantly impact mining of salt deposits. Although lignite beds underlie the entire Project area, there are no active lignite coal mines in the vicinity of the proposed Project. Additionally, based on publicly available information from the North Dakota Public Service Commission (NDPSC), no formal notices for proposed coal mines have been filed in counties that the Project would cross (NDPSC, 2014, 2020a).

Based on review of the NDPSC Abandoned Mine Lands Program database (NDPSC, 2019), one abandoned subsurface coal mine and two abandoned surface coal mines were identified within 0.25 mile of the proposed Tioga-Elkhorn Creek pipeline. The abandoned subsurface Quality Coal Company mine is approximately 220 feet south of MP 19.1 in Williams County; however, based on review of available aerial imagery and correspondence with the NDPSC (NDPSC, 2020b), no sinkholes or signs of subsidence were identified in the mapped mine location and the NDPSC was not able to verify the location of the subsurface mine in their records. At MP 19.1, the proposed Tioga-Elkhorn Creek pipeline is immediately adjacent to an existing, previously cleared utility corridor in an area with existing utility infrastructure.

The Skogheim Coal Mine and John Gustafson Mine are abandoned surface coal mines approximately 350 feet west and 0.2 mile east of the Tioga-Elkhorn Creek pipeline at MP 38.6 and MP 39.7, respectively. Based on available information from the NDPSC, the precise location and boundary of the Skogheim Coal Mine is not well documented; however, aerial imagery and local topography do not indicate the presence of a former surface coal mine near the Project area. The John Gustafson Mine boundary is visible in aerial imagery and does not extend north of the tributary to Tobacco Garden Creek or west near the Project area. As such, we conclude that the Project would not impact availability of, or access to, coal resources and would not be impacted by any geologic hazards associated with abandoned mine sites. In addition, the NDPSC confirmed that no known coal seam fires are within 0.25 mile of Project facilities (NDPSC, 2020c).

Sand and gravel are the third largest mineral industry in the state after oil and natural gas, and lignite. Based on review of available aerial imagery, USGS topographic maps, and

landmarks mapped by the North Dakota Department of Transportation (NDDOT), the Project would be within 0.25 mile of 13 gravel or scoria pits (USGS, 2019b; NDDOT, 2019a). The closest mapped gravel or scoria pit is 200 feet east of the Tioga-Elkhorn Creek pipeline at MP 38.6; however, the status of the pit is listed as inactive. Additionally, the proposed Elkhorn Creek Compressor Station would be within a retired and depleted scoria pit. This unpermitted scoria pit was used for personal use by the landowners. Per WBI Energy's communications with the landowners, bulldozers and backhoes were used to excavate the private scoria pit, and no blasting occurred at the site. WBI Energy has a signed purchase agreement to acquire the compressor station property in fee and negotiations with the current landowners prohibit any continued scoria extraction within the boundaries of the fee property. WBI Energy would perform earthwork to prepare and grade the site, including the depleted scoria pit, prior to compressor station construction. WBI Energy plans to maintain open communication with this landowner regarding any future plans for scoria extraction. If the landowner intends to extract scoria adjacent to the compressor station property, no blasting is expected to occur. The closest gravel pit with an active status is approximately 0.2 mile southeast of MP 59.2 of the Tioga-Elkhorn Creek pipeline. Based on this assessment and given the distance to active mineral extraction, we conclude that the Project would not significantly impact availability of or access to non-fuel mineral resources.

Geologic Hazards and Impact Mitigation

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically include seismicity (e.g., earthquakes, surface faults, soil liquefaction), landslides, flooding, and subsidence (including karst terrain). These hazards, as well as the feasibility of utilizing HDD/guided bore construction based on hydrogeologic conditions present in the Project area, are discussed below.

Seismic Hazards

The shaking during an earthquake can be expressed in terms of the acceleration as a percent of gravity (g), and seismic risk can be quantified by the motions experienced at the ground surface or by structures during a given earthquake expressed in terms of g. For reference, a peak ground acceleration of 10 percent g (0.1g) is generally considered the minimum threshold for damage to older structures or structures not constructed to resist earthquakes. USGS National Seismic Hazard Probability Mapping shows that for the Project area, within a 50-year period, there is a 2 percent probability of an earthquake with an effective peak ground acceleration of 2 to 4 percent g; and a 10 percent probability of an earthquake with an effective peak ground acceleration of 0 to 1 percent g being exceeded (Rukstales and Petersen, 2019). Even under much higher ground vibrations, the main risk to pipelines and aboveground facilities would be a slip fault that displaces laterally during an earthquake. Project facilities would not cross any active faults (USGS, 2019c).

A study of induced seismicity[20] in the Williston Basin recorded nine earthquakes in the region between 2008 and 2011 (Frohlich et al., 2015). Three of these earthquakes were near

[20] Seismicity (earthquakes) of likely anthropogenic origin, is principally driven by deep injection of wastewater co-produced with oil and gas and disposed of into underground injection wells.

injection wells; however, based on the results of the study, only one earthquake may have been induced. This potentially induced Richter scale magnitude 2.5 earthquake occurred in 2010 approximately 37 miles west of the Tioga-Elkhorn Creek pipeline at MP 38. Overall, the study noted that the Williston Basin produced the fewest number of potentially induced earthquakes compared to oil and gas production areas in Texas, Oklahoma, and Arkansas. A 2018 study concluded that induced seismicity is low or absent in the Williston Basin because the vertical distance between faults in the Precambrian basement rock and depth of wastewater injection is greater than 1 kilometer (Skoumal et al., 2018). Given that the occurrence of induced seismicity is very low or absent in the Williston Basin, it is not anticipated that induced earthquakes would affect the Project. Given these conditions, we conclude that there is a low potential for damage due to prolonged ground shaking or ground rupture to occur within the Project area. The Project is in an area of low seismic hazard, and therefore, the potential for soil liquefaction to occur is negligible.

Landslides

Landslides involve the downslope mass movement of soil, rock, or a combination of materials on an unstable slope. Potential causes of construction-induced landslides include vibrations from machinery or traffic, alterations to slope morphology caused by earthwork, the addition of new loads on an existing slope, the removal of deep-rooted vegetation that binds shallow soils to bedrock, or changes in water volume infiltrating into the soil as a result of construction. In areas with steep slopes, soils may be unstable and present erosion management problems when disturbed, often requiring erosion and sedimentation control measures during pipeline construction and operation. The entire Project area has a low incidence of landslides. Segments from approximately MPs 3.1 and 62.8 of the Tioga-Elkhorn Creek pipeline, the entire Elkhorn Creek-Northern Border pipeline, and MPs 0.0 and 5.6 of the Line Section 25 Loop would be within an area of moderate landslide susceptibility; however, the incidence is still classified as low (NDGS, 2019b). Landslide deposit maps indicate that most landslide deposits in the Project area are associated with high-relief topography. Based on review of the USGS National Elevation Dataset, the Project would not cross slopes greater than 15 percent. Smaller-scale landslide deposits are associated with the north and south banks of Lake Sakakawea (NDGS, 2019b); however, the bore entry sites for the proposed HDD crossing of Lake Sakakawea would be set back from each bank by approximately 850 and 2,100 feet, respectively. Due to the generally low relief of the Project area, low historic incidence of slope failure in the Project area and vicinity, and WBI Energy's proposed crossing method of Lake Sakakawea, we conclude that the Project is not likely to be significantly adversely impacted by or cause significant slope instability.

Flooding

Hazards associated with flooding include stream bank erosion, scour, channel relocation, bedload movement, and debris flows. Based on information available from the Federal Emergency Management Agency for McKenzie County, the Project area is within a minimal flood hazard zone (Zone X, outside of the 500-year floodplain). Flood hazard information is not available for the Project area in Williams, Mountrail, and Burke Counties. In these counties, WBI Energy would consult with county floodplain managers and would obtain approvals, as necessary, prior to construction within a flood zone. No aboveground structures would be

installed within the mapped floodplain. As such, construction and operation of the Project would not affect floodplain storage capacity or floodplain elevations.

Heavy or excessive rainfall in a relatively short time period can cause flash flooding and scour along streambanks and within flood zones. NDDEQ commented that trenchless waterbody crossings should be installed at depths at least 4 feet deeper than any potential bank erosion or bed scour as calculated by appropriate engineering methods. WBI Energy proposes to cross 8 waterbodies via the open-cut method and 12 waterbodies via the HDD or guided bore method. A search of publicly available information did not return studies or evidence of past scour or flash flooding events where the Project would cross perennial waterbodies, including Tobacco Garden Creek, Beaver Creek, Cherry Creek, and White Earth Creek. Where the Project would cross these perennial waterbodies, WBI Energy would design and install the pipeline at a burial depth necessary to prevent scour from exposing it in accordance with 49 CFR 192. Specifically, proposed guided bore crossings would be installed at depths ranging from approximately 7 to 23 feet below grade.

The depth of the Lake Sakakawea HDD crossing would be approximately 250 feet below the lake bed, which would prevent damage to the pipeline from scour. A summary of proposed guided bore locations and crossing depths is included as appendix E. Therefore, we conclude that the Project would not be significantly affected by flood or scour hazard. More information regarding the HDD and guided bore method is provided below, as well as in section A.7.2.

As discussed in section A.1.2, flood control is one of the congressionally authorized purposes of the USACE Garrison Project. Lake Sakakawea is one of six major reservoirs on the Missouri River created in an effort to minimize annual flooding on adjacent river lowlands.

The NDDEQ provided comments that advised WBI Energy to obtain all applicable permits for crossing floodplain of class I, IA, II, and III rivers or streams. The proposed Project would be reviewed by the USACE Floodplain office for its compliance with EO 11988 as part of the USACE permitting process.

The proposed pipeline would be installed under the Missouri River floodplain using the HDD intersect method as described in section A.7.2. The northern entry side would be about 750 feet from the shoreline at an elevation of about 1,850 feet. The southern entry side would be approximately 2,000 feet from the shoreline at an elevation of about 1,925 feet. As described in section B.1.1 below, based on the geotechnical information available to date, stress analysis, and model results, the feasibility study determined that the proposed HDD would be geometrically feasible. WBI Energy would implement its HDD Plan to minimize the potential for an inadvertent returns of drilling fluid and outline mitigation measures if a return were to occur. No aboveground structures would be installed within the floodplain. Project construction and operation would not affect floodplain elevations, river flows, or flood storage capacities. Additionally, Project construction and operation would not affect the occupancy of the floodplain nor would it result in modifications to the floodplain or promote floodplain development. Therefore, we conclude that impacts on flood controls would be temporary, and not significant.

Subsidence

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst dissolution; sediment compaction due to oil, natural gas, and/or groundwater extraction; and underground mines. As described previously, there are no documented salt mines within 0.25 mile of Project facilities; as such, the risk of dissolution of evaporates affecting the Project is low. Three abandoned coal mines (one subsurface mine and two surface mines) are within 0.25 mile of the Project; however, based on available information, aerial imagery, and discussion with the NDPSC (NDPSC, 2020b), the risk of abandoned mine-related subsidence affecting the Project is low.

Karst terrain or lithology with the potential to develop karst features were not identified in the Project vicinity. The USGS Digital Map Compilation and Database for karst in the U.S. indicates that areas of the Sentinel Butte Formation may locally contain pseudokarst features including erosional piping. The closest of these areas is approximately 0.8 mile east of MP 60.4 of the proposed Tioga-Elkhorn Creek pipeline (USGS, 2014). Erosional piping has been documented within the Sentinel Butte Formation basal sandstone in Theodore Roosevelt National Park at the base of steep slopes. The Project facilities that cross the Sentinel Butte Formation are not at the base of steep slopes where erosional piping features typically form; as such, the risk that the collapse of piping features would impact the Project is low.

Therefore, we conclude there is low risk for subsidence to occur in the Project area or to significantly affect the pipelines or aboveground facilities.

Shallow Bedrock and Blasting

Based on prior construction experience in the area, field observations, and publicly available data, WBI Energy does not anticipate the need to conduct blasting activities during construction of the Project. Based on a query of the Soil Survey Geographic database for soil characteristics in the Project area, about 10 percent (143.5 acres) of the Project overlies soils where bedrock is shallower than 60 inches from the ground surface. However, the shallow bedrock in the Project area is classified as paralithic, indicating it is weathered and should be rippable using typical construction equipment.

If shallow bedrock or boulders are encountered that cannot be removed by conventional methods, blasting may be required. If blasting is necessary, WBI Energy's construction contractor would conduct blasting activities in accordance with the Project Blasting Plan and in compliance with state and federal regulations governing the use of explosives to assist in the removal of rock from the pipeline trench. WBI Energy would use the minimum explosive charge necessary to fracture bedrock and keep shot-rock from leaving the construction right-of-way. To avoid damage, WBI Energy would conduct pre-blasting evaluations of the rock, as needed, and develop specific blasting operations and monitoring plans. Control of blasting would limit stresses on existing pipelines, nearby domestic structures, water supply wells, or electric transmission tower footings near the Project. If blasting is required, WBI Energy would conduct blasting activities during daylight hours and would not begin until occupants of nearby buildings, stores, residences, places of business, and farms have been notified.

HDD and Guided Bore Feasibility and Geotechnical Investigations

The length of an alignment, the pipeline diameter, and subsurface material are factors in the technical feasibility of a trenchless installation. Subsurface conditions that can affect feasibility of an HDD or guided bore installation include excessive rock strength and abrasiveness, unconsolidated gravel and boulder materials, poor bedrock quality, solution cavities, and artesian conditions. It is also possible for HDD and guided bore installations to fail, primarily due to encountering unexpected geologic conditions such as transitioning from coarse unconsolidated materials into bedrock or if the pipe were to become lodged in the hole during pullback operations. During HDD and guided bore operations, drilling fluid consisting primarily of water and bentonite clay is pumped under pressure through the inside of the drill pipe and flows back (returns) to the drill entry point and exit points along an annular space between the outside of the drill pipe and the drilled hole. Because the drilling fluid is pressurized, in certain conditions it can seep into the surrounding rocks and sediment. Formational drilling fluid losses typically occur when the drilling fluid flows through the pore spaces in soil or within fractures in rock formations. Inadvertent returns are more likely to occur in more permeable soils or via fractures or fissures in bedrock. Chances for an inadvertent return of drilling fluid to occur are greatest near the drill entry and exit points where the drill path has the least amount of ground cover.

WBI Energy proposes to use the HDD intersect method to cross Lake Sakakawea. To confirm the surficial and bedrock geology and evaluate the feasibility of the HDD crossing, WBI Energy completed a geotechnical survey involving the installation of three land borings (LB-1, LB-2, and LB-3) to depths from 370 to 400 feet below the ground surface in April and May 2019 and six over-water borings (WB-4 through WB-9) to depths ranging from 300 to 315 feet below the Lake Sakakawea mudline in May 2020. The land borings encountered sedimentary sequences of interlayered sand, silt, clay, coal seams, and shale to the final termination depths. Near the surface, the borings encountered primarily poorly graded sand to a depth of approximately 25 feet below ground surface in LB-1, silt or silty sand to a depth of approximately 35 feet in LB-2, and well-graded sand to a depth of approximately 70 feet in LB-3. The over-water borings encountered shallow alluvial deposits such as silts and poorly graded sands and gravels to a depth of about 45 feet below the mudline in WB-4 and WB-9, and a depth of 220 feet below the mudline in WB-7. The geotechnical investigation determined that poorly lithified shale and sand associated with the Sentinel Butte and Bullion Creek formations underlie the alluvial deposits. The sedimentary strata within the nine borings were relatively consistent, and two relatively continuous coal seams, approximately 5 to 30 feet thick, were identified near the bottom of the proposed HDD bore path. Bedrock strata associated with the Sentinel Butte Formation are anticipated to be the primary material encountered during the HDD. The bottom tangent depth for the proposed HDD is around 250 feet below the bottom of the lake. Based on geotechnical information and stress analysis, WBI Energy's feasibility study determined that the proposed HDD would be geometrically feasible; however, WBI Energy's geotechnical contractor identified numerous potential risk factors and provided recommendations for mitigation, summarized below.

The crossing is proposed to be approximately 15,400 feet in length, approaching record lengths for an HDD installation of 24-inch-diameter pipe. The length of this drill elevates the risk of complications compared to shorter crossings, including the risk of compounding issues

inhibiting successful completion. For example, loss of equipment or pipe sections in the borehole would be a larger risk than with a shorter crossing, and maintaining weight on the bit to steer may be difficult. The utilization of intersect methodology would help mitigate the risk of losing equipment within the borehole because if problems arise on one side of the reamer, the opposite rig would maintain contact with the downhole tooling and be able to trip to surface. The crossing is also designed with a large radius which would reduce the steering requirements, and the long bottom tangent would allow the drills sufficient time to align for intersect operations. WBI Energy states that preventative measures to reduce complications while pulling back product pipe could include, but would not be limited to: utilizing drilling equipment capable of supplying enough power to remove seized pipe from either entry or exit location, including potential use of a pipe thruster; performing an extra reaming pass with the purpose of cleaning out the reamed hole; and adding proper lubrication with precise weight drilling fluid.

The length of the crossing and fractured formations (including coal seams as identified within the bedrock formation) could result in high annular pressures and the subsequent release of drilling fluid to the surface. Further, the bedrock layer is inconsistent and dips significantly in the middle of the crossing, reducing the expected strength of the overburden formation. Although not encountered in the geotechnical investigation, there is also the potential to encounter cobbles and/or boulders along the drill path. By definition, glacial deposits consist of a variation of all soil types, including a random distribution of cobble and boulder-sized materials, and granular layers/lenses.

WBI Energy's hydrofracture assessment determined that drilling pressures would remain below the limiting pressures of the overburden along the first 5,000 to 6,000 feet of the drill from either side. Within the middle section of the drill, near the intersect zone, the risk of inadvertent return would be moderate. Use of the intersect method, as well as the depth of the crossing would help to limit the potential for fracture. Further, WBI Energy would adhere to its HDD Plan, which states that it would continuously monitor drilling pressures during active drilling operations and it would use a downhole annular pressure tool during the pilot hole drilling phase to ensure that it could respond to a loss or spike in drilling fluid pressure which would be indicative of a potential hydrofracture and possible inadvertent return. Drilling operations would be stopped immediately at the first sign of an inadvertent return of drilling fluid to the surface and WBI Energy would implement response and cleanup efforts specific to the location of the inadvertent return (e.g., upland, waterbodies or wetlands, sensitive resource areas). WBI Energy would contact appropriate agencies as needed, depending on the location of the inadvertent return.

WBI Energy may install conductor casing at either, or both, entry locations in order to traverse unconsolidated formations, alleviate conditions associated with inadvertent drilling fluid returns and settlement, or to allow a better transition into more consolidated formations. Casing at the entry locations may also help to maintain weight on the bit for improved steering, would minimize the amount of coal seams the drill path would encounter, and would help with circulation back to the entry locations.

Finally, drilling operations require soil cuttings to be cleaned out of the bore and hydrotransported back to the rig by the drilling fluid. This process requires large volumes of pressurized drilling fluid to be pumped downhole. Further, as the volume of drilling fluid within

the borehole increases, it becomes more difficult to change its properties with drilling fluid additives. The large diameter borehole combined with the length of the crossing could impact the quality and makeup of the drilling fluid. Drilling fluid would also need to be stored and disposed of. The length and large borehole size would result in significant volumes of drilling fluid, and drilling fluid may be contaminated due to coal seams.

WBI Energy states that its HDD contractor would maximize reuse of drilling fluid by providing solids control and fluid cleaning equipment. The HDD contractor would maintain logs of drilling fluid composition and physical properties throughout drilling activities. WBI Energy would obtain water from a local water depot and transport it to HDD and guided bore locations. WBI Energy is coordinating with landowners on potential locations within agricultural areas for the beneficial reuse of HDD drilling fluid. In the event it is determined that coal is an unacceptable contaminant for land-farming/beneficial reuse, WBI Energy would identify when coal appears in the cuttings as solid drilling waste and it would be trucked to a state-approved disposal facility. All Project drilling fluid would be disposed of in accordance with federal, state, and local regulations. Prior to construction, WBI Energy would develop site-specific procedures related to storage and management of drilling fluid. These plans would include a Lake Sakakawea crossing-specific Engineered Drilling Fluid Plan and a Water Management and Drilling Fluid Disposal Plan. Because these plans would detail water use measures and drilling fluid composition and management, as well as other mitigation measures for potential complications described above, and have not yet been finalized and filed with the FERC, **we recommend that:**

- **Prior to construction of the Lake Sakakawea HDD, WBI Energy should file with the Secretary of the Commission (Secretary) for review and written approval by the Director of OEP, or the Director's designee, its crossing-specific Engineered Drilling Fluid Plan and Water Management and Drilling Fluid Disposal Plan**.

WBI Energy would complete 89 crossings via the guided bore method. The guided bore crossings are short (generally less than 1,000 feet) and shallow (less than 25 feet below the ground surface), and generally involve crossings of roads and railroads. However, a few select environmental features (e.g., waterbodies, wetlands, sensitive habitats) would be crossed. WBI Energy did not conduct geotechnical investigations for guided bore installations; however, based on the limited length and depth of guided bore installations, as well as anticipated subsurface geology crossed (determined based on a review of desktop sources), WBI Energy has not identified conditions that would adversely affect the feasibility of completing the proposed crossings. WBI Energy would employ the guided bore method to provide additional depth at these crossings, maintain function of ditches and roads during construction, and minimize disturbance to these features. WBI Energy would implement the measures in its HDD Plan during HDD and guided bore installations. More information regarding the guided bore method is provided in section A.7.2. A summary of proposed guided bore locations and geology crossed is included as appendix E.

Further, drilling fluids would consist primarily of fresh water and a high yield bentonite clay. WBI Energy's HDD Plan includes potential drilling fluid additives and Safety Data Sheets for the HDD crossing of Lake Sakakawea. If drilling fluid additives are deemed necessary for

any guided bore crossings, WBI has committed to providing this information to the appropriate agencies (e.g., NDDEQ and FERC) for approval prior to use.

We conclude that subsurface conditions identified by the geotechnical studies completed to date would not render the Lake Sakakawea HDD infeasible. Based on the surficial geologic sediments that may be encountered during the proposed guided bores for the Project, as well as WBI Energy's measures, it is not anticipated that hard, consolidated bedrock or large cobbles or boulders would prevent successful completion of the guided bores. With consideration of this, our recommendation, and WBI Energy's implementation of its HDD Plan, we conclude that impacts from HDD and guided bore construction and potential inadvertent returns of drilling fluid to the ground surface would be temporary and not significant.

1.2 Soils

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, such as water infiltration, storage and routing, and soil nutrient levels, thus reducing soil productivity. Clearing removes protective vegetative cover and exposes soils to the effects of wind and water, which increases the potential for soil erosion and the transport of sediment to sensitive resource areas. Individual soil characteristics and the mitigation measures that would be employed for each characteristic are discussed separately below.

WBI Energy identified and assessed soil characteristics in the Project area using the Soil Survey Geographic database (Soil Survey Staff, 2019a), which is a digital version of the original county soil surveys developed by the USDA's Natural Resources Conservation Service (NRCS) for use with geographic information systems (GIS). Table B-2 provides a summary of the significant soil characteristics and acreage that would be affected by the Project.

Pipeline Facilities

Prime Farmland

The USDA defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. Unique farmland is land, other than prime farmland, that is used for production of specific high-value food and fiber crops. Soils that do not meet all of the requirements to be considered prime or unique farmland may be considered farmland of statewide or local importance if soils are capable of producing a high yield of crops when treated or managed according to accepted farming methods.

Table B-2

Acres of Soil Characteristics Affected by the Proposed Project [a]

Facility	Total Acres	Prime Farmland [b]	Compaction Prone [c]	Highly Erodible		Revegetation Concerns [f]	Rocky [g]	Shallow Bedrock [h]
				Water [d]	Wind [e]			
Pipeline Facilities [i]								
Tioga-Elkhorn Creek	802.3	393.6	3.0	258.6	47.0	202.8	32.9	134.3
Elkhorn Creek-Northern Border	2.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Line Section 25 Loop	210.8	86.5	15.1	59.4	0.0	22.6	25.6	0.4
Line Section 30 Loop	96.9	63.7	2.2	20.9	0.0	17.3	4.8	0.0
Tioga Compressor Lateral	4.4	3.1	0.0	0.6	0.0	0.0	0.0	0.0
Uprate Line Section 25	15.3	2.8	2.9	7.6	0.0	6.6	1.5	0.0
Subtotal	**1,132.3**	**549.8**	**23.1**	**347.2**	**47.0**	**249.2**	**64.9**	**134.8**
Aboveground Facilities [j]								
Elkhorn Creek Compressor Station	13.1	0.0	0.0	5.4	0.0	3.9	3.4	1.6
Tioga Compressor Station	8.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0
Lignite Plant Receipt Station and Lignite Town Border Station	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Norse Plant Receipt Station	0.6	0.2	0.0	0.0	0.0	0.0	0.4	0.0
Norse Transfer Station	1.5	1.1	0.0	0.0	0.0	0.0	0.4	0.0
Northern Border Interconnect	4.2	0.0	0.0	1.4	0.0	1.1	0.7	0.3
Robinson Lake Plant Receipt Station	1.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Springbrook Plant Receipt Station	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Tioga Plant Receipt Station	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Block valves [k]	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Pig launchers/receivers [l]	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	**33.4**	**15.2**	**0.0**	**6.7**	**0.0**	**4.9**	**5.0**	**1.9**
Access Roads								
Temporary Access Roads	43.4	16.5	1.6	16.5	3.0	12.4	3.5	3.4
Permanent Access Roads	2.6	0.7	0.0	0.9	0.0	0.5	0.3	0.1
Subtotal	**46.0**	**17.2**	**1.6**	**17.4**	**3.0**	**12.9**	**3.7**	**3.5**
Staging Areas								
68th Street Yard	20.4	0.0	0.6	5.0	0.0	5.0	13.5	0.0
Boehm Staging Yard	6.2	4.9	0.0	0.0	0.0	0.0	1.3	0.0
CRS Yard	22.8	0.5	0.0	3.2	0.0	10.5	22.3	0.0
Delta Contractors Yard	23.6	22.3	0.0	1.4	0.0	1.4	0.0	0.0
Enget Yard	39.8	0.0	0.3	33.6	0.0	39.2	39.2	0.0
Flatlands Yard 1	4.9	4.4	0.0	0.4	0.0	0.3	0.0	0.0
Flatlands Yard 2	6.1	0.0	0.0	1.9	0.0	1.9	5.5	0.0
Lobell Yard	39.5	36.6	0.1	1.8	0.0	0.0	0.0	0.0
Schmidt Yard	8.4	1.4	0.0	4.5	0.0	0.0	0.0	0.0
Weflen Staging Yard	17.7	15.6	0.0	1.4	0.0	0.0	0.0	0.0

Table B-2

Acres of Soil Characteristics Affected by the Proposed Project [a]

Facility	Total Acres	Prime Farmland [b]	Compaction Prone [c]	Highly Erodible		Revegetation Concerns [f]	Rocky [g]	Shallow Bedrock [h]
				Water [d]	Wind [e]			
Franz Yard	22.2	14.4	0.0	7.8	2.0	4.1	0.0	3.3
Aux Sable Yard	46.2	43.7	0.0	1.2	0.0	0.2	0.0	0.0
Subtotal	**257.8**	**143.7**	**1.0**	**62.2**	**2.0**	**62.7**	**81.7**	**3.3**
Total	**1,469.5** [m]	**725.9**	**25.7**	**433.8**	**52.0**	**329.7**	**155.3**	**143.5**

Sources: Soil Survey Staff, 2020a and 2020b

[a] The area affected includes all permanent and temporary workspace (including additional temporary workspace). The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends. The values in each row do not add up to the total acreage for each facility because the soils may occur in more than one characteristic class or may not occur in any class listed in the table. The soils in the table do not include areas of open water.

[b] As designated by the NRCS. Prime farmland includes those soils that are considered prime if a limiting factor is mitigated (e.g., through artificial drainage) and soils designated as farmland of statewide importance.

[c] Soils in somewhat poor to very poor drainage classes with surface textures of sandy clay loam and finer.

[d] Soils in land capability subclasses 4E through 8E and soils with an average slope greater than 8 percent.

[e] Soils with a Wind Erodibility Group classification of 1 or 2.

[f] Soils with a surface texture of sandy loam or coarser that are moderately well to excessively drained, and soils with an average slope greater than 8 percent.

[g] Soils with one or more horizons that have a cobbley, stony, bouldery, channery, flaggy, very gravelly, or extremely gravelly modifier to the textural class and/or contain greater than 5 percent by weight rocks larger than 3 inches.

[h] Soils identified as containing bedrock within 60 inches of the ground surface.

[i] Includes the appurtenant facilities within the pipeline rights-of-way (e.g., block valves, cathodic protection facilities).

[j] Includes the appurtenant facilities within the aboveground facility sites (e.g., pig launcher/receiver).

[k] Four of the six proposed block valves (Valve No. 13.6, the 56th Avenue N.W. Block Valve, the Highway 10 Block Valve, and the South Lake Block Valve) would be constructed entirely within the permanent pipeline rights-of-way, and no additional land would be required for their construction or operation. However, the Cherry Creek Block Valve and Valve No. 6.8 would require an additional 0.9 acre and less than 0.1 acre of land, respectively, outside the existing permanent pipeline right-of-way for construction and operation.

[l] One pig launcher/receiver site would be constructed at MP 6.1 of the Tioga-Elkhorn Creek pipeline. The remaining pig launcher/receiver sites would be constructed and operated within the compressor/meter station sites; no additional land would be required for construction and operation of these facilities.

[m] Acreages do not include impacts due to two minor route changes filed by WBI Energy on December 4, 2020 (accession number 20201204-5043), which would impact less than 3 acres total and would not impact any additional resources.

About 549.8 acres (49 percent) of the soils crossed by the pipeline facilities are considered prime farmland or farmland of statewide importance. Impacts on prime farmland soils resulting from pipeline construction and operation would be temporary and short-term because the pipelines would be buried and the disturbed soils within the construction and permanent rights-of-way would revert to pre-construction uses or be maintained in an herbaceous state. Agricultural use would be allowed to continue within the pipeline right-of-way, with the exception of deep-rooted crops, such as orchards or tree farms.

Compaction Potential

Approximately 2 percent (23.1 acres) of the soils that would be affected by pipeline construction are prone to compaction. In accordance with the FERC Plan, EIs could restrict construction activities in areas with unfavorable conditions (e.g., saturated soils) to minimize compaction and rutting. WBI Energy would further mitigate compaction by using a paraplow or

similar implement to conduct deep tillage operations during restoration. In areas where topsoil segregation occurs, plowing to alleviate subsoil compaction would be conducted before replacement of the topsoil.

Soil Erosion

The majority of Project area soils are not highly susceptible to erosion by wind or water; however, clearing, grading, and equipment movement can accelerate the erosion process and, without adequate protection, result in discharge of sediment to waterbodies and wetlands. Specifically, about 31 percent (347.2 acres) of the soils affected by pipeline construction are considered susceptible to erosion by water and 4 percent (47.0 acres) are considered highly wind erodible. The Hartels expressed concern about controlling soil erosion, the loss of topsoil during construction and restoration, and dust control. WBI Energy would implement measures in the FERC Plan and Procedures to minimize erosion during construction and restoration. FERC's Plan requires installation of temporary erosion controls, including interceptor diversions and sediment filter devices such as silt fences, immediately following land disturbing activities where necessary to prevent the deposition of sediments beyond approved workspaces or into sensitive resources. The EI would inspect these controls on a regular basis and after each rainfall event of 0.5 inch or greater to ensure proper functioning. As required, WBI Energy would maintain temporary erosion control devices until workspaces are successfully revegetated. As described in section A.8.1, WBI Energy would also segregate topsoil from subsoil in all unsaturated areas affected by standard pipeline construction to aid in successful revegetation. Topsoil and subsoil would be replaced in the proper order during backfilling and final grading. Implementation of proper topsoil segregation would help promote postconstruction revegetation success, thereby minimizing the potential for long-term erosion. FERC staff would conduct periodic inspections throughout construction and restoration to ensure WBI Energy's compliance with these measures.

In accordance with its Fugitive Dust Control Plan, WBI Energy would apply water to exposed work areas and/or topsoil storage piles during construction to control fugitive dust, as necessary. WBI Energy may use magnesium chloride on unpaved roads as a dust suppressant; only water would be used on the right-of-way. Fugitive dust is also addressed in section B.8.1. Given WBI Energy's commitment to follow the measures in the FERC Plan and its Fugitive Dust Control Plan, we conclude that significant impacts from wind and water erosion would not occur as a result of the Project.

Revegetation Potential

About 22 percent (249.2 acres) of the soils that would be affected by pipeline construction are considered to have poor revegetation potential. To aid in successful revegetation, WBI Energy would complete topsoil segregation in all areas of standard pipeline construction. In accordance with the FERC Plan, after construction, WBI Energy would condition the construction right-of-way for planting, prepare a seedbed, and incorporate soil amendments, where necessary, at rates agreed to by the landowner or as specified in writing by an appropriate soil conservation authority.

WBI Energy may elect to incorporate soil amendments (e.g., hydrated lime) to saturated upland soils. Application rates, material storage, and handling would be conducted in accordance with the manufacturer's recommendation. In accordance with the FERC Procedures, WBI Energy would not use soil amendments in wetlands unless required in writing by the appropriate federal agency. In addition, WBI Energy would not use hydrated lime within 100 feet of wetlands or waterbodies in order to reduce the potential for downgradient water quality impacts.

WBI Energy has consulted with the NRCS and USFS to obtain recommendations for seed mixtures to be used in non-cropland areas during right-of-way restoration. As of January 2020, WBI Energy received comments from one of the four NRCS offices. WBI Energy continues to consult with the NRCS and would provide any additional responses and incorporated recommendations as they are available.[21] With implementation of WBI Energy's proposed measures, including the use of seed mixes recommended by the NRCS and USFS, we conclude that significant impacts due to soils with poor revegetation potential would not occur.

Rocky and Shallow Depth to Bedrock

Construction through soils with shallow bedrock could result in the incorporation of bedrock fragments into surface soils. The pipeline routes would cross about 134.8 acres (12 percent) of soils that contain shallow bedrock (i.e., bedrock within 60 inches of the surface). This bedrock is paralithic and would likely be rippable using standard construction equipment (see section B.1.1 for more information regarding bedrock in the Project area). WBI Energy would minimize the introduction of subsoil rocks/stones by segregating and replacing topsoil in all areas of standard pipeline construction. WBI Energy would also remove excess rock/stone from surface soils disturbed by construction such that the size, density, and distribution of rock on the construction right-of-way would be similar to adjacent off-right-of-way areas and would replace rock in the trench to a level not higher than the original bedrock profile. Given these mitigation measures, we conclude that shallow bedrock soils would not impact restoration of the pipeline right-of-way.

Aboveground Facilities

The Project would require construction of one new compressor station (Elkhorn Creek Compressor Station), modifications to the Tioga Compressor Station, and construction of, or modifications to, measurement, delivery, receipt, and transfer stations, block valves, pig launcher and receiver facilities, and associated appurtenances. Each of these facilities would be fenced and retained for Project operations. WBI Energy would stabilize these Project areas with gravel cover or maintain them in an herbaceous state, minimizing erosion during operation. Construction and modification of these facilities would permanently convert approximately 21.9

[21] The current seed mixes recommended by the NRCS and USFS are identified in WBI Energy's application, accession numbers 20200928-5091 and 20200214-5292.

acres of land to commercial/industrial use, of which approximately 7.4 acres are classified as either prime farmland or farmland of statewide importance.

Construction of the Project's aboveground facilities would cause a permanent removal of available farmland soils from agricultural production; however, these impacts would be minor based on the quantity of available prime farmland and farmland of statewide importance in the Project vicinity.[22] Soils underlying permanent aboveground facility foundations would also be permanently affected by compaction; however, resulting impacts on subsurface hydrology would be highly localized and minor. During construction, WBI Energy would minimize impacts on soils outside of the permanent fence line at the aboveground facilities by implementing the measures specified in the FERC Plan.

Access Roads

Use of temporary access roads would affect approximately 43.4 acres of land. Ten permanent access roads (affecting approximately 2.6 acres) would be graveled or paved and retained during operation to provide access to aboveground facilities. Use of the permanent access roads would affect 0.7 acre classified as farmland of statewide importance. Construction of the Project permanent access roads would cause a permanent removal of available farmland soils from agricultural production; however, these impacts would be minor given that these soils are not in agricultural use and based on the minimal acres of permanent impacts compared to the quantity of available prime farmland and farmland of statewide importance in the Project vicinity.

Staging Areas

WBI Energy would use about 257.8 acres of land as staging areas. Of this, 57.5 acres have been previously disturbed and are primarily being used for industrial or commercial purposes. Approximately 111.8 acres consist of land in agricultural use, of which approximately 80.1 acres are classified as farmland of statewide importance. Impacts on agricultural areas would be minimized by the implementation of the measures specified in the FERC Plan for topsoil segregation and replacement. Topsoil segregation would not occur at staging areas that have already been disturbed and utilized for commercial/industrial uses. After construction is complete, WBI Energy would return staging areas to pre-construction uses and no permanent impacts would occur. Therefore, we conclude that these impacts would be short-term and not significant.

Inadvertent Spills or Discovery of Contaminants

Contamination from inadvertent spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. WBI Energy would implement its SPCC Plan to prevent and contain, if necessary, accidental spills of any material that may contaminate soils, and to ensure that inadvertent spills are cleaned up and disposed of in an appropriate manner. It is possible that unknown contaminated sites could be encountered along the pipeline routes during construction. Section B.5.3 identifies known hazardous waste sites within 0.25

[22] Per the NRCS (Soil Survey Staff, 2019a), there are approximately 1,672,307 acres of prime farmland and farmland of statewide importance in Burke, Mountrail, McKenzie, and Williams counties.

mile of Project facilities. If contaminated soils or groundwater are encountered, all on-site personnel would stop work, evacuate the area, and implement the measures specified in the Plan for Unanticipated Discovery of Contaminated Environmental Media. This plan includes measures to be taken by the EI, Spill Coordinator, and construction personnel to isolate the contaminated area, notify the appropriate agencies, gather information, monitor hazardous conditions (if possible), and remove and properly dispose of contaminated media in accordance with federal and state regulations.

We conclude impacts on soils would be short-term (lasting until revegetation is successful) and no significant impacts on soils would occur as a result of this Project, given the implementation of the FERC Plan and Procedures and WBI Energy's SPCC Plan.

2. Water Resources and Wetlands

2.1 Groundwater Resources

Existing Groundwater Resources

The Project area is underlain by sedimentary bedrock aquifers of Paleogene age and by Quaternary-age glacial outwash aquifers. The bedrock aquifers are composed mostly of sandstone and lignite and are highly variable in horizontal extent and thickness, which make them less reliable than the overlying glacial aquifers for groundwater development. However, most farms and ranches and many small communities are able to obtain water from these bedrock aquifers for most purposes excluding large-scale irrigation due to high mineral content and insufficient water quantity (Paulson, 1983).

The overlying unconsolidated aquifers consist of loose beds of gravel, sand, silt, and/or clay resulting from glacial outwash deposits, and they are generally more productive and of better water quality than aquifers found in the underlying bedrock (NDSWC, 2005; Paulson, 1983). Generally, these upper aquifers are suitable for irrigation, but there are local exceptions based on water quality, crop, and soil type (Paulson, 1983). As shown in table B-3, the Project would cross three alluvial and glacial aquifers for a distance of about 9.3 miles: the Hofflund aquifer, the Tobacco Garden aquifer, and the Cherry Creek aquifer.

The Hofflund aquifer consists of glaciofluvial deposits overlain by alluvial sand, gravel, silt, and clay. The average aquifer thickness is approximately 45 feet. The depth to the top of the aquifer ranges from 10 to over 100 feet below the ground surface (Armstrong, 1969). The Tobacco Garden aquifer consists of a bed of alluvial material deposited along the floor of the pre-glacial Little Missouri River Valley. The maximum aquifer thickness ranges from 80 to 99 feet. The depth to the top of the aquifer ranges from approximately 50 to 1,000 feet below the ground surface (Croft, 1985). The Cherry Creek aquifer consists of glaciofluvial deposits underneath the portion of Cherry Creek southeast of Watford City, North Dakota. The maximum aquifer thickness is approximately 100 feet (Croft, 1985). The depth to the top of the aquifer ranges from approximately 6 to 30 feet below the ground surface (USGS, 2019d).

Table B-3

North Bakken Expansion Project Areas Underlain by Regional Aquifers [a]

Facility/County	Aquifer Name	Approximate Start Milepost	Approximate End Milepost	Miles Crossed
Tioga-Elkhorn Creek Pipeline				
Williams County	Hofflund	19.6	22.4	2.8
Williams County	Hofflund	22.4	23.2	0.8
McKenzie County	Tobacco Garden	29.6	31.3	1.7
McKenzie County	Tobacco Garden	31.8	32.2	0.4
McKenzie County	Tobacco Garden	32.3	32.4	<0.1
McKenzie County	Tobacco Garden	36.4	37.3	0.9
McKenzie County	Tobacco Garden	39.8	40.2	0.4
McKenzie County	Cherry Creek	46.8	48.6	1.8
McKenzie County	Cherry Creek	52.4	52.8	0.4
McKenzie County	Cherry Creek	55.0	55.1	0.1
TOTAL				**9.3**

Source: NDDEQ, 2019b

[a] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

Designated Sole Source Aquifers and Wellhead Protection Areas

The U.S. Environmental Protection Agency (EPA) oversees the Sole Source Aquifer Protection Program to protect high production aquifers that supply 50 percent or more of the region's water supply and for which there are no reasonably available alternative drinking water sources should the aquifer become contaminated. There are currently no designated sole source aquifers in North Dakota (EPA, 2019a). Further, based on a review of maps prepared by the NDDEQ, there are no wellhead protection areas within 0.25 mile of the construction workspaces (NDDEQ, 2019b). Therefore, the Project would have no effect on sole source aquifers or wellhead protection areas.

Public and Private Water Supply Wells

Groundwater is the most common source of domestic water in North Dakota (NDSWC, 2005). According to the NDSWC well permit database and online map system, there are no water supply wells within 150 feet of the Project footprint (NDSWC, 2019). WBI Energy also recorded the location of private wells identified during civil surveys and through landowner interviews. One private livestock watering well was identified within 150 feet of the proposed Project footprint. This well is about 30 feet from MP 25.9 of the Tioga-Elkhorn Creek pipeline.

Based on a review of USGS topographic maps and conversations with landowners, WBI Energy identified two springs near MP 12.2 of the Tioga-Elkhorn Creek pipeline. The exact location of these springs is not currently known; however, WBI Energy has confirmed that neither spring is used by the landowner for potable water. WBI Energy would coordinate with the landowners to identify these springs prior to construction. If these springs are within 150 feet of the proposed workspace, WBI Energy would clearly demarcate the springs using orange

construction fencing. Further, in accordance with the FERC Plan, WBI Energy would install erosion control devices to prevent sediment flow into sensitive environmental resource areas, such as springs.

Contaminated Groundwater

The primary potential sources of groundwater contamination in the vicinity of the Project are related to agricultural activities, including the leaching of pesticides, herbicides, and fertilizers into underlying aquifers. Other possible sources of groundwater contamination in the area include cattle feedlots, municipal landfills, septic tanks, sewage lagoons, oil wells, and leaking underground storage tanks (Paulson, 1983). On-site septic systems are the primary form of wastewater treatment in rural North Dakota. WBI Energy routed the pipelines to avoid residences, thereby minimizing potential impacts on septic systems. The pipeline routes would pass within 500 feet of residences in 11 locations near MPs 22.5, 23.1, 28.2, 30.0, 30.5, and 39.2 of the Tioga-Elkhorn Creek pipeline; MPs 8.0, 10.9, 11.5, and 19.3 of the Line Section 25 Loop; and MP 5.1 of the Line Section 30 Loop. In all instances, the pipelines would be greater than 350 feet from the nearest farmstead or residence. WBI Energy does not anticipate that construction activity would affect active septic systems; however, WBI Energy would coordinate with the landowners in these 11 locations during construction to ensure no impacts would occur. In the unforeseen instance that an active septic system is impacted by Project construction, WBI Energy would repair the system to its previous condition or better.

Based on a review of aerial photographs and field surveys, no livestock feedlots, municipal landfills, sewage lagoons, or contamination due to oil and natural gas development were identified within 0.25 mile of the Project workspace. In addition, a review of the EPA's Facility Registration System map service and the NDDEQ underground storage tank data identified no known sites of potential contamination within 500 feet of the Project area (NDDEQ, 2019c). Additional information on hazardous waste sites and potential groundwater contamination can be found in section B.5.3.

Impacts and Mitigation

Surface drainage and groundwater recharge patterns could be temporarily altered by clearing, grading, trenching, dewatering, and soil stockpiling activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. We expect the resulting changes in water levels and/or turbidity in these aquifers to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside. The addition of impervious surfaces at aboveground facilities may affect overland flow patterns and subsurface hydrology. However, these effects would be highly localized and minor.

WBI Energy's SPCC Plan contains specific construction measures to prevent and cleanup spills of fuels, oils, and other hazardous fluids. The SPCC Plan contains measures for refueling, storage, handling, containment, and cleanup of fuels, oils, and other hazardous fluids. In addition, WBI Energy would prohibit refueling activities and storage of hazardous liquids within at least a 200-foot-radius of all private wells and at least a 400-foot radius of all municipal or

community water supply wells. If WBI Energy encounters contaminated groundwater during construction, it would follow the procedures within its Plan for Unanticipated Discovery of Contaminated Environmental Media. This plan includes measures to be taken by the EI, Spill Coordinator, and construction personnel to isolate the contaminated area, notify the appropriate agencies, gather information, and monitor hazardous conditions (if possible), and remove and properly dispose of contaminated media in accordance with federal and state regulations. Areas of existing known soil and groundwater contamination are discussed in section B.5.3.

For known active water wells and any additional active water wells identified within 150 feet of construction work areas, WBI Energy would conduct pre-construction and post-construction water quality and yield testing and/or sampling to verify that Project construction would not permanently affect water wells. WBI Energy would obtain landowner or municipality permission prior to testing. In the event that an active well is identified within construction work areas and must be taken out of service, WBI Energy would provide an alternate water source or negotiate a mitigation plan with the landowner to offset any adverse impacts. WBI Energy would analyze any damaged well or water supply system (including changes in water quality or yield) and perform the necessary repairs and/or modifications to return it to its former capacity as determined by testing and/or sampling. In the event that a private well or water supply system is damaged beyond repair due to construction-related activities, WBI Energy would provide a temporary water source and replace the well as necessary. Within 1 year of the completion of construction, WBI Energy would file a report identifying all potable water supply systems damaged by construction and how they were repaired. Given the distance to known wells, and with implementation of WBI Energy's construction and mitigation measures, we conclude that Project-related impacts on groundwater resources would primarily be temporary and would not be significant.

2.2 Surface Water Resources

Watersheds are classified by regions that drain into the same river system, which can be defined by topography. Many smaller watersheds (also known as sub-basins and sub-watersheds) are contained within larger watersheds. The Project would occur within 27 hydrologic unit code (HUC) 12 sub-watersheds and are identified in FERC docket CP20-52-000[23].

Based on review of USGS mapping, aerial photography, and WBI Energy's field investigations to-date, the Project would involve 22 waterbody crossings, consisting of 11 perennial streams, 6 intermittent streams, 2 ephemeral streams, and 3 open water ponds. Of the 22 waterbody crossings, 2 waterbodies (s-wm-ea-001p and s-wm-ea-002) would be crossed by both the Tioga-Elkhorn Creek Pipeline and Line Section 30 Loop at the same location. Information on each of the waterbodies, including name, water quality classification, flow regime, crossing width, and crossing method, is provided in table B-4. Waterbodies that were not surveyed due to a lack of survey permission (about 10 percent), or route adjustments that occurred after the end of the 2019 survey season, are referred to in the Feature ID column of

[23] The table for watersheds crossed by the Project can be found in FERC docket CP20-52-000 with accession number 20200911-5167.

Table B-4

North Bakken Expansion Project Waterbodies Crossed [a]

Approx. Milepost	Feature ID	Waterbody Name [b]	Water Quality Classification [c]	Flow Regime [d]	Width (feet) [e]	Crossing Method [f]
Tioga to Elkhorn Creek						
0.8	s-wm-ea-001p[l]	Unnamed tributary to Paulson Creek	Class III	PN	39	Open Cut
2.4	s-wm-ea-002[l]	Unnamed tributary to Dry Fork Creek	Class III	PN	<10	Open Cut
12.3	s-wm-ee-001	Unnamed tributary to Beaver Creek	Class III	PN	<10	Open Cut
18.2	s-wm-eb-002	Beaver Creek	Class III	PN	<10	Guided Bore
24.4	s-wm-eb-003p	Lake Sakakawea	Class I	PN	12,560	HDD
25.7	o-mk-ee-001	Natural Pond	Class 4	NA	34	HDD
27.1	s-mk-eb-001	Unnamed tributary to Sand Creek	Class III	E	<10	Open Cut
27.5	s-mk-ea-001	Unnamed tributary to Sand Creek	Class III	E	<10	Guided Bore
29.0	s-mk-wa-001	Unnamed tributary to Tobacco Garden Creek	Class III	IT	25	Guided Bore
30.3	s-mk-eb-002	Tobacco Garden Creek	Class III	PN	58	Guided Bore
36.5	s-mk-ea-003	Tobacco Garden Creek	Class III	PN	45	Guided Bore
39.2	s-mk-ea-002	Unnamed tributary to Tobacco Garden Creek	Class III	IT	<10	Open Cut
44.9	DSK_NHD_11 [g]	Timber Prong Creek	Class III	IT	20	Guided Bore
44.9	DSK_NHD_5 [g]	Timber Prong Creek	Class III	IT	32	Guided Bore
51.5	s-mk-eb-005	Northfork Creek	Class III	IT	<10	Guided Bore
52.4	s-lbt-001a	Cherry Creek	Class III	PN	39	Guided Bore
58.0	DSK_NHD_2 [g]	Unnamed tributary to Sevenmile Creek	Class III	IT	<10	Open Cut
Line Section 25 Loop						
13.4	s-bk-eb-001p	White Earth Creek	Class III	PN	28	Guided Bore
Line Section 30 Loop						
7.2 [h]	s-wm-ea-002	Unnamed tributary to Dry Fork Creek	Class III	PN	<10	Open Cut
8.8 [h]	s-wm-ea-001p	Unnamed tributary to Paulson Creek	Class III	PN	38	Open Cut
Tioga Compressor Station						
NA	o-wm-eb-001	Man-made pond [i]	Class 4	NA	NA	N/A
Yards						
Enget Yard	o-mt-ee-001	Man-made pond [j]	Class 4	NA	NA	N/A

[a] Based on the following data: Project field surveys to date, USGS mapping, NHD data, the NDSWC's geographic information system data viewer, and review of aerial photographs.

[b] Waterbody names are based on USGS topographic maps.

[c] See section 2.2.2 below for category definitions (source: NDDEQ 2019d). None of the Class III streams are specifically identified in the Stream Classifications Table in appendix I of the NDDEQ Standards of Quality for Waters of the State, and are classified as Class III as a default based on specifications included in that appendix.

[d] Based on field surveys, NHD designations, and/or aerial photography interpretation for unmapped streams: IT = Intermittent, PN = Perennial, E = Ephemeral (U.S. Army Corps of Engineers [COE], 2012), NA = Not applicable

Table B-4

North Bakken Expansion Project Waterbodies Crossed [a]

Approx. Milepost	Feature ID	Waterbody Name [b]	Water Quality Classification [c]	Flow Regime [d]	Width (feet) [e]	Crossing Method [f]

[e] Approximate width based on field surveys and/or estimated from aerial photography. Where NHD data have been used to supplement areas where surveys are not complete, an assumed <10 feet wide has been used for all intermittent NHD features.

[f] Open Cut = If the waterbody has no flow at time of construction, the crossing would be installed using the open-cut method. If the waterbody has perceivable flow at the time of construction, the waterbody would be crossed using either the guided bore crossing method or a dry crossing method (flume or dam-and-pump) based on site-specific conditions.

[g] Survey permission has not been granted in this area; information provided is based on NHD data.

[h] Overlaps with the Tioga-Elkhorn Creek pipeline.

[i] Waterbody consists of a man-made pond to address stormwater permitting requirements at the Tioga Compressor Station. The final location of this pond would likely change after final engineering of the compressor station is complete, and not be crossed.

[j] Waterbody consists of a man-made pond which would be avoided and fenced off during use of the yard.

[k] Existing culverted crossing waterbodies s-wm-ea-001p and s-wm-ea-002 would be crossed by both the Tioga-Elkhorn Creek Pipeline and Line Section 30 Loop at the same location.

table B-4 as National Hydrography Dataset (NHD); waterbody characteristics for these features are based on the NHD and/or recent aerial photography.

Sensitive Waterbodies

Section 303(d) of the Clean Water Act requires that each state review, establish, and revise water quality standards for the surface waters within the state. States develop monitoring and mitigation programs to ensure that water standards are attained and designated. Waters that fail to meet their designated beneficial use(s) are considered impaired and are listed under a state's 303(d) list of impaired waters. The Project crosses one waterbody, Lake Sakakawea, which is listed in North Dakota's 2018 Integrated Section 305(b) Water Quality Assessment Report and Section 303(d) List of Waters Needing Total Maximum Daily Loads for the presence of methylmercury.

The NDDEQ provided comments that WBI Energy should avoid 303(d) waters where it is possible. As discussed in section A.1.2, water quality is one of the congressionally authorized purposes of the USACE Garrison Project. Water quality in Lake Sakakawea must comply with the State of North Dakota's standards for a Class 1 lake. The USACE has a water quality monitoring program in place. The Garrison Project has identified silt control; soil erosion prevention; pollution abatement; adequate and safe municipal water supplies; improving quality of water for irrigation; provision of water suitable for domestic, sanitary, and industrial purpose; and improving clarity of water for recreation and for fish and wildlife as means of maintaining and improving water quality (USACE, 2007). WBI Energy would cross Lake Sakakawea and a small natural pond using the HDD crossing method. With implementation of this crossing method, and adherence to the mitigation measures in the FERC Plan and Procedures, SPCC Plan, and HDD Plan, impacts on sensitive waterbodies would be adequately minimized or avoided.

Surface Water Intakes and Surface Water Protection Areas

As discussed in section A.1.2, water supply is one of the congressionally authorized purposes of the USACE Garrison Project. In 2007, according to the USACE, the cities of Garrison, Parshall, Pick City, and Riverdale, along with three industrial water systems, were obtaining water from Lake Sakakawea or Garrison Dam's penstocks for industrial and municipal uses. Additionally, 19 communities and 186 homes near the lake had water supply intakes for withdrawing water from Lake Sakakawea (USACE, 2007). According to water permits on file with the NDSWC, there are no potable surface water intakes within 3 miles downstream of the pipeline routes. The nearest surface water intake is a rural water permit for the Paradise Point Association. This permit is approximately 2.8 miles upstream from the northern Lake Sakakawea HDD entry point (NDSWC, 2019).

The North Dakota Source Water Protection Program has three federally mandated program elements for public water systems including: (1) the delineation of a wellhead protection area or source water protection area based on existing hydrogeologic and geologic information; (2) a contaminant source inventory, which identifies the presence and location of sources or activities within the protection area that may contaminate groundwater or surface water; and (3) a susceptibility analysis that determines the susceptibility (ranking) of the public water systems wells or intakes to contamination by sources inventoried within the protection area (NDDEQ, 2019b). The NDDEQ provided comments that WBI Energy should avoid water source protection areas. Based on the review of the source water protection status list of North Dakota's public water systems, no surface water-dependent communities, non-transient non-communities, or transient non-community systems exist within the Project area (NDDEQ, 2019b). WBI Energy would not divert or appropriate water from surface waters (i.e. the Missouri River or Lake Sakakawea) during Project construction or operation. Therefore, we conclude the Project would not have any impacts on the reservoir water capacity.

Impacts and Mitigation

WBI Energy has routed the pipeline facilities to avoid and minimize the number of stream crossings to the extent practicable. Pipeline construction activities that potentially could affect water resources include clearing and grading, pipeline installation across waterbodies, HDD and guided bore crossings, hydrostatic testing, and potential spills or leaks of hazardous materials. Pipeline construction can affect surface waters in several ways, including modifying the existing aquatic habitat, increasing runoff and the rate of in-stream sediment loading, and increasing turbidity levels. The clearing and grading of the waterbody banks, in-stream trenching and backfilling, and trench dewatering associated with non-HDD/guided bore crossings would disturb the riparian vegetation and soils, exposing the site(s) to erosion. It could also introduce sediment directly or indirectly into the water column. WBI Energy proposes to use various waterbody crossing techniques including open-cut, guided bore, and HDD. The use of the dry would be used if site-specific conditions at the time of construction prevent the use of the open-cut method. While WBI Energy's proposed construction schedule would occur during the wet season in North Dakota, based on past project experience, WBI Energy anticipates that most intermittent and ephemeral streams crossed are not likely to be flowing at the time of construction. Other waterbodies with perceptible flow at the time of construction would be

crossed using either the guided bore crossing method or a dry open-cut crossing method (flume or dam-and-pump) based on site-specific conditions.

WBI Energy would avoid, minimize, or mitigate impacts on surface waters in accordance with the FERC Plan and Procedures. To minimize impacts, WBI Energy would implement measures to limit the effects of clearing and grading, in-stream trenching, trench dewatering, and backfilling operations on aquatic habitats. WBI Energy would implement the measures in its SPCC Plan to prevent a potential inadvertent release of contaminants into waterbodies due to spills. Additionally, construction activities at waterbody crossings would comply with other federal, state, and local regulations and permit requirements.

As shown in table B-4, WBI Energy proposes 8 open-cut and 12 HDD or guided bore waterbody crossings during Project construction. WBI Energy anticipates that most of the intermittent and ephemeral streams crossed by the Project would have no or low flows at the time of construction. This would avoid or minimize the potential for increased turbidity within waterbodies as well as potential impacts on fisheries. If at the time of construction there is flow present at waterbodies currently proposed to be crossed using the open-cut method, either a guided bore or dry crossing would be used. To minimize sedimentation during construction across flowing waterbodies, WBI Energy would place silt fences and/or straw bales around the spoil piles to prevent spoil from flowing into the waterbody.

Once the pipe is placed in the trench, the excavated spoil would be replaced in the trench, and the stream banks and streambed would be restored as close as practicable to their preconstruction contours. WBI Energy would implement additional measures, such as the installation of erosion control blankets, as necessary, to stabilize the banks of the waterbody. During final restoration, stream banks and riparian areas would be revegetated using appropriate seed mixes developed in consultation with the NRCS to further stabilize the banks.

Additional measures WBI Energy would implement to minimize the impacts of construction at stream crossings would include, but not be limited to, the following:

- locating workspace at least 50 feet from the waterbody (except as indicated in table A-5);
- storing chemicals and lubricating, washing, or refueling equipment in designated areas greater than 100 feet from the waterbody at stream crossings;
- mixing concrete at least 100 feet from a river, stream bank, or any area where contamination from concrete may reach a water course or wetland; and
- monitoring spoil pile placement and erosion control devices during construction across streams.

The Hartels provided comments about potential impacts on surface waters, with specific concerns regarding Cherry Creek. WBI Energy would use the guided bore method to install the pipeline beneath Cherry Creek. As described in section A.8.2, use of the guided bore method

would avoid direct impacts on the bed and banks of waterbodies; however, a temporary, localized increase in turbidity could occur in the event of an inadvertent release of drilling fluid. To minimize potential impacts of inadvertent releases of drilling fluids, WBI Energy would implement the measures identified in its HDD Plan. In the event of an inadvertent release of drilling fluid to surface waters, WBI Energy would contain the release to the extent practicable. Where feasible, underwater releases would be collected using pumps. If the amount of any drilling fluid release within a waterbody exceeds that which could be practically contained and collected, drilling operations would be suspended until the release is controlled. In the event that the guided bore cannot be completed, WBI Energy would implement a contingency plan for the crossing, such as abandoning the drill hole, drilling along a new path, or utilizing an alternate crossing method subject to agency review and any required permits or approvals. Given these measures, we conclude that impacts on Cherry Creek would be minimized to the extent practicable.

The NDDEQ provided comments that the crossing of Lake Sakakawea should be given extra attention. During the HDD crossing of Lake Sakakawea, the primary method for monitoring for a potential inadvertent release would be through the instrumentation in the drilling rig monitoring annulus mud pressure and flowrates. If these gauges indicate a loss of return, then either a drone would be used to view the water surface for turbidity or a small boat would be launched from a dedicated boat ramp to view surface conditions. Further, WBI Energy would inspect the HDD right-of-way for inadvertent returns at a minimum of twice per shift, and be documented in daily reports. No impacts on surface waters would occur from these monitoring activities. Additionally, no guide wires would be used during construction of the Lake Sakakawea HDD.

Dewatering of the pipeline trenches may require pumping of groundwater in areas where the water table is high. During construction, WBI Energy would discharge water removed from excavations by directing it to upland vegetated land surfaces (where available) to control erosion and runoff. If adequate vegetation is not present, water would be filtered through appropriate dewatering structures. The Hartels provided comments regarding trench dewatering off rights-of-way. WBI Energy would be required to obtain landowner approval to conduct this activity outside of the certificated right-of-way.

The Hartels provided comments on the need for a Stormwater Pollution Prevention Plan for the Project and that it should be the responsibility of FERC inspectors to enforce the requirements of the plan. Prior to construction, WBI Energy would obtain authorization under North Dakota's General Permit for Construction Stormwater Discharge for the Project under the National Pollutant Discharge Elimination System and prepare a Project Stormwater Pollution Prevention Plan as required. The NDDEQ, Division of Water Quality, would be responsible for enforcing any requirements of its permit. FERC staff would conduct periodic inspections of Project activities during construction and restoration of the Project to confirm compliance with all Commission orders and approvals. If any problem areas or non-compliances are identified, FERC would require WBI Energy to correct the problem area/non-compliance.

As shown in table A-5, WBI Energy is requesting a modification from section V.B.2.a of our Procedures to allow ATWS areas within 50 feet of waterbodies at site-specific locations. We have reviewed these requested modifications and find them acceptable.

With the implementation of the FERC Plan and Procedures and WBI Energy's proposed construction methods and SPCC Plan, and HDD Plan, we conclude that the Project's impacts on surface water resources would be temporary and not significant.

Construction and Operational Water Needs

Water use for the Project would primarily consist of hydrostatic testing of the pipe, dust control, HDD/guided bore drilling fluid, and operational water needs. Pursuant to USDOT regulations (49 CFR 192), WBI Energy would verify the integrity of the pipeline facilities by conducting hydrostatic testing prior to placing them into service, as described in section A.8.1. This testing would involve filling the pipelines with water, pressurizing it, and then checking for pressure losses due to pipeline leakage. WBI Energy anticipates testing the pipeline facilities in segments as shown in table B-5.

Table B-5

Estimated Construction Water Volume Requirements

Pipeline Hydrostatic Test Segment	Hydrostatic Testing (gallons)	HDD and Guided Bore Drilling Fluid (gallons)	Dust Suppression (gallons)	Water Source [a]
Tioga-Elkhorn Creek	3,042,000 [b]	2,000,000	4,800,000	Water depot
Line Section 25 Loop	627,000	151,000	475,000	Water depot
Line Section 30 Loop	388,000	57,000	260,000	Water depot
Tioga Compressor Lateral	50,400	8,500	0	Water depot
Lake Sakakawea HDD	663,000	1,000,000	0	Water depot
Uprate Line Section 25	141,000	25,000	16,000	Water depot
Subtotal	**4,911,400**	**3,233,000**	**5,559,500**	
TOTAL	**13,703,900**			

[a] If WBI Energy determines that it is necessary to obtain water from surface water sources for hydrostatic testing, it would obtain any required permits or approvals in accordance with state regulations and FERC requirements.

[b] The Tioga-Elkhorn Creek pipeline is anticipated to be tested in a minimum of three sections.

As shown in table B-5, WBI Energy would obtain approximately 13.7 million gallons of water from local water depots in accordance with state regulations for a combination of hydrostatic testing of the pipelines, HDD and guided bore drilling fluid, and dust control. Although not proposed at this time, if WBI Energy determines it would be necessary to pipe water to the right-of-way in lieu of transporting it via truck, it would provide site-specific information and any associated impacts in a supplemental filing to FERC. Of these 13.7 million gallons, about 4.9 million would be required for hydrostatic testing. Depending on the source of

water, WBI Energy may use dechlorination tablets to treat water prior to testing. After successfully testing each segment or section, the pipeline would be dewatered or the test water would be cascaded into the next section of the pipeline. To minimize water withdrawals, WBI Energy anticipates cascading water between test segments and sections, where feasible, to reuse as much water from prior test segments as possible. WBI Energy would dewater the hydrostatic test water into a well-vegetated upland area with appropriate erosion control devices in accordance with the FERC Plan and Procedures and applicable permits. WBI Energy proposes to use diffusers, sediment control devices, and other energy dissipating devices to minimize the potential erosion from discharges that occur in upland areas.

Estimates provided in table B-5 for dust suppression assume that WBI Energy would only use water in areas where stringing, welding, coating, ditching, and backfilling are taking place. The following additional assumptions are included in the estimated volumes.

- Elkhorn Creek-Tioga pipeline—Two construction spreads working concurrently during construction. WBI Energy would use water to spray only the working side of the right-of-way (70 feet). The spoil dirt side of the right-of-way would not be sprayed. Assumes 70 days of construction would require dust suppression.

- Line Section 25 Loop—One construction spread. WBI Energy would use water to spray only the working side of the right-of-way (50 feet). The spoil dirt side of the right-of-way would not be sprayed. Assumes 45 days of construction would require dust suppression.

- Line Section 30 Loop—One construction spread. WBI Energy would use water to spray only the working side of the right-of-way (50 feet). The spoil dirt side of the right-of-way would not be sprayed. Assumes 25 days of construction would require dust suppression.

- Uprate Line Section 25—One construction spread. Assumes 10 days of construction would require dust suppression.

Project operational water needs would be limited to the Tioga Compressor Station and Elkhorn Creek Compressor Station. The source of water at the Tioga Compressor Station is a commercial service provided by R&T Water Supply Commerce Authority. Average water usage during 2019 was approximately 150 gallons/month. During operation of the Project, this average is expected to increase to 450 gallons/month under normal operations given the additional staff, buildings, and equipment to maintain. The new Elkhorn Creek Compressor Station would receive water from the McKenzie County Rural Water District. The water usage under normal operations is expected to be 150 gallons/month. Given the measures discussed above, we conclude that impacts from water use for Project construction would be mostly temporary and not significant.

Irrigation

As discussed in section A.1.2, irrigation is one of the congressionally authorized purposes of the USACE Garrison Project. The USACE authorized the Garrison Diversion Unit in 1965

with the purpose of diverting Missouri River water to central and eastern North Dakota for irrigation, water supply (industrial and municipal), fish and wildlife conservation, flood control, and recreation. Over 30 agricultural irrigation water systems have intakes for withdrawing water from Lake Sakakawea (USACE, 2007).

Project construction and operation would not divert or appropriate water from the Missouri River; therefore, the Project would not affect the lake water volumes. Based on field surveys and discussions with landowners, the Project would not cross or affect any irrigation systems or directly affect any water diversions. Should any systems be affected during construction, WBI Energy states that it would restore/repair any damaged systems in accordance with the FERC Plan. Therefore, we conclude the Project would not impact irrigation in the Project area.

2.3 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing wildlife habitat, recreational opportunities, and flood control, and naturally improving water quality.

Existing Wetland Resources

WBI conducted field surveys during the 2019 and 2020 field seasons where landowner access was granted to identify and delineate wetlands within the proposed Project work areas. The surveys examined about 99.5 percent of the proposed pipeline routes, as well as the proposed aboveground facilities, access roads, and yards. Approximately 0.5 mile (less than one percent) of the pipeline routes and some additional access roads and yards were not examined due to lack of survey permission from landowners or as a result of route variations identified after the conclusion of the 2019 and 2020 field seasons. Review of National Wetland Inventory (NWI) data in areas where no survey permission has been granted indicated that no additional wetlands are present in these areas. WBI Energy would confirm this information using field surveys prior to construction. Based on the field surveys and NWI data, the Project would affect 43 wetlands (one that would be crossed twice), encompassing a total of 5.1 acres. In total, approximately 2,958 linear feet of wetlands would be crossed by the pipeline centerlines. The wetland classifications, milepost locations, crossing lengths, and acreage of wetland that would be affected by construction and operation of the Project are provided in appendix G.

All wetlands that would be crossed by the pipeline are classified as palustrine emergent wetlands. Cowardin et al. (1979) describes palustrine emergent wetlands by erect, rooted, herbaceous hydrophytes not including mosses and lichens. Dominant vegetation in the emergent wetlands in the Project area includes *Bromus* spp., *Brassica* spp., *Alopercurus* spp., *Carex* spp., *Juncus* spp., and *Rumex* spp. Other hydrophytic vegetation such as water smartweed, narrowloaf cattail, alkali plantain, common threesquare, spike-rush, green bulrush, stinging nettle, foxtail barley, marsh arrowgrass, three-way sedge, and marsh skullcap were also observed during field surveys.

USFWS Wetland Easements

Several private parcels in the vicinity of the proposed pipeline routes are subject to wetland easements obtained by the USFWS under regulations described at 16 USC 668dd(c). The easements define permanent agreements between the USFWS and all present and future landowners to protect wetland basins within the easements in perpetuity. WBI Energy coordinated with the USFWS and incorporated several route variations into the proposed route to avoid or minimize crossings of wetland easements.

The USFWS interests in wetland easements are limited to individual wetland basins as opposed to the entire area within the easements. Ground-disturbing activities which affect protected wetland basins within easements are prohibited without prior approval of the USFWS. Such activities are subject to review by USFWS staff to determine if they are appropriate and compatible with the objectives of the easement program and require a special use permit/right-of-way grant if they are found to be compatible. Ground-disturbing activities that do not affect protected wetland basins within easements are not subject to review by the USFWS.

The USFWS provided WBI Energy with maps depicting locations of protected wetland basins within the wetland easements crossed by the proposed pipeline. WBI Energy would make route adjustments to avoid all of the wetland basins within the USFWS easements or to cross those basins by guided bore. As shown in table B-6, the proposed pipeline would cross wetland easements at seven locations and two protected basins within those easements. One of the two basins is currently proposed to be crossed by guided bore and WBI Energy is currently working with the USFWS to avoid the other basin. If any route changes were to occur that would affect wetland basins within USFWS easements, WBI Energy would submit a request with the USFWS for compatibility determinations for these crossings.

Impacts and Mitigation

WBI Energy developed the proposed route with the intention of avoiding wetlands where possible. WBI Energy would construct wetland crossings in accordance with the FERC Procedures. Construction within wetlands would mostly be limited to a 75-foot-wide corridor.

As shown in table A-5, WBI Energy is requesting a modification from section VI.B.a of our Procedures to allow ATWS within 50 feet of wetlands at site-specific locations. We have reviewed these requested modifications and find them acceptable, with the exception of an ATWS at MP16.2 of the Line Section 25 Loop. The ATWS was proposed to facilitate a guided bore crossing of 99th Avenue NW; however, WBI Energy later clarified in a December 4, 2020 filing that there was no justification to locate the ATWS within 50 feet of the wetland. To ensure that WBI Energy adjusts the workspace appropriately, **we recommend that**:

- **<u>Prior to construction</u>, WBI Energy should modify the workspace configuration of ATWS at MP 16.2 of the Line Section 25 Loop to maintain at least a 50-foot offset from adjacent wetlands, and file updated maps/figures with the Secretary depicting this change, for review and written approval by the Director of OEP, or the Director's designee.**

Table B-6

U.S. Fish and Wildlife Service Wetland Easements Crossed by the Pipeline Routes

Pipeline Facility/Approximate Starting and Ending Mileposts	Length of Easement Crossing (miles)	Number of Protected Basins Within the Crossing
Line Section 25 Loop		
0.6 to 1.6	1.0	2
5.2 to 5.8	0.6	0
18.8 to 20.4	1.5	0
Line Section 30 Loop		
0.5 to 1.0	0.5	0
Uprate Line Section 25		
NA (Bore 1)	<0.1	0
NA (Bore 2)	<0.1	0
NA (Bore 4)	<0.1	0
Total	**3.6**	**0**

WBI Energy would implement measures outlined in our Plan and Procedures to mitigate impacts from these modifications to the extent practicable. To minimize impacts on these wetland resources that would not be directly affected by the Project, but would be in close proximity to construction activities, WBI Energy would install a double row of silt fence to prevent sedimentation into adjacent wetlands and would not conduct refueling operations within 100 feet of these wetlands.

WBI Energy would stabilize the working side of the construction right-of-way with timber mats or travel pads, as necessary, to provide a firm surface for construction equipment. Where the pipeline trench may drain a wetland, WBI Energy would place trench plugs in the trench to maintain the original wetland hydrology. Exposed soil in wetland areas would be restored in accordance with the FERC Procedures, as well.

WBI Energy would install silt fence, straw bales, or other appropriate sedimentation control devices at the edges of the construction right-of-way in areas where spoil may flow into undisturbed areas of wetland to prevent sediment migration. Topsoil over the trenchline would be segregated and stockpiled separately from subsoil (except in areas of standing water or saturated soils). The trench would be backfilled with subsoil and the topsoil would be replaced in accordance with the FERC Procedures. Contours in wetlands would be restored as near as practicable to preconstruction conditions.

WBI Energy would implement restoration, monitoring, and maintenance programs for wetlands along the pipeline as described in the FERC Procedures. Wetlands would be stabilized temporarily with a cover species, such as annual ryegrass if appropriate based on weather conditions, and allowed to revegetate naturally with the original seed stock contained in the conserved topsoil. Following restoration, WBI Energy would monitor disturbed areas for at least three years and continue monitoring until revegetation is successful. At the end of three years, WBI Energy would file a restoration report with the Commission documenting the success of wetland restoration and committing to a plan (in consultation with a professional wetland

ecologist) to restore any wetlands not restored at that time. Project construction and operation would not permanently convert any wetlands to uplands.

To facilitate periodic pipeline corrosion/leak surveys, a corridor up to 10 feet in width centered on the pipeline would be maintained in an herbaceous state. In addition, WBI Energy would selectively cut and remove trees within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline from the permanent right-of-way. Vegetation maintenance activities during pipeline operation would affect less than 1 acre of palustrine emergent wetlands.

As discussed above, the Project would have only temporary impacts and would not result in any permanent impacts on wetlands. The primary effect of Project construction and operation activities on wetlands would be alteration of wetland vegetation. In emergent wetlands, the impact of construction on vegetation is anticipated to be relatively short term and minor, because the herbaceous vegetation is expected to regenerate within 2 to 3 growing seasons.

The implementation of mitigation measures outlined in the FERC Plan and Procedures would minimize wetland impacts and help ensure the successful restoration of wetland areas. We conclude that short-term wetland impacts would be minimized by WBI's implementation of its mitigation measures and, therefore, impacts on wetlands would not be significant.

In addition, the state and USACE may require additional mitigation measures to further limit impacts on wetlands caused by construction of the Project. Further, WBI Energy, through its consultation with the USFWS may avoid an additional wetland basin through project routing.

3. Vegetation, Fisheries, and Wildlife

3.1 Vegetation

Characteristics of the Project regions include numerous wetlands, particularly on the eastern edge, decreasing toward the Missouri River and irregular topography. Project construction and operation would affect three general vegetation cover types: open land (non-native grassland), open land (native grassland), and forested land. Forested land is limited in North Dakota and is primarily found in riparian zones, which are areas between waterbodies and adjacent upland (NDGFD, 2016a). Forest land, which includes hedgerows, forested wetlands, and upland tree stands, comprises less than 1 percent of the Project area. Developed land, which supports only limited vegetation such as grasses or other maintained cover, is discussed further in section B.5.1. Our discussion of specific wetland types and impacts is found in section B.2.3. Table B-7 summarizes Project-related impacts on vegetation cover types in the Project area.

Non-native grassland in the Project area appears to have been tilled in the past, but is currently used for grazing, wildlife habitat, or hay production. Typical species in the Project area include planted non-native grasses, such as smooth brome and Kentucky bluegrass, as well as clovers such as alfalfa. Non-native forbs, like Canada thistle and bindweed, also are common throughout the area.

Table B-7

Vegetation Types Affected by Construction and Operation of the Project (acres)[a]

	Open Land (Non-Native Grassland) [b]		Open Land (Native Grassland) [c]		Forested Land [d]		Total	
Facility	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Pipeline Facilities								
Tioga-Elkhorn Creek	157.9	84.8	61.1	33.4	1.1	0.6	**220.1**	**118.8**
Elkhorn Creek-Northern Border Lateral	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Line Section 25 Loop	54.1	36.8	4.7	3.0	0.0	0.0	**58.8**	**39.8**
Line Section 30 Loop	12.4	8.3	0.0	0.0	0.0	0.0	**12.4**	**8.3**
Tioga Compressor Lateral	1.6	1.2	0.0	0.0	0.0	0.0	**1.6**	**1.2**
Uprate Line Section 25	2.4	2.0	0.0	0.0	0.0	0.0	**2.4**	**2.0**
Subtotal	**228.5**	**133.0**	**65.8**	**36.4**	**1.1**	**0.6**	**295.4**	**170.0**
ATWS								
Tioga-Elkhorn Creek	16.2	0.0	6.2	0.0	0.0	0.0	**22.4**	**0.0**
Line Section 25 Loop	8.6	0.0	0.3	0.0	0.0	0.0	**8.9**	**0.0**
Line Section 30 Loop	1.0	0.0	0.0	0.0	0.0	0.0	**1.0**	**0.0**
Tioga Compressor Lateral	0.4	0.0	0.0	0.0	0.0	0.0	**0.4**	**0.0**
Uprate Line Section 25	7.4	0.0	0.0	0.0	0.0	0.0	**7.4**	**0.0**
Subtotal	**33.5**	**0.0**	**6.5**	0.0	**0.0**	**0.0**	**40.0**	**0.0**
Staging Areas								
Boehm Staging Yard	5.9	0.0	0.0	0.0	0.0	0.0	**5.9**	**0.0**
Weflen Staging Yard	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
68th Street Yard	5.6	0.0	0.0	0.0	0.0	0.0	**5.6**	**0.0**
CRS Yard	13.0	0.0	0.0	0.0	0.0	0.0	**13.0**	**0.0**
Delta Contractors Yard	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Enget Yard	39.3	0.0	0.0	0.0	0.0	0.0	**39.3**	**0.0**
Flatlands Yard 1	0.4	0.0	0.0	0.0	0.0	0.0	**0.4**	**0.0**
Flatlands Yard 2	1.1	0.0	0.0	0.0	0.0	0.0	**1.1**	**0.0**
Lobell Yard	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Schmidt Yard	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Franz Yard	19.9	0.0	0.0	0.0	0.0	0.0	19.9	0.0
Aux Sable Yard	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Subtotal	**87.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**87.5**	**0.0**
Access Roads								
Access Roads	14.6	1.2	0.2	0.0	0.0	0.0	**14.8**	**0.0**
Subtotal	**14.6**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**	**14.8**	**0.0**
Aboveground Facilities								
Elkhorn Creek Compressor Station (new)	2.2	2.2	0.0	0.0	0.0	0.0	**2.2**	**2.2**
Tioga Compressor Station (existing)	7.5	4.4	0.0	0.0	0.0	0.0	**7.5**	**4.4**
Springbrook Plant Receipt Station (existing)	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**

Table B-7

Vegetation Types Affected by Construction and Operation of the Project (acres)[a]

Facility	Open Land (Non-Native Grassland)[b]		Open Land (Native Grassland)[c]		Forested Land[d]		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Northern Border Interconnect (new)	3.0	2.5	0.0	0.0	0.0	0.0	**3.0**	**2.5**
Norse Plant Receipt Station (existing)	0.3	0.3	0.0	0.0	0.0	0.0	**0. 3**	**0.3**
Norse Transfer Station (new)	1.2	0.3	0.0	0.0	0.0	0.0	**1.2**	**0.3**
Tioga Plant Receipt Station (existing)	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Robinson Lake Plant Receipt Station (existing)	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Block valves (new)	1.1	1.1	0.0	0.0	0.0	0.0	1.1	1.1
Subtotal	**15.5**	**10.9**	**0.0**	**0.0**	**0.0**	**0.0**	**15.5**	**10.9**
Project Total	**379.5**	**145.2**	**72.4**	**36.4**	**1.1**	**0.6**	**453.0**	**115.8**

[a] The subtotals and totals in this table may not reflect the sum of the addends due to rounding. Totals do not account for agricultural lands which are discussed further in table B-13.

[b] Includes herbaceous land, scrub/shrub, and non-forested wetlands.

[c] Includes surveyed segments of native grassland.

[d] Includes deciduous and mixed forestland (hedgerows, upland wooded areas, and deciduous forests).

Native prairie is generally divided into three categories including tallgrass, mixed-grass, and shortgrass communities. Each of these categories is comprised of a blend of grasses and forbs (NDGFD, 2016a). Tallgrass prairie is predominantly found outside of the Project area. The Project area would primarily overlap mixed-grass and shortgrass communities. Mixed-grass prairie includes a combination of tallgrass and shortgrass species and is dominated by warm and cool season grasses and sedges. Common grasses include prairie junegrass, western wheatgrass, green needlegrass, needle and thread, blue grama, little bluestem, and needleleaf sedge. Mixed-grass prairie also includes a variety of forbs such as pasque flower, prairie smoke, Missouri milkvetch, and purple prairie clover (USFS, 2019a; NDGFD, 2016a). Shortgrass prairie is primarily found in the higher elevations within the Missouri Slope region. Dominant species in shortgrass prairie include warm season grasses such as spikemoss, blue grama, needleleaf sedge, and buffalograss. A variety of forb species are often found in North Dakota shortgrass prairie and include purple locoweed, white wild onion, prickly pea, and white beardtongue (USFS, 2019a; NDGFD, 2016a).

WBI Energy documented locations of native prairie in the Project area as part of its environmental field survey. Native prairie was distinguished from other grasslands based on the species diversity and the absence of agricultural activity indicators (e.g., tillage patterns in soil, rock piles along margins of fields).

Forest land in the Project area predominantly consists of small stands of deciduous trees, primarily in wooded riparian areas and along the edges of wetlands, and hedgerows along roads and fields. Trees common in these areas include green ash and eastern cottonwood.

Vegetation Communities of Special Concern or Value

The proposed Project would cross about 2.1 miles of the LMNG. In conjunction with Dakota skipper (DASK) habitat mapping, WBI Energy conducted sensitive plant surveys along the 2.1 miles where the Project would cross USFS-managed lands within the LMNG. Prior to surveys, biologists reviewed the most recent *Biological Survey and Report Guidelines – Little Missouri National Grassland* (USFS, 2019b) and associated GIS data with known DASK locations and sensitive plant species.

In addition to surveying for sensitive plant species, biologists also surveyed for any occurrence of USFS watch list plant species. The survey area included mixed-grass and shortgrass prairie communities, including the LMNG area crossed by the Project. Suitable habitat for five USFS sensitive plant species was observed during the survey of the LMNG area crossed by the Project. These include Easter daisy, Hooker's Townsend daisy, lanceleaf cottonwood, sand lily, and Missouri foxtail cactus. One USFS sensitive species, Hooker's Townsend daisy, was observed during the survey.

Mixed grass prairie includes a combination of tallgrass and shortgrass species and is dominated by warm and cool season grasses and sedges. Common grasses include prairie junegrass, western wheatgrass, green needlegrass, needle and thread, blue grama, little bluestem, and needleleaf sedge. Mixed- grass prairie also includes a variety of forbs such as pasque flower prairie smoke, Missouri milkvetch, and purple prairie clover.

Shortgrass prairieis primarily found in the higher elevations within the Missouri Slope region. Dominant species in shortgrass prairie include warm season grasses such as spikemoss, blue grama, needleleaf sedge, and buffalograss. A variety of forb species are often found in North Dakota shortgrass prairie and may include purple locoweed, white wild onion, prickly pear, and white beardtongue.

Noxious Weeds

Noxious weeds include non-native, undesirable native, or introduced species that are able to exclude and/or out-compete desired native vegetation, thereby decreasing overall species diversity. The North Dakota Department of Agriculture maintains a statewide list of noxious weeds. Counties have the option to add weeds to a list for enforcement in their jurisdictions. McKenzie, Williams, Burke, and Mountrail Counties list 19 noxious weed species potentially occurring in the Project area including: absinth wormwood; baby's breath; black henbane; common tansy; common burdock; Canada thistle*;* calmatian toadflax; ciffuse knapweed; halogeton; houndstongue; leafy spurge; musk thistle; narrowleaf hawksbeard; Palmer amaranth; purple loosestrife; Russian knapweed; saltcedar; spotted knapweed; and yellow toadflax.

As a result of WBI Energy's field surveys along a majority of the proposed pipeline route between June and October 2019, 18 locations of noxious weeds, including five noxious weed

species (absinth wormwood, Canada thistle, leafy spurge, Russian knapweed, and purple loosestrife), were identified.

Impacts and Mitigation

The primary impact of the Project on vegetation would result from clearing and grading of the construction right-of-way. The amount of time it would take for vegetation in disturbed areas to recover would vary by vegetation type. Impacts on non-native grassland would be short-term because herbaceous vegetation in these areas would regenerate relatively quickly once the right-of-way has been restored. Impacts from construction (53.9 acres) on native prairie including LMNG lands would take additional time to restore the species diversity in these areas; therefore, impacts on disturbed native prairie (including areas within temporary workspaces and within the permanent right-of-way) would be considered long-term. Native grasslands areas may take longer to restore (approximately 3 to 5 years) and forested areas can take between 5 to 10 years. As shown in table B-7, native grassland accounts for 53.9 acres and forested land 2.1 acres. However, some native prairie species would recolonize the disturbed area quickly (within one or two growing seasons). About 28.9 acres of native prairie would be maintained for pipeline rights-of-way; however, no aboveground facilities are proposed within this vegetation type. Further, routine vegetation maintenance is expected to be minimal for native prairie given the low growing vegetation which allows for less clearing for inspections.

Construction of the Project would disturb approximately 1.1 acres of forest land. The Project would result in the long-term conversion of forested land to earlier successional stages in temporary work areas (a total of approximately 1.1 acre) and the permanent conversion of forest land to scrub/shrub and/or non-woody herbaceous species in the permanent pipeline easement (0.6 acres).

The Hartels commented that all pastureland should be seeded with a native seed mix that is recommended by the local NRCS office. The Hartels also expressed concern about Project areas being successfully restored and revegetated following construction. In general, the revegetation rate along the pipeline right-of-way would depend on several factors, including rainfall, soil type, land use, existing vegetation, reseeding, and vegetation maintenance practices. Following construction, WBI Energy would revegetate disturbed non-agricultural upland areas within the right-of-way and ATWS areas with seed mixes recommended by the NRCS, landowners/land managing agencies, or other appropriate agencies. Wetlands would be allowed to revegetate naturally in accordance with the FERC Procedures. Following restoration, WBI Energy would monitor revegetation success within all disturbed areas in accordance with the FERC Plan and Procedures and continue revegetation efforts until revegetation is successful. Per the FERC Plan, revegetation would be considered successful if the density and cover of non-invasive vegetation were similar to adjacent undisturbed land. FERC also would verify that disturbed areas are restored to original contours with successful revegetation during its restoration inspections. WBI Energy would maintain the permanent right-of-way in low-growing herbaceous vegetation.

The USFWS and NDGFD expressed concern about impacts on native prairie (grasslands), which provides habitat for migratory birds (see also section B.3.3 below). WBI Energy would implement the measures in the FERC Plan and Procedures to minimize impacts on

these areas. Native prairie areas would be reseeded in accordance with agency recommendations for seed mixes, rates, techniques, and dates. The seed mixes would take into account growth patterns, forage characteristics, and wildlife values, and would include a diverse mixture of cool and warm season grasses and forbs. As stated above, impacts on native prairie would be long term.

The Hartels provided comments about the spread of noxious weeds as a result of construction of the Project. Specifically, the Hartels requested that WBI Energy pressure wash all equipment before leaving infested lands and entering onto lands where noxious weeds have not been introduced. WBI Energy would implement measures identified in its Noxious Weed Management Plan to control the spread of weeds, including cleaning all equipment prior to an area infested with noxious weeds with an air compressor. The measures contained in the Noxious Weed Management Plan are designed to identify areas supporting noxious weeds prior to construction; prevent the introduction and spread of weeds from construction equipment moving along the right-of-way; contain weed seeds and propagules by preventing segregated topsoil containing weed species from being spread to adjacent areas or along the construction right-of-way; and address weed infestations that develop during operation of the Project. Further, seeding with approved seed mixes immediately following restoration of grade and contours would displace potential weed species from invading the construction work areas. We have reviewed WBI Energy's Noxious Weed Management Plan and believe it addresses the Hartels concerns and would minimize the spread of noxious weeds.

Based on the types and amounts of vegetation affected by the Project and WBI Energy's proposed avoidance, minimization, and mitigation measures to limit Project impacts, we conclude that impacts on vegetation from the Project would be mostly short-term to long-term, but not significant.

3.2 Fisheries

Fisheries occur in surface waterbodies that provide habitat for fish and other aquatic species North Dakota has established water quality classification systems for streams and lakes/reservoirs that provide information on the quality of fisheries. Based on these systems, the proposed Project would have 1 Class I stream (Lake Sakakawea), 22 crossings of Class III streams, and 3 Class 4 open water ponds within the Project area (NDDEQ, 2019c). The Project would not cross any Category 3 waterbodies designated as Outstanding State Resource Waters.

All of the waterbodies that would be crossed by the Project with the exception of Lake Sakakawea are considered warmwater fisheries. Representative fish species in the area include bass, crappie, blue gill, goldeye, sunfish, and white sucker. Smaller streams may also support species including darters and minnows. Fish typical of Lake Sakakawea include walleye, yellow perch, northern pike, bullhead, and burbot.

Fisheries of Special Concern

Fisheries of special concern may include waterbodies such as those that contain fisheries of exceptional recreational value, support commercial fishing, or provide habitat for fish species listed for protection at the federal, state, or local level. One federally listed endangered fish species, the pallid sturgeon, occurs in waters within McKenzie County, but only in the Missouri

and Yellowstone Rivers (NDGFD, 2015). This species is discussed in more detail in section B.4.1.

The USFS lists the northern redbelly dace as a sensitive wildlife species for the LMNG (USFS, 2019b). This is an uncommon species in North Dakota where suitable habitat including cold, clear headwater streams are found. Currently, the proposed Project area would overlap with the secondary range for the northern redbelly dace (NDGFD, 2016b). Northern redbelly dace populations have historically been found within the Missouri River drainage and northeastern and east-central counties of North Dakota. Potential effects on this species and fisheries are discussed below.

The Project would cross Lake Sakakawea which is an actively stocked lake and supports recreational fishing and is classified as a Fishery of Special Concern. According to the 2018 fish stocking report, Chinook salmon, paddlefish, and walleye were all stocked in the lake (NDGFD, 2018). As discussed in section B.2.2, Lake Sakakawea would be crossed using the HDD crossing method and no impacts on fisheries are anticipated from this crossing.

Impacts and Mitigation

The proposed pipeline segments would cross a total of 22 surface waterbodies. Construction methods at waterbody crossings are discussed in section A.7.2. Construction impacts on fisheries resources may include:

- temporary increases in sedimentation or turbidity immediately downstream of construction activities;
- alteration or removal of aquatic habitat cover;
- introduction of pollutants through potentially contaminated bottom sediments or spills of fuels or lubricants; and
- impingement or entrainment of fish and other biota associated with the use of water pumps used for dam-and-pump waterbody crossings or potential surface water withdrawals.

As discussed in section A.1.2, fish and wildlife is one of the congressionally authorized purposes of the USACE Garrison Project. WBI Energy proposes to use the HDD method to cross Lake Sakakawea and a natural pond, and the guided bore method to cross Beaver Creek, Tobacco Garden Creek, Northfork Creek, Cherry Creek, and White Earth Creek. These methods would reduce or eliminate potential impacts on fisheries in these waterbodies because it would not require disturbance of the streambeds or banks. While HDDs and guided bores generally minimize impacts on aquatic resources, an inadvertent release of drilling fluids to a waterbody would cause increased turbidity and sedimentation that could adversely affect fish in the vicinity of the release. This increase in turbidity and sedimentation could reduce dissolved oxygen levels in the water column. Increased turbidity could also reduce the ability for aquatic species to find food sources or avoid prey as well as cause physiological effects in fish, such as gill clogging. WBI Energy would implement the measures in its HDD Plan to prevent, detect, contain, and clean up any drilling fluid releases.

The remainder of waterbodies would be crossed using open-cut construction methods if no flow is present during construction. While WBI Energy's proposed construction schedule would occur during the wet season in North Dakota, based on past project experience, WBI Energy anticipates that most intermittent and ephemeral streams are not likely to be flowing at the time of construction. Other waterbodies with perceptible flow at the time of construction would be crossed using either the guided bore crossing method or a dry open-cut crossing method (flume or dam-and-pump) based on site-specific conditions.

Fisheries could be affected by spills or leaks of fuels, oils, lubricants, or coolant during construction of the Project; however, WBI Energy would avoid or mitigate these impacts by implementing the measures identified in its SPCC Plan. This plan describes procedures for refueling, storage, handling, containment, and cleanup of fuels, oils, and other hazardous fluids, including restricting refueling and storage of hazardous substances within 100 feet of waterbodies.

WBI Energy would implement the measures in the FERC Plan and Procedures to minimize the potential for erosion and sedimentation during waterbody crossings and to restore these areas to preconstruction conditions. If in-water construction is required, in accordance with the FERC Procedures, WBI Energy would adhere to the approprate timing windows for in-water work.

Impacts on aquatic resources from construction and operation of the Project woud be temporary and WBI Energy would limit impacts on aquatic species by implementing its proposed construction methods and mitigation measures. With the implementation of measures identified in the FERC Procedures, the SPCC Plan, and HDD Plan, the Project's impacts on fisheries would be temporary to short-term (as revegetation progresses) and not significant.

3.3 Wildlife

The suitability of an area as habitat for wildlife is closely related to the vegetation of that particular area. The Project would cross three major vegetation classes comprising many distinct cover types as well as small amounts of developed land and some open water. The vegetation classes and their associated habitats include: agricultural land (cultivated crops, hayfields, and pastureland), open land (short- and mixed-grass prairie, shrubland, and non-forested wetlands), and forest land (hedgerows, isolated upland tree stands, and deciduous forests). Developed land includes roads, railroads, utility corridors, and light industrial areas. Agricultural land, open land, and developed land comprise over 99 percent of the Project area. Table B-8 provides a list of the common wildlife species present in each of these cover types within the Project area.

Cultivated cropland in the Project area supports relatively low wildlife diversity, but may provide a food source for opportunistic species. Most of the non-agricultural land in the Project area is open land. Emergent wetlands contained within open land may provide feeding and resting areas for migrating waterfowl. Prairie wetlands also provide breeding habitat for reptile and amphibian species such as the western painted turtle and northern leopard frog and provide year-round habitat for muskrats and American mink.

Table B-8

Common Wildlife Species in the Project Area

Vegetation Cover Type	Common Wildlife Species
Agricultural Land	Coyote, mule deer, pronghorn, raccoon, striped skunk, white-tailed deer, white-tailed jackrabbit, Canada goose, greater white-fronted goose, gray partridge, magpie, mallard, mourning dove, northern harrier, northern shoveler, prairie falcon, red-tailed hawk, ring-necked pheasant, sandhill crane, snow goose, boreal chorus frog, plains spadefoot toad
Open Land or Grasslands	American badger, American beaver, American mink, common muskrat, coyote, deer mouse, eastern cottontail, eastern fox squirrel, elk, long-tailed weasel, meadow vole, mule deer, pronghorn, raccoon, red fox, striped skunk, white-footed mouse, white-tailed deer, white-tailed jackrabbit, American wigeon, blue-winged teal, Canada goose, clay-colored sparrow, gadwall, greater white-fronted goose, gray partridge, least flycatcher, magpie, mallard, mourning dove, northern harrier, northern shoveler, prairie falcon, red-eyed vireo, redhead, red-tailed hawk, ring-necked pheasant, sandhill crane, sedge wren, snow goose, western kingbird, yellow warbler, boreal chorus frog, bullsnake, common gartersnake, eastern yellow-bellied racer, great plains toad, northern leopard frog, plains gartersnake, plains spadefoot toad, prairie rattlesnake, sharp-tailed grouse, short-tailed lizard, tiger salamander, western painted turtle, Woodhouse's toad
Developed Land	Coyote, eastern fox squirrel, raccoon, white-tailed deer, mourning dove, boreal chorus frog, Woodhouse's toad

Developed land generally provides poor habitat for wildlife. Many species found in developed areas are considered opportunistic species that inhabit a number of the other habitat types found along the Project. These species have adapted to developed areas. In addition to fish, several mammal species, waterfowl, and a variety of amphibians and reptiles use open water habitat. Some mammal and bird species are dependent on aquatic habitats for food and cover, while other species, such as the raccoon, are less restricted, but prefer to be close to water.

Forested land, which includes primarily small stands of deciduous trees in riparian areas or along wetland edges and hedgerows along roads or fields, comprises less than 1 percent of the Project area that would be affected by construction. Trees may provide nesting or roosting sites for a variety of birds and mammal species as well as foraging opportunities for birds. Secondary canopy shrubs and saplings, brush piles, and fallen logs provide cover for several small- to medium-sized mammals.

Sensitive Wildlife Habitats

The Project would cross about 46.6 acres of USFWS conservation easements or management areas, including wetland easements and Waterfowl Production Areas (WPA) (USFWS, 2019a). WPAs provide habitat for a variety of waterfowl, shorebirds, grassland birds, plants, insects, and wildlife. These WPAs are acquired as public lands or protected through easements within the USFWS National Wildlife Refuge System (USFWS, 2012). WPAs are primarily within the prairie wetlands or potholes of the Dakotas, Minnesota, and Montana. WBI Energy is continuing to consult with the USFWS regarding these easements and working to adjust the route and workspaces as needed to minimize or avoid impacts where feasible. However, the FERC Plan allows for minor route alignment per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas and that these shifts would likely be a reduction in impact of wetlands and/or WPAs.

Impacts and Mitigation

The Hartels provided comments about the Project's potential impacts on wildlife. Construction and operation of the Project would result in short- and long-term impacts on wildlife. The extent and duration of impacts on wildlife would vary depending on the species present in each affected habitat type and their individual life histories. Mobile species may be disturbed temporarily or displaced from portions of their habitats, and mortality of individuals of less mobile species, such as some small mammals, reptiles, or amphibians, may occur. Because the Project would not permanently alter the characteristics of the majority of the available wildlife habitats, most Project-related impacts on wildlife are anticipated to be short-term. During construction, most wildlife in the area would move to other, nearby locations with suitable habitat. Wooded habitats, which comprise less than 1 percent of the Project area, would be affected to a greater extent than other habitat types due to the long-term (0.9 acre) conversion of wooded areas to earlier successional stages in the temporary right-of-way, and the permanent (1.1 acre) conversion to scrub/shrub and/or non-woody herbaceous species in the permanent, maintained easement. Construction and operation of the proposed aboveground facilities would result in minimal impacts on wildlife because they are on predominantly agricultural (cultivated) lands that tend to support a lower diversity of species and are accustomed to routine disturbance.

As discussed in section A.1.2, conservation and management of fish and wildlife is one of the congressionally authorized purposes of the USACE Garrison Project. All lands associated with the Garrison Project are managed to benefit and enhance wildlife species. The Lake Audubon and Lake Sakakawea General Plans identify 51,000 acres at Lake Sakakawea to be used primarily for the conservation and management of wildlife. WBI Energy would cross all Garrison Project lands within the span of the proposed HDD crossing of Lake Sakakawea. Short-term impacts on wildlife could include temporary displacement due to construction noise and increased human activity from HDD operations. Impacts associated with general wildlife species on USACE lands would be similar in scale to those for the Project as a whole as they would be avoided using the HDD crossing method (USACE, 2007).

In its review of the Project, the NDGFD identified its primary wildlife concern as the disturbance of native prairie and wooded draws (NDGFD, 2019a). As shown in table B-7 in section B.3.1, less than 1 percent of the route crosses wooded areas. Crossings of native prairies, although minimized to the extent practicable, could not be entirely avoided, as discussed in section B.3.1 and B.5.8. In addition to avoiding these habitats to the extent practicable, WBI Energy would follow measures provided in its *Noxious Weed Management Plan* and would restore rights-of-way to the extent practicable in accordance with the FERC Plan and Procedures.

WBI Energy would seed these areas in accordance with the NRCS and USFS to determine appropriate seed mixes, including potential pollinator-friendly species and allow them to revegetate to pre-construction conditions. As wildlife would be expected to return to the areas after vegetation has reestablished, short-term effects on native prairies would have minimal impacts on their importance to wildlife, and no changes to wildlife populations are anticipated.

The Project area that would be disturbed by construction would be a limited area within the broader landscape, and similar wildlife habitat is available nearby. WBI Energy would restore wildlife habitat in accordance with the FERC Plan and Procedures. Agricultural land and

most open lands (e.g., non-native grassland) would be expected to revert to preconstruction condition relatively quickly, generally within 1 or 2 years following construction. As shown in table B-7, this accounts for about 1,145 acres.

Based on the types of wildlife in the Project area discussed above, the measures included in WBI Energy's construction, restoration, and mitigation plans, and implementation of the FERC Plan and Procedures, we conclude that impacts on wildlife resources would be primarily short-term and not significant.

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703-711), and bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 USC 668-668d). EO 13186 (66 FR 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 impacts on migratory birds through enhanced collaboration with the USFWS. The Executive Order states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that focus should be given to addressing population-level impacts.

On March 30, 2011, the USFWS and the Commission entered into a MOU that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the Commission and the USFWS by identifying areas of cooperation. This voluntary MOU does not waive legal requirements under the Migratory Bird Treaty Act or any other statutes and does not authorize the take of migratory birds.

Although the Migratory Bird Treaty Act provides protection for all migratory birds and their nests, it is standard practice as noted in EO 13186 and the MOU between FERC and the USFWS (unless notified otherwise by the USFWS) to use the Birds of Conservation Concern (BCC) list when evaluating the potential impact of a project on migratory birds because this list identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing." The BCC for the Bird Conservation Regions (BCR) that would be crossed by the Project are identified in table B-9. This table identifies the habitat association for each species.

A variety of migratory bird species may occur seasonally along the proposed pipeline route. The Project is within the Central Flyway for waterfowl. Many species of waterfowl such as ducks, geese, doves, and pigeons, as well as sandhill cranes and tundra swans, use the flyway during spring and fall migrations between the Gulf of Mexico and central Canada. All of these species use open land and wetland areas and could be sensitive to Project construction activities.

Table B-9

Birds of Conservation Concern with Potential to Occur in the Project Area

Species	Habitat Association	BCR [a]
Bald eagle [b, c]	Typically breeds in forested areas adjacent to large bodies of water. Nests in trees and will occasionally nest on cliff faces and ground nest in treeless areas. Stopover habitat during migration includes roosting sites with deciduous trees that are in or near riparian areas, protected from human disturbance, and in proximity to foraging habitat.	11, 17
Baird's sparrow	Breeds mainly in northern prairies with fairly tall grass and with scattered tall weeds or low bushes; also sometimes nests in fields of wheat or other crops. Mixed-grass and fescue prairie with scattered low shrubs and vegetation from previous year's growing season. Associated with club moss, pasture sage, June grass, and needle grass in North Dakota.	11, 17
Black tern	Nests within shallow freshwater marshes with emergent vegetation, which includes prairie sloughs, margins of lakes, and river or island edges.	11
Bobolink	Nests within fields comprised of mixed grasses and broad-leaved forbs (e.g., red clover and dandelion).	23[d]
Chestnut-collared longspur	Primarily found and nests in grazed or hayed mixed-grassed prairie and/or shortgrass prairie.	11, 17
Franklin's gull	Habitat within breeding range includes freshwater marshes nesting over water, on floating mats built on water's surface, muskrat houses, or floating debris.	NA[e]
Golden eagle [c]	Primary nesting habitat includes rugged portions of badlands, buttes overlooking native prairie, large trees, and frequently associated with prairie dog colonies.	17
Lesser yellowlegs	Utilizes a variety of habitats during migration including freshwater marshes and edges of lakes and ponds. Nests on the ground in open, typically in dry site and sometimes far from water; may be placed close to log, burned stump, or brushpiles.	NA[e]
Marbled godwit	Associated with a variety of wetlands and nests frequently on grazed native prairie. Nests on the ground, usually in short grass on dry spots fairly close to water.	11, 17
Seimipalmated sandpiper[f]	Stopover at wetlands in the prairie pothole region during migration. Nests on the ground, often at top of low mound or on islands, under small shrubs.	NA[e]
Sprague's pipit	Habitat includes grazed native prairie with few shrubs. Preferred habitat species include blue grama, threadleaf sedge, June grass, and plains muhly. Nests on the ground in grassy fields, usually in a slight depression or tucked into the side of a clump of grass.	11, 17
Willet	Breeds in prairies comprised of short, sparse cover near wetlands and grasslands. Nests on the ground among dense short grasses.	NA[e]

Sources: Bird Studies Canada and North American Bird Conservation Initiative, 2014; Cornell Lab of Ornithology, 2019; USFWS, 2008 and 2019a; NDGFD, 2016c

[a] BCRs overlapping the Project facilities include BCR 11 (i.e., Prairie Potholes) and BCR 17 (i.e., Badlands and Prairies).

[b] ESA delisted species.

[c] Protected under the Bald and Golden Eagle Protection Act.

[d] Not identified within BCR 11 or 17, but identified within the USFWS Information, Planning and Conservation System as a BCC species that could be found within the Project area. Bobolinks are found in BCR 23, which is the Prairie Hardwood Transition region located east/southeast of the Project.

[e] Not identified within BCR 11 or 17, but identified within USFWS Information, Planning and Conservation System as a BCC species that could be found within the Project area.

[f] Non-breeding within North Dakota.

Migratory birds, particularly ground-nesting birds, could use grassland habitat present in the Project area. Impacts on habitat include the potential temporary disturbance of soils and vegetation during construction. Direct impacts on species include the potential for mortality or injury during construction from destruction of ground nests or vehicle collisions and displacement due to construction noise. Construction of the Project is planned to begin in the spring of 2021, subject to receipt of necessary permits and regulatory approvals, which could overlap with the migratory bird nesting season. To minimize impacts on migratory bird habitat, WBI Energy collocated new pipeline facilities with existing pipeline, utility, and road corridors to the extent practicable (47 percent). In addition, WBI Energy designed the Project to use HDDs and conventional bores to the extent practicable to avoid surface impacts on waterways and wetlands. The potential loss of nests and adult birds relocating to avoid construction is an impact of limited duration that would not result in a substantial or long-term change in migration patterns through the area nor constitute a population-level impact, as areas not maintained for operation would be allowed to return to preconstruction vegetation cover and continue to provide habitat for migratory birds. Following construction, WBI Energy would restore the right-of-way as near as practical to preconstruction conditions in accordance with the FERC Plan and Procedures. Cropland would be allowed to return to active agricultural production, and other areas would be revegetated using methods and seed mixes appropriate to existing land uses. To reduce effects of vegetation maintenance on nesting birds, WBI Energy would not conduct routine vegetation maintenance more frequently than once every 3 years and would not occur between April 15 and August 1 of any year unless approved in writing from the USFWS. The majority of the route has low growing vegetation, which allows for regular inspection without regular clearing. Therefore, the need for routine vegetation maintenance would be infrequent and limited to specific locations, such as areas around pipeline markers and road crossings.

WBI Energy reviewed golden eagle nest habitat range data available from the NDGFD, which shows there is no nest habitat for golden eagles within the proposed Project (NDGFD, 2017). The nearest habitat is adjacent (less than 20 feet) to MP 19.2 of the proposed Tioga-Elkhorn Creek pipeline. Incidental on-the-ground raptor nest surveys were conducted during wetland and waterbody surveys (limited to the 300-foot-wide wetland/waterbody survey corridor), during which no nesting activity for bald or golden eagles was observed. This survey corridor did not capture potential noise impacts associated with the HDD crossing of Lake Sakakawea and a natural pond. According to the NDGFD golden eagle nest habitat data, there is no known habitat within 0.5 mile of the HDD entry sites for Lake Sakakawea. Prior to the start of HDD construction at Lake Sakakawea and the natural pond, WBI Energy would complete surveys for eagle nests within 0.5 mile of the proposed entry sites. If an eagle nest is identified near the Project area, WBI Energy would implement the measures described in the USFWS' 2007 National Bald Eagle Management Guidelines (USFWS, 2007) to avoid and minimize impacts on nesting eagles. Given WBI Energy's proposed restoration procedures and commitment to avoid eagles, we conclude that the proposed Project would not result in adverse permanent impacts on migratory birds or eagles.

In addition, to further minimize impacts, WBI Energy proposes to conduct surveys for nesting birds prior to clearing the right-of-way in areas where clearing cannot occur prior to the migratory bird nesting season. If nests were identified during surveys, depending on local topography and vegetation buffers, WBI Energy would stop work up to 0.1 mile from the nest.

Construction activities in these areas would resume when the chicks have fledged or the nest has failed. In areas where clearing occurs prior to migratory bird nesting, but construction does not occur right after clearing, WBI Energy would maintain the construction area (as needed) to avoid the regrowth of potential nesting habitat.

4. Threatened, Endangered, and Other Special Status Species

Special status species are those species for which federal or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category for this EA are federally listed species that are protected under the ESA, as amended, and those species that are state-listed as threatened, endangered, or other special status. Section 7 of the ESA requires each federal agency to confirm that an action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed endangered or threatened species, or result in the destruction or adverse modification of designated critical habitat for federally listed species. As the lead federal agency, FERC is responsible for the section 7 consultation process with the USFWS.

To comply with the requirements of the ESA, WBI Energy, as FERC's non-federal representative, conducted informal coordination with the USFWS for the purpose of complying with section 7(a)(2) of the ESA. As part of this coordination, WBI Energy considered the potential for the Project to affect the federally listed threatened and endangered species as well as candidate species and designated critical habitat. WBI Energy conducted habitat assessment surveys to identify potential habitats for threatened and endangered species within the Project area. While North Dakota does not have a state endangered species program, it does track data regarding species identified as species of concern and other significant ecological communities.

4.1 Federally Listed Species

Based on publicly available information, agency correspondence, field surveys and other information submitted by WBI Energy, and our own independent analyses, we have determined that eight federally listed species[24] potentially occur in the Project area and have the potential to be affected by the Project. Table B-10 lists the federally listed species and designated critical habitat potentially occurring in the Project area, describes the habitat requirements for each species, and identifies our determinations of effect. Further discussion of these species and assessment of potential impacts are described below.

Northern Long-eared Bat

The threatened northern long-eared bat (NLEB) ranges across the eastern and northcentral United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (78 FR 61046). NLEBs are considered common in only small portions of the western part of its range (i.e., Black Hills of South Dakota) and uncommon or rare in the western extremes of the range (78 FR 61046). NLEBs spend winter months hibernating in crevices or cracks of caves and mines. Summer months are spent roosting underneath bark or in cavities or

[24] No species that are currently candidates for federal listing under the ESA are in the Project area.

Table B-10

Federally Listed Species Potentially Occurring in the Vicinity of the Proposed Project

Species	Federal Status [a]	Habitat Description	Determination of Effect
Mammals			
Gray wolf	E	Rare to uncommon in North Dakota. Occasional sightings. No known breeding population. Occupy wide variety of habitats where large ungulates (e.g., elk and deer) are found. Is known to cross into North Dakota from neighboring states and Manitoba, Canada.	*No effect* Likely extirpated from North Dakota and prefer forested areas which would only be minimally impacted.
Northern long-eared bat	T	Rare in North Dakota. Primarily found in woodland habitats. A significant loss of individuals to white-nose syndrome in the Eastern and Midwestern United States and Canada have caused population concern throughout this species' range.	*not likely to adversely affect* with implementation of proposed mitigation measures
Birds			
Interior least tern	E	Utilizes sparsely vegetated sandbars on the Missouri and Yellowstone Rivers.	*not likely to adversely affect* with implementation of proposed mitigation measures
Piping plover	T	Utilizes barren sand and gravel shores of rivers, prairie alkali wetlands, natural lakes with salt-encrusted, white beaches, and rangeland with mid- or short-grass prairie during the non-winter season.	*not likely to adversely affect* with implementation of proposed mitigation measures
	CH	Critical habitat is present at the crossing of Lake Sakakawea.	*not likely to adversely modify* with implementation of proposed mitigation measures
Red knot	T	Migrant species occurring in North Dakota during the spring and fall seasons (mid-May and mid-September to October). Utilize alkaline and freshwater lakes in North Dakota during migration. Red knots have been observed in the Missouri River system as well as sewage lagoons and large permanent freshwater wetlands.	*No effect*
Whooping crane	E	Migrant species occurring in North Dakota during the spring and fall seasons (April to mid-May and September to early November). Utilize wetlands, lakes, riverine areas, and a variety of cropland for roosting and foraging.	*not likely to adversely affect* with implementation of proposed mitigation measures
Fish			
Pallid Sturgeon	E	Utilizes main channel areas with island or sandbars present within the upper Missouri River. Dams have substantially fragmented the pallid sturgeon's range in the upper Missouri River basin.	*not likely to adversely affect* with implementation of proposed mitigation measures
Insects			
Dakota skipper (DASK)	T	Reliant upon high-quality tall-grass and mixed-grass prairie. Habitat includes wet prairie dominated by bluestem grasses, wood lily, harebell, and smooth camas; dry prairie on ridges and hillsides dominated by bluestem grasses, needlegrass, pale purple coneflower, upright coneflower, and blanketflower.	*not likely to adversely affect* with implementation of proposed mitigation measures
DASK	CH	No critical habitat is crossed by the Project. North Dakota Critical Habitat Units 11 and 12, which are the closest critical habitats to the Project area, are in McKenzie County about 5 and 12 miles southeast of the HDD crossing of Lake Sakakawea on the south shoreline.	*No effect*

[a] E = Endangered Species; T = Threatened Species; CH = Critical Habitat. No candidate species occur in the Project area.

crevices of live and dead trees. There are no known NLEB hibernacula within North Dakota; however, there has been limited survey efforts in the state (78 FR 61046). The estimated NLEB hibernation season in North Dakota is from October 1 through May 15 (USFWS, 2014a).

The NLEB is very susceptible to white-nose syndrome, which has led to significant losses and caused a population concern range wide. Other sources of mortality for the NLEB include impacts on winter hibernation areas, loss or degradation of summer habitats, and wind farm operations (USFWS, 2015a; NDGFD, 2016d).

The proposed Project is within the probable range of NLEB. In addition, there are no known caves or bat hibernacula within 50 miles of the proposed Project (NDGFD, 2016d). Direct effects could occur if roosting trees actively used by NLEB were removed by construction activities during summer use (May through September). Indirect effects could occur if construction activities were to displace roosting or foraging bats from nearby habitat due to the increase in noise and human activity in the area. Construction of the Project is anticipated to occur from spring to late fall of 2021, which would overlap the NLEB active and breeding season. Although WBI Energy would clear small tree stands that bats could potentially roost in, there are no large forested habitats in the vicinity of the proposed Project. Additionally, bats would likely move to surrounding undeveloped treed areas and any indirect impacts are expected be insignificant. NLEB habitat is limited within the Project area; there are no documented occurrences of the species in the Project area; and the Project would not cross any forested areas where NLEB more commonly roost. WBI Energy completed an Information, Planning and Conservation submission for the Project. Based on that submission, the USFWS determined that activities related to the Project are consistent with those analyzed in the USFWS' January 5, 2016, Programmatic Biological Opinion. Therefore, given the small amount of tree clearing that would occur, we conclude the Project *is not likely to adversely affect* the NLEB. As noted in the January 5, 2016 Programmatic Biological Opinion, any take that may occur as a result of the Project is not prohibited under the ESA section 4(d) rule adopted for this species at 50 CFR 17.40(o).

Interior Least Tern

The endangered interior least tern inhabits sparsely vegetated sandbars or shoreline salt flats of lakes along the Missouri River System for breeding purposes. Least terns are present in North Dakota from mid-May through August, with peak breeding season ending in mid-July (USFWS, 2013b, 2019c). In McKenzie and Williams Counties, known breeding areas for the least tern occur on sandbars of the Missouri and Yellowstone Rivers (USFWS, 2018a). In North Dakota, the least tern is found mainly on the Garrison reach of the Missouri River from the Garrison Dam south to Lake Oahe (southeast of the Project), and on the Missouri and Yellowstone Rivers upstream of Lake Sakakawea (west of the Project). Available shoreline habitat can fluctuate depending on water levels in the reservoir, and releases from Garrison Dam are regulated during the nesting season to accommodate nesting terns (USACE, 2018b).

The interior population of least tern is listed as an endangered species under the ESA. The U.S. population of the interior least tern was proposed for delisting on October 23, 2019, however a final determination has not yet been made (USFWS, 2018a). If delisted, the interior least tern would maintain protection under the Migratory Bird Treaty Act, but would no longer

receive protection under the ESA. The population has declined due to loss of habitat from dam construction and river channelization on the major rivers they inhabit. Other factors inhibiting interior least tern populations include human disturbance and changes in water temperatures that may affect the quantity of forage fish available (USFWS, 2013b; NDGFD, 2016d).

The USACE has monitored the least tern at Lake Sakakawea since at least 1993. Their data (years 1993 to 2018) show several observations of non-nesting birds (including interior least terns) within the Project area, the closest about 0.2 mile from one of the proposed geotechnical bore locations, and nesting pairs documented near Tobacco Garden Bay about 1 mile west of the HDD crossing on the south side of Lake Sakakawea (USACE, 2018b).

Nesting and foraging habitat for interior least terns is present on Lake Sakakawea. However, WBI Energy proposes to cross Lake Sakakawea using the HDD method, which would minimize impacts on shoreline and open water foraging habitat. Project activity occurring within 0.5 mile of an active nest has the potential to adversely affect nesting terns. Pipeline construction is currently planned to begin in May of 2021. Prior to the start of HDD construction activities at Lake Sakakawea, WBI Energy would conduct preconstruction species-specific surveys using a trained biologist to verify that no nesting is occurring within line of sight or 0.5 mile of the proposed HDD entry sites (whichever is a shorter distance) to minimize potential impacts on least terns. If least tern are observed during these preconstruction surveys, WBI Energy would contact the USFWS to determine what, if any, avoidance/minimization measures should be implemented. Given that HDD activities would occur 7 days a week from sunrise to sunset, if no least tern are detected during the 7-day preconstruction survey, no additional survey work would be required. With implementation of these measures, we conclude the Project *is not likely to adversely affect* the interior least tern.

Piping Plover

The threatened piping plover of the Northern Great Plains breeds along barren sand and gravel shores of prairie rivers and alkali wetlands (USFWS, 2003, 2018b). North Dakota is the most important state within the Great Plains region for nesting piping plovers (USFWS, 2018b). In North Dakota, piping plovers nest on prairie alkali lakes, the free-flowing stretch of the Missouri River, and barren river sandbars typically along the Missouri and Yellowstone Rivers (USFWS, 2018b). In North Dakota, piping plovers arrive in early to mid-April and remain until the end of August.

The recent decline in the Northern Great Plains piping plover population is attributed to the destruction of vegetated sandbars and river islands for flood control and navigation, water level regulation policies that endanger nesting habitat, direct disturbance by people, and poor breeding success, primarily because of an increase in predator abundance (USFWS, 2018b). Nineteen areas of critical habitat for the Northern Great Plains population of the piping plover have been designated by the USFWS (67 FR 57638), totaling about 183,422 acres in Minnesota, Montana, Nebraska, North Dakota, and South Dakota. Within the Project area, the entirety of Lake Sakakawea is designated piping plover critical habitat. The habitat features present at Lake Sakakawea that are essential to the conservation of the species include islands composed of sand, gravel, or shale, and the islands interface with water, sparsely vegetated shorelines, and peninsulas. Temporary deterrence from shoreline habitat could occur during Project

construction, but no direct disturbance of critical habitat would occur. Therefore, we conclude the Project *would not adversely modify* piping plover critical habitat.

The USACE has been monitoring the piping plover at Lake Sakakawea since at least 1993. Their data (years 1993 to 2018) show occurrences of nesting plovers near the Project area on the north shoreline of the proposed Tioga-Elkhorn Creek pipeline crossing at Lake Sakakawea and about 0.1 mile west of the south shoreline crossing (USACE, 2018b).

Piping plovers arrive in the Project area in April for mating and nesting and migrate south in August. Because construction of the Project is anticipated to occur from spring to late fall of 2021, which would overlap with the piping plover breeding and nesting season, it is possible that nesting birds would be present during construction. Activity occurring within 0.5 mile of an active nest has the potential to adversely affect nesting piping plovers. Therefore, noise, visual, and physical disturbances from Project activity may affect essential mating, nesting, and foraging behaviors of piping plovers at Lake Sakakawea. Prior to the start of HDD construction activities at Lake Sakakawea, WBI Energy would conduct 7-day preconstruction species-specific surveys using a qualified biologist to verify that no nesting is occurring within line of sight or 0.5 mile of the proposed HDD entry sites (whichever is a shorter distance) to minimize potential impacts on piping plovers. If piping plovers are observed during these preconstruction surveys, WBI Energy would contact the USFWS to determine what, if any, avoidance/minimization measures should be implemented. Given that HDD activities would occur 7 days a week from sunrise to sunset, if no piping plovers are detected during the 7-day preconstruction survey, no additional survey work would be required. With implementation of these measures, we conclude the Project *is not likely to adversely affect* the piping plover.

Red Knot

In North America, the threatened red knot is commonly found in marine habitats and coastal areas along sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments, and lagoons, and peat banks (USFWS, 2014b). Red knots have been documented along the Northern Plains during their spring migration and they have been tracked along the central flyway with geolocators (USFWS, 2014b). The red knot is considered a rare migrant in North Dakota, but may pass through in mid-May and mid-September to October during spring and fall migrations. There are no stopover sites in North Dakota that are consistently used by red knots (USFWS, 2014b); however, there is potential for them to be present in the Project vicinity during migration. There is a lack of information on the specific non-coastal habitats used by red knots (USFWS, 2014b); however, given their specialized molluscivore diet, it can be assumed they would use shallow wetlands, lake margins, and riverine habitats within North Dakota for foraging and/or roosting areas.

Red knot populations have declined due to degradation of wetland areas, reduced food availability, expanding oil and gas development that overlaps migration ranges, and contamination to alkali lakes and the Missouri River system (USFWS, 2014b; NDGFD, 2016d). Because of the rare incidence of the species and the probability that they would avoid areas of active construction during migration due to noise disturbance, we conclude the Project *is not likely to adversely affect* the red knot.

Whooping Crane

The endangered whooping crane utilizes a variety of habitats along their migration route, including croplands, freshwater wetlands with shallow areas, and submerged sandbars in wide, unobstructed river channels isolated from human disturbance (Austin and Richert, 2005; Urbanek and Lewis, 2015). The Aransas-Wood Buffalo population of the whooping crane migrates in the spring and fall through the central portion of North Dakota. Spring migration occurs from late April to mid-June, with most sightings occurring in the western two-thirds of the state. During migration, preferred stopover sites include large shallow marshes with minimal to no emergent zones for roosting, and nearby upland cropland and pastures for foraging. Fall migration normally begins in mid-September, with most birds arriving at the Texas wintering grounds between late October and mid-November.

Only about 430 individual whooping cranes remain in the Aransas-Wood Buffalo population (International Crane Foundation, 2018). Current threats to whooping cranes include loss or deterioration of critical wetland habitat, low genetic diversity, utility line collisions, predation, disease, disturbance at nest sites, and illegal shooting (International Crane Foundation, 2018; Meine and Archibald, 1996). Whooping crane populations have primarily declined due to loss of habitat and illegal shooting. The Aransas-Wood Buffalo whooping crane population has a restricted wintering distribution along the Gulf Intracoastal Waterway of Texas where the risk of contaminant spills is high based on the amount of barge traffic (Urbanek and Lewis, 2015). Delayed sexual maturity, small clutch sizes, and low recruitment rates have also affected recovery efforts.

Given the abundance of both wetlands and croplands in the Project vicinity, migrant cranes would be able to find suitable feeding and roosting areas away from the Project during the temporary disturbance from construction and post-construction restoration. WBI Energy would train Project EIs in whooping crane identification prior to the start of construction. If individual cranes are observed along the Project right-of-way during construction, WBI Energy would notify the USFWS of the location of the observance, the cranes would be left undisturbed, and construction within 1 mile of the cranes would cease until they vacate the area, at which time construction activities would resume.

Whooping cranes that may occur along the pipeline routes or in the Project vicinity would be individual migrants preparing to primarily fly south, and the likelihood of occurrence of those individuals is reduced with the proposed spring to late fall 2021 construction schedule. Following restoration, WBI Energy would return the right-of-way to preconstruction condition to the extent practicable in open lands. With these proposed mitigation measures, we conclude the Project *is not likely to adversely affect* the whooping crane.

Pallid Sturgeon

The endangered pallid sturgeon is a prehistoric fish that can weigh up to 80 pounds, reach 6 feet in length, and live up to 60 years. Habitat for the pallid sturgeon includes large rivers with high turbidity, swift currents, and natural flow. Their preferred habitat has a diversity of depths and velocities formed by braided channels, islands, and mid-channel sandbars. Their habitat is fragmented by dams on the Missouri River; only scarce populations remain in the upper Missouri

River above Fort Peck Reservoir, in the Missouri and lower Yellowstone Rivers. While pallid sturgeon have been documented in Lake Sakakawea upstream of the proposed Tioga-Elkhorn Creek pipeline crossing, reservoirs are not considered to be suitable pallid sturgeon habitat due to the alteration of natural flow regimes (USFWS, 2019b; Guy et al., 2015).

Factors contributing to the pallid sturgeon decline include habitat loss due to construction of dams, channelization of rivers, commercial fishing, and environmental contaminants (USFWS, 2015b). Additionally, hybridization with the more common shovelnose sturgeon poses a threat to species stability (Tranah et al., 2004).

In North Dakota, pallid sturgeon occur primarily in the Missouri and Yellowstone Rivers, but occasionally enter Lake Sakakawea. WBI Energy proposes to cross Lake Sakakawea via the HDD method, which would reduce potential impacts on pallid sturgeon. To minimize potential impacts on water quality due to an inadvertent release of drilling fluid during the HDD, WBI Energy would implement the measures in its SPCC Plan and HDD Plan. Sedimentation of connected waterbodies could also affect water quality in Lake Sakakawea. WBI Energy would implement best management practices during construction and operation of the Project to minimize migration of sediment or fluids to waterbodies, including the use of appropriate erosion control devices. The proposed entry and exits pits for the HDD would be set back from the water's edge by approximately 850 and 1,200 feet, respectfully. With implementation of WBI Energy's proposed mitigation measures and because the nearest pallid sturgeon habitat is about 66 miles upstream from the Project area, we conclude the Project *is not likely to adversely affect* pallid sturgeon.

Dakota Skipper

The DASK is a small to medium-sized butterfly with a wingspan of about one inch. Historically, the threatened DASK was distributed throughout tallgrass prairie habitats of Illinois, Iowa, Minnesota, South Dakota, North Dakota, Manitoba, and Saskatchewan (Vaughan and Shepherd, 2005). Within the United States, DASK have been extirpated from Illinois and Iowa, and are now only present in scattered isolated sites in western Minnesota, northeastern South Dakota, and the northern half of North Dakota (USFWS, 2016). There are three known DASK sites in McKenzie County, North Dakota and two designated critical habitat sites in northern McKenzie County (USFWS, 2016; 80 FR 59248).

DASK inhabit two types of prairie habitat; low wet-mesic prairie with little topographic relief that occurs on near-shore glacial lake deposits (Type A) and dry-mesic mixed-grass prairie dominated by mixed bluestem and green needlegrasses occurring primarily on rolling terrain over gravelly glacial moraine deposits (Type B) (USFWS, 2016). Both habitat types contain an abundance of flowering plants and alkaline soils (Vaughan and Shepherd, 2005). In dry mixed-grass prairie, DASK can be found along ridges and hillsides (Cochrane and Delphey, 2002).

DASK complete one generation per year (Cochrane and Delphey, 2002). The larvae overwinter at or below ground level. During the spring, the larvae emerge to complete their development. The larvae eventually pupate in June (Vaughan and Shepherd, 2005). Adults generally emerge in mid-June to early July, and mate during a 2- to 4-week flight period (Cochrane and Delphey, 2002; Vaughan and Shepherd, 2005). Females lay eggs on a range of

broadleaf plants and grasses, which hatch after incubating for 7 to 20 days (Cochrane and Delphey, 2002). Little bluestem is often selected for both egg laying and as a food source for larvae (Vaughan and Shepherd, 2005). Nectar sources for adults vary regionally and include purple coneflower, blanketflower, black-eyed Susans, and evening primrose (Cochrane and Delphey, 2002; Vaughan and Shepherd, 2005).

Although the proposed Project is within DASK range and habitat, DASK are not specifically known to occur within the Project area and the Project would be 5 miles from the nearest critical habitat. The Hartels provided comments about the Project's potential impacts on DASK habitat. WBI Energy designed the Project to avoid and minimize impacts on DASK to the greatest extent practicable; however, they may be present within the reproductive, foraging, and dispersal habitats adjacent to the construction workspace.

Based on the results of WBI Energy's 2019 and 2020 DASK habitat surveys, WBI Energy incorporated some route changes to minimize and/or avoid impacts on potential DASK habitat (see table C-1). The USFWS designated critical habitat for the DASK in North Dakota, South Dakota, and Minnesota (80 FR 59248). North Dakota Critical Habitat Units 11 and 12, which are the closest critical habitats to the Project area, are approximately 5 and 12 miles southeast of the HDD crossing on the south shoreline of Lake Sakakawea in McKenzie County. Due to the distance between the Project and the North Dakota Critical Habitat Units, we conclude the Project would have no effect on DASK critical habitat.

DASK flight periods vary annually; however, the USFWS confirmed that construction activities should be restricted in DASK foraging and reproductive habitat areas from June 10 through July 15 (USFWS, 2020). Therefore, WBI Energy would exclude areas identified during 2019 and 2020 surveys as potential reproductive habitat that are adjacent to or within the Project area during construction between June 10 and July 15 using a combination of HDD and/or guided bore crossing methods and installation of orange construction exclusion fencing and/or silt fencing to demarcate avoidance areas Implementation of these measures would prevent construction equipment and temporarily stockpiled soil from encroaching into the habitat.

After construction in grassland areas, WBI Energy would focus revegetation efforts on establishing a native grass and forb plant community that provides foraging opportunities for the DASK and reducing habitat fragmentation along the Project alignment. Because noxious weeds and invasive plants can outcompete native forb food sources for DASK (USFWS, 2016), WBI Energy would implement the measures in its Noxious Weeds Management Plan to reduce the threat of introducing or spreading noxious weeds and invasive plant species within the Project area.

The Project would involve disturbances related to the physical presence of people, development activities, and moving vehicles and equipment within the Project area, which may be visually or physically disruptive to DASK. There is no evidence suggesting that acoustics from the construction and operation of the Project would elicit a disruptive (positive or negative) behavioral response or injurious physiological impairment to adults or larvae of the species (USFWS, 2016). It is expected that human presence would have no effect on the DASK egg or larval stages, but adults could be consistently disturbed during the adult flight period. The disturbance could cause individuals to move from resting/nectaring locations or alter the adult

flight paths. Adult DASK are generally believed to avoid areas of active disturbance (USFWS, 2016); however, they can traverse areas of disturbance or be driven by wind into disturbed areas. To reduce the likelihood of disrupting adult DASK during the flight period, WBI Energy would conduct clearing and grading activities outside the flight period (June 10 through July 15). With implementation of WBI Energy's proposed mitigation measures, we conclude the Project *is not likely to adversely affect* DASK.

Conclusion

Based on the analyses above, WBI Energy's survey results and proposed mitigation/conservation measures, and the implementation of the FERC Plan and WBI Energy's other Project-specific plans and best management practices, we conclude the Project would have *no effect* on the gray wolf and red knot, and would be *not likely to adversely affect* the NLEB, interior least tern, piping plover, whooping crane, pallid sturgeon, and DASK. In addition, the Project would have *no effect* on critical habitat for DASK and would be *not likely to adversely modify* critical habitat for the piping plover. WBI Energy submitted an updated biological assessment (BA) on September 11, 2020 to the USFWS requesting concurrence for its findings on federally threatened and endangered species under section 7 of the Endangered Species Act[25] On November 17, 2020, the USFWS stated in a letter that it concurs with the determinations made in the BA. Therefore, we conclude that consultation with the USFWS under section 7 of the Endangered Species Act is complete, and no further consultation is required at this time. Should there be newly listed species or Project modifications that necessitate additional consultation, we would consult with the USFWS regarding those additional impacts.

4.2 Federal Agency Sensitive Species

The Project would not cross any National Park Service Wilderness Areas, National Wild and Scenic Rivers, or state-designated high quality or outstanding natural resource waters (Wild and Scenic Rivers Council, 2014). The Project would cross about 2.1 miles of USFS property through the LMNG. The LMNG is the largest grassland in the country and was once considered part of the Custer National Forest, but is now part of the Dakota Prairie Grasslands (USFS, 2019c). The USFS manages a list of sensitive and watch list wildlife species of interest for the LMNG.

WBI Energy conducted surveys for DASK habitat along approximately 2.1 miles where the Project crosses the USFS lands within the LMNG. Prior to surveys, biologists reviewed the most recent *Biological Survey and Report Guidelines – Little Missouri National Grassland* (USFS, 2019b) and associated GIS data with known DASK locations. Biologists surveyed the Project area on the USFS land using meandering transects with an emphasis on areas having habitat features suitable to the USFS sensitive plant species. In addition to surveying for sensitive plant species, biologists also surveyed for any occurrence of USFS watch list plant species. WBI Energy completed a Biological Evaluation for the USFS sensitive and watch list

[25] The Biological Assessment for the Project can be found in FERC docket CP20-52-000 under accession number 20200911-5168 (Appendix 3A).

plants and animals, raptor species of concern, and management indicator species which was submitted to the USFS for review on February 14, 2020. The USFS provided concurrence on September 23, 2020 with WBI Energy's Biological Evaluation and botany and seed mix evaluation.[26]

4.3 State Species of Concern

While North Dakota does not have a state endangered species program, it does track data regarding species identified as species of concern and other significant ecological communities. Field surveys conducted by WBI Energy reported observations of short-eared owl and Hooker's townsendia in the Project area. Impacts on species of concern would be avoided or minimized through implementation of the measures in the FERC Plan and Procedures. These measures are designed to decrease potential for erosion, restore preconstruction contours, increase the potential for successful revegetation of the right-of-way, minimize impacts on native grassland habitat, and prevent or control the spread of noxious weeds. Given the nature of the habitats crossed and the mitigation measures that WBI Energy would implement as part of the Project, we conclude that impacts on state species of concern would be minimal, and not significant.

5. Land Use and Visual Resources

5.1 Land Use

Project construction would affect 1,469.5 acres of land, including 1,005.3 acres for pipeline construction rights-of-way, 127.0 acres for ATWS, 257.8 acres for staging areas, 46.0 acres for temporary and permanent access roads, and 33.4 acres for aboveground facilities. Following construction, 874.6 acres, including the temporary workspace portion of the construction right-of-way, the ATWS, the staging areas, and temporary access roads, would be restored to preconstruction conditions. The remaining 594.9 acres of land, including 568.1 acres of permanent pipeline easements, 2.6 acres for permanent access roads, and 24.1 acres for aboveground facilities would be retained for Project operation.

General land types that would be affected by the Project include agricultural land, forest land, open land, and developed land. A detailed discussion of forest land and open land is included in section B.3, and wetlands and waterbodies are discussed in section B.2. Table B-11 summarizes the acreage of agricultural and developed land that would be affected by construction and operation of Project facilities.

Agricultural Lands

Most land affected by the Project would be agricultural land. Agricultural lands in the Project area include those used for cultivated fields, including permanent or rotated croplands; working areas within farms; pastures used for grazing; and hayfields. Construction of the Project

[26] The Biological Evaluation for the Project can be found in FERC docket CP20-52-000 under accession number 20200911-5168 (Appendix 3B).

Table B-11

Land Uses Affected by Construction and Operation of the Project (in acres) [a]

	Agricultural		Developed	
Facility/County/Workspace	Const.	Oper.	Const.	Oper.
BURKE				
Pipeline Facilities				
Line Section 25 Loop	61.8	41.1	2.4	1.6
Uprate Line Section 25	0.6	0.4	0.8	0.6
ATWS				
Line Section 25 Loop	8.8	0.0	0.8	0.0
Updating Existing Site	3.8	0.0	0.3	0.0
Aboveground Facilities				
Norse Plant Receipt Station	<0.1	<0.1	0.3	0.3
Norse Transfer Station	<0.1	<0.1	0.3	0.0
Lignite Plant Receipt Station and Lignite Town Border Station	0.0	0.0	0.4	0.4
Access Roads	5.1	0.1	1.4	<0.1
Subtotal	**80.1**	**41.6**	**6.7**	**2.9**
MCKENZIE				
Pipeline Facilities				
Tioga-Elkhorn Creek	241.2	121.0	8.6	4.5
Elkhorn Creek-Northern Border	2.7	1.4	0.0	0.0
ATWS				
Tioga-Elkhorn Creek	11.0	0.0	2.2	0.0
Staging Areas				
Boehm Staging Yard	0.0	0.0	0.2	0.0
Delta Contractors Yard	13.1	0.0	10.5	0.0
Flatlands Yard 1	4.2	0.0	0.3	0.0
Flatlands Yard 2	0.3	0.0	4.8	0.0
Franz Yard	0.0	0.0	2.2	0.0
Aboveground Facilities				
Elkhorn Creek Compressor Station	10.4	8.6	0.5	0.1
Northern Border Station	1.2	0.8	0.0	0.0
Cherry Creek Valve Site	0.6	0.6	0.0	0.0
Access Roads	4.5	0.6	1.5	0.2
Subtotal	**289.2**	**133.0**	**30.8**	**4.8**
MOUNTRAIL				
Pipeline Facilities				
Line Section 25 Loop	23.0	15.3	0.9	0.6
ATWS				
Line Section 25 Loop	2.8	0.0	0.0	0.0
Aboveground Facilities				
Robinson Lake Plant Receipt Station	1.4	0.6	0.0	0.0
Valve No. 6.8	<0.1	<0.1	0.0	0.0
Staging Areas				
Enget Yard	0.0	0.0	0.1	0.0
Access Roads	1.7	0.1	0.5	0.1

Table B-11

Land Uses Affected by Construction and Operation of the Project (in acres) [a]

Facility/County/Workspace	Agricultural		Developed	
	Const.	Oper.	Const.	Oper.
Subtotal	**28.9**	**16.1**	**1.5**	**0.7**
WILLIAMS				
Pipeline Facilities				
Tioga-Elkhorn Creek	233.6	117.9	5.6	3.2
Line Section 25 Loop	35.5	23.5	1.3	0.9
Line Section 30 Loop	71.9	48.0	2.4	1.5
Tioga Compressor Lateral	1.5	1.0	0.8	0.6
ATWS				
Tioga-Elkhorn Creek	40.7	0.0	1.7	0.0
Line Section 25 Loop	5.5	0.0	0.2	0.0
Line Section 30 Loop	8.3	0.0	0.8	0.0
Tioga Compressor Lateral	0.1	0.0	0.0	0.0
Staging Areas				
Weflen Staging Yard	17.2	0.0	0.5	0.0
68th Street Yard	14.2	0.0	0.6	0.0
CRS Yard	9.8	0.0	<0.1	0.0
Lobell Yard	5.8	0.0	33.7	0.0
Schmidt Yard	7.9	0.0	0.5	0.0
Aux Stable Staging Yard	39.5	0.0	4.7	0.0
Aboveground Facilities				
Tioga Compressor Station	0.0	0.0	0.5	0.0
Tioga Plant Receipt Station	1.1	1.1	0.0	0.0
Springbrook Plant Receipt Station	1.0	0.4	0.0	0.0
104th Ave NW Pig Launcher	0.1	0.1	0.1	0.1
Access Roads	12.3	0.1	4.4	0.2
Subtotal	**505.9**	**192.1**	**57.3**	**6.4**
SUBTOTALS BY FACILITY TYPE				
Pipeline Facilities	**672.0**	**369.7**	**22.8**	**13.4**
ATWS	**81.1**	**0.0**	**5.9**	**0.0**
Staging Areas	**111.8**	**0.0**	**57.7**	**0.0**
Aboveground Facilities	**15.8**	**12.3**	**2.1**	**0.9**
Access Roads	**23.6**	**0.9**	**7.8**	**0.5**
PROJECT TOTAL [b]	**904.3**	**382.9**	**96.2**	**14.8**

[a] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[b] Acreages do not include impacts due to two minor route changes filed by WBI Energy on December 4, 2020 (accession number 20201204-5043), which would impact less than 3 acres total and would not impact any additional resources.

would affect about 904.3 acres of agricultural land. Following construction, agricultural lands would be restored and allowed to revert to previous land uses, except at the aboveground facility sites and permanent access roads, which would be converted to developed land (13.2 acres). While about 369.7 acres of agricultural land would be within the permanent pipeline rights-of-way, continued use of the land for agriculture would be allowed during operation of the Project. The Project would not affect agricultural drain tile or irrigation systems. As stated in section A.8.2, if drain tiles are identified and/or encountered, WBI Energy would implement measures to maintain flow during construction to avoid ponding in nearby areas. Following construction, WBI Energy would restore any impacted drain tiles to preconstruction conditions in accordance with the FERC Plan.

Developed Land

Developed lands in the Project area primarily consist of existing roads and utility lines crossed by the proposed pipeline rights-of-way. Construction of the Project would affect approximately 96.2 acres of developed land. Operational impacts would require 14.8 acres for the permanent pipeline rights-of-way, permanent access roads, and aboveground facilities. The Project would have minimal impacts on these lands because most paved roads and highways would be crossed by subsurface boring. WBI Energy would cross existing transmission line corridors by methods agreed upon with the facility operators. Additionally, WBI Energy would cross unpaved roads, two-tracks, and driveways, using the open-cut method and would restore these areas to preconstruction conditions. Further, WBI Energy states that it would implement traffic control measures to minimize impacts on major roadways during construction and to assist with transportation of construction equipment and materials to and from the construction right-of-way (see section B.6).

Impacts and Mitigation

Most impacts on land use would be temporary to short-term as they would restore immediately following construction (e.g., road crossings), or within a few years (e.g., revegetation of agricultural areas). Operation of the Project would premanently convert about 13.2 acres of agricultural land to developed land for aboveground facilities (12.3 acres) and permanent access roads (0.9 acre). WBI Energy would bury the pipeline with a minimum depth of 48 inches to prevent interference with agricultural activities, such as plowing and planting.

The Hartels commented during scoping that WBI Energy's previous pipeline project on their property resulted in severe loss of topsoils and subsoils. To minimize impacts on topsoil, WBI Energy would perform topsoil segregation in accordance with the FERC Plan (see also section A.8.1) which requires either full right-of-way or partial (ditch plus spoil side method) topsoil stripping in croplands, pastures, and hayfields. To enhance restoration success, WBI Energy has proposed full topsoil segregation and would remove the topsoil layer up to 12 inches from the entire width of the construction right-of-way and project workspaces. As required by the FERC Plan, WBI Energy would implement mitigation measures to stabilize segregated topsoil, maintain separation of topsoil and subsoil piles, install temporary erosion controls, and return topsoil to the right-of-way at the approximate pre-construction grade and contour to restore drainage. In cultivated croplands, reseeding of the right-of-way is not required by the FERC Plan, unless requested by the landowner. WBI Energy is required to leave the soil in

proper condition for planting and incorporate soil additives in accordance with written recommendations from the local soil conservation authority, land management agency, or landowner. These measures are designed to minimize potential mixing or loss of topsoil and subsoil and provide conditions that would allow successful restoration, provided that impacted land is returned to agricultural land use practices.

Agricultural land in the construction area generally would be taken out of production for one growing season while Project facilities are constructed. However, it is possible that saturated or frozen soil conditions could delay topsoil replacement and final grading until conditions allow for proper soil handling and restoration. In addition, some restoration issues within agricultural areas may develop over time after initial restoration (e.g., trench subsidence, revegetation concerns) that may require additional disturbance of the right-of-way by WBI Energy to correct. Problems with topsoil replacement, compaction, subsidence, rocks, and drainage and irrigation systems resulting from construction in active agricultural areas would continue to be monitored and corrected until restoration is successful. WBI Energy has proposed to negotiate agreements with individual landowners to provide compensation for crop damages or losses caused by Project construction.

Revegetation of agricultural areas would be considered successful when crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise. Resumption of agricultural operations following Project construction and/or planting of a cover crop would aid in the restoration of soil structure and productivity that could take several years to achieve success, depending on site-specific conditions and land use practices. Buildings, structures, wells, reservoirs, obstructions, or removal/addition of cover would not be allowed within the permanent pipeline right-of-way. WBI Energy would minimize impacts and ensure restoration of land disturbed during construction in accordance with the FERC Plan, Procedures, and the other construction, restoration, and mitigation plans identified in this EA.

The Hartels provided comments on maintaining access to a landowner's property during construction and repairing fences and gates damaged during construction. WBI Energy would coordinate with landowners on property access and repair any damage to gates and fences that occurred during construction. Further, the Hartels requested that WBI Energy replace no trespassing" signs on new gates. WBI Energy has committed to install no trespassing signage where required by the landowner agreements. Furthermore, WBI Energy would develop and implement an environmental complaint resolution procedure and would provide that procedure to landowners to resolve any issues that may arise during Project construction and restoration as outlined in section B.9 of this EA.

Based on the land use characteristics identified in the Project area and the implementation of WBI Energy's mitigation plans, it is anticipated that the impacts resulting from construction and operation of the Project on agricultural and developed land would not be significant.

5.2 Residential Areas and Planned Developments

There are no residences (or any other structures) within 50 feet of the construction corridor or other work areas. The Project would not affect residential areas.

WBI Energy consulted with the Williams, Mountrail, McKenzie, and Burke County Planning and Zoning Offices, as well as the planning and zoning offices for Tioga and Watford City to obtain information on any planned future developments (i.e., permitted or proposed residential or commercial developments) in the vicinity of the Project. Based on data provided by each county, there are no planned residential or commercial developments within 0.5 mile of the proposed pipeline.

There are two planned industrial/energy projects within 0.5 mile of the proposed Project. The Aurora Wind Project would encompass approximately 44,000 acres, and consist of a maximum of 121 turbines, with a capacity of 300 megawatts. Construction began in 2019 and the project is anticipated to be in-service by the end of 2020 (Enel Green Power, 2020). Additionally, the Gunslinger Federal and Gladstone Oil and Gas Well Pads project (currently under construction) would include the installation of 10 and 7 wells, respectively. These projects would include the construction of new access roads, as well as associated oil and gas equipment and utilities. The Aurora Wind Project and Gunslinger Federal and Gladstone Oil and Gas Well Pads projects are included in the cumulative impact analysis (section B.10).

5.3 Landfills and Hazardous Waste Sites

WBI Energy reviewed the EPA's EnviroFacts website (EPA, 2019b) and an EPA data set for hazardous sites to identify hazardous waste sites, landfills, or other sites with the potential for soil or groundwater contamination within 0.25 mile of the Project (EPA, 2019c). Additionally, WBI Energy reviewed NDDEQ databases, including Solid Waste Facilities; Environmental Incident Reports; Underground Storage Tank Registry; Leaking Underground Storage Tank Registry; Brownfield Sites in North Dakota; and publicly available NDDEQ GIS data (NDDEQ, 2020). Table B-12 identifies the known hazardous waste sites within 0.25 mile of Project facilities.

Most hazardous waste sites identified within 0.25 mile of the Project are not associated with release or remediation events. Of the four sites identified with existing or historic contamination, two are 0.1 mile or more from the Project area and are described as having completed remediation efforts. The nearest site, Slawson Exploration Company, Inc., is mapped as being 38 feet from the Project area, but is associated with a release and completed remediation of bentonite clay and water. Given that bentonite clay is non-toxic, the release impacted soil only, and remediation is completed, this site is not anticipated to impact Project construction. The remaining site is associated with the same "Lignite Gas Plant" as WBI Energy's proposed Lignite Plant Receipt Station and Lignite Town Border Station activities and is listed with remediation "in progress" for spills of brackish water and condensate. This contamination is mapped as being 50 feet from the Project area; however, the location and extent of contamination have not been verified. It is also unclear if site characterization at the Lignite Gas Plant is complete. Based on this information and because the remediation is ongoing and the location(s) and extent of existing contamination has not been verified, **we recommend that:**

- **<u>Prior to construction</u>, WBI Energy should consult with the NDDEQ to confirm the location(s) and extent of soil and/or groundwater contamination at the Lignite Gas Plant (near the Lignite Plant Receipt Station and Lignite Town Border Station) and the status of remediation efforts. If contaminated**

soil or groundwater remain at the site, WBI Energy should develop management procedures to ensure that construction and operation of the Project would not result in the spread of existing contamination and would not adversely impact on-going remediation efforts. The results of these consultations and any resulting management procedures should be filed with the Secretary for review and written approval by the Director of OEP, or the Director's designee.

Table B-12

Hazardous Waste Sites Within 0.25 Mile of the Project

Facility Site	Location	Distance to Project (miles [feet]) [a]	Direction from Project to Site	Media Affected	Substance of Concern	Status of Remediation
Andeavor High Plains Company LLC Tioga Station	10318 68th Street NW Tioga, ND 58852	0.1	Southeast	N/A	N/A	N/A
Former "The Attic" Building	302 Elm St. NE Tioga, ND 58852	0.2	North	N/A	N/A	N/A
Triple Aggregate LLC – White Earth Pit	1027 S Welo St Tioga, ND 58852	0.1	North	N/A	N/A	N/A
Tioga Gas Processing Plant	10340 68th Street Northwest	0.1	Southeast	N/A	N/A	N/A
Tioga Airport Authority – Tioga Municipal Airport	67th St. NW Tioga, ND 58852	<0.1 [170 feet]	South	N/A	N/A	N/A
Hess Corporation – Tioga Gas Plant Lab	10340 68th Street NW Tioga, ND 58852	0.1	Southeast	Surface Water	Effluent	Complete
Hess Corporation	48.379807, -102.928248	<0.1 [155 feet]	North	N/A	N/A	N/A
Lignite Gas Plant	10050 84th Avenue Lignite, ND 58752	<0.1 [50 feet]	South	Soil	Brackish Water, Condensate	In Progress
Slawson Exploration Company, Inc. – Gunslinger 327 Right-of-way	48.08890, -103.10250	<0.1 [38 feet]	West	Soil	Bentonite Clay and Water	Complete
Area Adjacent to WBI Energy Pipeline Access Road	47.80530, -103.16470	0.3	East	Soil	Hydraulic Fluid	Complete
OXY USA, Inc. – Storage Tank	10050 84th Avenue Lignite, ND 58752	<0.1 [50 feet]	North	N/A	N/A	N/A
Balsam, Inc. – Northern Tank Line Terminal	48.401767, -102.91635	<0.1 [175 feet]	South	N/A	N/A	N/A
Oasis-Johnson 16- 34H	47.7616934, -103.201131	0.1	West	N/A	N/A	N/A

Sources: EPA, 2019b; NDDEQ, 2020

a Distance in feet is provided for any hazardous waste sites less than 0.1 mile from the Project.

Notes: N/A = Not applicable

WBI Energy would adhere to the SPCC Plan to minimize and mitigate for impacts of spills of hazardous materials during construction. It is possible that additional, unknown sites could be encountered along the pipeline route during construction. If any contaminated soils or groundwater are encountered during construction, WBI Energy would implement the measures specified in its Plan for Unanticipated Discovery of Contaminated Environmental Media, and would notify the landowner and, if required, the appropriate regulatory agency, of the discovery.

5.4 Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program administered in North Dakota by the Farm Service Agency that allows owners of agricultural tracts to conserve environmentally sensitive lands with financial assistance from the federal government. Based on WBI Energy's coordination with landowners, there are no CRP lands that would be crossed by the Project; therefore, no impacts on CRP lands would occur.

5.5 Agricultural Conservation Easement Program

The Agricultural Conservation Easement Program is a program administered in North Dakota by the NRCS that combines the purposes of the former Farmland and Ranch Lands Protection Program, Grassland Reserve Program, and Wetland Reserve Program. WBI Energy consulted with the NRCS on a preliminary version of the proposed pipeline routes. Based on this initial consultation, the Project did not cross any Agricultural Conservation Easement Program lands. WBI Energy has sent the current pipeline routes to the NRCS for a second round of review and will provide FERC with the results of these consultations once they are available. The Project is not expected to have any impacts on ACEP lands.

5.6 Public Land, Recreation, and Special Interest Areas

The Project would not cross any wild and scenic rivers; national or state scenic byways; wildlife management areas; old growth forests; designated scenic areas; nature/forest preserves; state, county, or local parks; campgrounds; or natural landmarks. The Project would cross Lake Sakakawea and the LMNG, and would pass through North Dakota Surface Trust Lands and multiple areas of Private Land Open to Sportsmen (PLOTS) lands. Each of these areas is discussed below.

As discussed in section A.1.2, recreation is one of the congressionally authorized purposes of the USACE Garrison Project. Recreational use of Garrison Project lands is encouraged through the availability of public parks and recreational facilities and the Garrison Project is managed to provide a diverse and high quality outdoor recreation experience. Planning for the development and use of recreation facilities is coordinated with tribal, state, county, municipal, and local non-government entities, who lease and manage most of the higher use recreation sites on Lake Sakakawea (USACE, 2007). Lake Sakakawea is a reservoir on the Missouri River and is about 368,000 acres in size. The Project would cross Lake Sakakawea and a small natural pond using the HDD method. The land accessed by the proposed Project to cross Lake Sakakawea is private and, therefore, does not have a public access to USACE land or the lake. Therefore, Project construction would not have a direct impact on recreational opportunities on Lake Sakakawea. The lake crossing would occur approximately 1.3 miles from Tobacco Garden Bay, which has a restaurant, convenience store, bait and tackle shop, as well as

100 campsites, two log cabins, and picnic shelters. This area also provides access to the Birnt Hills Trail and a boat launch on the north side. Temporary indirect impacts on recreational opportunities on Lake Sakakawea would be limited to noise, visual, and traffic impacts during HDD construction.

The Project would cross about 2.1 miles of the LMNG between MPs 27.3 and 27.7 and MPs 28.2 and 29.9 of the Tioga-Elkhorn Creek pipeline. The LMNG is a USFS-managed area and the largest grassland in the United States. This area is open to the public for mountain biking, backpacking/camping, fishing, horseback riding, and small game hunting. The portion of the LMNG crossed by the proposed Project does not contain any designated recreation areas or trails and is classified as having a low Scenic Integrity Objective in the LMNG. The proposed Tioga-Elkhorn Creek pipeline would cross one two track USFS road (at MP 27.3) and one paved/graveled USFS road (MP 29.9), which is 115th Ave NW and primarily managed by McKenzie County. WBI Energy is consulting with the USFS regarding the appropriate permitting and mitigation for these crossings; however, impacts on recreational opportunities within the LMNG are not anticipated. The Hartels provided comment that WBI Energy needs to follow the standards and guidelines in the USFS Land and Resource Management Plan and that the plan provides standards for right-of-way easements on USFS lands. WBI Energy has been in consultation with the USFS to discuss right-of-way easement standards and to minimize any potential impacts on USFS lands. As discussed in section A.1.5, the USFS is a cooperating agency in the preparation of this document and has provided comments and feedback to WBI Energy throughout the FERC pre-filing process.

The Project would cross about 1.0 mile of North Dakota Surface Trust Lands along the Line Section 25 Loop. The Surface Division of the North Dakota Department of Trust Lands manages 706,600 acres held in trust for various schools and institutions. The major source of income on these lands comes from agricultural leases, with grazing being the predominant use. WBI Energy has an existing easement with the North Dakota Department of Trust Lands for Line Section 25, which the Line Section 25 Loop would parallel for this stretch across state land. WBI Energy would coordinate with the North Dakota Surface Trust land to make any required updates to their existing easement for this crossing.

PLOTS lands are areas of private land that are open to hunting based on agreements between the NDGFD and landowners. The PLOTS program also identifies public lands, wildlife management areas, and WPAs open to hunting. These lands provide walk-in public access only, defined as "an individual traveling by foot with any legal firearm or bow, plus other equipment, accessories and provisions for the purposes of hunting" (NDGFD, 2019b). These lands do not allow activities such as horseback riding, placing bait, driving all-terrain vehicles or snowmobiles, or dog training, among other activities, without written permission from the landowner (NDGFD, 2019b).

The Project would cross one section of PLOTS land near MP 0.3 of the Line Section 30 Loop and would run parallel to one PLOTS parcel near MP 10.8 of the Tioga-Elkhorn Creek pipeline. Additionally, one access road would cross a small portion of a PLOTS parcel. In total, the Project would affect 2.3 acres of PLOTS lands. The PLOTS lands change often as new landowners join the program, therefore, WBI Energy would continue to monitor for any additional/new PLOTS lands that would be crossed prior to the start of construction.

Construction of the proposed pipeline facilities is scheduled to begin in spring of 2021 and would overlap with hunting season in the Project area. However, due to the small amount of PLOTS lands crossed, any potential impacts on PLOTS lands would be minor and temporary.

5.7 Grassland Easements

Grassland easements define permanent agreements between the USFWS and all present and future landowners to keep the land in native or restored grassland. WBI Energy's Project would not impact any grassland easements.

5.8 Visual Resources

The Project would affect primarily undeveloped rural, grasslands, or agricultural lands. There are few residences in the vicinity of the Project, and the proposed pipelines would not cross designated scenic areas. Most visual and aesthetic impacts would be limited to the period of active contruction as a result of operating equipment, personnel, and disturbed soil. After pipeline construction is complete, WBI Energy would recontour the landscape to as near preconstruction condition as practicable and revegetate in accordance with the FERC Plan and Procedures. Areas outside of and most areas within the permanent pipeline right-of-way would be allowed to revert to preconstruction condition and uses. WBI Energy states that the portions of the route crossing agricultural and most open land would likely return to preconstruction vegetation cover within one to two growing seasons. The Project would result in the permanent conversion of about 1.1 acres of forest land to open land within the permanent right-of-way, but these areas primarily consist of wooded upland, hedgerows, or stands of trees near wetlands. Forest land within temporary construction areas (about 1.0 acre) would be allowed to revegetate and eventually recover to preconstruction conditions.

The Tioga-Elkhorn Creek pipeline would cross Lake Sakakawea and the LMNG. WBI Energy would cross Lake Sakakawea using the HDD method and the entry points would be offset from the lake. These points may be visible to recreationists and short-term visual impacts could occur; however, WBI Energy would restore these sites to preconstruction conditions so no permanent impacts on Lake Sakakawea would occur. The pipeline would cross the LMNG in an area that has a Low Scenic Integrity Objective, which means that visual disturbances are allowed (USFS, 2019d). The route would not need to clear any forested areas within the LMNG, and WBI Energy would revegetate and restore the right-of-way after construction in accordance with the USFS requirements. WBI Energy is consulting with the USFS on the crossing of any woody draws, which would be completed using the guided bore crossing method to avoid tree clearing. Therefore, the Project would have no permanent visual impacts on USFS land.

Visual impacts from the construction of aboveground facilities are anticipated to be minimal. Table B-15 outlines the proposed new and modified aboveground facilities associated with the Project and the potential visual resource impacts associated with each facility. As shown in section B.7.3, there are currently no historic structures along the Project routes that are recommended as potentially eligible for the National Register of Historic Places (NRHP).

As shown in table B-15, the Tioga Compressor Station, Lignite Plant Receipt Station and Lignite Town Border Station, Robinson Lake Plant Receipt Station, Springbrook Plant Receipt

Station, and Tioga Plant Receipt Station are all existing aboveground facilities that would be modified as part of the Project. Given the existing presence of an industrial facility at these locations, no impacts on the current visual character of these locations is expected.

The new Elkhorn Creek Compressor Station would be constructed primarily on agricultural land and land associated with a retired scoria pit. The nearest residence is over 0.6 mile east of the site. While the compressor station would be a new facility, there are two existing industrial facilities less than 0.25 mile east of the proposed compressor station. The compressor station is expected to be visible from the nearest residence; however, the two existing industrial facilities are also visible from the residence (in the same direction but closer in proximity to the residence). Therefore, we conclude that construction and operation of the new Elkhorn Creek Compressor Station would not cause significant changes to the overall visual character of the area.

The new Norse Transfer Station would be constructed primarily on open land and the nearest residence is approximately 0.5 mile north of the proposed facility. The Norse Transfer Station would be constructed adjacent to the existing Norse Plant Receipt Station. While the proposed station would be visible from the nearest residence, we conclude no significant changes to the overall visual character of the area would occur because the station would be constructed adjacent to an existing facility.

The new Northern Border Interconnect facility would be constructed primarily on agricultural and open land. The nearest residence is approximately 0.6 mile to the southwest of the facility site with an existing industrial facility approximately halfway between the residence and the proposed facility. While the interconnect facility is expected to be visible from the nearest residence, we conclude no significant changes to the overall visual character of the area would occur given the existing energy development present within the viewshed.

6. Socioeconomics

The Project would affect four counties in North Dakota: Williams, Burke, McKenzie, and Mountrail. The proposed pipeline routes primarily cross rural, sparsely populated areas that are dominated by agricultural lands. The routes avoid several of the larger population centers in northwestern North Dakota, such as Bowbells in Burke County, Watford City in McKenzie County, Stanley in Mountrail County, and Williston in Williams County.

In 2018, the combined estimated population for the four counties in the Project area was 61,300 people (U.S. Census Bureau, 2018). The socioeconomic impacts of construction and operation of the Project would be related to the number of construction workers that would work in the Project area and their impacts on population, public services, and employment during construction. Other potential effects include increased local traffic, decreased available housing, and increased local purchases and tax revenue.

6.1 Population

Construction and operation of the Project would not be anticipated to result in significant changes to the existing population. WBI Energy estimates that, for pipeline construction, an

average of approximately 250 temporary construction workers would be required over the 8-month construction period for the pipeline; approximately 1/10th of these workers may be hired locally. Construction of the Elkhorn Creek Compressor Station would require an average of approximately 30 construction workers over the same 8-month period; about 1/3rd of these would be hired locally. Construction at the Tioga Compressor Station would require an average of approximately 45 construction workers over the same 8-month period; about 1/4th of these construction workers would be hired locally. Construction of the remaining aboveground facilities would require an average of 20 construction workers over approximately a 20-day period, of which about 1/4th may be hired locally.

WBI Energy anticipates it would require four additional permanent staff for operation of the pipeline and aboveground facilities. The additional staff would likely be based out of the Tioga and Elkhorn Creek Compressor Stations.

Project construction would result in a temporary influx of non-local construction workers to the Project area for a period of approximately 8 months. However, any increases in population levels are expected to be temporary and minor. Non-local construction workers would likely require temporary housing in the Project area, but this would be limited to the relatively short period of construction and is not expected to significantly affect the local population. The four positions during operation of the Project would represent a negligible permanent increase in population.

6.2 Employment

The unemployment rate in North Dakota was 2.3 percent in 2018, while unemployment rates in Williams, Burke, McKenzie, and Mountrail Counties were 2.0, 1.6, 1.7, and 1.6 percent, respectively (Bureau of Labor Statistics, 2019). WBI Energy estimates that the peak construction workforce would total 450 workers with an average of approximately 350 temporary construction workers. The workforce would consist of local residents, commuters, and workers who would temporarily relocate to the Project area. Construction of the pipeline would be accomplished using three construction spreads with an average temporary workforce of 250 people. Construction of the aboveground facilities would require an average of about 95 people, consisting of a mix of local residents and workers who would temporarily relocate to the Project area. Local workers would likely be residents of the counties in the Project area and/or adjacent counties and would reside within commuting distance of the Project.

Due to the relatively short duration and transient nature of construction, we anticipate that most non-local workers would not be accompanied by their families. The influx of any non-local workers would be temporary and limited to the construction period (about 8 months). The increase in employment for local workers would result in a temporary and negligible impact on unemployment rates in the Project area and a negligible impact on the population and services of the local municipalities.

WBI Energy anticipates that four additional permanent employees would be required to assist in operation and maintenance of the new facilities. These positions would represent only a negligible permanent increase in employment.

6.3 Transportation

Construction activities associated with the Project would result in additional, short-term impacts on transportation infrastructure, such as increased traffic flow due to movement of construction vehicles, personnel, and equipment; construction of the pipeline across roadways; delivery of equipment and materials to the work area; and potential damage to local roadways from heavy construction equipment. The Project would require 2 railroad, 83 public road, and 35 private road crossings (see appendix F). Some roads would be crossed more than once.

WBI Energy would cross 74 paved roads, highways, and railroads by conventional boring and 3 roads by HDD to avoid disruption to traffic. Additionally, WBI energy would cross 43 unpaved farm roads, two-tracks, trails, and driveways, using the open-cut method and would restore these areas to preconstruction conditions.

As part of the proposed HDD crossing of Lake Sakakawea, the pipe pullback would extend across 51st Street NW on the north side of the lake. WBI Energy has proposed a temporary aerial span of this road with the pipe during the pullback, which is anticipated to take between 24 and 36 hours to complete. Should a road closure be necessary, WBI Energy would work with local law enforcement and county agencies, and coordinate with land and business owners, to ensure that impacts on local traffic are minimized.

The Hartels provided comments about construction traffic on the right-of-way and access roads, and safety concerns due to the lack of flaggers warning traffic of construction activity. The movement of construction equipment, materials, and construction personnel would cause a temporary increase in traffic volumes along area roadways. However, impacts from construction-related traffic would be short-term at any location as construction personnel and equipment finish construction of particular areas, and personnel would travel to and from the Project area primarily during early morning and late evening hours. Additionally, construction contractors, vehicles, and equipment would comply with all federal, state, and county regulations, as well as local weight limitations and restrictions on area roadways. WBI Energy would remove any soil that falls onto roadway surfaces from construction equipment (e.g., sweeping construction entrances and installing rock pads at construction entrances to limit tracked soil entering the roadway). Construction across roads and highways would result in short-term, local impacts on public transportation while construction activities pass through the Project area. Most paved roads, highways, and railroads would be crossed by boring beneath the roadbed or railroad, which would reduce potential impacts on transportation during construction. Brief traffic delays may occur when equipment needed to complete a bore or directional drill is brought onto or off of the Project site; however, WBI Energy would use flaggers and signage to safely slow or direct traffic as appropriate. Unpaved farm roads, two-tracks, trails, and driveways, as well as roads in areas with a high water table, would be crossed using the open-cut method and then restored to preconstruction condition. WBI Energy would implement measures (e.g., detours, plating over the open portion of the trench) to maintain passage for landowners and emergency vehicles, as appropriate.

Existing local county and township roads would be used to transport construction equipment to the Project area. WBI Energy's estimates for the number of construction vehicles

are provided in table B-13. Vehicles would include stringing trucks, welding rigs, water trucks, fuel trucks, mechanic trucks, tractor trailers carrying heavy construction equipment, and construction personnel and EI vehicles.

Table B-13

Estimated Daily Vehicle Traffic

Project Facility	Construction and Delivery Vehicles	Construction Personnel Vehicles	Estimated Duration of Construction	Estimated Trips Per Day Per Vehicle	Estimated Total Trips Per Day
Pipelines	75	25	8-months	2	200
Elkhorn Creek Compressor Station	15	5	8-months	2	40
Tioga Compressor Station	22	9	8-months	2	62
Measurement Receipt Stations (typical)	5	2	20 days	2	14
Total	**117**	**41**	**192 days**	**8**	**316**

The Hartels also commented that WBI Energy should use existing access roads and that WBI Energy should be responsible for any damage to those roads. Further, the Hartels commented that WBI Energy should not use privately owned roads to move their equipment. WBI Energy is only permitted to use privately owned roads that are approved by the FERC, as proposed and outlined in this EA. If WBI Energy identifies any additional access roads required for construction or operation of the Project at a later date, it would need to submit a variance request to FERC for approval to use those roads and complete all appropriate federal, state, and local permitting associated with the Project change. FERC requires that the locations of authorized access roads are visibly marked and maintained throughout construction. If damage occurs to access roads during Project construction, WBI Energy would be required to repair any damages to maintain safe road conditions, in accordance with section IV.E. of the FERC Plan, including any damages to roadway surfaces, shoulders, and bar ditches. We find these measures acceptable to ensure access road use is appropriately controlled and any damages mitigated.

WBI Energy anticipates that some workers would carpool to the construction area, thus reducing passenger vehicle load on local roads. During construction, vehicles would be distributed across the Project area according to the specific phase of construction (with the exception of the compressor station traffic), and vehicles involved in construction are anticipated to travel between the laydown yards and the construction workspace approximately one to two times per day. While the total duration of construction along the pipeline route is anticipated to last about 8 months, construction in any distinct location is anticipated to last about 4 weeks and construction activities would be scheduled to take advantage of daylight hours. As such, construction crews would typically avoid peak commuting periods by traveling to the worksite early in the morning and from the worksite later in the evening. Certain construction-related activities such as hydrostatic testing, HDDs, and tie-ins, amongst others, may occur at unspecified times and outside the normal work day. WBI Energy would attempt to schedule these activities (e.g., outside of peak traffic hours) to avoid impacts on local commuter traffic. The Project may create a minor temporary increase in traffic on county and township roads during active construction, but traffic delays are not anticipated. Construction of the pipeline

across paved public roads would be completed using the HDD or guided bore methods; therefore, no impacts from this construction activity on local traffic are anticipated.

WBI Energy would obtain appropriate permits prior to crossing any roads. Obtaining these permits would require direct consultation between WBI Energy and the appropriate state and local agencies and thus would include specific guidance on detour routes; speed/load limits; and other use limitations, conditions, restrictions, or requirements by the issuing agency. WBI Energy would also coordinate with landowners where local, private roadways would be affected to minimize impacts on these roads.

With implementation of WBI Energy's proposed traffic mitigation measures and adherence to applicable permits, we conclude impacts on transportation would be temporary and not significant. The four permanent employees who would be hired for operation and maintenance of the Project facilities would have a negligible permanent effect on traffic patterns.

6.4 Housing

In 2018, the U.S. Census Bureau reported 8,702 vacant housing units available for rent in the four counties that the Project would cross. There are approximately 4,029 hotel/motel rooms in the bigger cities (Tioga, Williston, Watford City) near the proposed Project. Most of the rooms are in the Williston area in Williams County (2,810 rooms) and in or near Watford City (953 rooms) (North Dakota Tourism Division, 2019). Additionally, there are at least eight modular work camps, across McKenzie, Mountrail, and Williams Counties, with a bed capacity of around 2,280 and these areas could provide temporary housing for workers.

As noted above, WBI Energy anticipates that the workforce for the Project would consist of local residents, commuters, and workers who would temporarily relocate to the Project area. The influx of construction workers would temporarily increase the demand for housing in the area; however, WBI Energy is not proposing to construct temporary work camps to accommodate the non-local workers. Due to the short duration of construction (about 8 months) and the sufficient availability of temporary housing options (e.g., housing units, hotel/motel rooms, recreational vehicle and camp sites, man camp openings), the Project would have a temporary and localized impact on housing.

The four additional permanent employees who would be hired for operation and maintenance of the Project facilities would have a negligible permanent effect on housing demand.

6.5 Public Services

WBI Energy has identified the existing inventory of public services in the Project area (Burke, Mountrail, McKenzie, and Williams Counties), which includes 4 hospitals, 20 fire departments, and 24 police departments. We conclude that these services would be adequate in the Project area to support the temporary addition of construction workers in a civil, criminal, or emergency event. WBI Energy would coordinate with these local public services to verify that they are adequately equipped to respond in the unlikely event of a major accident during Project construction.

There are numerous educational facilities near the Project area, particularly near larger population centers. Due to the relatively short duration and transient nature of construction, however, WBI Energy anticipates that most non-local workers would not be accompanied by their families. Therefore, we do not expect local schools to be affected by the temporary influx of non-local workers.

The four additional permanent employees who would be hired for operation and maintenance of the Project facilities would have a negligible permanent effect on public services.

6.6 Eminent Domain, Compensation, and Easement Terms

During scoping, the Hartels commented on eminent domain, compensation for acquisition of a right-of-way, and right-of-way easement lease term length. Pipeline operators must obtain easements from landowners to construct and operate authorized facilities or acquire the facilities' land. Easements can be temporary, granting the operator the use of the land during construction (e.g., extra workspaces, temporary access roads, contractor yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed. An easement agreement between a company and a landowner typically specifies easement term, compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way. Compensation would be fully determined through negotiations between WBI Energy and the landowner. Regarding compensation, WBI Energy states that it would negotiate with affected landowners in good faith to obtain an easement to construct, operate, and maintain the proposed pipeline based on fair market value.

The Hartels commented that WBI has not been willing to fairly negotiate right-of-way and/or surface damage fees with any of their previous lines. The Hartels also stated that WBI Energy used eminent domain in the past to access valuable lands at significantly less value. If an easement cannot be negotiated with a landowner and if the Project is approved by the Commission, the NGA provides the Certificate holder (WBI Energy) with the right of eminent domain under section 7(h) of the NGA and the procedures set forth under the Federal Rules of Civil Procedure (Rule 71A) to acquire the necessary property rights to construct and operate its Project. This right would apply to all Project-related workspace covered by an approval, including the temporary and permanent rights-of-way, aboveground facility sites, contractor yards, access roads, and extra workspaces. An easement gives the natural gas company the right to use the property, but the landowner retains the legal title or ownership of the land itself. WBI Energy would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to federal or state law. WBI Energy would negotiate easement terms with the landowner and would follow the requirements in the North Dakota Century Code T47C05. FERC has no involvement in eminent domain proceedings.

6.7 Economy and Tax Revenue

Construction personnel hired directly or through a third party would have a positive impact on local tax revenues through payroll spending on housing, food, utilities, entertainment, and luxury items. The Project construction payroll is estimated to total approximately $114,487,800 over the duration of the Project, which may help stimulate regional employment as

new workers are hired to meet construction demands. Due to the minimal number (four) of new permanent employees for operation of the Project facilities, there would be insignificant changes to the long-term contribution of payroll to the local economies.

WBI Energy estimates that the cost of construction materials and supplies would be about $71,405,000. Materials such as concrete, stone, erosion control materials, mulch, seed, and fencing are all items that can be purchased from local vendors. These purchases would result in short-term beneficial impacts on local businesses by generating additional revenues and contributing to the tax base. Based on current state sales tax rates, the Project's estimated state sales tax revenues for material and supplies would be about $3,785,000.

In addition, ad valorem, or property taxes, result in long-term benefits to local and regional economies. Ad valorem tax revenues would depend on the length or footprint of Project facilities in each county and would be paid over the life of the Project. Based on estimated property tax rates, WBI Energy estimates that total annual ad valorem tax revenue associated with the Project would be $672,008.

Project construction would result in positive temporary benefits through increased state and local sales tax revenues associated with increased payroll spending and the purchase of construction materials as well as goods and services purchased from local vendors and businesses by the construction workforce. Positive indirect impacts include increased sales for businesses that specifically service construction activities. WBI Energy would also be required to pay county environmental and construction permit fees as well as property taxes on purchased easements during the development phase of the Project, which would generate a small amount of revenue for the counties. As most of these increases in revenue would be temporary, we conclude that Project impacts on the local economies would not be significant.

6.8 Navigation

As discussed in section A.1.2, navigation is one of the congressionally authorized purposes of the USACE Garrison Project. The Missouri River does not support commercial navigation in the portion of the river that the Project would cross. While commercial navigation does not occur in the proposed Project area, the entire mainstem dam system is operated to provide adequate flows to support navigation in the southern reaches (USACE, 2007).

WBI Energy would install the pipeline under Lake Sakakawea using the HDD method. Project construction would not require the use of any barges or other structures within Lake Sakakawea. During construction of the HDD across Lake Sakakawea, the primary method for monitoring for a potential inadvertent release would be the instrumentation in the drilling rig constantly monitoring annulus mud pressure and flowrates. If these gauges indicate a loss of return, drill activities would be temporarily stopped including a pump shut down. Then either a drone would be used to monitor the water surface for turbidity or a small boat would be launched from a dedicated boat ramp to view surface conditions. The water-based portion of the right-of-way would also be inspected by unmanned drone at a minimum of once every 4 hours during daylight hours. As Lake Sakakawea is actively used for recreation, we conclude the addition of one potential motorized boat would not cause impacts on navigation. Once the pipeline is in place, it would be installed between 200 and 300 feet below the lakebed, preventing any

interference with navigation on Lake Sakakawea. Therefore, construction and operation of the proposed Project would have no impacts on navigation.

6.9 Hydropower

As discussed in section A.1.2, hydropower is one of the congressionally authorized purposes of the USACE Garrison Project. The Garrison power plant is operated to assist meeting peak-load demands for hydropower in the Upper Missouri River basin. The plant contains five turbines and generators with a generating capacity of 517,750 kilowatts, which produces about 2.5 billion kilowatt-hours of energy each year. The power is marketed by the Western Area Power Administration and is integrated with the generation provided from other mainstem projects along with other public and private facilities in the market area (USACE, 2007).

Project construction and operation would not divert or appropriate water from Lake Sakakawea; therefore, the Project would not affect lake water volumes or the ability to generate hydropower.

6.10 Environmental Justice

EO 12898 on Environmental Justice recognizes the importance of using the NEPA process to identify and address, as appropriate, any disproportionately high and adverse health or environmental effects of its programs, policies, and activities on minority and low-income populations. Consistent with EO 12898, the CEQ called on federal agencies to actively scrutinize the following issues with respect to environmental justice (CEQ, 1997):

- the racial and economic composition of affected communities;
- health-related issues that may amplify project effects on minority or low-income individuals; and
- public participation strategies, including community or tribal participation in the process.

According to CEQ environmental justice guidance under NEPA (CEQ, 1997) and EPA's Environmental Justice Interagency Working Group's *Promising Practices for Environmental Justice Methodologies in NEPA Reviews* (EPA, 2016), minorities are those groups that include American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. The guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. In this EA, low-income populations are defined as those individuals with reported income below the poverty level.

To determine if the Project would result in disproportionately high and adverse impacts on minority or low-income populations, we used the following criteria to identify potential environmental justice communities:

- Census block groups that have a minority population of more than 50 percent or a minority or other vulnerable population that is 10 percentage points higher than in their respective county; and

- Census block groups that have a household poverty rate that is equal to or greater than that of the county.

Based on the review of census data for block groups within 1 mile of the proposed Project (displayed in table B-14 below), only two block groups meet the definition of an environmental justice community using the EPA's low-income analysis and none meet the definition using the meaningfully greater analysis for minority populations. The poverty levels for Burke County and Census Tract 9533, block groups 1 and 2 are both 7.3 percent. Therefore, these block groups would be considered environmental justice populations as they are equal to the poverty level percentage in the county. The poverty level in Census Tract 9533 is slightly lower than the poverty level for the state of North Dakota (11.0 percent).

As described throughout the EA, potentially adverse environmental effects on surrounding communities associated with the Project, including environmental justice communities, would be minimized and/or mitigated, as applicable. No environmental justice populations are within 1 mile of new aboveground facilities. The Line Section 25 pipeline would cross two block groups containing environmental justice populations. Visual impacts of new rights-of-way along the proposed pipeline route would decrease over time as vegetation becomes reestablished (in most areas between 1-2 years following construction). Area residents may also be temporarily affected by traffic delays during construction of the Project. However, these impacts would be temporary, only lasting the duration of Project construction. Potential pollution emissions from the Project, when considered with background concentrations, would be below the National Ambient Air Quality Standards (NAAQS), which are designated to protect public health and impacts would not be significant (see section B.8.1 for a discussion of air quality impacts). Temporary construction impacts on residents in proximity to construction work areas could include noise. Noise levels resulting from construction would vary over time and would depend upon the number and type of equipment operating, the level of operation, and the distance between sources and receptors. The closest residence to the pipeline is at least 350 feet from project construction. The Project would not result in significant noise impacts on local residents and the surrounding communities (see section B.8.2 for a detailed noise discussion).

Based on our analysis, we conclude that although low income populations exist within the Project area, the Project would not result in disproportionately high and adverse impacts on environmental justice populations within the study area. Impacts on environmental justice populations associated with Line Section 25 would be temporary and not significant.

Table B-14

Environmental Justice Demographic Indicators of Census Blocks in the Vicinity of the Project [a]

State/County	White Alone Not Hispanic or Latino (percent)	African American or Black (percent)	Native American/Alaska Native (percent)	Asian (percent)	Native Hawaiian or Other Pacific Islander (percent)	Some Other Race (percent)	Hispanic or Latino (percent)	**Total Minority [b] (percent)**	Below Poverty Level [c] (percent)
North Dakota	87.7	2.3	5.3	1.4	>0.1	>0.1	3.3	**12.3**	11.0
Burke County	**94.4**	**0.4**	**2.8**	**>0.1**	**>0.1**	**0.6**	**1.6**	**5.4**	**7.3**
Census Tract 9533, Block Group 1	99.4	>0.1	>0.1	>0.1	>0.1	0.6	0.6	**1.1**	7.3 [d]
Census Tract 9533, Block Group 2	89.9	0.8	5.2	0.1	>0.1	0.6	2.5	**9.2**	7.3 [d]
McKenzie County	**82.8**	**0.6**	**13.3**	**0.6**	**>0.1**	**0.6**	**7.0**	**22.1**	**11.7**
Census Tract 9623, Block Group 1	93.2	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	**>0.1**	8.9 [d]
Census Tract 9623, Block Group 2	95.0	>0.1	>0.1	2.4	>0.1	0.3	4.9	**7.6**	8.9 [d]
Mountrail County	**65.9**	**1.1**	**26.9**	**0.4**	**>0.1**	**1.9**	**7.0**	**37.3**	**11.2**
Census Tract 9552, Block Group 1	85.7	3.2	2.4	1.1	>0.1	2.4	8.1	**17.1**	7.3 [d]
Census Tract 9552, Block Group 2	97.9	0.1	0.2	0.2	>0.1	>0.1	1.5	**1.9**	7.3 [d]
Census Tract 9552, Block Group 3	92.3	>0.1	>0.1	>0.1	>0.1	4.9	3.2	**8.1**	7.3 [d]
Williams County	**85.2**	**3.4**	**2.8**	**0.7**	**>0.1**	**3.5**	**6.1**	**16.5**	**9.0**
Census Tract 9534, Block Group 1	96.9	>0.1	>0.1	>0.1	>0.1	>0.1	2.7	**2.7**	4.5 [d]
Census Tract 9534, Block Group 2	93.2	0.6	0.3	>0.1	>0.1	0.8	4.1	**5.9**	4.5 [d]
Census Tract 9536, Block Group 2	93.2	>0.1	4.4	>0.1	0.3	0.1	1.5	**6.2**	7.1 [d]
Census Tract 9536, Block Group 3	85.7	8.8	3.3	0.0	>0.1	>0.1	6.4	**18.5**	7.1 [d]

Source: U.S. Census Bureau, 2017

a Data represents census populations within 1 mile of the Project.

b Minority refers to people who reported their ethnicity and race as something other than non-Hispanic white. Totals may not sum to 100 due to rounding.

c Poverty level is set by the U.S. Census Bureau based on family size and composition; poverty status is determined based on pre-tax income excluding capital gains.

d Value represents the census tract; data for individual block groups is not available.

Note: Shading represents the Environmental Justice communities that would be affected by the Project.

7. Cultural Resources

In addition to accounting for impacts on cultural resources under NEPA, section 106 of the NHPA requires that FERC take into account the effects of its undertakings on historic properties listed, or eligible for listing, on the NRHP,[27] and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. WBI Energy, as a non-federal party, is assisting the Commission in meeting these obligations under section 106 and the implementing regulations as authorized by 36 CFR 800.2(a)(3).

7.1 Area of Potential Effects

As defined by 36 CFR 800.16(d), the area of potential effects (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties." For archaeological resources, the APE is generally defined as the construction footprint for an undertaking, which in the case of the Project encompasses 1,470.3 acres.

To allow for flexibility for Project design and possible avoidance of sensitive cultural resources, WBI Energy examined aboveground facility sites, staging areas, a 50-foot-wide corridor for access roads, and a nominal 300-foot-wide corridor along the proposed pipeline routes. In total, the archaeological survey area for the Project, including areas surveyed for recent route changes, encompassed 4,316.7 acres.

For the Project, the historic structures survey area encompassed the planned construction footprint, as well as a buffer surrounding the proposed facilities and areas where vegetation would be cleared, encompassing the extent of potential viewshed effects up to a maximum distance of 0.5 mile. In total, the study area for historic structures and other aboveground resources encompassed 67,581.2 acres.

7.2 Cultural Resources Investigations

In an effort to identify historic properties within the Project APE and to account for any direct or indirect effects to those properties by the proposed Project, WBI Energy completed cultural resources investigations which included a Class I literature review, Class III archaeological surveys and testing, geomorphological testing, tribal resources surveys, and historic structures surveys. The results of these efforts are summarized in several reports (Derrick et al., 2020a and 2020b; Hajic, 2020; Malloy et al., 2020a; Malloy et al. 2020b, Reich, 2020; Reich et al. 2020). A separate, standalone report describing the results of the archaeological survey on lands managed by the USFS was also prepared at the request of the USFS (Malloy et al. 2020c).

[27] In accordance with 36 CFR 800.16(l)(1), a historic property is any prehistoric or historic district, site, building, structure, object, or property of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization, included in, or eligible for inclusion in, the NRHP. This term includes artifacts, records, and remains that are related to and located within such properties.

Tribal Participation in Cultural Resources Investigations

During the 2019 field season, three tribes expressed interest in participating in surveys to identify tribal resources that might be affected by the proposed Project: Rosebud Sioux Tribe, Assiniboine & Sioux Tribes, and Fort Belknap Indian Community. However, only the Rosebud Sioux Tribe joined the 2019 survey effort. A tribal cultural specialist from the Rosebud tribe monitored survey activities at the end of the mobilization between September 25 and October 16, 2019. The survey examined short segments of pipeline routes and reroutes, ATWS, and access roads. The tribal cultural specialist was present for site delineation activities at nine sites: 32MZ598, 32MZ3314, 32MZ3315, 32MZ3318, 32MZ3222, 32WI976, 32WI2389, 32WI2390, and 32WI2392.

Prior to the 2020 field season, WBI Energy contacted the 13 tribes, each of whom expressed an interest in participating in fieldwork or requested ongoing updates regarding the Project. Tribal cultural specialists from four tribes—Assiniboine & Sioux Tribes, Rosebud Sioux Tribe, Standing Rock Sioux Tribe, and Turtle Mountain Band of Chippewa Indians—monitored fieldwork. Two specialists from the Rosebud Sioux Tribe joined the 2020 survey effort, one of whom worked on behalf of the Sisseton Wahpeton Oyate Tribe.

The tribal cultural specialists monitored all survey, delineation, and testing activities completed in 2020, which included site testing at select sites and survey of route changes and other facility modifications. Additionally, the tribal cultural specialists revisited the prehistoric stone feature sites identified and delineated in 2019. Tribal cultural specialists also participated in a cultural heritage sites survey conducted by WBI Energy in 2020.

7.2.1 Consultation

North Dakota State Historic Preservation Officer

WBI Energy sent the State Historic Preservation Officer (SHPO) an introductory Project letter on April 15, 2019. WBI Energy submitted a survey work plan to the SHPO for review on May 15, 2019, which the SHPO approved on June 5, 2019. WBI Energy sent the SHPO proposed modifications to the work plan in an email on June 14, 2019, which the SHPO approved on June 19, 2019. On February 14, 2020, WBI Energy sent copies of its Class III archaeological and historic structures survey reports to the SHPO for review. WBI Energy received comments from the SHPO on the Class III inventory reports on April 16, 2020. WBI Energy submitted the updated Class III archaeological survey report, the geomorphology report, and the addendum Class III structures report to the SHPO on September 16, 2020. WBI Energy submitted a Class III archaeological survey report of 1.2 miles on private land to the SHPO on September 30, 2020. WBI Energy also submitted the Class III Survey Report Addendum and the Cultural Avoidance and Monitoring Plan to the SHPO on November 10, 2020. Consultation is ongoing.

Federal Agencies

As portions of the Project are on federally administered lands, WBI Energy sent introductory Project letters to the USACE and USFS on April 15, 2019. WBI Energy discussed survey requirements for federal lands with each agency between May 3 and September 13, 2019.

WBI Energy submitted applications for survey permits for archaeological surveys on federal lands to the USACE on May 9, 2019 and the USFS on May 21, 2019. The USFS issued a permit on August 15, 2019 and the USACE issued a permit on September 15, 2019. An archaeologist from the USACE participated in a portion of the archaeological field surveys on USACE lands in September 2019. WBI Energy sent copies of its Class III archaeological and historic structures survey reports to the BLM, USACE, and USFS for review and comment on February 14, 2020. WBI Energy received comments on the reports from all three agencies. WBI Energy submitted the updated Class III archaeological survey report, the geomorphology report, and the addendum Class III structures report to the BLM, USACE, and USFS on September 16, 2020. WBI Energy also submitted a Class III archaeological survey report of 1.2 miles on private land to the agencies on September 30, 2020. Further WBI Energy submitted the Class III Survey Report Addendum and the Cultural Avoidance and Monitoring Plan to all three agencies on November 10, 2020. Consultation is ongoing.

Indian Tribes

WBI Energy contacted the following Indian tribes regarding the Project: Assiniboine and Sioux Tribes of the Fort Peck Reservation, Cheyenne River Sioux Tribe, Fort Belknap Indian Community, Northern Arapaho Tribe, Northern Cheyenne Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Oyate of the Lake Traverse Reservation, Spirit Lake Sioux Tribe, Standing Rock Sioux Tribe, Three Affiliated Tribes of the Fort Berthold Reservation, Turtle Mountain Band of Chippewa Indians, and Yankton Sioux Tribe. On April 15, 2019, WBI Energy sent introductory Project letters to 12 tribes[28] to solicit their comments regarding the potential of the Project to impact cultural resources. Since then, WBI Energy has had multiple meetings and correspondence with the tribes which are detailed in appendix H.

Prior to WBI Energy requesting the pre-filing process for the Project, the Cheyenne River Sioux Tribe sent a letter to FERC via email on May 14, 2019 regarding the proposed Project. The letter indicated that the tribe (1) opposes any new, renewel, or expansion of oil and natural gas pipelines within Treaty Territory; (2) that they want to consult with FERC and not representatives for WBI Energy; (3) they request face to face, government to government consultation with all federal agencies associated with the proposed Project; (4) they request an EIS be developed for the Project; (5) they request tribal involvement in the cultural resources investigations and review of the findings; (6) they request a traditional cultural property survey be conducted; and (7) that the EPA be the lead federal agency for the Project. FERC responded to the tribe on May 16, 2019 via email to let them know that the Project has not been filed with FERC and that once the Project is filed, the tribe would need to file its comments to the docket. On July 1, 2019, FERC sent an email to the Cheyenne River Sioux Tribe stating that WBI Energy has entered the FERC pre-filing review process for their Project and to submit any comments they have regarding the Project to the docket. To date, FERC has received no further correspondence from the Cheyenne River Sioux Tribe.

[28] Fort Belknap Indian Community was not originally contacted by WBI Energy when introductory Project letters were distributed. Consultation with the tribe for the Project began on June 13, 2019 during a joint meeting with the Assiniboine and Sioux Tribes of the Fort Peck Reservation.

In June and July 2019, FERC exchanged multiple emails with the Assiniboine and Sioux Tribes of the Fort Peck Reservation regarding the FERC process, tribal consultation, and participation in cultural resources surveys. FERC also made a follow-up telephone call to the tribe on August 12, 2019, but has not received a response from the tribe.

In an email to FERC on August 22, 2019, the Northern Cheyenne Tribe requested information on tribal participation in field surveys or site visits. In an email on August 30, 2019, WBI Energy renewed its previous invitation to the tribe to participate in ongoing surveys or site visits and reconfirmed a previous commitment to provide copies of survey reports when complete. FERC exchanged emails with the tribe on September 4 and 5, 2019 detailing WBI Energy's efforts to notify and involve tribes in identifying cultural resources that may be affected by the Project and participate in surveys. FERC requested WBI Energy contact the tribe to invite them to participate in the cultural resources surveys, which they did in a subsequent email on September 5, 2019, and in phone messages on September 5 and 6, 2019. On October 9 and 10, 2019, WBI Energy exchanged emails with the Northern Cheyenne Tribe regarding the status of field surveys.

On September 13, 2019 and September 25, 2019, respectively, FERC sent the Project NOI and follow-up consultation letters to 12 federally recognized tribes that were originally contacted by WBI Energy, requesting their comments about the Project and their assistance in identifying properties of traditional, religious, or cultural importance to the tribes that may be affected by the proposed Project.[29]

On September 25 and 30, 2019, FERC exchanged emails with the Oglala Sioux Tribe regarding their interest in receiving a copy of the cultural resources reports for review and whether any tribes were involved in the surveys. FERC informed the tribe that the Rosebud Sioux Tribe was participating in the cultural resources survey at that time.

On April 14, 2020, FERC had email and telephone correspondence with the Northern Arapaho Tribe regarding the Notice of Schedule for the Project. FERC provided a summary of the Project process to date.

The Standing Rock Sioux Tribe contacted FERC via email on September 2, 2020 requesting a site visit as the tribe had some concerns over some cultural resources recorded by WBI Energy. FERC requested WBI Energy set up the site visit and contact the tribes interested in attending. A site visit was conducted on September 11, 2020 with representatives from the Standing Rock Sioux Tribe, Rosebud Sioux Tribe, BLM, USFS, the SHPO, and WBI Energy to visit and address cultural resources of concern to the tribes. A follow-up conference call was held on September 25, 2020 to discuss the site visit, FERC's process, and tribal consultation for

[29] Due to an administrative oversight, the Fort Belknap Indian Community was inadvertently left off FERC's mailing list and was not sent the NOI or the follow-up consultation letters. We have added the tribe to the Project mailing list and will be included in any additional consultation with FERC and will receive notification of the issuance of the EA for the opportunity to review and comment. The Fort Belknap Indian Community was included in WBI Energy's tribal communications regarding the Project.

the Project. Representatives from FERC, Standing Rock Sioux Tribe, BLM, USFS, the SHPO, and WBI Energy attended the meeting.

7.2.2 Cultural Resources Inventory Results

Archaeological Resources Surveys and Testing

During WBI Energy's Class I literature review, it identified 36 previously recorded archaeological resources (15 site leads[30] and 21 archaeological sites) in the Project survey area.

Field methods for the archaeological survey consisted of 15-meter interval pedestrian with supplemental shovel testing. In 2019 and 2020, WBI Energy conducted Class III archaeological surveys in support of the Project. Investigations were completed along 20.3 miles of the Line Section 25 Loop, 0.5 mile of the Tioga Compressor Lateral, 60.1 miles of the Tioga-Elkhorn Creek Pipeline, 0.3 mile of the Elkhorn Creek to Northern Border Pipeline, 8.8 miles of the Line Section 30 Loop, and three uprate sites. In addition, WBI Energy surveyed all aboveground facility locations, 12 staging areas, and 83 of 86 access roads. In total, 4,261.6 of 4,316.7 acres (99 percent) of the Project survey area has been surveyed for archaeological resources.[31] One hundred and thirty-nine archaeological resources were recorded during the Class III survey for the Project including 99 archaeological sites, 26 isolated finds, and 14 site leads. Information on these resources is provided in appendix I. WBI Energy also conducted archaeological site testing on 17 archaeological sites to assess the potential for intact subsurface deposits.

Of the 99 archaeological sites that have been identified within the Project survey area, WBI Energy recommended 26 sites as not eligible for listing on the NRHP and that no further work at these sites was necessary. 68 sites remain unevaluated for listing in the NRHP. WBI Energy also recommended five archaeological sites as eligible for inclusion in the NRHP.

WBI Energy designed the Project to avoid eligible and unevaluated archaeological sites with a minimum 50-foot buffer between site boundaries and the nearest workspace. For sites greater than 100 feet from Project workspaces, no further actions are recommended. For sites under 100 feet from Project workspaces, WBI Energy would install fencing along the edge of the workspaces in the vicinity of the sites and maintain the fencing for the duration of construction to ensure they are adequately protected during Project construction. Further, WBI Energy would conduct archaeological monitoring during construction at these sites. WBI Energy has developed a cultural resources avoidance and monitoring plan for construction in consultation with the SHPO, participating agencies, and tribes. In total, 37 eligible or unevaluated archaeological sites are under 100 feet from the proposed construction workspaces for the

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[30] Site leads are defined by the state of North Dakota as areas containing cultural resources identified by a landowner or other nonprofessional; an area with five or less artifacts visible on the surface that may have intact subsurface cultural deposits; or architectural sites that have not been fully recorded due to being located outside of a given project area or where property access has been denied (SHSND, 2018). If an archaeological site or historic structure was identified by WBI Energy based on a site lead, it was recorded as such and included in the total number of archaeological sites and/or historic structures for this Project.

[31] Of the 1,470.3 acres encompassing the construction footprint for the Project (APE), 1,429.9 acres (97 percent) have been surveyed for archaeological resources.

Project. Of the 37 sites, site 32WI976, would be drilled under via HDD, in which the pipe would be installed at depths ranging from 80-110 feet below the ground surface in the location of the site.

The Project is unlikely to result in indirect effects on archaeological sites based on the ACHP's definition of indirect effects. There are no development plans associated with the Project that would result in reasonably foreseeable impacts that are later in time or farther removed in distance from the Project. Construction would result in visual effects and noise due to operating equipment in the settings of archaeological sites near to, but outside, of the area of direct physical impact, but the effects would be temporary. No impacts on archaeological sites outside the area of direct impact would result from operation of the pipelines or aboveground facilities. Therefore, no indirect effects on archaeological resources are anticipated by the proposed Project.

Approximately 55 acres have not been surveyed for cultural resources. WBI Energy would complete the survey as soon as access is obtained, and field conditions permit. None of the remaining areas that require survey are on federal lands.

Geomorphological Testing

WBI Energy identified nine locations along the proposed pipeline routes, each consisting of one or more waterbody crossings and associated alluvial and colluvial surfaces, with the potential to contain deeply buried archaeological deposits. These locations are: White Earth Creek Valley, Beaver Creek Valley (two crossings), Missouri River Valley, Tobacco Garden Creek Valley (three crossings), Tributary to Tobacco Garden Creek, and Cherry Creek Valley. WBI Energy conducted coring and augering at eight locations to test for the presence of intact buried prehistoric cultural deposits based on the presence of favorable depositional environments of appropriate age. Other than bison bone fragments that cannot be attributed to past human behavior, the only artifact encountered is a piece of chert debitage recovered from a core in Beaver Creek Valley. Based on observations and assessments of the testing efforts, monitoring (trench inspection) at eight of the nine crossings was recommended due to their potential to contain buried archaeological deposits at depths that would be impacted by pipeline trenching. WBI Energy has committed to preparing a monitoring and avoidance plan for the Project, which would include the trench inspections based on the geomorphological assessment.

Traditional Cultural Sites Survey

In 2020, WBI Energy conducted a traditional cultural sites survey. WBI Energy sent invitations to all the tribes to participate in the surveys. Tribal representatives from the Turtle Mountain Band of Chippewa, Fort Peck Assiniboine and Sioux Tribes, Rosebud Sioux, Standing Rock Sioux, and Mandan, Hidatsa, and Arikara Nation participated in the survey. Additionally, a tribal cultural specialist from the Rosebud Sioux Tribe acted as a representative for the Sisseton-Wahpeton Oyate of the Lake Traverse Reservation. A total of 65 traditional cultural sites were identified and recorded during the survey. The sites are on property managed by the USFS, North Dakota State Trust Land, and private property. Due to the importance of the sites to the tribes, WBI Energy has committed to avoiding traditional cultural properties sites during

Project construction and operations. Therefore, the Project would have no adverse effect on these resources.

Historic Architectural Resources Survey

To assess the potential of the Project to affect historic architectural resources, WBI Energy documented historic architectural resources within the APE for direct effects plus a buffer of up to 0.5 mile to encompassing potential viewshed impacts from the proposed facilities. Prior to survey, WBI Energy conducted a Class I literature review to identify previously recorded historic structures within and near the survey areas for the Project. Five previously recorded historic architectural resources were identified within the Project APE.

In 2019 and 2020, WBI Energy conducted two Class III surveys of historic architectural resources, of which 18 historic architectural resources were documented, including the five previously recorded sites. Information on these sites is provided in appendix I. Seven resources are recommended not eligible for listing in the NRHP. Eleven structures have not been evaluated for inclusion in the NRHP, however, as there would be no vegetation clearing or aboveground facilities constructed within the structures' viewsheds, these resources would not be adversely affected by the Project.

7.3 Unanticipated Discovery Plan

WBI Energy developed a Project-specific plan for the unanticipated discovery of cultural resources and/or human remains. The plan establishes procedures to be implemented in the event that previously unreported historic properties or human remains are found during construction of the Project. Copies of the plan were appended to the Class III archaeological survey reports, which WBI Energy sent on February 14, 2020 to the SHPO, BLM, USACE, USFS, and federally recognized tribes who requested copies.

7.4 Compliance with the National Historic Preservation Act

Section 106 compliance requirements with the NHPA for the proposed Project are incomplete. To ensure that FERC's responsibilities under the NHPA and its implementing regulations are met for the Project, **we recommend that:**

- **WBI Energy <u>should not begin construction</u> of facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

    a. WBI Energy files with the Secretary:

        i. remaining cultural resources survey reports;

        ii. site-specific evaluation reports, avoidance plans, monitoring plans, and/or treatment plan(s), as required; and

        iii. comments on the cultural resources reports and plans from the SHPO, USACE, USFS, and/or tribes, as applicable;

b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

c. the FERC staff reviews and the Director of the OEP, or the Director's designee, approves the cultural resources reports and plans and notifies WBI Energy in writing that avoidance and/or treatment measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All materials filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CUI/PRIV –DO NOT RELEASE."

8. Air Quality and Noise

8.1 Air Quality

Air quality would be affected by construction and operation of the Project. This section addresses the construction- and operation-based emissions from the Project as well as applicable regulatory requirements and projected impacts on air quality. The term *air quality* refers to the relative concentrations of pollutants in the ambient air.

Combustion of fossil fuels, such as natural gas, produces criteria air pollutants, such as nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and inhalable particulate matter ($PM_{2.5}$ and PM_{10}). $PM_{2.5}$ includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM_{10} includes particles with an aerodynamic diameter less than or equal to 10 micrometers. Combustion of fossil fuels also produces volatile organic compounds (VOCs), a large group of organic chemicals that have a high vapor pressure at room temperature; and nitrogen oxides (NO_X). VOCs react with NO_X, typically on warm summer days, to form ozone, which is another criteria air pollutant. Other byproducts of combustion are greenhouse gases (GHG) and hazardous air pollutants (HAP). HAPs are chemicals known to cause cancer and other serious health impacts.

Other pollutants, not produced by combustion, are fugitive dust and fugitive emissions. Fugitive dust is a mix of $PM_{2.5}$, PM_{10}, and larger particles thrown up into the atmosphere by moving vehicles, construction equipment, earth movement, and/or wind erosion. Fugitive emissions, in the context of this EA, would be fugitive emissions of methane (CH_4) and/or VOCs from operational pipelines and aboveground facilities.

The subsections below describe well-established air quality concepts that are applied to characterize air quality and to determine the significance of increases in air pollution. This includes metrics for specific air pollutants known as criteria pollutants, in terms of ambient air quality standards, regional designations to manage air quality known as Air Quality Control Regions (AQCR), and the ongoing monitoring of ambient air pollutant concentrations under state and federal programs.

As described in section A.2, the purpose and need for the Project includes providing a mechanism to transport natural gas captured at the oil production well heads that is currently

being flared. Flaring at the well head is an inefficient method of combustion. Further, natural gas flared at the wellhead is "rich gas," which often contains other hydrocarbons and compounds beyond just CH_4. WBI Energy states that one of the barriers to capturing the flared gas in the region is lack of gas processing and transportation options. Although the natural gas to be captured and transported as part of this Project would likely also eventually be combusted, this ultimate combustion would occur in a more controlled and efficient manner, burning a refined natural gas product with fewer air pollutants.

Existing Air Quality

The Project would be in McKenzie, Williams, Mountrail, and Burke Counties, North Dakota, with the two proposed compressor stations in Williams and McKenzie Counties. The climate of the Project area is characterized as continental with cold, dry, and windy winters and warm to hot windy summers. North Dakota is in the transition zone between the moist eastern United States and the semi-arid western states, as precipitation and humidity decrease from east to west. Annual average precipitation for Williams County is 14.9 inches and 15.8 inches in McKenzie County (National Centers for Environmental Information, 2019). Temperatures peak in July at about 86 degrees Fahrenheit (°F) and plummet to an average low of 4°F in January.

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, which established NAAQS for six criteria pollutants: ground-level ozone, CO, NO_2, SO_2, respirable and fine particulate matter (inhalable PM_{10} and $PM_{2.5}$), and airborne lead, to protect public health and welfare (referred to as primary standards), and to protect plant and animal life, buildings, and other features in the public interest (referred to as secondary standards) (EPA, 2015). The EPA oversees the implementation of the CAA and establishes NAAQS to protect human health and welfare. While states have the authority to adopt more stringent Ambient Air Quality Standards for other pollutants, North Dakota has adopted the federal primary and secondary NAAQS. In addition, North Dakota has established Ambient Air Quality Standards for hydrogen sulfide. Ozone develops as a result of a chemical reaction between NO_X and VOCs in the presence of sunlight. Accordingly, NO_X and VOCs are often referred to as ozone precursors. $PM_{2.5}$ may be directly emitted and can also be secondarily formed in the atmosphere as a result of SO_2 and NO_X emissions. SO_2 and NO_X are also referred to as $PM_{2.5}$ precursors. Table B-15 lists NAAQS for the criteria pollutants described above.

AQCRs are areas established for air quality planning purposes in which State Implementation Plans (SIP) describe how ambient air quality standards would be achieved and maintained. AQCRs were established by the EPA and local agencies, in accordance with section 107 of the CAA and its amendments, as a means to implement the CAA and comply with the NAAQS through SIPs. The AQCRs are intrastate and interstate regions such as large metropolitan areas where the improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. The entire Project site would be within the 172 AQCR. AQCR designations fall under three general categories as follows: attainment (areas in

Table B-15

National Ambient Air Quality Standards

Pollutant	Averaging Period	Standards	
		Primary	Secondary
Sulfur dioxide (SO_2)	1-hour [l,m]	75 ppb	
		196 µg/m^3	0.5 ppm
	3-hour [b]	--	
			1300 µg/m^3
	Annual [a,m]	0.03 ppm	--
		80 µg/m^3	
	24-hour [b,m]	0.14 ppm	--
		365 µg/m^3	
PM_{10}	24-hour [d]	150 µg/m^3	150 µg/m^3
$PM_{2.5}$ (2012 Standard)	Annual [e]	12.0 µg/m^3	15.0 µg/m^3
$PM_{2.5}$ (2006 Standard)	24-hour [f]	35 µg/m^3	35 µg/m^3
Nitrogen Dioxide (NO_2)	Annual [a]	0.053 ppm (53 ppb)	0.053 ppm (53 ppb)
		100 µg/m^3	100 µg/m^3
	1-hour [c]	100 ppb	--
		188 µg/m^3	
Carbon Monoxide (CO)	8-hour [b]	9 ppm	--
		10,000µg/m^3	
	1-hour [b]	35 ppm	--
		40,000 µg/m^3	
Ozone (2008 Standard)	8-hour [g,h]	0.075 ppm	0.075 ppm
Ozone (2015 Standard)	8-hour [i]	0.070 ppm	0.070 ppm
Ozone (O3)	1-hour [j,k]	0.12 ppm	0.12 ppm
Lead (Pb)	Rolling 3-month [a]	0.15 µg/m^3	0.15 µg/m^3

a Not to be exceeded
b Not to be exceeded more than once per year
c Compliance based on 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area
d Not to be exceeded more than once per year on average over 3 years
e Compliance based on 3-year average of weighted annual mean PM2.5 concentrations at community-oriented monitors
f Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population-oriented monitor within an area
g Compliance based on 3-year average of fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area
h The 2008 8-hour ozone standard would remain in effect until one year after an area is designated for the 2015 8-hour ozone standard, which corresponds with January 16, 2019 based upon attainment designations for the 2015 ozone standard issued on January 16, 2018
i Permit applications that have not met EPA's grandfathering criteria would have to demonstrate that the proposed project does not cause or contribute to a violation of any revised ozone standards that are in effect when the permit is issued, including the 2015 revised standards
j Maximum 1-hour daily average not to be exceeded more than one day per calendar year on average
k The 1-hour ozone standard has been revoked in all areas in which Project activities would occur
l Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average at each monitor within an area
m. The 24-hour and annual average primary standards for SO2 have been revoked

ppm = parts per million by volume; ppb = parts per billion by volume.
µg/m^3 = micrograms per cubic meter.

compliance with the NAAQS); nonattainment (areas not in compliance with the NAAQS); or unclassifiable. AQCRs that were previously designated nonattainment but have since met the requirements to be classified as attainment are classified as maintenance areas. The 172 AQCR is designated as unclassifiable and/or attainment for all criteria pollutants per 40 CFR 81 and has no areas that have maintenance status.

Greenhouse Gases

GHGs [32] occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. GHGs are gases that absorb infrared radiation in the atmosphere, and an increase in emissions of these gasses has been determined by the EPA to endanger public health and welfare by contributing to global climate change. The most common GHGs emitted during fossil fuel combustion and natural gas transportation are carbon dioxide (CO_2), CH_4, and nitrous oxide. Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_2e), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of CO_2 over a specific timeframe, or its GWP. The 100-year GWP of CO_2 is 1, CH_4 is 25, and nitrous oxide is 298. During construction and operation of the Project, these GHGs would be emitted from non-electrical construction and operational equipment, as well as from fugitive CH_4 leaks from the pipeline and aboveground facilities.

On November 8, 2010, the EPA signed a rule that finalizes reporting requirements for the petroleum and natural gas industry under 40 CFR 98. Subpart W of 40 CFR 98 requires petroleum and natural gas facilities that emit 25,000 metric tons or more of CO_2e per year to report annual emissions of specified GHGs from various processes within the facility. Construction emissions are not covered under the GHG Reporting Rule, but those related to the proposed Project are expected to be well below the 25,000 metric tons reporting threshold. Operational emissions from the proposed facilities are expected to exceed this threshold and be reported to the EPA. The EPA has expanded its regulations to include the emission of GHGs from major stationary sources under the Prevention of Significant Deterioration (PSD) program. The EPA's current rules require that a stationary source that is major for a non-GHG-regulated New Source Review pollutant must also obtain a PSD permit prior to beginning construction of a new or modified major source with mass-based GHG emissions equal to or greater than 100,000 tons per year (tpy) and significant net emission increases in units of CO2e equal to or greater than 75,000 tpy. There are no NAAQS or other significance thresholds for GHGs.

Permitting/ Regulatory Requirements

The Project would be potentially subject to a variety of federal and state regulations pertaining to the construction and operation of air emission sources. The CAA, 42 USC 7401 et seq., as amended in 1977 and 1990, and 40 CFR Parts 50 through 99 are the basic federal statutes and regulations governing air pollution in the U.S. The NDDEQ has the primary jurisdiction over air emissions produced by stationary sources associated with the Project. The NDDEQ is

[32] GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers.

delegated by the EPA to implement federal air quality programs. The following sections summarize the applicability of various federal and state regulations.

Prevention of Significant Deterioration/Nonattainment New Source Review

The Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) air permit programs are designed to protect air quality when air pollutant emissions are increased either through the construction of new major stationary sources or major modifications to existing stationary sources. The NDDEQ administers the NSR and PSD programs in North Dakota.

PSD regulation defines a major source as any source type belonging to a list of named source categories that have potential to emit 100 tpy or more of any regulated pollutant or 250 tpy for sources not among the listed source categories. These are referred to as the PSD major source thresholds. Based on the estimated operating emissions presented in table B-19 in the General Impacts and Mitigation section below, major source NSR permits would not be required for the Project. Both the Tioga and Elkhorn Creek Compressor Stations would be classified as new minor sources.

Title V Permitting

Title V is an operating air permit program run by each state for each facility that is considered a "major source." The major source threshold for an air emission source is 100 tpy for criteria pollutants, 10 tpy for any single HAP, and 25 tpy for total HAPs. Based on the potential emissions for each stationary source, the Tioga Compressor Station meets the definition of a major source and would be required to obtain a Title V major source permit. The Elkhorn Creek Compressor Station does not meet the definition of a major source and would not be subject to Title V permitting, but would require a permit to construct and a minor source permit to operate.

New Source Performance Standards

The New Source Performance Standards (NSPS), codified in 40 CFR 60, establish pollutant emission limits and monitoring, reporting, and recordkeeping requirements for specific emission source categories. The NSPS apply to new, modified, or reconstructed sources. The applicable NSPS to the Project are described below.

NSPS Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

NSPS subpart JJJJ applies to all new stationary spark ignition internal combustion engines, including auxiliary power units. At the Tioga Compressor Station, WBI Energy would install three 3,750 hp spark ignition internal combustion engines to drive the compressors and one 1,380 hp backup engine. At the Elkhorn Creek Compressor Station, WBI Energy would install one 3,750 hp spark ignition internal combustion engine to drive a compressor. The new spark ignition natural gas-fired engines would meet emission standards for NO_X, CO, and VOCs. The engines to be purchased by WBI Energy would be certified to meet the requirements of this NSPS.

Federal Class I Area Protection

The U.S. Congress designated certain lands as Mandatory Federal Class I areas in 1977. Class I areas were designated because the air quality was considered a special feature of the area (e.g., in national parks or wilderness areas). These Class I areas, as well as any other areas that have been re-designated Class I since 1977, are given special protection under the PSD program. This program establishes air pollution increment increases that are allowed by new or modified air emission sources. If the new source is a major PSD source and is near (within 100 kilometers [km] of) a Class I area, the source is required to determine its impacts on the Class I area. The source also is required to notify the appropriate federal land manager for the nearby Class I area. There are three Class I areas within 100 km of the proposed compressor stations: Theodore Roosevelt National Park, the Lostwood Wilderness Area, and the Medicine Lake Wildlife Refuge (approximately 4.3 miles to the southwest, 21 miles to the northeast, and 59 miles to the west, respectively, of the nearest proposed compressor station). Neither of the compressor stations associated with the Project would be considered major PSD sources that would trigger an impact analysis for Class I areas by the EPA. Based on consultations with the NDDEQ, due to the proximity of the Tioga Compressor Station to the Lostwood Wilderness Area, WBI Energy completed an assessment of the station's annual NO_2 impact on the wilderness area[33]. The results of this assessment show that maximum annual NO_2 impacts from the Tioga Compressor Station are below the Class 1 NO_2 Annual Significant Impact Level threshold.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

The NESHAP, codified in 40 CFR Parts 61 and 63, regulate HAP emissions. Part 61 was promulgated prior to the 1990 Clean Air Act Amendments (CAAA) and regulates specific HAPs, such as asbestos, benzene, beryllium, inorganic arsenic, mercury, radionuclides, and vinyl chloride.

The 1990 CAAA established a list of 189 HAPs, while directing EPA to publish categories of major sources and area sources of these HAPs, for which emission standards were to be promulgated according to a schedule outlined in the CAAA. These standards, also known as the Maximum Achievable Control Technology standards, were promulgated under Part 63. The 1990 CAAA defines a major source of HAPs as any source that has a PTE of 10 tpy for any single HAP or 25 tpy for all HAPs in aggregate. Area sources are stationary sources that do not exceed the thresholds for major source designation.

The Elkhorn Creek and the Tioga Compressor Stations would not be major sources of HAPs. The Tioga Compressor Station would include the addition of new compressor engines and a generator engine. The Elkhorn Creek Compressor Station would also have compressor engines but not any generator engines. The Project's compressor and generator engines would require compliance with NESHAP Subpart ZZZZ. Compliance with Subpart ZZZZ is demonstrated by meeting the requirements of NSPS JJJJ.

[33] The assessment can be found on FERC's eLibrary, accession number 20200728-5193

General Conformity

The General Conformity Rule was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the NAAQS. A general conformity analysis must be conducted by the lead federal agency if a federal action would result in the generation of emissions that would exceed the general conformity applicability threshold levels of the pollutants(s) for which an AQCR is in nonattainment. According to Section 176(c)(1) of the CAA (40 CFR §51.853), a federal agency cannot approve or support any activity that does not conform to an approved SIP. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of an existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

General Conformity assessments must be completed when the total direct and indirect emissions of a planned project would equal or exceed the specified pollutant applicability emission thresholds per year in each nonattainment area.

As stated previously, the entire Project area is designated as attainment for the NAAQS and a general conformity determination is not required.

Greenhouse Gas Mandatory Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000 metric tons of GHGs (as CO_2e) in one year. The Mandatory Reporting Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emission. Although the rule does not apply to construction source emissions, we have provided GHG construction emission estimates as CO_2e for accounting and disclosure purposes (see table B-18 below). Based on the emission estimates presented, actual GHG emissions from operation of the compressor stations would likely exceed the 25,000-tpy reporting threshold; therefore, reporting requirements for the Mandatory Reporting Rule would be applicable to the Project.

State Regulations

This section discusses the potentially applicable state air regulations for the Project. Emissions resulting from the Project are subject to North Dakota air quality standards, regulated by the NNDEQ Division of Air Quality under NDAC 33-15. This regulation requires WBI Energy to obtain a construction permit for the proposed compressor stations. WBI Energy submitted its state construction permit application on February 14, 2020, which addresses the applicable regulations.

Applicable North Dakota Air Quality Regulations

NDAC 33-15-02 establishes ambient air quality standards that are identical to the NAAQS promulgated by the EPA, with the exception of a state standard for hydrogen sulfide. Emissions of hydrogen sulfide associated with the Project would be negligible and would only occur during infrequent blowdown events of pipeline sections for maintenance. NDAC 33.1-15-03 restricts emission of visible air contaminants. This regulation applies to both point sources and fugitive sources of visible emissions. WBI Energy would maintain equipment to not exceed opacity standards and perform construction to minimize dust as outlined in its Fugitive Dust Control Plan.

NDAC 33.1-15-04 establishes restrictions on open burning. No open burning is planned; however, if the need arises, WBI Energy would follow all requirements stipulated in 33.1-15-04 for permissible open burning. NDAC 33.1-15-05 addresses emission requirements of particulate matter from industrial processes. Emissions of particulate matter during operation of the Project would not exceed any of the emission limitations set forth in NDAC 33.1-15-05 table 3.

NDAC 33.1-15-07-01 and 33.1-15-07-02 address emission requirements for VOCs. Per 33.1-15.07-02, no person is allowed to emit organic compound gases and vapors, except from an emergency vapor blowdown system or emergency relief system, unless these gases and vapors are burned by flares or an equally effective control device as approved by the NDDEQ Division of Air Quality. Minor sources, as determined by the NDDEQ Division of Air Quality and not subject to NSPS, may be granted exemptions to this subsection. WBI Energy would follow all requirements and each flare would be required to be equipped and operated with an automatic igniter or a continuous burning pilot.

NDAC 33.1-15-08 addresses operation and control of internal combustion engines. WBI Energy would comply with the requirements of NDAC 33-15-08-01 and 33-15-08-02 by operating internal combustion engines and exhaust emission control devices in a reasonable and appropriate manner according to manufacturer specifications.

NDAC 33.1-15-17 restricts fugitive emissions from any source, including emissions of particulate (dust) and various gaseous emissions including those subject to an ambient air quality standard or PSD increment, an odorous substance, or those subject to the restrictions of a visible air contaminant. WBI Energy would comply with the applicable requirements of this regulation during construction and operation of the Project. Information regarding specific techniques for the control of fugitive dust during construction is included in the Project's Fugitive Dust Control Plan.

NDAC 33.1-15-22 addresses emission standards for HAPs. Emission standards for this chapter are the federal NESHAPs incorporated by reference. WBI Energy would comply with NDAC 33.1-15-22 by complying with the federal NESHAPs, which were previously addressed in the federal air quality requirements section above.

North Dakota Dispersion Modeling and Air Toxics Review

Air dispersion modeling is required to obtain a permit to construct for compressor engines pursuant to a NDDEQ Division of Air Quality January 23, 2015 memorandum, unless certain conditions are met, including emissions from all compressor engines are controlled with a catalytic emission control system, emissions at the facility are vented from a stack height equal to or greater than 1.5 times the nearest building height, and if the facility is less than 0.25 mile from a residence, combined air toxics emissions from the entire facility must be less than 10 tpy, and benzene and formaldehyde emissions are each less than 2 tpy. The Elkhorn Creek CS would not exceed the NDDEQ modeling thresholds; however, the Tioga CS would exceed the NDDEQ modeling thresholds, presented in table B-16. During consultation between WBI Energy and NNDEQ, NDDEQ determined that only 1-hour NO_2 would require criteria pollutant air dispersion modeling.

Table B-16

Significant Impact Level (SIL) Analysis

Pollutant	Averaging period	Project Impact ($\mu g/m^3$)	Significant Impact Area (km)	SIL ($\mu g/m^3$)	SIL
NO_2	1-hour	124.42	50.0	7.5	Yes

($\mu g/m^3$) = micrograms per cubic meter

The project-only impacts exceed the SIL for 1-hour NO_2. As such, impacts from the facility, in combination with the background concentration, were evaluated for 1-hour NO_2 for comparison with the NAAQS. Although the Tioga Compressor Station is an existing facility, there were no NO_2 emissions from any of the existing emission units located at the facility, as shown in table B-17. Therefore, only the project-related sources were included in the NO_2 cumulative analysis.

Table B-17

Summary of Cumulative NAAQS Analysis

Pollutant	Averaging Period	Facility Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	NAAQS Exceeded?
NO_2	1-hour	115.14	35	150.14	188	No

Modeling results show that the 1-hour NO2 NAAQS is not exceeded. Therefore, the Tioga Compressor Station demonstrates compliance with the NAAQS. According to the NDDEQ *Criteria Pollutant Modeling Requirements for a Permit to Construct* memo published on October 6, 2014[34], the potential emissions from the facility for CO, PM_{10}, $PM_{2.5}$, and SO_2 were below the significant levels for projects not subject to PSD; therefore, no modeling would be required for these pollutants. No further air dispersion modeling is required per NDDEQ Division of Air

[34] https://deq.nd.gov/aq/modeling/

Quality guidelines as both the Tioga and Elkhorn Creek Compressor Stations meet the specified requirements.

North Dakota requires an air toxics review to be completed for any source that is required to submit a permit to construct that has the potential to emit HAPs. The air toxics review is a stepped approach of comparing HAP concentrations to acceptable values by reviewing the maximum individual carcinogenic risk. The analysis allows the NDDEQ Division of Air Quality to determine if the emission sources require additional review. The air toxics review is part of the permit to construct applications WBI Energy submitted to the NDDEQ for each of the compressor stations[35].

General Impacts and Mitigation

Construction

Project construction would result in temporary, localized emissions that would last the duration of construction activities (i.e., up to 8 months). Exhaust emissions would be generated by the use of diesel- or gasoline-powered heavy equipment and trucks used by construction workers commuting to and from work areas. Construction activities would also result in the temporary generation of fugitive dust due to vegetation clearing and grading, ground excavation, and driving on unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic and types, and fine-textured soils subject to surface activity.

Construction emissions were estimated based on the fuel type and anticipated frequency, duration, capacity, and levels of use of various types of construction equipment. Construction emissions were calculated using emission factors provided in EPA AP-42 data, 40 CFR 98 Table C-2, and the EPA's NONROAD 2008 and MOVES 2014a models.

Estimated construction emissions for the Project are shown in table B-18. These construction emissions would occur over the duration of construction activity and would be emitted at different times and locations along the length of the Project between March and October 2021. As such, impacts from construction equipment would be temporary and should not result in a significant impact on air quality. The construction emissions listed do not include any venting of the pipeline segments under construction or the equipment at the compressor stations[36]. Blowdowns that would occur as part of startup and commissioning of the compressor stations were estimated as part of the operation emissions for those facilities but identified as part of the commissioning process.

WBI Energy would minimize construction emissions by operating equipment on an as-needed basis, following equipment manufacturer operating recommendations to maximize fuel efficiency, and contractually requiring the construction contractor to minimize emissions by limiting idling of equipment and following state and federal emission standards for air quality regulations. The Hartels commented on dust created by construction traffic on the right-of-way.

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35 Appendix E, Resource Report 9

36 Detailed emissions are provided as part of resource report 9, accession number 20200214-5293

WBI Energy would implement measures in its Fugitive Dust Control Plan, which we have reviewed and find acceptable, to reduce fugitive emissions including:

- utilizing existing highways, frontage roads, and secondary roads for access to the Project's construction right-of-way;
- reducing vehicle speeds on unpaved roads;
- cleaning construction entrance/exit access locations onto paved roads at a minimum of once every 48 hours, or as needed, if materials are observed to be accumulating on the road surface; and
- applying dust suppressants to disturbed work areas and unpaved access roads.

Table B-18

Construction Emissions (tpy)

Construction Activity	CO	NOx	PM_{10}	$PM_{2.5}$	SO_2	VOC	HAP	CO_2e
Tioga Compressor Station	1.54	1.37	1.14	0.25	0.0	0.23	0.05	41.36
Elkhorn Creek Compressor Station	1.57	1.22	1.38	0.28	0.0	0.21	0.05	55.45
Tioga-Elkhorn Creek Pipeline	14.23	18.18	143.38	20.18	0.06	1.94	1.01	490.86
Line Section 25 Loop	4.0	5.06	37.10	5.21	0.02	0.51	0.17	181.76
Line Section 30 Loop	2.27	3.48	15.80	2.35	0.01	0.30	0.17	56.04
Tioga Lateral Pipeline	1.12	1.09	0.86	0.18	0.0	0.14	0.06	16.70
Lake Sakakawea HDD	0.93	3.49	1.08	0.28	0.01	0.16	0.15	19.58
Total Project Emissions	**25.66**	**33.89**	**200.75**	**28.73**	**0.11**	**3.48**	**1.67**	**861.74**

Construction emissions would occur over the duration of construction and would be emitted at different times and locations throughout the proposed pipeline areas. Aboveground facility construction emissions would be more focused to the proposed footprint of the facility. Construction emissions would be minor and would result in temporary, localized impacts in the immediate vicinity of Project construction. With implementation of WBI Energy's proposed mitigation measures, and given the temporary nature of these emissions, we conclude that Project construction would not significantly affect regional air quality.

Operations

Project operation would result in air emissions due to combustion at the Tioga and Elkhorn Creek Compressor Stations, as well as fugitive and vented emissions at the compressor stations and delivery, receipt, and transfer stations.

The expansion of the Tioga Compressor Station would involve the installation of the following emission producing equipment:

- three Caterpillar 3612 natural gas-fired engines (3,750 hp each) coupled to a KBZ-4 compressor unit;

- one natural gas cooler and one auxiliary cooler for each compressor unit;
- one natural gas-fired Waukesha generator (1,380 hp) with a 980-kilowatt backup power generator;
- comfort heating: two Weil-McLain LGB-10 (2.47 MMBtu/hr) and one unit heater (0.25 MMBtu/hr);
- four pig launchers/receivers;
- one underground 3,000-gallon pipeline liquids storage tank; and
- one underground 3,000-gallon waste oil storage tank.

The proposed new Elkhorn Creek Compressor Station would involve the installation of the following equipment:

- one Caterpillar 3612 natural gas-fired engine (3,750 hp) coupled to a KBZ-4 compressor unit;
- one gas cooler and one auxiliary cooler;
- comfort heating: one Weil-McLain LGB-12 gas boiler (1.69 MMBtu/hr), one water heater (2.08 MMBtu/hr), and one building unit heater (0.25 MMBtu/hr);
- pig launcher/receiver, valve setting;
- one underground 2,000-gallon pipeline liquids storage tank; and
- one underground 2,000-gallon waste oil storage tank.

Other operational emissions would be from pipeline fugitive emissions. Pigging along the pipeline for maintenance would occur at least every 5 to 10 years depending on the location. Emissions associated with pig launching and receiving facilities not located at aboveground facilities are included with the pipeline operational emission calculations. Pigging emissions are reported as annual as if all pigging occurs in the same year. Table B-19 provides a summary of annual operation emissions for the Project.

WBI Energy would implement measures to reduce fugitive emissions, including operation and preventative maintenance practices consistent with manufacturer recommendations. Based on the emission estimates provided, we conclude that operation of the Project would not result in significant impacts on air quality in the Project area.

8.2 Noise

Construction and operation of the Project would affect the local noise environment in the Project area. The ambient sound level of a region, which is defined by the total noise generated within the specific environment, is usually comprised of sounds emanating from both natural and

Table B-19

Project Operating Emissions Summary (tpy)

Emission Unit	NO_X (tpy)	CO (tpy)	VOCs (tpy)	$PM_{10}/PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)	Total HAPs (tpy)
PSD Permitting Thresholds (stationary source)	**250**	**250**	**250**	**250**	**100**	**N/A**	**100,000**
Title V Permitting Threshold (stationary source)	**100**	**100**	**100**	**100**	**100**	**N/A**	**100,000**
Tioga CS [a, b]	65.48	74.04	93.66	4.22/4.22	0.24	52,842	11.94
Elkhorn Creek CS [a]	37.18	18.92	82.44	1.30/1.30	0.08	32,824	4.15
Aboveground Facilities (fugitive leaks)	N/A	N/A	8.83	N/A	N/A	2,159	0.002
Tioga-Elkhorn Creek, 104th Avenue NW (MP 6.1)	N/A	N/A	60.96	N/A	N/A	14,896	0.014
Line Section 25 Loop, Norse Transfer Station (MP 20.4)	N/A	N/A	5.21	N/A	N/A	1,274	0.001
Line Section 30 Loop, Nesson Valve Setting (MP 0.0)	N/A	N/A	3.53	N/A	N/A	862	0.001
Tioga Compressor Lateral, Tioga Plant Receipt Station (MP 0.0)	N/A	N/A	0.24	N/A	N/A	59	0.000
Uprate Line Section 25, Norse Transfer Station	N/A	N/A	2.25	N/A	N/A	549	0.001
Uprate Line Section 25, Lignite Border Station	N/A	N/A	2.25	N/A	N/A	549	0.001
Uprate Line Section 25, Norse Transfer Station	N/A	N/A	1.44	N/A	N/A	353	0.000
Pipeline Length (fugitive leaks)	N/A	N/A	N/A	N/A	N/A	106	N/A
TOTAL	**102.66**	**92.96**	**176.1**	**1.52/5.52**	**0.32**	**85,666**	**16.09**

[a] This includes emissions from commissioning of the station prior to commercial operation. The commission blowdown would not be part of annual ongoing emissions.

[b] Values reflect the total proposed PTE for the new modifications at Tioga CS.

N/A = not applicable

artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week, in part due to changing weather conditions and the impacts of seasonal vegetative cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same sound energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, in the calculation of the L_{dn}, late night to early morning (10:00 p.m. to 7:00 a.m.) noise exposures are penalized +10 decibels (dB), to account for people's greater sensitivity to sound during the nighttime hours. The A-weighted scale (dBA) is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. For an essentially steady sound source that operates

continuously over a 24-hour period and controls the environmental sound level, the L_{dn} is approximately 6.4 dB above the measured L_{eq}.

The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSAs), such as residences, schools, or hospitals. Also, in general, a person's threshold of a perceivable change in loudness on the A-weighted sound level is about 3 dBA, whereas a 5 dBA change is clearly noticeable, and a 10 dBA change is perceived as either twice or half as loud.

North Dakota regulates noise using public nuisance laws, but does not impose property-line noise limits for new facilities. McKenzie and Burke Counties do not regulate noise. Williams County maintains noise regulations with maximum noise standards by district, which are listed in table B-20 (Williams County, 2015).

Table B-20

Williams County Maximum Noise Standards by District

Zone of Property Receiving Noise	Maximum Noise Level dB, L_{eq}
Residential Districts: Urban Residential, Rural Residential	60
Commercial Districts: Urban Commercial, Rural Commercial	65
Industrial Districts: Light Industrial, Heavy Industrial	70
Planned Development	Planned unit development in accordance with base district

Additionally, Williams County code states "The noise standards above shall be modified as follows to account for the effects of time and duration on the impact of noise levels:

- in the [Urban Residential] and [Rural Residential] districts, the noise standards shall be 5 dB lower between 10:00 p.m. and 7:00 a.m.; and
- noise that is produced for no more than a cumulative period of five minutes in any hour may exceed the standards above by 10 dB." (Williams County, 2015)

Williams County's noise regulations are less strict than FERC's requirements for operational noise and FERC's guidance for nighttime construction noise; therefore, meeting FERC's 55 dBA L_{dn} criteria would be sufficient to meet Williams County's noise regulations.

Construction

Construction of the facilities would involve operation of general construction equipment and noise would be generated during the installation of the Project components. Construction noise would be highly variable because the types of equipment in use at a construction site changes with the construction phase and the types of activities. Noise from construction activities may be noticeable at nearby NSAs. However, construction equipment would be operated on an as-needed basis during the short-term construction period. Further, Northern would limit construction activities to occur during daytime hours, except when required for activities such as hydrostatic

testing, operation of pumps at waterbody crossings, and certain HDD activities, such as pull back that require continuous work. WBI Energy proposes to cross Lake Sakakawea using the HDD intersect method as described in section A.7.2 and in the pre-construction noise survey located in appendix J. Three NSAs were identified within 0.5 mile of the proposed HDD entry sites. Drilling activities are expected to last up to six months. Results of the HDD analysis are provided in table B-21.

Table B-21

Noise Quality Analysis for Lake Sakakawea Horizontal Directional Drill

NSA Location	Distance and Direction of NSA	Calculated Ambient L_{dn} (dBA)	HDD L_{dn} (dBA)	Potential Increase Above Ambient (dB)	Unmitigated HDD L_{dn} Plus Ambient L_{dn} (dBA)	Mitigated HDD L_{dn} Plus Ambient L_{dn} (dBA)
NSA 1 – South Side	2,240 feet southwest	55	70	25	71	64
NSA 1 – North Side	492 feet southeast	45	85	40	85	78
NSA 2 – North Side	2,597 feet southeast	49	69	20	69	63

Note: The Mitigated HDD L_{dn} Plus Ambient L_{dn} noise column does not include additional proposed noise controls, such as residential-grade silencers or mufflers, gear boxes, or other mechanical noise dampening blankets. Further, it does not take into account foliage, obstructions, and atmospheric absorption.

In an effort to mitigate impacts on nearby NSAs, WBI Energy would require the HDD contractor to install at least a 16-foot Sound Transmission Class 32 barrier within the line-of-sight of each NSA and all major noise-producing equipment. Due to the high sound power level of the HDD equipment and proximity to NSAs, noise barriers alone would likely not reduce the HDD L_{dn} at NSAs to below 55 dBA. WBI Energy would also require the HDD contractor to install at least residential-grade silencers or mufflers on all engines, which typically reduce exhaust noise by 15 to 20 dB, and utilize gear box and other mechanical noise dampening blankets which would further minimize the sound levels from those depicted in table B-21. As discussed above in the Geology section, the drill is feasible and WBI Energy does not anticipate the need for nighttime drilling; however, nighttime drilling may be required to minimize the possibility of borehole collapse. The more likely nighttime work would be from pullback activities, which would occur on the south side drill entry site, 2,240 ft from the nearest NSA. WBI Energy states that pullback activities are likely to take less than a week to conclude. Given the length of time to complete the drill (six months) and the continuous nature of HDD noise during both daytime and potentially nighttime activities, we conclude that HDD noise levels at nearby NSA's would adversely impact the ambient sound environment; however these impacts can be further mitigated with additional noise controls such as residential-grade silencers, a gear box, and mechanical noise dampening blankets. To ensure noise impacts are minimized at the drill entry and exit locations, **we recommend that:**

- **Prior to construction of the Lake Sakakawea HDD, WBI Energy should file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, an HDD noise mitigation plan to further**

reduce the projected noise level attributable to the proposed drilling operations at the entry and/or exit sites. During drilling and pull back operations, WBI Energy should implement the approved plan, monitor noise levels, document the noise levels in the weekly status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than a L_{dn} of 55 dBA at the NSAs.

We note that additional noise mitigation measures could be added to those described above in response to our recommendation to help achieve an Ldn of 55 dBA, such as hospital or higher grade silencers and positioning of trailers and constructing berms to deflect noise. If 24-hour HDD activity is required for more than 1 week, and reducing noise impacts on NSAs to below 55 dBA L_{dn} or 10 dBA over ambient is not feasible, WBI Energy has committed to establishing a supervised hotline to address landowner complaints regarding increased noise levels, including offers to compensate landowners for temporary relocation if necessary. However, our above recommendation would require noise from the HDD to be within acceptable levels.

While blasting is not anticipated to be necessary for the Project, WBI Energy has stated that it would mitigate against potential noise impacts by using controlled blasting techniques (e.g., notification, blasting mats). WBI Energy would also comply with state and federal regulations governing the use of explosives to assist in the removal of rock from the pipeline trench. WBI Energy would procure the required state permits prior to conducting blasting activities.

Based on the proposed mitigation measures presented above, the intermittent transient nature of construction activities, that construction activities would largely be limited to daytime hours, and our recommendation, we conclude that construction noise from the Project would be temporary and not have a significant impact on the noise environment at the nearby NSAs.

Operation

The modified Tioga Compressor Station and proposed Elkhorn Creek Compressor Station would generate sound on a continuous basis when operating. Some sound would also be generated by the operation of the new and existing delivery, receipt, and transfer stations. Noise impacts associated with the operation of these aboveground facilities would be limited to the vicinity of the facilities.

WBI Energy's consultant performed an ambient noise survey and acoustical analysis to quantify the sound level contribution at nearby NSAs that would result from the operation of the proposed compressor stations. These analyses were also used to determine noise control measures to meet applicable sound level criteria. Blowdown events of varying duration would occur at compressor stations during startup and commissioning, annual operation, and emergencies. The sound levels associated with high-pressure gas venting are a function of initial blowdown pressure, the diameter and type of blowdown valve, and the diameter and arrangement of the downstream vent piping. Blowdown sound levels are loudest at the beginning of the blowdown event and they decrease as the blowdown pressure decreases. The

specific operational noise sources associated with these facilities and their estimated impact on the nearest NSAs are described below.

Tioga Compressor Station

WBI Energy proposes to install an additional 11,250 hp of compression and new equipment/facilities at the Tioga Compressor Station in Williams County. The following equipment would contribute to noise at the station:

- three reciprocating compressor units;
- three 3,750-hp gas-fired engines;
- three auxiliary coolers; and
- one 840 hp natural gas fired generator

Predicted noise levels due to compressor station operation were estimated at the nearest NSAs based on the proposed equipment, noise mitigation measures, and the baseline sound level measurements using hemispherical attenuation calculations. The results of this analysis are summarized in table B-22.

Table B-22

Noise Analysis for Operation of Tioga Compressor Station

NSA	Distance and Direction of NSA	Surveyed Ambient Noise Level [a] (L_{dn}) dBA	Estimated L_{dn} of the Station at Full Load [b] (dBA)	L_{dn} of Station Plus Ambient L_{dn} (dBA)	Estimated Noise Increase (dB)
NSA 1 (residential)	3,974 feet north	50.9	58.2	50.9	1.0
NSA 2 (residential)	4,076 feet northeast	50.7	58.9	50.7	0.7
NSA 3 (residential)	4,920 feet east	49.0	55.2	49.0	1.2
NSA 4 (residential)	2,221 feet east	55.9	58.8	55.9	3.2
NSA 5 (residential)	4,940 feet southeast	49.0	55.2	49.-	1.2
NSA 6 (residential)	5,229 feet west	48.5	61.5	48.5	0.2
NSA 7 (residential)	4,862 feet northwest	49.1	61.5	49.1	0.3

[a] Includes existing station noise.

[b] Includes existing station noise plus project modifications.

The noise from operation of the modified Tioga Compressor Station is existing above 55 dBA at several locations, but would not result in perceptible impacts on the local ambient sound environment because the noise level would not increase by more than 3 dB at NSAs or contribute a sound level of 55 dBA L_{dn} for those NSA's existing below 55 dBA. To confirm that noise from the compressor station does not contribute to significant impacts on the nearest NSA, **we recommend that:**

- **WBI Energy should file a noise survey with the Secretary no later than 60 days after placing the authorized units at the modified Tioga Compressor**

Station in service. If a full-load condition noise survey is not possible, WBI Energy should provide an interim survey at the maximum possible horsepower load and provide the full-load survey within 6 months. If the noise attributable to the operation of all the equipment at the Tioga Compressor Station at interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy should file a report on what changes are needed and should install additional noise controls to meet the level within 1 year of the in-service date. WBI Energy should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

Twelve to 32 blowdown events would occur at the Tioga Compressor Station during startup and commissioning: 2 full station blowdowns and 10 to 30 compressor unit blowdowns. Blowdowns would not occur simultaneously. During annual operation of the compressor station, there would be approximately 36 total scheduled preventative maintenance compressor unit blowdowns and 1 scheduled emergency shutdown test full-station blowdown. Scheduled blowdowns would take place during daytime hours, and nearby residents would be notified prior to the blowdown occurring. Additional unscheduled compressor unit blowdowns would occur approximately 108 times per year in total (between the three compressor units). Additional emergency shutdown blowdowns could occur as a result of a real emergency, but their frequency is unpredictable. Table B-23 provides an evaluation of the noise associated with blowdown events at the Tioga Compressor Station. Mitigation measures for blowdown events would not be necessary because blowdown noise would be less than 55 dBA at NSAs, with the exception of NSA 4, where ambient noise levels are greater than 55 dBA and blowdown noise would not contribute greater than a 10 dBA increase in noise.

Table B-23

Noise Analysis for Blowdown Events at the Tioga Compressor Station

NSA	Distance and Direction of NSA	Surveyed Ambient Noise Level (L_{dn}) dBA	Estimated L_{dn} of Station Blowdown (dBA)	L_{dn} of Station Plus Ambient L_{dn} (dBA)	Potential Noise Increase (dB)
NSA 1 (residential)	3,974 feet north	57.2	54.0	58.9	1.7
NSA 2 (residential)	4,076 feet northeast	58.2	53.7	59.5	1.3
NSA 3 (residential)	4,920 feet east	54.0	52.1	56.2	2.2
NSA 4 (residential)	2,221 feet east	55.6	59.0	60.6	5.0
NSA 5 (residential)	4,940 feet southeast	54.0	52.1	56.2	2.2
NSA 6 (residential)	5,229 feet west	61.3	51.6	61.7	0.4
NSA 7 (residential)	4,862 feet northwest	61.3	52.2	61.8	0.5

Elkhorn Creek Compressor Station

WBI Energy proposes to construct the new 3,750-hp greenfield Elkhorn Creek Compressor Station on an approximately 10.9-acre site near MP 61.9 in McKenzie County. The following equipment would contribute to noise at the station:

- one reciprocating compressor unit;
- one 3,750-hp gas-fired engine;
- one gas cooler; and
- one auxiliary cooler.

Predicted noise levels due to compressor station operation were estimated at the nearest NSAs based on the proposed equipment, noise mitigation measures, and the baseline sound level measurements using hemispherical attenuation calculations. The results of this analysis are summarized in table B-24.

Table B-24

Noise Analysis for Operation of Elkhorn Creek Compressor Station

NSA	Distance and Direction of NSA	Calculated Ambient Noise Level (L_{dn}) dBA	Estimated L_{dn} of the Station at Full Load (dBA)	L_{dn} of Station Plus Ambient L_{dn} (dBA)	Estimated Noise Increase (dB)
NSA 1 (residential)	4,253 feet southwest	55.6	45.5	56.0	0.4
NSA 2 (residential)	3,465 feet east	41.0	47.3	48.2	7.2
NSA 3 (residential)	3,895 feet northeast	41.0	46.3	47.4	6.4

The noise from operation of the proposed compressor station would result in an impact on the local ambient sound environment at NSAs 2 and 3 because the noise level would increase by more than 3 dB; however, sound levels from Project facilities are not expected to exceed the 55 dBA L_{dn} threshold at any NSAs. To confirm that noise from the proposed Elkhorn Creek Compressor Station does not contribute to significant impacts on the nearest NSA, **we recommend that:**

- **WBI Energy should file a noise survey with the Secretary no later than 60 days after placing the Elkhorn Creek Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy should provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the Elkhorn Creek Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy should file a report on what changes are needed and should install additional noise controls to meet the level within 1 year of the in-service date. WBI Energy should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Four to seven blowdown events would occur at the Elkhorn Creek Compressor Station during startup and commissioning, consisting of two full station blowdowns and two to five compressor unit blowdowns. During annual operation of the compressor station, there would be approximately six scheduled preventative maintenance compressor unit blowdowns and one scheduled emergency shutdown test full-station blowdown. Scheduled blowdowns would take

place during daytime hours, and nearby residents would be notified prior to the blowdown occurring. Additional unscheduled compressor unit blowdowns would occur approximately 18 times per year, and additional emergency shutdown blowdowns could occur as a result of a real emergency, but their frequency is unpredictable.

An evaluation of the noise associated with blowdown events at the Elkhorn Creek Compressor Station is provided in table B-25.

Table B-25

Noise Analysis for Blowdown Events at Elkhorn Creek Compressor Station

NSA	Distance and Direction of NSA	Surveyed Ambient Noise Level (L_{dn}) dBA	Estimated L_{dn} of Station Blowdown (dBA)	L_{dn} of Station Plus Ambient L_{dn} (dBA)	Potential Noise Increase (dB)
NSA 1 (residential)	4,338 feet southwest	55.6	53.2	57.6	2.0
NSA 2 (residential)	3,538 feet east	41.0	55.0	55.1	14.1
NSA 3 (residential)	4,386 feet northeast	41.0	53.9	54.1	13.1

NSAs 1 and 2 would experience levels greater than 55 dBA, but NSA 1 has an ambient noise level greater than 55 dBA and blowdown noise would not contribute greater than a 10 dBA increase in noise. WBI Energy is still considering potential mitigation measures for blowdown events and would provide these measures to the FERC prior to construction. Blowdown activities at NSA 2 have the potential to exceed 55 dBA, but as the scheduled events would occur during daytime hours and would be short duration for each event, we conclude that blowdown activities at the Elkhorn Creek CS would not significantly impact noise quality in the area.

Delivery, Receipt, and Transfer Stations

Three of the proposed delivery, receipt, and transfer stations have NSAs within 0.5 mile of the facility, including the Norse Transfer Station, the Norse Plant Receipt Station, and the Robinson Lake Plant Receipt Station.

WBI Energy proposes to upgrade meter, station piping, and associated facilities at the existing Norse Plant Receipt Station at about MP 20.4 of the proposed Line Section 25 Loop to accommodate incremental volumes associated with the Project. However, there would be no new potential sound sources associated with the upgrades to the Norse Plant Receipt Station.

WBI Energy also proposes to construct, own, and operate the Norse Transfer Station on a new tract of land adjacent to and south of the existing Norse Plant Receipt Station at about MP 20.4 of the proposed Line Section 25 Loop. Up to four regulation control valves would be installed at the station, which would serve as potential noise sources from this facility. WBI Energy would install the valves within a single building and design them such that the interior sound level would not exceed 100 dBA. The analysis was developed utilizing this interior sound level and a building constructed of 24-gauge sheet steel with acoustically absorptive interior walls and ceiling. The calculated noise impact associated with operation of the proposed Norse Plant Receipt and Transfer Stations at the nearby NSA is provided in table B-26.

Table B-26

Noise Analysis for Operation of the Norse Plant Receipt and Transfer Stations

Nearest NSA Name (type)	Distance and Direction of NSA	Estimated Ambient Noise Level [a] (L_{dn}) dBA	Estimated L_{dn} of the Transfer Station (dBA)	L_{dn} of Station Plus Ambient L_{dn} (dBA)	Estimated Noise Increase (dB)
NSA 1 (residential)	2,478	48.7	38.5	49.1	0.4

[a] Receipt/transfer station locations had not been determined at the time of the ambient noise survey. Ambient L_{dn} was estimated to be similar to the L_{dn} at NSA 2 at the Lake Sakakawea north HDD site due to similar land use in the surrounding area.

Given the distance to the nearest NSA and estimated noise levels, we find the meter station would not contribute to significant impacts on noise in the surrounding area. Operational noise contributed by the proposed receipt and transfer station is not expected to exceed the 55 dBA L_{dn} requirement at the NSA. WBI Energy proposes to upgrade the meter, station piping, and associated facilities at the existing Robinson Lake Plant Receipt Station at its current location along Line Section 7 about 1.5 miles southeast of Stanley, North Dakota. The upgrades would be required to accommodate incremental volumes associated with the Project. No new sound sources at the Robinson Lake Receipt Station are proposed. Therefore, no noise impacts on the nearby NSAs are anticipated.

During operation, noise would be negligible along the proposed pipeline route except at the proposed compressor stations, which would constitute a moderate permanent noise impact. Based on the existing noise environment and the proposed mitigation measures, we conclude that noise from the Project would not have a significant impact on the acoustical environment or nearby NSAs.

9. Reliability and Safety

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for an accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

The Project would transport natural gas that contains primarily CH_4, as well as smaller amounts of ethane, propane, and higher hydrocarbon gases such as butane. This product is a colorless, practically odorless gas. If natural gas is breathed in high concentrations, oxygen deficiency can occur, resulting in serious injury or suffocation.

Natural gas has an auto-ignition temperature of 1,000 °F and is flammable at CH_4 concentrations between 5 and 15 percent in air. These concentrations can be reached when natural gas is present in a confined space and could result in a hazard in the presence of an ignition source. Unconfined mixtures of natural gas and air become highly diluted and are not usually explosive. Lighter components of natural gas, such as CH_4, are buoyant at atmospheric temperatures, and if released, rise and disperse rapidly in air. Higher hydrocarbon components of natural gas, such as propane, are heavier than air, and although unlikely, may form a potentially flammable cloud near the ground until sufficiently dispersed in air.

9.1 Safety Standards

The USDOT is mandated to provide pipeline safety under 49 USC 601. The USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety.

The PHMSA endeavors to ensure that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while section 5(b) permits a state agency that does not qualify under section 5(a) to perform certain inspection and monitoring functions. A state may also act as the USDOT's agent to inspect interstate facilities within its boundaries; however, the USDOT is responsible for enforcement actions. The majority of the states have either a 5(a) certification or a 5(b) agreement, and nine states act as interstate agents. North Dakota has a 5(a) certification, but does not act as an interstate agent.

The USDOT pipeline standards are published in Parts 190-199 of CFR Title 49. Part 192 specifically addresses natural gas pipeline safety issues.

Under a MOU on Natural Gas Transportation Facilities dated January 15, 1993, between the USDOT and the FERC, the USDOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the USDOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional pipeline safety standards other than the USDOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the MOU to promptly alert the USDOT. The MOU also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the USDOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

9.2 Project Design Requirements

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the

public and to prevent natural gas facility accidents and failures. The USDOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Safety guidelines for the design and construction of compressor stations are established in 49 CFR 192 in addition to pipeline safety standards. Part 192.163 requires the location of each main compressor building of a compressor station be on a property under the control of the operator. The station must also be far enough away from adjacent property, not under control of the operator, to minimize the possibility of fire spreading to the compressor building from structures on adjacent properties. Part 92.163 also requires each building on a compressor station site be made of specific building materials and to have at least two separate and unobstructed exits. The station must be in an enclosed fenced area and must have at least two gates to provide a safe exit during an emergency.

The compressor station safety systems would be engineered with automated control systems to ensure the station and pipeline pressures are maintained within safe limits, and would include several additional over-pressure protection systems that provide an additional layer of safety to back-up the primary controls. The station would also have an automated emergency system that would shut down the station to prevent an incident should an abnormal operation condition occur, and, if appropriate, would evacuate the gas from the station piping at a safe location.

9.3 Pipeline Safety

The USDOT also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1 mile length of pipeline.

Class 1	Location with 10 or fewer buildings intended for human occupancy.
Class 2	Location with more than 10 but less than 46 buildings intended for human occupancy.
Class 3	Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12- month period.
Class 4	Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; MAOP; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

The Project would fall under a Class 1 designation for its entire length. Over the life of the new pipeline system, WBI Energy would monitor population changes in the vicinity of the pipeline. If an increase in population density adjacent to the right-of-way is detected, WBI Energy would evaluate whether a change in class location is required and would respond accordingly to meet the USDOT requirements for the new class location.

The Pipeline Safety Improvement Act of 2002 requires operators to develop and follow a written integrity management program that contains all the elements described in 49 CFR 192.911 and addresses the risks on each transmission pipeline segment. Specifically, the law establishes an integrity management program which applies to all high consequence areas (HCA).

High Consequence Areas

The USDOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for USDOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius[37] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;[38] or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

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[37] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in pounds per square inch gauge multiplied by the square of the pipeline diameter in inches.

[38] The potential impact circle is a circle of radius equal to the potential impact radius.

In the second method (which WBI Energy uses on their projects), an HCA includes any area within a potential impact circle which contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The USDOT regulations specify the requirements for the integrity management plan at section 192.911.

No HCAs have been identified along the proposed route for the Project. WBI Energy would incorporate the Project into its existing integrity management program, however, and would use criteria specified by the USDOT to identify HCAs if conditions change along the pipeline system.

On October 1, 2019, PHMSA issued a final rule amending the Federal Pipeline Safety Regulations in 49 CFR 191 and 192 to address integrity management requirements and improve the safety of onshore gas transmission lines (84 FR 52180). The amendments, which will become effective July 1, 2020, focus on reconfirmation of MAOP for existing pipelines and the expansion of assessment requirements for pipelines in areas not designated as HCAs. The criteria for a moderate consequence area (MCA) as defined in the new amendments is an area that is within the potential impact circle of the pipeline that contains five or more buildings intended for human occupancy, or any portion of the paved surface including shoulders of a designated interstate, freeway, expressway, or any other principal arterial roadway with four or more lanes that lies within the potential impact circle. WBI Energy has identified one MCA that would exist where the new Tioga-Elkhorn Creek pipeline would cross 64th Street NW/Highway 2. WBI Energy would install additional launching and receiving facilities on both sides of the MCA to facilitate the required pipeline assessments in accordance with 84 FR 52180.

9.4 Project Operations

Parts 192.731 through 192.736 of 49 CFR establish safety guidelines for inspection, testing, and monitoring at compressor stations. WBI Energy personnel would operate and maintain the proposed compressor stations and other aboveground facilities in accordance with all USDOT requirements. Operational testing would be performed on safety equipment to ensure that it performs as intended, and corrective actions would be taken as necessary. The proposed compressor station would be equipped with gas and fire detection monitoring systems that have the ability to alert Gas Control through a supervisory control and data acquisition system or automatically shut down the compressor station, close the valves isolating the station from the pipeline, and safely vent the gas inside the compressor station to a location that would not create a hazard. Individual pieces of equipment, such as the compressors, would be equipped with sensors and control systems that would shut down the equipment if operating improperly. Station piping would be equipped with overpressure protection devices or relief valves so that the maximum pressure is not exceeded.

9.5 Emergencies

The USDOT prescribes the minimum standards for operating and maintaining pipeline facilities including a requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first, then property, and making them safe from actual or potential hazards.

The USDOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. WBI Energy currently has an Emergency Response Plan for its existing pipeline system in accordance with USDOT regulations. WBI Energy would update its plan, as necessary, to incorporate the proposed Project.

9.6 Pipeline Accident Data

The USDOT requires all operators of natural gas transmission pipelines to notify the USDOT of any significant incident and to submit a report within 30 days. Significant incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 (1984 dollars)[39].

During the 20-year period from 1998 through 2017, a total of 1,365 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide. Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table B-27 provides a distribution of the causal

[39] $50,000 in 1984 dollars is approximately $112,955.73 as of May 2015 (CPI, Bureau of Labor Statistics, 2015)

factors as well as the number of each incident by cause. The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 53.2 percent of all significant incidents. The pipelines included in the data set in table B-27 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline. The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain is a time-dependent process.

Table B-27

Natural Gas Transmission Pipeline Significant Incidents by Cause (1998-2017) [a]

Cause	Number of Incidents	Percentage
Pipeline material, weld, or equipment failure	403	29.5
Corrosion	324	23.7
Excavation	198	14.5
All other causes [b]	148	10.8
Natural forces [c]	148	10.8
Outside force [d]	90	6.6
Incorrect operation	54	4.0
Total	**1,365**	**100**

[a] All data gathered from PHMSA's Oracle BI Interactive Dashboard website for Significant Transmission Pipeline Incidents (PHMSA, 2019)

[b] All other causes include miscellaneous, unspecified, or unknown causes.

[c] Natural force damage includes earth movement, heavy rain, floods, landslides, mudslides, lightning, temperature, high winds, and other natural force damage.

[d] Outside force damage includes previous mechanical damage, electrical arcing, static electricity, fire/ explosion, fishing/maritime activity, intentional damage, and vehicle damage (not associated with excavation).

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. The use of both an external protective coating and a cathodic protection system[40], required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected systems.Outside forces (including excavation damage, natural force damage, and other outside force damage) are the dominant causes in a combined 31.9 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements. Data for significant incidents attributed to outside

[40] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline that includes the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

forces is presented in table B-28. The data includes pipeline failures of all magnitudes with widely varying consequences.

Since 1982, operators have been required to participate in "One Call" public utility programs to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the location of underground pipes, cables, and culverts.

The available data from PHMSA show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. The construction and operation of the facilities would represent a minimum increase in risk to the nearby public and we are confident that with implementation of the required design criteria for the design of these facilities, that they would be constructed and operated safely.

Table B-28

Outside Forces Incidents by Cause (1998 to 2017) [a]

Cause	No. of Incidents	Percent of Outside Force Incidents
Operator excavation damage	26	6.0
Unspecified equipment damage/Previous damage	12	2.8
Third-party excavation damage	160	36.7
Earth Movement	29	6.7
Heavy Rain/Floods	78	17.9
Lightning/Temperature/High Winds	30	6.9
Unspecified Natural Force/Other Natural Force	11	2.5
Electrical arcing from other equipment/facility	1	0.2
Fire/Explosion	10	2.3
Fishing or maritime activity/maritime equipment	9	2.1
intentional damage	1	0.2
Previous mechanical damage	6	1.4
Vehicle (not engaged with excavation)	52	11.9
Total	**436**	**-**

[a] Excavation, Outside Force, and Natural Force from table B-27.

9.7 Impact on Public Safety

As stated above, WBI Energy would comply with the USDOT pipeline safety standards as well as regular monitoring and testing of the pipeline. While pipeline failures are rare the potential for pipeline systems to rupture and the risk to nearby residents is discussed below. Table B-29 presents the average annual injuries and fatalities that occurred on natural gas transmission lines in the 5-year period between 2015 and 2019.

The majority of fatalities from pipelines are due to local distribution pipelines. These pipelines, which are not regulated by the FERC, distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes, plastic pipes, and older pipelines which are more susceptible to damage. In addition, distribution systems do not have large rights-of-way and pipeline markers common to the FERC regulated natural gas transmission pipelines.

Table B-29

Annual Average Fatalities – Natural Gas Transmission Lines [a]

Year	Injuries	Fatalities
2015	16	6
2016	3	3
2017	3	3
2018	7	1
2019	8	1

[a] Source: PHMSA, 2019

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table B-30 to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. For example, the fatality rate is more than 25 times lower than the rate from natural hazards such as lightning, tornados, and floods.

Given the distance to the nearest NSA and estimated noise levels, we find the meter station would not contribute to significant impacts on noise in the surrounding area. Operational noise contributed by the proposed receipt and transfer station is not expected to exceed the 55 dBA L_{dn} requirement at the NSA. WBI Energy proposes to upgrade the meter, station piping, and associated facilities at the existing Robinson Lake Plant Receipt Station at its current location along Line Section 7 about 1.5 miles southeast of Stanley, North Dakota. The upgrades would be required to accommodate incremental volumes associated with the Project. No new sound sources at the Robinson Lake Receipt Station are proposed. Therefore, no noise impacts on the nearby NSAs are anticipated.

The Hartels provided comments on WBI Energy's use of pipeline markers. Pipeline markers are a requirement under USDOT regulations to identify where a transmission pipeline is located, specifically at street, highway, and railway crossings along with waterbody crossings and other prominent points along a route. WBI Energy would comply with the USDOT pipeline safety standards as well as regular monitoring and testing of the pipeline.

Table B-30

Accidental Deaths by Cause

Type of Accident	Number of Fatalities [a]
All injuries (unintentional) [a]	169,936
Motor vehicle accident [a]	40,231
Poisoning/exposure to noxious chemicals (unintentional) [a]	64,795
Falls (unintentional) [a]	36,338
Suffocation (unintentional) [a]	6,946
Drowning (unintentional) [a]	3,709
Fire/flame (unintentional) [a]	2,812
Floods [b]	85
Tornado [b]	69
Lightning [b]	44
Natural gas transmission pipelines [c]	7

Sources:

[a] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2019

[b] National Oceanic and Atmospheric Administration, National Weather Service, 2019; 30-Year Average (1988 to 2017)

[c] PHMSA, 2019; Serious Pipeline Incidents By Cause

Polychlorinated Biphenyls

When any existing station piping or pipeline is cut, WBI Energy would follow the EPA issued Polychlorinated Biphenyls rules and regulations contained in 40 CFR 761. The Project involves abandonment in place of several sections of WBI Energy Line Section 25, however, no liquids analyzed from the pipeline section have contained polychlorinated biphenyls concentrations of more than 50 ppm. In the event contaminated liquid, soil, or pipeline facilities are encountered unexpectedly during construction, WBI Energy would manage these materials in accordance with federal and state regulations. Based on this, we conclude that polychlorinated biphenyl impacts are not expected at Project facilities.

10. Cumulative Impacts

In accordance with NEPA and FERC policy, we considered the cumulative impacts of the Project and other projects or actions in the Project area. As defined by CEQ, a cumulative effect is the impact on the environment that results from the incremental impact of the proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (CEQ, 1997). Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant. This cumulative impacts analysis includes other actions meeting the following three criteria:

- the action affects a resource that is also potentially affected by the Project;
- the action causes the impact(s) within all or part of the timespan encompassed by the construction or operations schedule of the Project; and
- the action causes the impact(s) within all or part of the same geographical area affected by the Project.

These actions include (but are not limited to) actions that are being implemented, have been funded, are under review by a regulatory agency, or are being considered by state and local planners. Actions that have not progressed beyond planning and feasibility stages of development are not included in the analysis due to the uncertainty of whether the projects will be implemented. The Hartels provided comments that FERC needs to assess cumulative impacts for all resource areas with this Project and all previous and future projects in the area. While recent past actions that continue to contribute to discernable impacts on a resource are included (e.g., a project that is operational, but restoration/revegetation is not complete), the impacts of completed/past actions are considered part of the baseline environmental conditions (included in section B above) and are not included in the cumulative impact analysis.

For the purpose of this analysis, we are including the following resources:

- geological resources;
- soils;
- water resources and wetlands;
- fish, wildlife, and vegetation;
- special status species;
- land use, recreation, and special interest areas;
- visual resources;
- socioeconomics;
- cultural resources; and
- air quality and noise.

The geographic scope for each resource is unique and is generally more localized for somewhat stationary resources (e.g., geological resources and soils) and more expansive for resources with a large geographic area (e.g., air quality). Table B-31 summarizes the resource-specific geographic boundaries considered in this cumulative impacts analysis and the justification for each. Actions occurring outside these boundaries were generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

In addition to the geographic relationship between the Project and other projects in the area, we also considered temporal relationships. If the Commission authorizes the Project, construction would be anticipated to begin as early as spring of 2021 and to be completed no earlier than October 2021 with at least 2 years of restoration monitoring to follow. Therefore, this cumulative impact analysis considers current and other reasonably foreseeable future projects that may be constructed within the geographic scope of analysis up through about 2023 for some effects/resources. Actions occurring outside these temporal boundaries were not evaluated because of their diminished potential to contribute to a cumulative impact.

Table B-31

Resource-Specific Geographic Regions for the Cumulative Impacts Analysis

Environmental Resource	Geographic Scope for Cumulative Impacts	Justification for Geographic Scope
Soils and Surficial Geology	Construction workspaces	Impacts on soils and surficial geology would be highly localized and would not be expected to extend beyond the area of direct disturbance associated with the Project.
Groundwater, Surface Water, Wetlands, and Fisheries	HUC-12 subwatershed	Impacts on groundwater and surface water resources could reasonably extend throughout a HUC-12 subwatershed (i.e., a detailed hydrologic unit that can accept surface water directly from upstream drainage areas, and indirectly from associated surface areas), as could the related impacts on aquatic resources and fisheries.
Wildlife and Vegetation	HUC-12 subwatershed	Consideration of impacts within a HUC-12 sub-watershed sufficiently accounts for impacts on vegetation and wildlife that would be directly affected by construction activities and for indirect impacts such as changes in habitat availability and displacement of transient species.
Socioeconomics	Affected counties	Affected counties would experience the greatest impacts associated with employment, housing, public services, transportation, traffic, property values, economy and taxes, and environmental justice.
Land Use, Recreation, and Special Interest Areas	1 mile from the Project	Impacts on general land uses would be restricted to the construction workspaces and the immediate surrounding vicinity; therefore, the geographic scope for land use and recreation is 1 mile from the Project.
Visual Resources	Viewshed	Assessing the impact based on the viewshed (i.e., the distance that the tallest feature at the planned facility would be visible from neighboring communities) allows for the impact to be considered with any other feature that could have an effect on visual resources.
Cultural Resources	Overlapping impacts within the APE	The APE for direct effects (physical) includes areas subject to ground disturbance, while the APE for indirect effects (visual or audible) includes aboveground ancillary facilities or other Project elements that are visible from historic properties in which the setting contributes to their NRHP eligibility.
Air Quality – Construction	0.25 mile of construction footprint	Air emissions during construction would be limited to vehicle and construction equipment emissions and dust and would be localized to the Project construction sites.
Air Quality - Operation	31.1 miles (50 km) of Project facilities with operational emissions such as gas-fired compressor stations	Impacts on air quality beyond 31.1 miles (50 km) would be *de minimis*.
Noise – Construction	0.25 mile – daytime only construction 0.5 mile – nighttime and 24-hour construction	Areas in the immediate proximity of construction activities (within 0.25 mile during daytime construction and 0.5 mile during nighttime and 24-hour construction) would have the potential to be affected by construction noise.
Noise – Operation	1 mile – permanent aboveground facilities	Noise from the Project's permanent aboveground facilities is not anticipated to have an impact beyond 1.0 mile.

10.1 Projects Identified within the Geographic Scope

Appendix K identifies 32 past, present, and reasonably foreseeable future actions within the geographic scope of the Project that are considered in this cumulative impacts analysis, including detailed project descriptions, estimated construction timeframes, distance to the proposed Project, and acres of potential overlap (if applicable). Most of these projects include

other oil and gas pipeline and storage developments, along with renewable energy, transportation, utilities, and commercial development projects. We identified these projects through information provided by WBI Energy, publicly available data, internet searches, and consultation with various agencies. Figure 3 shows the approximate location of these actions in relation to the proposed Project.

10.2 Potential Cumulative Impacts by Resource

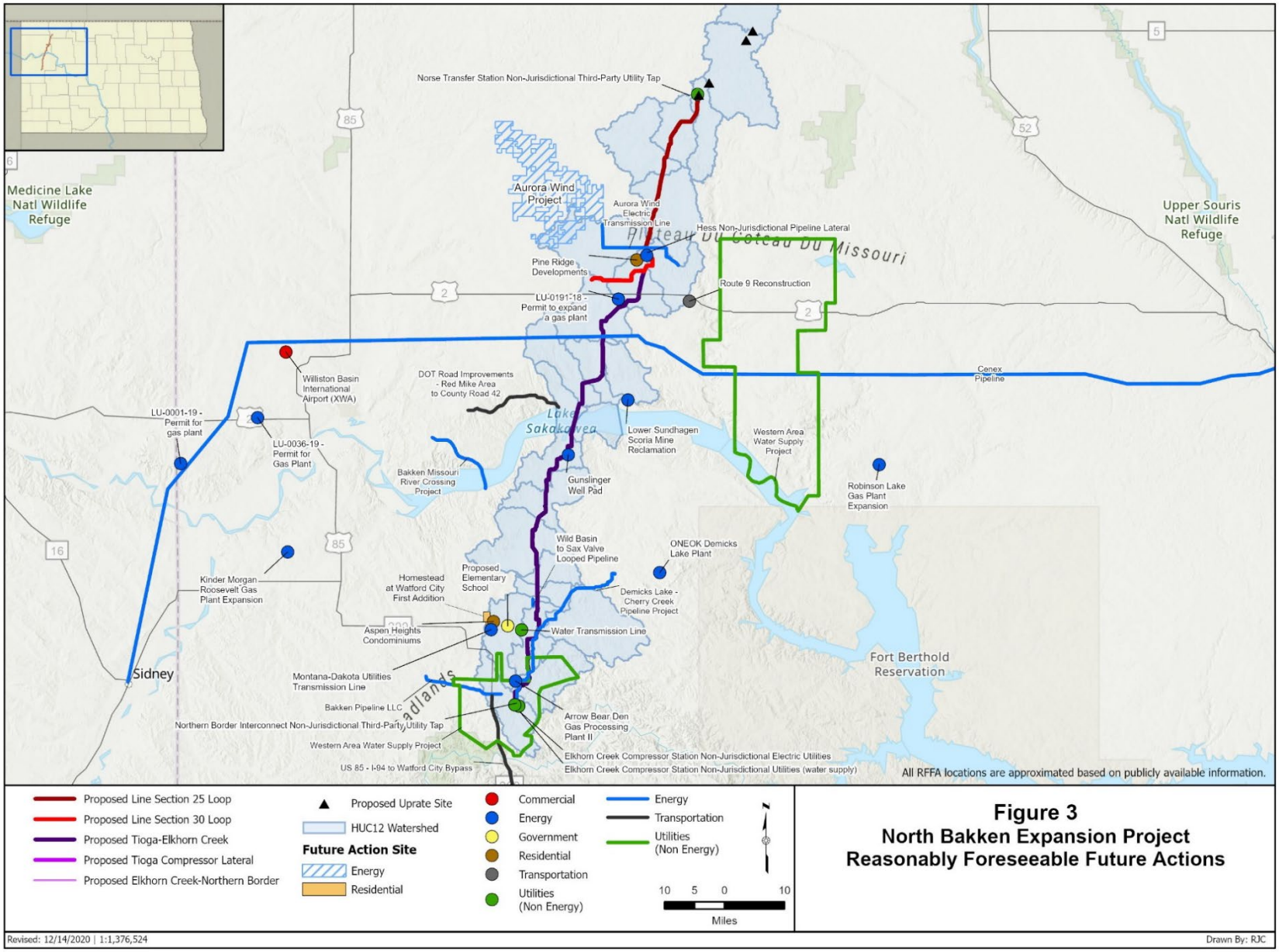
This section describes the potential cumulative impacts associated with the proposed Project in conjunction with the other past, present, and reasonably foreseeable future actions identified in appendix K.

Geological Resources

The Project's impacts on geologic resources would be highly localized (i.e., not expected to extend beyond the Project's area of direct disturbance) and limited to the time of active construction. Therefore, this cumulative impact assessment focuses on impacts from other actions that could reasonably extend into the area of direct disturbance during the period of active construction and prior to final restoration. WBI Energy would implement mitigation measures to avoid or mitigate the Project's impact on mineral and geological resources, which would include but not be limited to implementing best management practices, returning contours to preconstruction condition, and identifying and avoiding mineral resources. With implementation of these measures, the Project would generate limited temporary impacts on geological resources.

The Aurora Wind electric transmission line, Cherry Creek Pipeline Project, Gunslinger Federal and Gladstone Oil and Gas Well Pads, Hess Pipeline Lateral, North Bakken Expansion Project Customer Tie-in Facilities, Cenex Pipeline, Norse Transfer Station utility tap, Northern Border Interconnect utility tap, non-jurisdictional electric and potable water utility installation at the Elkhorn Creek Compressor Station, and the Western Area Water Supply Project [WAWSP]) would fall within the Project's geographic and temporal scope for geological resources. All of these projects could result in temporary to short-term impacts on geological resources that would be similar to those described for the proposed Project. However, it is anticipated that these projects would implement erosion and sediment control measures and other best management practices to minimize impacts on geological resources during construction. Therefore, impacts associated with these projects would also be temporary to short-term and localized.

While both the Project and the other actions could contribute to impacts on geological resources within the overlapping construction areas during construction and restoration, these impacts would be temporary and highly localized. As a result, we conclude the Project, when combined with the other actions, would not have a significant cumulative impact on geological resources.


Norse Transfer Station Non-Jurisdictional Third-Party Utility Tap
Aurora Wind Project
Aurora Wind Electric Transmission Line
Hess Non-Jurisdictional Pipeline Lateral
Pine Ridge Developments
Route 9 Reconstruction
LU-0191-18 - Permit to expand a gas plant
Medicine Lake Natl Wildlife Refuge
Upper Souris Natl Wildlife Refuge
Plateau du Coteau du Missouri
Williston Basin International Airport (XWA)
DOT Road Improvements - Red Mike Area to County Road 42
Cenex Pipeline
LU-0001-19 - Permit for gas plant
LU-0036-19 - Permit for Gas Plant
Lake Sakakawea
Lower Sundhagen Scoria Mine Reclamation
Western Area Water Supply Project
Bakken Missouri River Crossing Project
Gunslinger Well Pad
Robinson Lake Gas Plant Expansion
Wild Basin to Sax Valve Looped Pipeline
ONEOK Demicks Lake Plant
Kinder Morgan Roosevelt Gas Plant Expansion
Homestead at Watford City First Addition
Proposed Elementary School
Demicks Lake - Cherry Creek Pipeline Project
Aspen Heights Condominiums
Water Transmission Line
Fort Berthold Reservation
Sidney
Montana-Dakota Utilities Transmission Line
Badlands
Bakken Pipeline LLC
Northern Border Interconnect Non-Jurisdictional Third-Party Utility Tap
Arrow Bear Den Gas Processing Plant II
Western Area Water Supply Project
Elkhorn Creek Compressor Station Non-Jurisdictional Electric Utilities
US 85 - I-94 to Watford City Bypass
Elkhorn Creek Compressor Station Non-Jurisdictional Utilities (water supply)
All RFFA locations are approximated based on publicly available information.
Proposed Line Section 25 Loop
Proposed Line Section 30 Loop
Proposed Tioga-Elkhorn Creek
Proposed Tioga Compressor Lateral
Proposed Elkhorn Creek-Northern Border
Proposed Uprate Site
HUC12 Watershed
Future Action Site
Energy
Residential
Commercial
Energy
Government
Residential
Transportation
Utilities (Non Energy)
Energy
Transportation
Utilities (Non Energy)
10 5 0 10
Miles
Figure 3
North Bakken Expansion Project
Reasonably Foreseeable Future Actions
Revised: 12/14/2020 | 1:1,376,524
Drawn By: RJC

Soils

The Project's impacts on soils would be limited to the period of active construction until the soils have been restored. Therefore, this cumulative impact assessment focuses on impacts from other actions that could reasonably extend into the area of direct soil disturbance during the period of active construction and prior to final restoration. The Project would disturb topsoil and subsoil during topsoil removal, grading, and trenching activities, which could result in soil erosion, reduction in topsoil quality, compaction, or potential soil contamination. Additionally, construction of new aboveground facilities and new permanent access roads would permanently convert approximately 20.7 acres of land (including approximately 7.4 acres of prime farmland or farmland of statewide importance) to commercial/industrial use. WBI Energy would implement mitigation measures in accordance with the FERC Plan and Procedures and its Fugitive Dust Control Plan to prevent or minimize the Project's impacts on soil resources. As detailed in section B.1.2, these measures include topsoil segregation, installation of erosion control measures, soil stabilization measures to reduce the potential for erosion by wind (e.g., application of water or mulch), and soil decompaction. With implementation of these measures, the Project's impacts on soil resources would be short-term, except at the permanent aboveground facilities where minor permanent impacts would occur.The Aurora Wind electric transmission line, Cherry Creek Pipeline Project, Gunslinger Federal and Gladstone Oil and Gas Well Pads, Hess Pipeline Lateral, North Bakken Expansion Project Customer Tie-in Facilities, Cenex Pipeline, Norse Transfer Station utility tap, Northern Border Interconnect utility tap, non-jurisdictional electric and potable water utility installation at the Elkhorn Creek Compressor Station and the WAWSP would fall within the Project's geographic and temporal scope for soil resources. All of these projects would result in short-term impacts on soil resources during soil-disturbing activities that could be similar to those described for the proposed Project. However, it is anticipated that these projects would implement similar erosion and sediment control measures and other best management practices to minimize impacts on soil resources during construction. Therefore, these projects would also be expected to have primarily short-term and localized impacts on soil resources.

While both the Project and the other actions could contribute to impacts on soil resources within the overlapping construction areas during construction and restoration, these impacts would be temporary and highly localized. Permanent impacts would be limited to permanent aboveground facilities. As a result, we conclude that the Project, when combined with other actions, would not have a significant cumulative impact on soils due to the localized nature of soil impacts.

Water Resources and Wetlands

The Project's impacts on water resources (groundwater and surface water) and wetlands would primarily be limited to the period of active construction until successful revegetation is established. Therefore, the cumulative impact assessment for water resources and wetlands focuses on impacts from other reasonably foreseeable future actions that could occur in the same HUC-12 subwatershed as the proposed Project during that same time period.

Groundwater Resources

The Project could affect groundwater by causing localized changes to existing groundwater flow paths. Additionally, development of impervious surfaces and structures at the proposed aboveground facility sites could result in permanent impacts on groundwater recharge. WBI Energy would implement best management practices to reduce erosion from trench dewatering, install trench breakers to reduce erosion within the trench, minimize compaction during construction, and decompact agricultural areas as necessary post construction. In addition, WBI Energy would implement its SPCC Plan to minimize the potential for discharge of hazardous materials that could affect groundwater. In the event that a private well or water supply system is damaged beyond repair due to construction-related activities, WBI Energy would provide a temporary water source, replace the well as necessary, and, within 1 year of the completion of construction, file a report with FERC identifying all potable water supply systems damaged by construction and how they were repaired. Due to the relatively small footprint of impervious surfaces in relation to the total potential groundwater recharge area and with implementation of the above measures, the overall effect of the Project on groundwater resources would be temporary and not significant.

The Bakken natural gas pipeline, Montana-Dakota Utilities Transmission Line, Aurora Wind Electric Transmission Line, Natural Gas Plant Expansion, Kinder Morgan Roosevelt Gas Plant Expansion, Demicks Lake – Cherry Creek Pipeline Project, Wild Basin to Sax Valve Looped Pipeline, Gunslinger Federal and Gladstone Oil and Gas Well Pads, other oil and gas developments, Cenex refined fuels pipeline, a water transmission line in Watford City, and the WAWSP would occur within the same HUC-12 subwatersheds that are proposed to be crossed by the Project facilities and within the same temporal scope (time of active construction until successful revegetation of disturbed areas). Impacts and mitigation measures proposed by the individual company on groundwater resulting from construction and operation of these actions are expected to be similar to the impacts and mitigation measures described above for the proposed Project. Additionally, as many of these projects are linear in nature requiring very little aboveground facilities, the footprint of all of these actions would be cumulatively relatively small compared to the size of the subwatershed. As a result, we conclude the Project, when combined with these other actions, would not have a significant cumulative impact on groundwater resources.

Surface Water Resources

The Project would result in short-term impacts on waterbodies as a result of construction activities in stream channels and on their adjacent banks. Clearing and grading of stream banks, blasting (if required), in-stream trenching, trench dewatering, and backfilling could each result in temporary local modifications of aquatic habitat involving sedimentation, increased turbidity, and decreased dissolved oxygen concentrations. In addition, there would be potential for drilling fluid loss during HDD and guided bore operations. In most cases, these impacts would be limited to the period of in- or under stream construction, and conditions would return to normal shortly after stream restoration activities were completed. We do not expect operation of the new pipeline and aboveground facilities to result in any impacts on surface water use or quality. WBI Energy would implement the measures in our Procedures to minimize potential impacts on surface water resources, including, but not limited to, using equipment bridges, mats, and pads at

stream crossings to minimize stormwater runoff; and installing erosion and sediment controls around spoil piles at least 10 feet from the top of the bank where topography allows; in addition to implementing its HDD Plan. Further, any water withdraws for Project use (e.g., hydrostatic test water, dust suppression water, and water for drilling mud) would be temporary (only occurring during construction activities).

The following reasonably foreseeable future actions would fall within the same HUC-12 subwatershed as the proposed Project during the same temporal scope and have potential to contribute to cumulative impacts on surface water resources: the Montana-Dakota Utilities and Aurora Wind electric transmission line projects; a natural gas processing facility laydown space expansion (LU-0191-18); the Bakken natural gas pipeline; McKenzie Electric Cooperative project; the Cenex refined fuels pipeline; the Gunslinger Federal and Gladstone well pads; a water transmission line in Watford City; the WAWSP; oil and gas exploration and development in the region (including wells and well pads, directional drilling, and access roads); two road construction projects (the Red Mike Area to County Road 42 road project and the proposed expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass); the Natural Gas Plant Expansion; the Kinder Morgan Roosevelt Gas Plant Expansion, the Demicks Lake – Cherry Creek Pipeline Project; the Wild Basin to Sax Valve Looped Pipeline; and one new elementary school in Watford City.

All these actions have the potential to affect surface water resources during construction. The magnitude of these impacts would depend largely on the specific activity, season, proximity to waterbodies, location in the watershed, effectiveness of mitigation, time until reclamation success, and characteristics of any hydrologically connected aquifers. Direct and indirect impacts on surface water quality and hydrology from ground-disturbing activities could result in increased runoff from reduced infiltration capacity, erosion of soils to downstream drainages, altered hydrology, and surface water contamination. Water for construction (hydrostatic test water, fugitive dust control, etc.) may be required from the projects listed in appendix K. However, it is expected that all of these actions would be required to comply with applicable federal, state, and local water quality requirements, which would include permits, mitigation measures (including many of the best management practices included in our Procedures) to limit runoff, sediment discharge, and potential contamination to surface waters. Additionally, the majority of the proposed Project's impacts would be limited to the relatively brief period of in-stream construction and stream restoration, which would not be expected to coincide with the known construction schedules for these reasonably foreseeable future actions described above. As a result, the Project, when combined with these other actions, would not be expected to have a significant cumulative impact on surface waters.

Wetlands

Project construction would result in approximately 5.1 acres of temporary wetland impacts, primarily involving vegetation removal, soil disturbance and potential for soil compaction, and potential spills during construction activities. No fill of wetlands is proposed as part of this Project. The following reasonably foreseeable future actions fall within the 27 HUC-12 sub-watersheds that would be crossed by the Project and the Project's temporal scope for wetland resources (about 2-3 years after construction).

Two electric transmission line projects (Montana-Dakota Utilities and Aurora Wind) could result in permanent impacts on wetlands associated with monopole structures, monopole structure foundations, and guy wires. Each of these structures are assumed to affect less than 0.1 acre at each location. For the Aurora Wind Project, all permanent impacts on wetland basins under USFWS easements would be avoided.

Several pipeline transmission projects could result in short-term construction impacts similar to the impacts described for the Project. The proposed Bakken natural gas pipeline would temporarily affect 0.9 acre of wetlands. The Cenex pipeline could cross 120.2 acres of USFWS wetland easements. Large impacts would be avoided using the HDD crossing method based on the requirements of the USACE Nationwide Permit 12. Wetlands impacts associated with the water transmission line in Watford City, and the WAWSP are not publicly available; however, these pipelines are likely to be collocated with existing roads.

Two road construction projects fall within the geographic scope for wetland impacts. The Red Mike Area to County Road 42 project would permanently affect 1.1 acres of wetlands and temporarily affect 0.2 acre of wetlands, which it would mitigate through compensatory mitigation, removal of temporary fill material, and restoration of preconstruction contours. The proposed expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass would permanently affect 19.0 to 26.8 acres of wetlands.

Local developments, notably the Pine Ridge Development in Tioga and the new elementary school in Watford City, would likely be sited to avoid wetlands for constructability purposes.

It is assumed that these other actions would comply with federal wetlands regulations, which require mitigation measures for impacts on USACE-jurisdictional wetlands. Additionally, the footprint of each action that falls within the geographic scope for impacts on wetlands is relatively small compared to the size of the subwatershed. As a result, we conclude Project impacts when combined with these other actions, would not have a significant cumulative impact on wetlands.

Fisheries

The Project's impacts on fisheries would primarily be limited to the period of active construction until restoration commences. Therefore, the cumulative impact assessment for fisheries focuses on impacts from other reasonably foreseeable future actions that could occur in the same HUC-12 subwatershed as the proposed Project during that same time period.

For perennial waterbodies or those with flow at the time of construction, temporary impacts associated with construction of the proposed Project may include increased sedimentation and turbidity, temperature changes due to removal of vegetation cover over streams, introduction of water pollutants, or entrainment of fish. Impacts on fisheries and other aquatic life are expected to be minor, localized, and limited to the construction period.

Two transmission pipeline projects that intersect the proposed Project could result in impacts on fish. These include the Bakken Pipeline, and the Cenex pipeline projects. Limited

information is available regarding these projects' potential impacts on fish; however, it is assumed that the impacts would be similar to those described above for the proposed Project.

The NDDOT's expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass. To minimize impacts on fish habitat in the Spring Creek HUC-12 watershed, construction would occur outside of the fish spawning period (April 15 to June 1) (NDDOT, 2019b).

Impacts from the Bakken natural gas pipeline, Montana-Dakota Utilities Transmission Line, Aurora Wind Electric Transmission Line, Aurora Wind Project, Natural Gas Plant Expansion, Kinder Morgan Roosevelt Gas Plant Expansion, Demicks Lake – Cherry Creek Pipeline Project, Wild Basin to Sax Valve Looped Pipeline, Gunslinger Federal and Gladstone Oil and Gas Well Pads, other oil and gas developments, Cenex refined fuels pipeline, a water transmission line in Watford City, and the WAWSP could include degradation of aquatic habitat due to spills or sediment loading. Coordination with the USFWS is ongoing regarding potential mitigation measures.

Due to the proposed timing for construction of the projects listed above, it is unlikely that construction impacts would occur simultaneous with construction of the Project; however, restoration activities for the actions could be ongoing during Project construction. WBI Energy would implement the proposed mitigation measures described in section B.3.2 to minimize impacts of the proposed Project on fish. It is anticipated that the reasonably foreseeable future actions listed above would also implement similar measures. As a result, we conclude the Project impacts, when combined with those other actions, would not have a significant cumulative impact on fish.

Wildlife

The Project's impacts on wildlife would primarily be limited to the period of active construction until restoration commences. Therefore, the cumulative impact assessment for wildlife focuses on impacts from other reasonably foreseeable future actions that could occur in the same HUC-12 subwatershed as the proposed Project during that same time period.

Construction and operation of the Project may result in short-term impacts on wildlife species and their habitat along the proposed pipeline routes and long-term impacts at aboveground facility sites. Until vegetation has become re-established, construction activities would temporarily reduce feeding, nesting, and cover options for wildlife and migratory birds in the immediate Project area. Additionally, wildlife and migratory birds could be temporarily displaced due to construction noise and increased human activity.

Construction of the Aurora Wind electric transmission line would temporarily affect potential habitat for ground-dwelling mammals and could potentially result in direct mortality or injury from collisions with construction equipment. Operation of the transmission line may increase the potential for bird or bat strikes with transmission line structures, conductors, or associated infrastructure.

The Aurora Wind Project has been sited primarily within tilled and agricultural land to avoid impacts on habitat. Existing access roads would be used to the extent practical. Turbines

and access roads have been sited to avoid wooded draws and shelterbelts and minimal tree removal is expected. Tree impacts would be mitigated on a 2:1 basis, as approved by the landowner and consistent with the NDPSC's specifications. All collector lines would be buried to avoid potential for bird strikes. Temporarily disturbed areas would be revegetated, as appropriate, with vegetation consistent with the surrounding vegetation types. Aurora Wind would develop a Bird and Bat Conservation Strategy that would propose specific mitigation measures to minimize potential impacts on birds and bats. Coordination with the USFWS is ongoing regarding potential mitigation measures for the project.

Anticipated impacts from a third project, the Montana-Dakota Utilities Transmission Line, are not currently available, but could be similar to those described for the Aurora Wind electric transmission line depending on the wildlife habitat present in the project area.

The Cenex pipeline would result in short-term, adverse impacts on mammals during construction, as well as long-term impacts on avian species due to wetland loss.

Little information is publicly available regarding the potential impacts of the WAWSP and the 12-inch-diameter water transmission lines proposed to furnish water to "The Crossings at Watford City." It is possible that these projects could have similar impacts on wildlife as the proposed pipeline projects described above.

Operation of roadways, such as the proposed expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass, can result in habitat loss, degradation, and fragmentation; barriers to wildlife movement; and mortality from wildlife-vehicle collisions. To offset project impacts on wildlife mobility and habitat connectivity, three wildlife crossings (i.e., structures along roadways that provide wildlife habitat connections) have been incorporated into the project design. Proposed construction and operation activities would have the potential to contribute sound and visual stimuli at levels that could result in the temporary avoidance of habitat and behavioral effects (NDDOT, 2019b).

According to Gunslinger Federal, construction and operation of the Gunslinger Federal and Gladstone oil and gas well pads would not impact species or their habitat in such a way that would affect the long-term viability or continued existence of the species. No migratory birds or resident wildlife species in the area would be impacted in such a way that would cause their populations to be listed or adversely affected. The project has been designed to minimize the acreage of disturbance to native habitat by having multi-well pads versus single-well pads and reduce habitat fragmentation by siting project features along existing roads and within previously disturbed areas. Approximately 40 acres of undisturbed habitat (e.g., grasslands, shrublands, wetlands, woodlands) would be affected during construction. Construction and operation of well pads and access roads would result in localized temporary disturbances as well as permanent conversion of potentially suitable habitat. Short-term, indirect impacts on wildlife, including noise and visual disturbances are anticipated. Some species of wildlife would permanently relocate to adjacent habitat, while others would be temporarily displaced during construction and drilling operations.

The proposed utility line associated with the Gunslinger Federal and Gladstone project overlaps with the proposed Project at MPs 28.6, 29.2, and a less than 0.1-mile section across a

temporary access road at MP 29.4 of the Tioga-Elkhorn Creek pipeline. While the schedule for the Gunslinger Federal and Gladstone Project is unknown, it is unlikely that construction of the utility corridor would occur simultaneous to construction of the collocated or overlapping segments of the proposed Project. Cumulative impacts would occur if construction of the Gunslinger Federal and Gladstone project occurs during or after construction of the Tioga-Elkhorn Creek pipeline, and prior to final restoration of wildlife habitat. The time during which impacts on wildlife and their habitat would occur in this area would be extended; however, due to the temporary and localized nature of impacts of these two utility corridors, significant cumulative impacts are not expected.

There is potential for cumulative habitat loss within the Tioga Dam HUC-12 watershed resulting from temporary right-of-way clearing combined with permanent impacts from transmission structures, the Aurora Wind Project, and road projects. Impacts from construction of the proposed Project right-of-way within the Tioga Dam HUC 12 watershed would be limited to 0.2 mile of the Line Section 25 Loop and 0.8 mile of the Line Section 30 Loop. For the remainder of the projects listed above, it is unlikely that habitat disturbance would occur simultaneously with the proposed Project; however, restoration activities could be ongoing at the time of Project construction. With implementation of the mitigation measures described in section B.3.3, the abundance of similar habitat types in the project areas, and mitigation measures by the other projects, we conclude the Project, when combined with these other actions, would not have a significant cumulative impact on wildlife.

Vegetation

The Project's impacts on vegetation would primarily be limited to the period of active construction until restoration commences. Therefore, the cumulative impact assessment for vegetation focuses on impacts from other reasonably foreseeable future actions that could occur in the same HUC-12 subwatershed as the proposed Project during that same time period. Construction and operation of the Project may result in short- and long-term impacts on vegetation associated with clearing and grading of the temporary right-of-way and routine clearing of permanent rights-of-way throughout operation. In the permanent right-of-way, a 10-foot-wide area over the pipelines may be maintained in an herbaceous state to facilitate pipeline inspection. Vegetation maintenance activities on the rest of the permanent right-of-way would be conducted no more than once every 3 years. The remaining temporary workspace along the construction right-of-way and any ATWS areas would be allowed to revert to preconstruction conditions.

Two electric transmission lines, the Montana-Dakota Utilities Transmission Line and the Aurora Wind Electric transmission line, could result in temporary impacts on vegetation within the construction corridor and minor permanent impacts associated with monopoles and guy wires. Following construction of the Aurora Wind electric transmission line, temporarily disturbed areas would be reclaimed with vegetation consistent with the surrounding vegetation types and in accordance with NRCS recommendations, unless otherwise specified by and approved by the landowner and jurisdictional agency. Seed mixtures would be free of noxious weeds.

Areas temporarily disturbed during construction of the Aurora Wind Project would be reclaimed following construction. Revegetation would be consistent with the surrounding vegetation types and in accordance with NRCS recommendations, unless otherwise specified by the landowner and approved by the jurisdictional agency. Seed mixtures would be free of noxious weeds.

Arrow Bear Den Gas Processing Plant II comprises 51 acres of land currently maintained as herbaceous upland/rangeland and cropland. A weed management plan for the project would be required as part of the county's Conditional Use Permit.

Future oil and gas exploration and development of a lease parcel could result in removal of vegetation. The magnitude of these impacts would depend largely on the specific activity. For new exploratory and development gas wells, the BLM estimates that each well pad could result in approximately 1.1 acres (0.6 acre for access roads and 0.5 acre for the well pad) of permanent surface disturbance. For new producing gas wells, each well pad could result in approximately 0.6 acre (0.3 acre for access roads and 0.3 acre for the well pad) of long-term surface disturbance.

Construction and operation of the proposed Gunslinger Federal and Gladstone oil and gas well pads would disturb approximately 50.4 acres on USFS lands within the LMNG, of which approximately 9.7 acres would be within previously disturbed areas (developed and cultivated lands) and 40.7 acres would be within undisturbed areas (grassland, shrubland, wetlands, or woodlands land use classes). Interim reclamation of the road ditches and edges of the well pads would occur after drilling and completion of the wells (i.e., within a 1-year timeframe); however, well pads would affect vegetation until final reclamation (20 to 40 years). Grading and permanent modification within areas of gravel fill (e.g., well pads and access road running surfaces) may result in modification of potential suitable habitat or undiscovered individuals for 4 of the 14 LMNG-listed sensitive plant species including blue lips, sand lily, Easter daisy, and Hooker's townsendia. Applicable LMNG-wide Standards and Guidelines would be applied to all resources potentially affected by the project. Mitigation measures include minimizing areas and widths of disturbance, cleaning vehicles and equipment to remove seeds and plant propagules prior to entering USFS lands, and controlling noxious weeds according to the 2007 *Noxious Weeds Management Environmental Impact Statement* (USFS, 2007).

Two transmission pipeline projects could result in impacts on vegetation, including the Bakken Pipeline and the Cenex pipeline projects which would require clearing and grading of the temporary right-of-way. Mitigation measures would include topsoil segregation and revegetation of disturbed non-agricultural upland areas. Vegetation along the pipeline rights-of-way may be cleared periodically.

Water transmission projects include the WAWSP, a proposed water transmission line in Watford City. This project would likely temporarily affect vegetation from clearing and grading.

Two road construction projects fall within the geographic scope for vegetation impacts. The proposed expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass would permanently convert vegetated areas into a transportation corridor, and construction activities would have the potential to spread or introduce noxious weeds. Upon

completion of construction activities, vehicles travelling along U.S. Highway 85 would have the potential to spread or introduce noxious weeds along the project corridor. The NDDOT is also proposing to make road improvements along ND 1804 from Red Mike Area to CR 42 (Epping Road). These improvements include increasing structural capacity, widening the shoulders, improving the road surface, and installing a stop light. Disturbed, non-roadway areas would be re-seeded and a noxious weed management plan would be implemented during construction for both projects.

McKenzie Electric Cooperative would install an overhead powerline that crosses the southern portion of the tract to support the Elkhorn Creek Compressor Station. All associated ground disturbance would be within the compressor station's workspace. WBI Energy anticipates obtaining water for potable water and cleaning needs from the McKenzie County Water Resource District via a 2-inch-diameter poly line leading from the new compressor station to an existing 6-inch-diameter water line in an easement that abuts the southern portion of the station tract.

Additionally, existing vegetation is likely to be permanently removed within the footprints of three proposed residential developments in Tioga and Watford City, as well as a new elementary school in Watford City 3 miles from the Project.

WBI Energy would implement the mitigation measures described in section B.3.1 to minimize impacts on vegetation during construction and operation of the Project. Timely restoration of the construction right-of-way, reseeding with the appropriate seed mixes, and the use of effective erosion control measures would minimize vegetation disturbance. The utility line associated with the Gunslinger Federal and Gladstone project would be collocated or overlapping with the proposed Project along Highway 1806 at three locations (MP 28.6, 29.2, and 29.4). The Gunslinger Federal and Gladstone project is currently under construction; therefore it is unlikely that construction of the utility corridor would occur simultaneous to construction of the overlapping segments of the proposed Project. Cumulative impacts would occur if construction of the Gunslinger Federal and Gladstone project occurs during or after construction of the Tioga-Elkhorn Creek pipeline, and prior to final restoration. The time during which impacts on vegetation would occur in this area would be extended; however, due to the temporary and localized nature of impacts of these two utility corridors, significant cumulative impacts on vegetation are not expected. Due to the proposed timing for construction of the remainder of the projects listed above, it is unlikely that vegetation disturbance would occur simultaneously with the proposed Project; however, restoration may be ongoing. Permanent impacts on vegetation from routine clearing within the permanent right-of-way and aboveground facilities are expected to be localized within the permanent project footprint and, we conclude significant cumulative impacts would not occur on vegetation.

Special Status Species

The Project's impacts on special status species would primarily be limited to the period of active construction until restoration commences. Therefore, the cumulative impact assessment for special status species focuses on impacts from other reasonably foreseeable future actions that could occur in the same HUC-12 subwatershed as the proposed Project during that same time period. As described in section B.4.1, the Project would be *not likely to adversely*

affect NLEB, least terns, piping plovers, whooping cranes, DASK, pallid sturgeon, or their habitat. Because the Project would have *no effec*t on the gray wolf and red knot, potential cumulative impacts on these species are not further evaluated. Mitigation measures that WBI Energy would implement to avoid or minimize potential impacts on federally threatened and endangered species and state species of concern are described in section B.4.

Two electric transmission line projects (the Montana-Dakota Utilities Transmission Line and the Aurora Wind Electric transmission line), the Aurora Wind Project, several pipeline projects (the Bakken Pipeline Project, the Watford City water transmission line, and the WAWSP), and two road construction projects (the Route 9 reconstruction and the U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass) fall within the Project's geographic and temporal scope for threatened and endangered species. Anticipated impacts on threatened and endangered species associated with the Montana-Dakota Utilities Transmission Line, the Watford City water transmission line, and the WAWSP are not currently available and would be dependent on whether the projects are sited within threatened and endangered species habitat. If these projects are sited within threatened and endangered species habitat, the project sponsors would be required to consult with the appropriate state and federal agencies to avoid or minimize impact. Therefore, significant cumulative impacts on threatened and endangered species or state species of concern are not anticipated, and these projects are not further evaluated.

The Aurora Wind Electric transmission line could potentially affect wetlands or waterbodies visited by piping plovers, is within the whooping crane migration corridor, and within potentially suitable habitat areas for the DASK. Although there is potential for piping plovers to utilize wetlands and waterbodies near the project corridor, the potential for habitat loss is unlikely as impacts on wetlands would be expected to be minimal (Burns and McDonnell, 2018). Because the transmission line is within the whooping crane migration corridor, collision and mortality risk exists associated with overhead transmission lines. However, all transmission lines within 1 mile of modeled suitable whooping crane habitat would be marked with bird flight diverters per Avian Power Line Interaction Committee recommendations and USFWS guidance. Construction activities would not occur within identified potentially suitable habitat areas during the DASK active flight period, any temporary impacts occurring outside of the DASK's brief flight period are unlikely to affect the species' population, and affected areas would be reseeded with the appropriate native seed mix.

The NLEB, the piping plover, and the whooping crane can occur within the proposed project area for the Aurora Wind Project. Coordination with the USFWS is currently ongoing for the project. However, impacts on threatened and endangered species associated with this project could include habitat fragmentation and increased likelihood of bird strikes with the turbine rotors. Impacts on state species of concern could include habitat loss and fragmentation, direct mortality or injury due to collisions with vehicles, equipment, and turbines, and degradation of aquatic habitat due to spills or sediment loading. The project has been sited primarily within tilled and agricultural land to avoid impacts on habitat; turbines and access roads have been sited to avoid wooded draws and shelterbelts; and minimal tree removal is expected. Tree impacts would be mitigated on a 2:1 basis, as approved by the landowner and consistent with the NDPSC's specifications. All collector lines would be buried to avoid potential for bird strikes. Temporarily disturbed areas would be revegetated, as appropriate, with

vegetation species consistent with the surrounding area. In addition, a bird and bat conservation plan would be prepared prior to operation. The geographic scope for cumulative impacts from the Aurora Wind Project includes the area within the Tioga Dam HUC-12 watershed. However, direct impacts from construction of the proposed Project's right-of-way within the Tioga Dam HUC-12 watershed would be limited to 0.2 mile of the Line Section 25 Loop and 0.8 mile of the Line Section 30 Loop. Additionally, suitable wetlands exist directly adjacent to the proposed right-of-way in this area.

The Hartels commented that impacts have already been made to the DASK habitat in portions of the Project area and that no additional cumulative effects should occur to DASK by the Project. The Bakken Pipeline Project has the potential to affect DASK; however, it would avoid or bore under DASK habitat or restrict construction during the DASK flight period.

The Route 9 reconstruction road project has the potential to affect federally listed endangered or threatened species or their critical habitat. However, the USACE would initiate consultation with the USFWS, pursuant to section 7 of the ESA, as appropriate. The proposed expansion of U.S. Highway 85 from the Interstate 94 interchange to the Watford City Bypass may affect, but is not likely to adversely affect DASK due to suitable habitat occurring adjacent to the project corridor.

With implementation of the mitigation measures described above and the federally required protections for these species, we conclude that significant cumulative impacts on threatened and endangered species or state species of concern would not occur from construction and operation of the proposed Project and the other actions.

Land Use, Recreation, and Special Interest Areas

The geographic scope of impacts on land use, recreation, and special interest areas includes impacts from actions that could reasonably extend within a 1.0-mile radius of the Project during construction. While most Project impacts on these resources would be temporary, here a permanent conversion from one land use type to another would occur, the temporal scope is expanded to include operation.

Land Use

Development of the pipeline construction rights-of-way, ATWS, staging areas, and temporary access roads, would result in temporary land disturbance. Permanent access roads, aboveground facility sites, and the permanent conversion of forested areas would result in permanent land disturbance. Acreages are provided in section B.5.1.

The following actions fall within the Project's geographic and temporal scope for land use impacts.

Two proposed electric transmission lines exist within the geographic scope for land use impacts. The Aurora Wind transmission line is not expected to result in a significant change in land use. The Montana-Dakota Utilities overhead electric transmission line project is in the early permitting phases and the specific location is currently unknown. However, it is not likely to permanently affect land use due to the nature of the project and its location within Watford City.

The Arrow Bear Den Gas Processing Plant II site would permanently affect about 51.0 acres of a 73.0-acre parcel currently classified as herbaceous upland/rangeland and cropland. Twenty acres of the parcel were recently developed as Arrow's Bear Den Gas Plant.

The Gunslinger Federal and Gladstone Oil and Gas Well Pads would disturb approximately 50.4 acres on USFS lands within the LMNG. Of the 50.4 acres, approximately 9.7 acres would be within previously disturbed areas (developed and cultivated lands) and 40.7 acres would be within undisturbed areas (grassland, shrubland, wetlands, or woodlands land use classes).

Several pipeline projects would affect land use. The proposed Cenex pipeline project would temporarily disturb approximately 1,360 acres of land associated with the construction corridor. Permanent impacts on land use are not anticipated. Little information is publicly available regarding potential impacts of the WAWSP; however, it is likely that the impacts associated with the pipeline construction would be temporary and that utilities would be collocated with existing roads.

The Hess Pipeline Lateral, North Bakken Expansion Project Customer Tie-in Facilities, Norse Transfer Station and Northern Border Interconnect utility taps, and the non-jurisdictional electric and potable water utility installation at the Elkhorn Creek Compressor Station would result in short-term impacts on land use during construction activities. However, it is likely that the impacts from these projects' construction would be temporary and that utilities would be collocated with existing roads and other utility lines.

The proposed utility line associated with the Gunslinger Federal and Gladstone Oil and Gas Well Pads project is collocated or overlapping with the Tioga-Elkhorn Creek pipeline along Highway 1806 for approximately 0.9 mile within the LMNG. The time during which impacts on vegetation would occur in this area would be extended; however, the impacts of these two utility corridors would be temporary and localized.

Due to the proposed timing for construction of the projects listed above, it is unlikely that construction impacts would occur simultaneously; however, restoration activities from the proposed Project could be ongoing. Ongoing maintenance of the permanent right-of-way is not anticipated to affect current land use and permanent impacts from aboveground facilities would be highly localized. WBI Energy would reduce impacts on land use by implementing the mitigation measures described in section B.5. As a result, we conclude the Project's impacts when combined with the other actions, would not have a significant cumulative impact on land use.

Recreation and Special Interest Areas

With implementation of the HDD for Lake Sakakawea and no designated recreation areas that would be impacted by the crossing of LMNG or state land, the Project would not have any impacts on recreation or special interest areas. Therefore, there would not be any cumulative impacts recreation or special interest areas.

Visual Resources

The geographic scope of impacts on visual resources includes impacts from actions within the viewshed of the proposed Project. The short-term visual impacts of the Project are associated with construction workspace and equipment. Permanent visual impacts associated with the Project would be limited to the areas of proposed aboveground facilities. The majority of aboveground facilities associated with the proposed Project would consist of modifications to existing structures. Modifications to the Tioga Compressor Station would be conducted within or adjacent to WBI Energy's existing station building in an area that has many oil and gas plants. Two existing receipt stations and a town border station (Tioga Plant Receipt Station, Lignite Plant Receipt Station, and Lignite Town Border Station) would be rebuilt as part of the Project.

Construction of the new Elkhorn Creek Compressor Station, Northern Border Interconnect, and Norse Transfer Station do not represent a significant change in the visual character of the area, given the amount of oil and gas infrastructure in the surrounding area. Visual impacts associated with these facilities are expected to be of the same magnitude as those for the current existing facilities.

Temporary minor cumulative impacts on visual resources would occur for those actions within the same geographic and temporal scope for visual resources. Permanent cumulative visual impacts would occur only if an action that also includes a permanent aboveground facility were to occur in the same viewshed as a new aboveground facility for the proposed Project. No actions with permanent aboveground facilities have been identified within the geographic scope for visual resources; therefore, no permanent cumulative visual impacts are anticipated from the proposed Project.

Socioeconomics

Socioeconomic impacts of the Project include increased traffic for workers who commute to and from Project activities, population increases in the project areas, economic migration and increased burden on local businesses and temporary accommodations, increased population especially in smaller communities, and decreased tourism revenue. This section focuses on actions that could impact socioeconomics on a county-wide scale within Williams, Mountrail, McKenzie, or Burke Counties.

Construction of the Aurora energy facilities (including electric transmission lines) are expected to result in short- and long-term economic benefits in Williams and Mountrail Counties. Benefits include employment, an increased tax base due to property taxes, increased spending during construction, and long-term income for landowners receiving lease payments. Although impacts are expected to be primarily positive, adverse impacts could include increased demand on the existing labor force and demand for local housing during construction. Construction is expected to temporarily increase traffic on haul roads and may affect electric, telephone, and fiber optic lines.

Several natural gas plant facilities are planned, including the Demicks Lake Plant II, two Nesson gathering facilities, the Roosevelt Gas Plant Expansion, the Arrow Bear Den Gas Processing Plant II, and the Robinson Lake Gas Plant. It is likely that these facilities would

contribute long-term employment opportunities at the county level for gas plant operators and technicians, as well as an indirect and direct contribution to tax base at the state and local levels. Construction of new facilities is expected to temporarily increase traffic on haul roads.

Several transmission pipeline projects and other non-energy utility projects could result in county-wide impacts on socioeconomics similar to those described for the Project. The non-jurisdictional electric and potable water utility installation at the Elkhorn Creek Compressor Station would contribute to a temporary increase in traffic during construction near the compressor station, but would not have any permanent socioeconomic impacts.

Oil and gas exploration and development in the region (including wells and well pads, directional drilling, and access roads) generate federal revenue and annual rents through leasing. These revenues are collected by the federal government, which then distributes a portion of the revenues collected to the state and counties (BLM, 2019).

Operation of the Williston Basin International Airport may encourage business and economic activity by making the region more accessible via an improved air transportation facility. Overall, the airport is not anticipated to cause a substantial socioeconomic impact on the community.

Following the temporary impacts due to construction, Red Mike Area to County Road 42 improvements would have overall beneficial impact because traffic flow, traffic safety, and highway accessibility would be improved throughout the corridor. The improvements would provide efficient and reliable means of transport for goods, services, and people facilitating economic growth and stability within the region.

The U.S. Highway 85 to I-94 to Watford City Bypass Project would improve the reliability and capacity of U.S. Highway 85 for industries dependent upon the project corridor. Although construction of the project could result in an expenditure of local funds, the regional economy would experience a temporary increase in construction employment opportunities and subsequent increase in payroll taxes, sales receipts, and indirect purchases of goods and services as result of construction activities. During construction, two lanes of traffic would be maintained and reasonable construction access to properties and roadways would be maintained. Speed limits within construction zones would be reduced, which would temporarily increase travel times, and accessing properties may require minor detours. Expanding U.S. Highway 85 to four lanes would provide a safer and more reliable highway corridor for the traveling public. Overall, reliability would be improved by reducing over-height restrictions, providing additional driving lanes, and expanding roadway shoulders (NDDOT, 2019b).

Residential developments, including the Pine Ridge Development, Homestead at Watford City First Addition, and Aspen Heights Condominiums would improve housing availability.

Construction-related impacts on socioeconomics, including housing and transportation, are not expected to result in significant cumulative impacts as no known construction schedules for the reasonably foreseeable future actions coincide with Project construction. Cumulative impacts on employment and workforce would largely depend on how much of the temporary construction workforce is sourced locally and the number of permanent positions that would be

needed to operate the other facilities listed above. There are likely to be long-term positive cumulative impacts on the economy from property, sales, and income tax collections associated with the Project and the other actions listed above. No permanent impacts on environmental justice populations are anticipated as a result of the Project. Therefore, the Project would not contribute to cumulative impacts on environmental justice populations.

Cultural Resources

Cumulative impacts on cultural resources would only occur if other actions were to affect the same historic properties as the Project. WBI Energy defined the APE for archaeological sites as the construction footprint for the Project facilities, staging areas, and access roads. For historic structures and other architectural resources, FERC defined the APE to include these areas as well as viewsheds from historic sites along or near the Project facilities. The expanded APE for historic structures considers potential changes in the viewsheds of historic properties, which could persist beyond the construction phase of the Project (e.g., viewshed impacts due to the installation and operation of aboveground facilities).

Other actions that could affect archaeological sites or historic structures within the APE for the Project include the Aurora Wind electric transmission line; Gunslinger Federal and Gladstone Oil and Gas Well Pad Project; Demicks Lake - Cherry Creek Pipeline Project; Cenex refined fuels pipeline; Northern Border Interconnect and Norse Transfer Station utility taps; the non-jurisdictional electric and potable water utility installation at the Elkhorn Creek Compressor Station; the Hess Pipeline Lateral; and WAWSP. Each of these projects would overlap with the Project APE. One archaeological site was identified that is within 100 feet of the workspace at the Elkhorn Creek Compressor Station; this could overlap with the proposed non-jurisdictional facilities and utility taps projects. WBI Energy has committed to avoiding and monitoring this site during construction; therefore, the proposed Project would not contribute to cumulative impacts on this resource. For the other projects, there are no NRHP-eligible or unevaluated archaeological sites or historic structures within the areas of overlap for the Project APE and these projects; therefore, there is no potential for cumulative impacts on cultural resources.

Two previously recorded archaeological sites appear to be in the areas of overlap for the Project APE and the Gunslinger Federal and Gladstone Oil and Gas Well Pad Project, which occurs on USFS lands. These two sites were previously evaluated as not eligible for listing in the NRHP. Three newly recorded archaeological sites were identified within or immediately adjacent to the area of overlap between the two projects; data analysis for these sites is ongoing. If the USFS, in consultation with the SHPO, determines that any of these sites are eligible for the NRHP and would be adversely affected by the Project, avoidance or mitigation measures would be developed and implemented, which would reduce the potential for cumulative impacts. No historic structures are within the area of overlap between the Gunslinger Federal and Gladstone Oil and Gas Well Pad Project and the proposed Project's APE. Therefore, no cumulative impacts on cultural resources are anticipated.

Air Quality and Noise

Air Quality

One project was identified that could contribute to cumulative air impacts during construction (WAWSP). Construction activities would result in short-term emissions that would be localized, temporary, and intermittent. To the extent any of the projects are constructed at or near the same time, the combination of construction activities could have a cumulative impact on air quality in the immediate area. However, the direct effects of the projects from construction activities would be localized and limited to the period of construction. Although the timing of construction of the WAWSP is unknown, if the construction occurs at the same time as the proposed Project, impacts would include emissions from construction equipment, operation, and fugitive dust. WBI Energy would operate equipment properly and minimize potential fugitive dust impacts by adhering to the NDDEQ's Division of Air Quality requirements to monitor dust emissions and implementing its Fugitive Dust Control Plan. Construction emissions would not extend significantly beyond the Project site and we conclude that no significant air quality cumulative impacts would occur.

Several projects were identified that could potentially contribute cumulatively to the operational air quality impacts in the region. Multiple oil and gas developments including well pads, directional drill (horizontal) wells, and access roads are planned throughout McKenzie County, and six natural gas processing plant developments or expansions. These facilities are expected to operate within compliance of all state and federal air quality regulations. As major source modeling would be required as part their operational permitting process, which takes into account other permanent emission sources in the area, additional projects in the Project area receiving a permit to construct would be in compliance with the NAAQS. Therefore, the Project and other actions would not have a significant cumulative impact on the air quality during operation of the Project.

Noise

Construction of the Project would result in temporary increases in noise equipment, which would be localized, temporary, and intermittent. There are five projects identified within the cumulative impact scope of the Project that may cumulatively affect noise during construction: Aurora Wind Electric Transmission Line, Cenex Pipeline, WAWSP, Pine Ridge Development, and a new elementary school in Watford City. To the extent any of the projects are constructed at or near the same time, the combination of construction activities could have a cumulative impact on noise, however, the direct effects of the projects would be localized and limited to the period of construction. Concurrent construction is not anticipated for the projected Project timeline.

No facilities were identified in the Project area that would contribute to cumulative impacts on noise in the area. The noise attributable to the operation of the Project facilities at the nearby NSAs must comply with FERC's sound level guideline and state noise requirements; therefore, cumulative noise impacts from operation of the facilities following the Project are not expected to have a significant adverse noise impact on nearby NSAs. Therefore, we conclude that there would be no significant cumulative impacts on noise during construction or operation of the Project.

10.3 Conclusions on Cumulative Impacts

Impacts associated with the proposed Project would be relatively minor, and we have included recommendations in this EA to further reduce the environmental impacts associated with the Project. The environmental impacts associated with the Project would be minimized by construction methods and implementation of appropriate mitigation and restoration measures. Consequently, the Project may contribute to negligible or minor cumulative impacts when added to the other identified actions within the geographic and temporal scope.

C. ALTERNATIVES

In accordance with NEPA and Commission policy, we considered and evaluated alternatives to the proposed Project to determine whether any would be technically and economically feasible and environmentally preferable to the proposed action. The range of alternatives analyzed includes the no-action alternative, system alternatives, route alternatives, route variations, and aboveground facility site alternatives. The evaluation criteria applied to each alternative include a determination whether the alternative:

- meets the objectives of the proposed action;
- is technically and economically feasible and practical; and
- offers a significant environmental advantage over the proposed action.

Our analysis of alternatives is based on Project-specific information provided by the applicant, affected landowners, and other concerned parties; comments received during Project scoping; publicly available information; our consultations with federal and state agencies; and our own research regarding the siting, construction, and operation of natural gas transmission facilities and their impacts on the environment (i.e., our alternatives analysis is comment and resource driven). Unless otherwise noted, to ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g., publicly available data, GIS data, aerial imagery). to standardize comparisons between the Project and each alternative. As a result, some of the information presented in this section relative to the Project may differ from information presented in section B, which is based on Project-specific data derived from field surveys and engineered drawings. Where appropriate, we also use site-specific information (e.g., field surveys or detailed designs).

1. Evaluation Process

Through environmental comparison and application of our professional judgment, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria.

The alternatives were reviewed against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the Project. An alternative that cannot meet the Project's objective would not be brought forward to the next level because it cannot be considered as an acceptable replacement for the Project.

The second evaluation criteria are feasibility and practicality. An alternative that would require the use of new, unique, or experimental construction methods may be feasible but not technically practical because the required technology is unproven and/or not yet available. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render the project economically impractical. An alternative that is not technologically feasible or economically practical was not brought forward to the next level of review (i.e., the third evaluation criterion).

Lastly, determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources, we also considered the degree of impact anticipated on each resource. Our environmental analysis and this evaluation consider quantitative data (e.g., acreage) and use common comparative factors such as site availability, existing land use, and land requirements. In recognition of the competing interests and the different nature of impacts resulting from an alternative that sometimes exists (i.e., impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative and discount or eliminate factors that are not relevant or may have less weight or significance. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

2. No-Action Alternative

If the Commission denies WBI Energy's application, the Project would not be built, and the environmental impacts associated with construction and operation of the proposed facilities would not occur. As a result, the objectives of the Project would not be met, and the benefits would not be realized. Under this alternative, WBI Energy would be unable to transport incremental volumes of processed natural gas, which would leave the processed natural gas stranded, possibly flared, and unable to reach markets. As described in section A.2, about 0.5 billion cubic feet per day, or about 17 percent, of the natural gas production from the Bakken and Three Forks Formations was flared due to limited or insufficient field gathering facilities, inadequate natural gas processing capacity, and/or insufficient pipeline infrastructure (NDDMR, 2020). Additionally, North Dakota has established state-mandated natural gas capture targets, which require producers to capture a certain percentage of natural gas production on an annual basis (North Dakota Industrial Commission, 2014). The current state-mandated target is 12 percent flared. Under the no-action alternative, other natural gas transmission companies might propose to construct similar, new facilities to meet the demand for transportation of processed natural gas from the Williston Basin area. Such actions could result in impacts similar to or greater than the proposed Project and might not meet the Project's objectives within the proposed timeframes. Therefore, we have concluded that the no-action alternative is not practical and provides no significant advantage over the Project.

3. System Alternatives

System alternatives would make use of other existing, modified, or proposed pipeline systems to meet the objectives of the Project. Implementation of a system alternative would make it unnecessary to construct all or part of the Project, although some modifications or additions to existing or proposed pipeline systems may be required. These modifications or additions could result in environmental impacts that are less than, similar to, or greater than those associated with construction and operation of the Project. The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with construction and operation of the Project could be avoided or reduced by using another pipeline system, while still meeting the objectives of the Project.

North Dakota has a broad network of high-pressure, high-volume, natural gas pipelines operating throughout the state. Based on information provided by WBI Energy, we identified and evaluated two existing pipeline systems in northwestern North Dakota that could meet the objectives of the Project: the Alliance pipeline system and the Northern Border pipeline system. These system alternatives are shown in figure 4 and described below.

Alliance Pipeline System Alternative

The Alliance pipeline system consists of 2,391 miles of integrated Canadian and U.S. natural gas transmission pipelines that provide transportation of rich natural gas from the Western Canadian Sedimentary Basin and the Williston Basin in North Dakota to the Chicago market hub. The U.S. portion of the system comprises about 887 miles of 36-inch-diameter pipeline with a maximum operating pressure of 1,935 psig. The system has been in commercial service since December 2000 and delivers an average of 1.6 billion standard cubic feet of natural gas per day to the Chicago market.

This system alternative would require construction of about 124 miles of new 24-inch-diameter pipeline from WBI Energy's Tioga Compressor Station traversing east to an interconnect with the Alliance pipeline system near Towner, North Dakota, and construction of a new compressor station near the interconnect. Construction of the proposed Line Section 25 and 30 pipeline loops, the Tioga Compressor Lateral, and the required additional compression at the Tioga Compressor Station would be required for this alternative. The new compressor station near the Alliance interconnect would be much larger than the proposed Elkhorn Creek Compressor Station (estimated at 6,300 hp higher) due to the higher operating pressure of the Alliance pipeline, as well as the additional distance to the Alliance interconnect. Due to the additional environmental impacts associated with the longer pipeline, we conclude that this alternative would not provide a significant environmental advantage and we have removed it from further consideration.

Northern Border Pipeline System Alternative

The Northern Border pipeline system, owned by TC Pipelines, LP and ONEOK Partners, is a major natural gas transportation system that links the Midwestern United States with reserves in the Western Canadian Sedimentary Basin and transports natural gas produced in the Williston and Powder River Basins in the United States to the Chicago area (Northern Border, 2019). WBI Energy currently has five interconnects with Northern Border in northwestern and central North Dakota. The system has a total design capacity of about 2.4 billion cubic feet per day.

To meet the Project purpose Northern Border's system alternative would require construction of a 24-inch-diameter pipeline from the Tioga Compressor Station to an interconnection with Northern Border west of Williston, North Dakota that would be about 3 miles longer than the proposed Tioga-Elkhorn Creek pipeline. The pipeline would likely be routed around the north side of Williston, North Dakota and traverse southwest towards WBI Energy's Stateline interconnect with Northern Border. Construction of the proposed Line Section 25 and 30 pipeline loops, the Tioga Compressor Lateral, Northern Border Interconnect, and the required additional compression at the Tioga Compressor Station would be the same as the proposed Project. This alternative has the advantage of avoiding the crossing of Lake

Sakakawea; however, the route is slightly longer than the Tioga-Elkhorn Creek pipeline, reduces pipeline collocation opportunities, and increased the length of the pipeline that would be constructed through less heavily oil- and gas-developed areas. In addition, the town of Williston is considered a hub city within the region. The town's population has tripled over that last 10 years and expanded to provide new housing and infrastructure to meet the demands of a growing city (City of Williston, 2019). This alternative route would be near the city of Williston and would increase the likelihood of encroachment on residences and businesses. Due to the proximity to the town of Williston, WBI Energy's proposed HDD of Lake Sakakawea to avoid impacts on this resource, and additional environmental impacts associated with the longer pipeline required by Northern Border, we conclude that this alternative would not provide a significant environmental advantage and have removed this alternative from further consideration.

North Badlands System Alternative

During the scoping period, we received comment letters regarding potential route alternatives. The Hartels suggested that WBI Energy consider replacing an existing pipeline that extends east of Watford City and ties into Northern Border south of Watford City with a larger diameter pipeline, as an alternative to constructing the proposed Tioga-Elkhorn Creek pipeline. WBI Energy's North Badlands sub-system's 16-inch-diameter pipeline generally follows a portion of the proposed Project route. This pipeline is designed to flow 200,000 million cubic feet per day, which would either be interrupted for approximately 8 months during the lift and re-lay construction of a replacement pipeline or would require additional workspace to install a new pipeline adjacent to the existing pipeline. An interruption in natural gas service would have a significant impact on upstream gas processing plants. To accommodate the combined volume level that would be flowing on the replacement pipeline (either a new pipeline or an additional pipeline), either the diameter of the pipeline would need to be increased or additional horsepower installed at the Elkhorn Creek Compressor Station. Either the lift and re-lay pipeline or the new adjacent pipeline would have to be extended an additional 3 miles from its current interconnect with Northern Border at Spring Creek to the Elkhorn Creek Compressor Station. In addition, WBI Energy's North Badlands sub-system is operated independently of WBI Energy's integrated system, with separate pressure requirements, transportation rates, and fuel reimbursement provision, which would be affected by replacing the current 16-inch-diameter pipeline. Because the alternative would impact similar land use types, would cause an interruption in natural gas service, and would be 3 miles longer, we conclude that the alternative would not provide a significant environmental advantage over the proposed Project.

4. Route Alternatives and Variations

We evaluated major route alternatives, minor route alternatives, and minor route variations.

4.1 Major Route Alternatives

Major route alternatives (generally greater than 1 mile) include those that deviate from the proposed route for a significant distance and provide a substantially different pathway from the source area to the delivery area. Major route alternatives would involve a new pipeline route

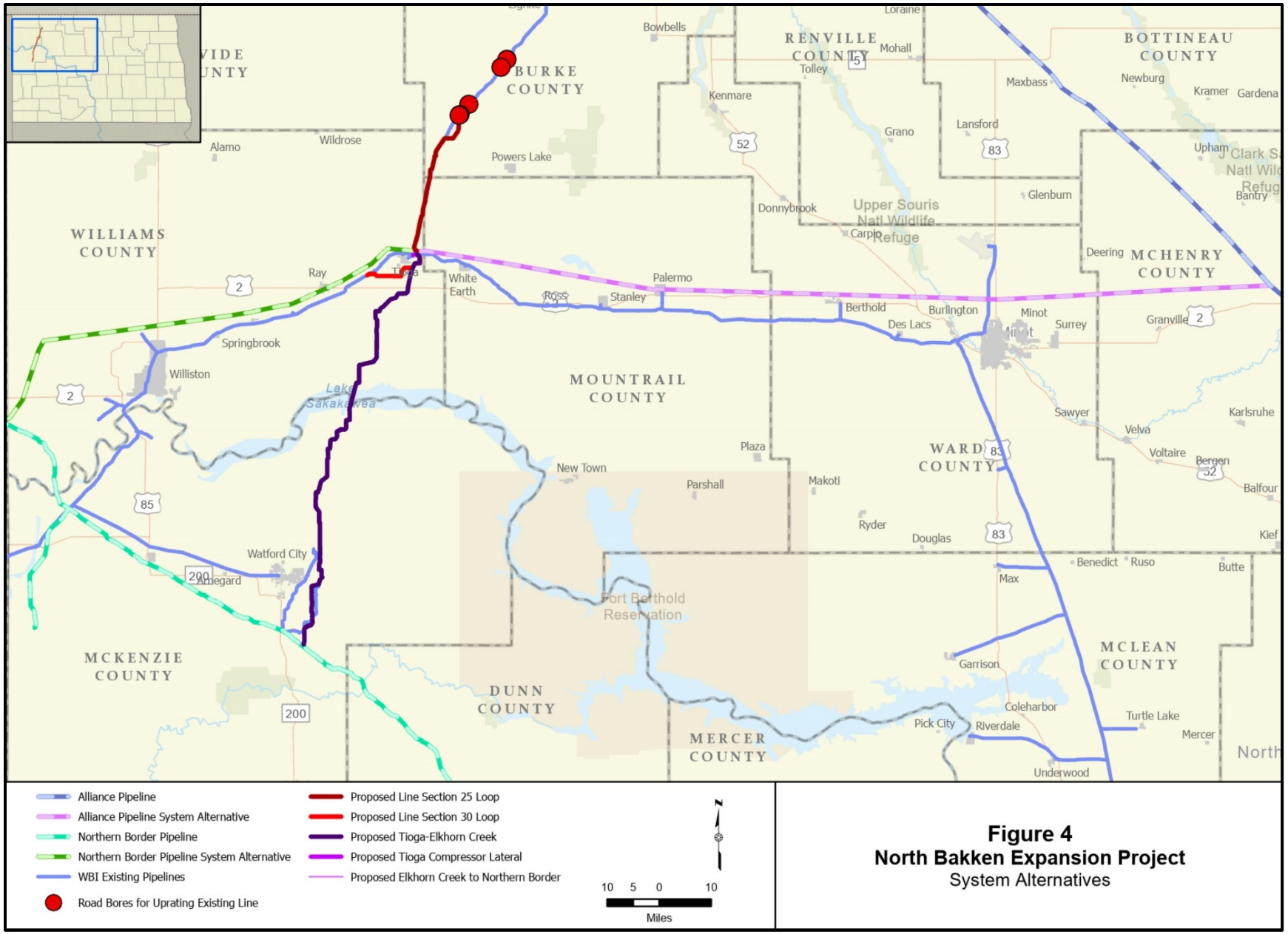


Figure 4
North Bakken Expansion Project
System Alternatives

that would still interconnect with the same existing pipeline systems, potentially at different locations, but would ultimately provide natural gas to the same proposed facilities.

Two major route alternatives were evaluated to see if crossing federal lands by the Project could be minimized or eliminated altogether: the Western and Eastern Alternatives. As depicted in figure 5, the Project route would cross both USACE land and USFS land. The USACE land extends approximately 45 miles west and over 100 miles southeast of the proposed Lake Sakakawea crossing location. Route alternatives to avoid USACE lands were deemed impracticable as they would add 90 and 200 miles to the proposed routes, which in turn would add additional environmental impacts, including but not limited to additional wetland crossings, waterbody crossings, wetland easements, and vegetation impacts. However, both alternative routes would eliminate USFS land crossed, as depicted in figure 6.

Western Alternative

The Western Alternative would extend west from MP 22.4 of the Tioga-Elkhorn Creek pipeline, follow the north side of 51st Lane NW until it connects with Highway 1804, and then continue along the north side of Highway 1804 for an additional 2 miles. The alternative route would then head southwest through steep topography along the north side of Lake Sakakawea between existing oil and gas well pad development. The alternative route then would cross Lake Sakakawea following an existing ONEOK Rockies Midstream gathering line through a valley on the south side of the lake. The route then continues south paralleling Highway 1806 west for about 1 mile before turning east and following 45th Street NW for an additional 0.9 mile. At this point, the alternative would rejoin the Tioga-Elkhorn Creek pipeline route near MP 30.8. The Western Alternative is 12.1 miles in length, compared with the corresponding 8.4-mile segment of the proposed Tioga-Elkhorn Creek pipeline route which would increase the potential for impacts by an additional 3.7 miles.

In comparison to the proposed Tioga-Elkhorn Creek pipeline route which would cross 2.7 miles of USACE lands, the Western Alternative would cross a total of 3.8 miles of USACE lands, including lands that extend on the north side of Highway 1804 near Lund's Landing Boat Ramp. The Western Alternative would be within 0.25 mile of both Lund's Landing and 3 D's Campground, which would have temporary impacts (visual, noise, traffic) on these existing recreation areas during construction.

The crossing of Lake Sakakawea (waterbody itself) would be 2.7 miles compared to 2.4 miles for the proposed route. While a configuration of a HDD layout was not developed for the Western Alternative, it is anticipated that the drill itself would need to extend north and south of the lake proper, making the drill a minimum of 0.3 mile longer than that of the proposed lake crossing. As previously mentioned, the topography on the north shore of Lake Sakakawea on the Western Alternative is much steeper than that of the proposed route and could potentially require grading for placement of the pipe pullback for the HDD. The south shore of Lake Sakakawea has the potential viability of a pipe pullback area for the Western Alternative; however, only approximately 0.7 mile of contiguous agricultural fields are present versus 2.7 miles on the proposed route. Additional shrub/tree clearing for the alternative would be required for a pullback on the south shore.

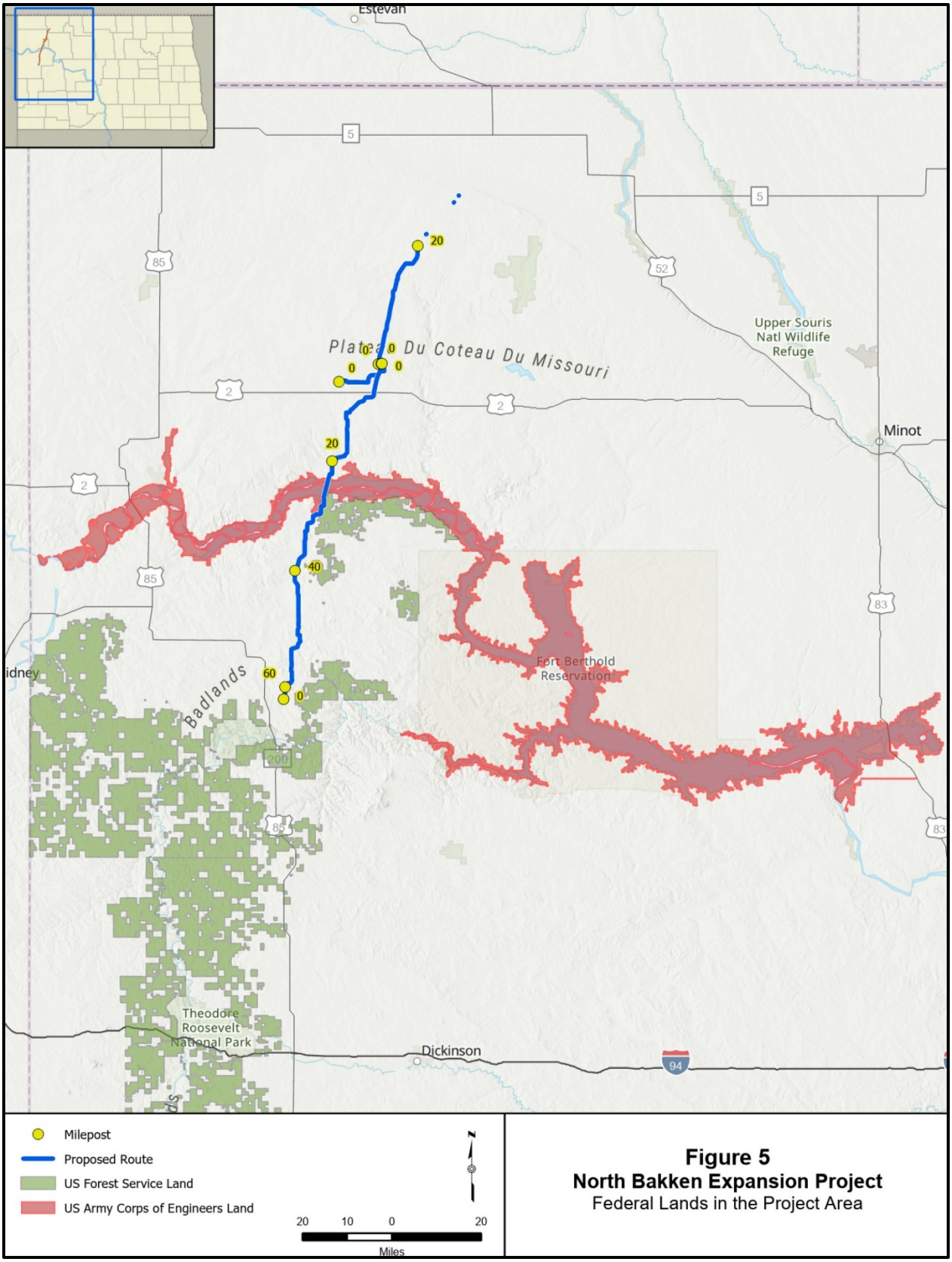


Figure 5
North Bakken Expansion Project
Federal Lands in the Project Area

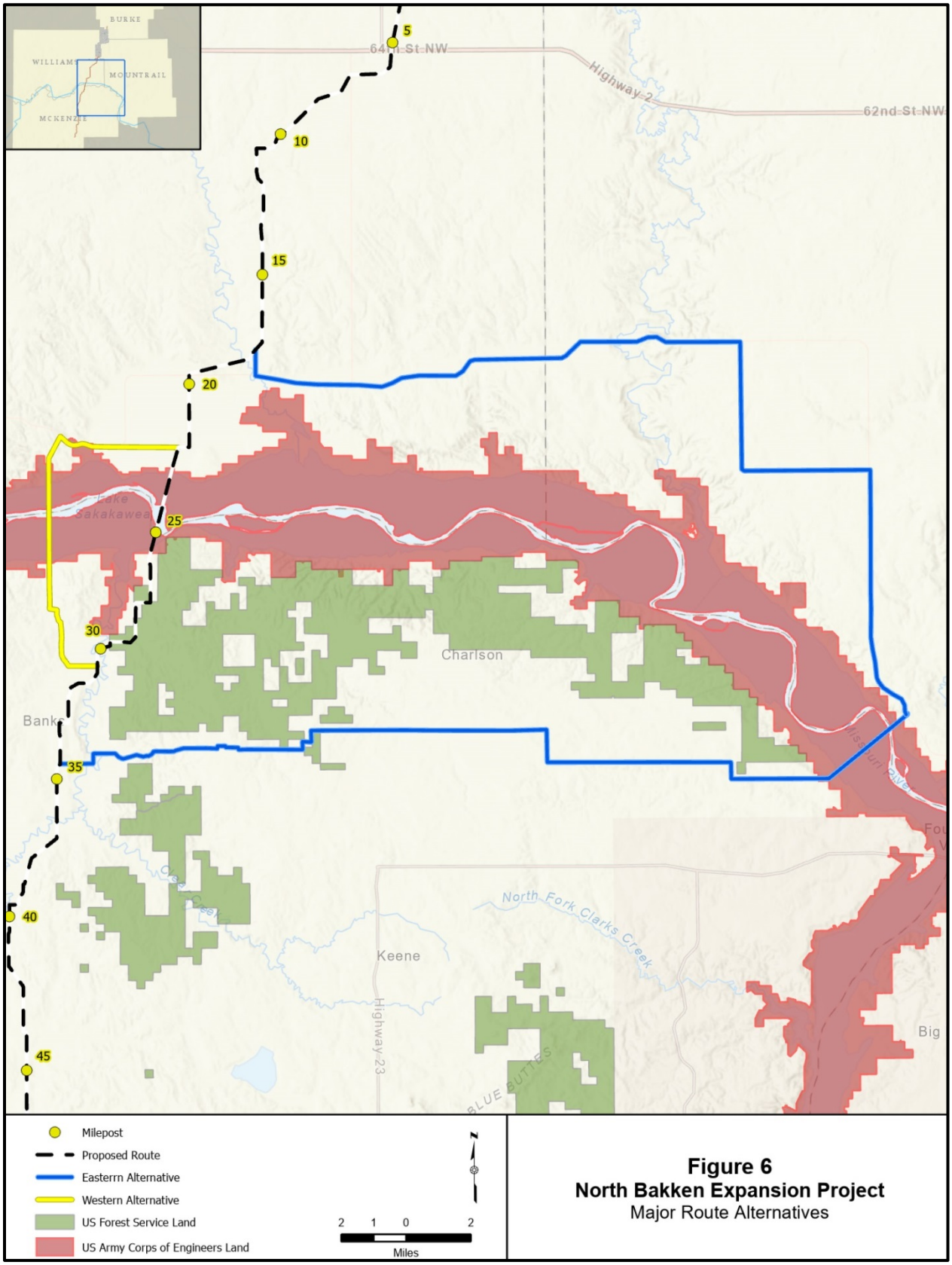


Figure 6
North Bakken Expansion Project
Major Route Alternatives

While the Western Alternative would avoid the crossing of the USFS LMNG, it would add approximately 3.7 miles to the pipeline route, increase the length of USACE-lands crossed, including near two existing recreation areas. Further, the additional crossing length and pullback challenges associated with the Lake Sakakawea HDD could make this alternative infeasible. For these reasons, we conclude that the Western Alternative would not offer a significant environmental advantage when compared to the corresponding segment of the proposed route.

Eastern Alternative

The Eastern Alternative would extend south from MP 17.6 of the Tioga-Elkhorn Creek pipeline for approximately 1 mile before heading east following 54th and 55th Streets NW for an additional 16 miles, head south following 96th Avenue NW for about 4 miles, and turn east along 51st Street NW for an additional 4 miles. The Eastern Alternative would then head southeast along Highway 1804 for approximately 8 miles before heading southwest across Lake Sakakawea. The alternative would then head west for about 21 miles generally following existing roads where possible and following existing utility rights-of-way for another 5 miles before rejoining the Tioga-Elkhorn Creek pipeline route near MP 34.7.

The Eastern Alternative is approximately 61.8 miles in length, compared with the corresponding 17.1-mile segment of the proposed Tioga-Elkhorn Creek pipeline route. The Eastern Alternative would cross a total of 3.2 miles of USACE-owned land compared with 2.7 miles of the proposed route, but would avoid crossing of USFS-owned land. While the alternative was routed to follow existing roads for most of the route, this does put the alternative in close proximity to various homes and businesses primarily along 54th Street NW, 92nd Avenue NW, 91st Avenue NW, 43rd Avenue NW, and 42nd Avenue NW. While the Eastern Alternative would not extend into the Fort Berthold Indian Reservation, it would be approximately 2 miles west of the reservation boundary for approximately 10 miles along the route. The Eastern Alternative crossing of Lake Sakakawea would be just upstream of the reservation boundary. Review of NHD data indicates that the Eastern Alternative would cross over 40 additional intermittent waterbodies compared with the corresponding segment of the proposed segment of the Tioga-Elkhorn Creek pipeline. The crossing of Lake Sakakawea (waterbody itself) would be 2.6 miles compared to 2.4 miles for the proposed route. While a configuration of an HDD crossing was not developed for the Eastern Alternative, it is anticipated that the HDD would need to extend on either side of the lake proper, making the drill a minimum of 0.2 mile longer than that of the proposed lake crossing. Similar to the Western Alternative, the topography on both shores of Lake Sakakawea is much steeper than that of the proposed route and could potentially require grading and/or tree clearing for placement of the HDD pipe pullback.

While the Eastern Alternative would avoid crossing the USFS LMNG, it would add over 50 miles to the pipeline route, increase the crossing length of USACE lands, be in close proximity to homes and businesses, increase the number of waterbody areas crossed, and require a longer, potentially more challenging HDD crossing of Lake Sakakawea. For these reasons, we conclude that the Eastern Alternative would not offer a significant environmental advantage when compared to the corresponding segment of the proposed route.

4.2 Minor Route Alternatives

The Hartels suggested a second minor route alternative that would involve routing the Tioga-Elkhorn Creek pipeline between two existing WBI Energy pipelines from approximately MPs 51.8 to 52.8. The two existing WBI Energy pipelines run parallel with the space between the pipelines varying from a minimum of 11 feet to a maximum of 60 feet. Given the space required to safely install the proposed 24-inch-diameter pipeline, this alternative is not considered feasible. WBI Energy did attempt to collocate the proposed pipeline with existing energy infrastructure across the property. The proposed route runs between an existing WBI Energy pipeline and an existing ONEOK pipeline for the first 0.6 mile and then parallels an existing Hiland crude oil pipeline for the remaining 0.4 mile. The current route was also engineered to minimize sidehill construction across the property. For these reasons, this minor route alternative may not be technically feasible in all locations and would not offer a significant environmental advantage over the proposed route.

However, this analysis was completed using desktop data because civil survey crews had not yet received landowner permission to access the Hartel property. Subsequently, civil surveys were completed the week of July 20, 2020 and the results are currently being reviewed to determine if there is enough room to safely route the pipeline between the two existing WBI Energy pipelines on the Hartel property. WBI Energy is continuing to work with the landowner on the route across their property.[41]

4.3 Minor Route Variations Incorporated into Project

As a result of ongoing environmental field surveys, consultations with regulatory agencies, and continued Project engineering design, WBI Energy identified several minor route variations along the current proposed route to avoid or minimize crossings of sensitive environmental features, address landowner concerns, and/or address engineering concerns. Table C-1 summarizes the minor route variations identified and incorporated into the proposed pipeline routes since the submittal of WBI Energy's February 14, 2020 Application.

5. Compressor Station Alternative

The location of the proposed Elkhorn Creek Compressor Station was primarily determined by WBI Energy due to its proximity to Northern Border's pipeline for tie-in capabilities, landowner considerations, its position near existing roads and electric power facilities, and the availability of land for purchase. We did not receive any comments, nor did we identify any significant environmental impacts associated with the proposed Elkhorn Creek Compressor Station site or any other aboveground facilities; therefore, we did not evaluate aboveground facility alternative sites further.

[41] In accordance with section IV.A.1 of the FERC Plan, minor field realignments and workspace shifts per landowner needs or requirements that do not affect other landowners or sensitive environmental resource areas, do not require Director approval.

Table C-1
Summary of Minor Route Variations Identified During the Pre-Filing Process and Incorporated into the Proposed Pipeline Routes

Pipeline Facility/ Route Variation	Approximate Milepost Begin	Approximate Milepost End	County	Justification for Variation
Tioga-Elkhorn Creek				
Route Variation 1	0.0	0.4	Williams	Engineering adjustment and cultural sites
Route Variation 2	0.7	0.9	Williams	Engineering adjustment
Route Variation 3	12.1	12.3	Williams	Avoid cultural sites
Route Variation 4	16.8	17.0	Williams	Avoid DASK habitat
Route Variation 5	17.8	18.0	Williams	Avoid cultural sites
Route Variation 6	18.9	18.9	Williams	Avoid cultural sites
Route Variation 7	19.2	19.8	Williams	Engineering adjustment and cultural sites
Route Variation 8	27.2	29.4	McKenzie	Adjustments to avoid cultural sites, DASK habitat, wetlands, and engineering constraints
Route Variation 9	29.9	30.3	McKenzie	Engineering adjustment
Route Variation 10	31.4	31.9	McKenzie	Avoid cultural sites
Route Variation 11	32.3	32.3	McKenzie	Avoid cultural sites
Route Variation 12	36.3	36.6	McKenzie	Avoid cultural sites
Route Variation 13	52.7	55.5	McKenzie	Landowner requests,DASK habitat, wetlands, and engineering constraints
Route Variation 14	55.7	56.5	McKenzie	Avoid DASK habitat
Route Variation 15	58.2	58.9	McKenzie	Avoid cultural sites
Route Variation 16	59.2	59.5	McKenzie	Avoid cultural sites
Route Variation 17	60.5	62.6	McKenzie	Landowner request
Line Section 25 Loop				
Route Variation 18	0.1	1.1	Williams	Adjustment to avoid cultural sites, wetlands, and engineering constraints
Route Variation 19	1.6	2.0	Williams	Engineering adjustment
Route Variation 20	4.2	4.6	Williams	Engineering adjustment and cultural site
Route Variation 21	12.9	13.3	Burke	Engineering adjustment and cultural site
Route Variation 22	13.9	15.0	Burke	Engineering adjustment and cultural site
Route Variation 23	20.2	20.3	Burke	Engineering adjustment
Line Section 30 Loop				
Route Variation 24	8.7	8.9	Williams	Engineering adjustment
Route Variation 25	9.2	9.6	Williams	Engineering adjustment and cultural sites

6. Conclusion

We reviewed alternatives to WBI Energy's proposal based on our independent analysis. Although most of the system and pipeline route alternatives we evaluated appear to be technically feasible, none provide a significant environmental advantage over the Project design. Therefore, the proposed Project, as modified by our recommendations in section D of this EA, is the preferred alternative to meet Project objectives.

D. STAFF CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if WBI Energy constructs and operates the proposed facilities in accordance with its application, supplements, and staff's recommended mitigation measures below, approval of the Project would not constitute a major federal action significantly affecting the quality of the human environment. The staff recommends that the Commission Order contain a finding of no significant impact and that the following mitigation measures be included as conditions to any Certificate the Commission may issue.

1. WBI Energy shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. WBI Energy must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;

    b. justify each modification relative to site-specific conditions;

    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and

    d. receive approval in writing from the Director of the OEP, or the Director's designee, **before using that modification**.

2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Project. This authority shall allow:

    a. the modification of conditions of the Order;

    b. stop-work authority; and

    c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction**, WBI Energy shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EIs' authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, WBI Energy shall file with the Secretary any revised detailed survey alignment

maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

WBI Energy's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. WBI Energy's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipelines or aboveground facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. WBI Energy shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP, or the Director's designee, **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by the FERC Plan and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;

   b. implementation of endangered, threatened, or special concern species mitigation measures;

   c. recommendations by state regulatory authorities; and

   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the Certificate and before construction begins**, WBI Energy shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP, or the Director's designee. WBI Energy must file revisions to the plan as schedules change. The plan shall identify:

a. how WBI Energy will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;

b. how WBI Energy will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to on-site construction and inspection personnel;

c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;

d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;

e. the location and dates of the environmental compliance training and instructions WBI Energy will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);

f. the company personnel (if known) and specific portion of WBI Energy's organization having responsibility for compliance;

g. the procedures (including use of contract penalties) WBI Energy will follow if noncompliance occurs; and

h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

i. the completion of all required surveys and reports;
ii. the environmental compliance training of onsite personnel;
iii. the start of construction; and
iv. the start and completion of restoration.

7. WBI Energy shall employ a team of EIs (i.e., two or more or as may be established by the Director of OEP, or the Director’s designee) per construction spread. The EIs shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;

c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

d. a full-time position, separate from all other activity inspectors;

e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and

f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, WBI Energy shall file updated status reports with the Secretary on a **weekly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on WBI Energy's efforts to obtain the necessary federal authorizations;

b. the construction status of the Project by spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EIs during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);

d. a description of the corrective actions implemented in response to all instances of noncompliance;

e. the effectiveness of all corrective actions implemented;

f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

g. copies of any correspondence received by WBI Energy from other federal, state, or local permitting agencies concerning instances of noncompliance, and WBI Energy's response.

9. WBI Energy shall develop and implement an environmental complaint resolution procedure. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, WBI Energy shall mail the complaint procedures to each landowner whose property would be crossed by the Project.

a. In its letter to affected landowners, WBI Energy shall:

i. provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;

ii. instruct the landowners that if they are not satisfied with the response, they should call a WBI Energy regional contact; the letter should indicate how soon to expect a response; and

iii. instruct the landowners that if they are still not satisfied with the response from the regional contact, they should contact the Commission's Landowner Helpline at 877-337-2237 or at LandownerHelp@ferc.gov.

b. In addition, WBI Energy shall include in its weekly status report a copy of a table that contains the following information for each problem/concern:

i. the identity of the caller and date of the call;

ii. the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;

iii. a description of the problem/concern; and

iv. an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

10. WBI Energy must receive written authorization from the Director of OEP, or the Director's designee, **before commencing construction of any Project facilities**. To obtain such authorization, WBI Energy must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

11. WBI Energy must receive written authorization from the Director of OEP, or the Director's designee, **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

12. **Within 5 days of receipt of a water quality certification issued by North Dakota Department of Health, Division of Water Quality**, WBI Energy shall file the complete certification, including all conditions, and all conditions attached to the water quality certification constitute mandatory conditions of this Order. **Prior to construction**, WBI Energy shall file, for review and written approval by the Director of OEP, or the Director's designee, any revisions to its Project design necessary to comply with the water quality certification conditions.

13. **Within 30 days of placing the authorized facilities in service**, WBI Energy shall file an affirmative statement with the Secretary, certified by a senior company official:

a. that the facilities have been constructed and installed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

b. identifying which of the Certificate conditions WBI Energy has complied with or will comply with. This statement shall also identify any areas affected by the

Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

14. **Prior to construction of the Lake Sakakawea HDD**, WBI Energy shall file with the Secretary for review and written approval by the Director of OEP, or the Director's designee, its crossing-specific Engineered Drilling Fluid Plan and Water Management and Drilling Fluid Disposal Plan. (*Section B.1.1*)

15. **Prior to construction,** WBI Energy shall modify the workspace configuration of ATWS at MP16.2 of the Line Section 25 Loop to maintain at least a 50-foot offset from adjacent wetlands, and file updated maps/figures with the Secretary depicting this change, for review and written approval by the Director of OEP, or the Director's designee. (*Section B.2.3*)

16. **Prior to construction**, WBI Energy shall consult with the NDDEQ to confirm the location(s) and extent of soil and/or groundwater contamination at the Lignite Gas Plant (near the Lignite Plant Receipt Station and Lignite Town Border Station) and the status of remediation efforts. If contaminated soil or groundwater remain at the site, WBI Energy shall develop management procedures to ensure that construction and operation of the Project would not result in the spread of existing contamination and would not adversely impact on-going remediation efforts. The results of these consultations and any resulting management procedures shall be filed with the Secretary for review and written approval by the Director of OEP, or the Director's designee. (*Section B.5.3*)

17. WBI Energy **shall not begin construction** of facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

    a. WBI Energy files with the Secretary:

        i. remaining cultural resources survey reports;

        ii. site-specific evaluation reports, avoidance plans, and/or treatment plan(s), as required; and

        iii. comments on the cultural resources reports and plans from the SHPO, USACE, USFS, and/or tribes, as applicable;

    b. the ACHP is afforded an opportunity to comment if historic properties will be adversely affected; and

    c. the FERC staff reviews and the Director of OEP, or the Director's designee, approves the cultural resources reports and plans and notifies WBI Energy in writing that avoidance and/or treatment measures (including archaeological data recovery) may be implemented and/or construction may proceed.

    All materials filed with the Commission containing **location, character, and ownership information** about cultural resources must have the cover and any relevant pages therein clearly labeled in **bold** lettering: "**CUI//PRIV – DO NOT RELEASE.**" (*Section B.7.4*)

18. **Prior to construction of the Lake Sakakawea HDD**, WBI Energy shall file with the Secretary, for the review and written approval by the Director of OEP, or the Director's designee, an HDD noise mitigation plan to further reduce the projected noise level attributable to the proposed drilling operations at the entry and/or exit sites. During drilling and pull back operations, WBI Energy shall implement the approved plan, monitor noise levels, document the noise levels in the weekly status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than a L_{dn} of 55 dBA at the NSAs. (*Section B.8.2*)

19. WBI Energy shall file a noise survey with the Secretary **no later than 60 days** after placing the authorized units at the modified Tioga Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy shall provide an interim survey at the maximum possible horsepower load and provide the full-load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the Tioga Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. WBI Energy shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. (*Section B.8.2*)

20. WBI Energy shall file a noise survey with the Secretary **no later than 60 days** after placing the Elkhorn Creek Compressor Station in service. If a full-load condition noise survey is not possible, WBI Energy shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the Elkhorn Creek Compressor Station under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, WBI Energy shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. WBI Energy shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. (*Section B.8.2*)

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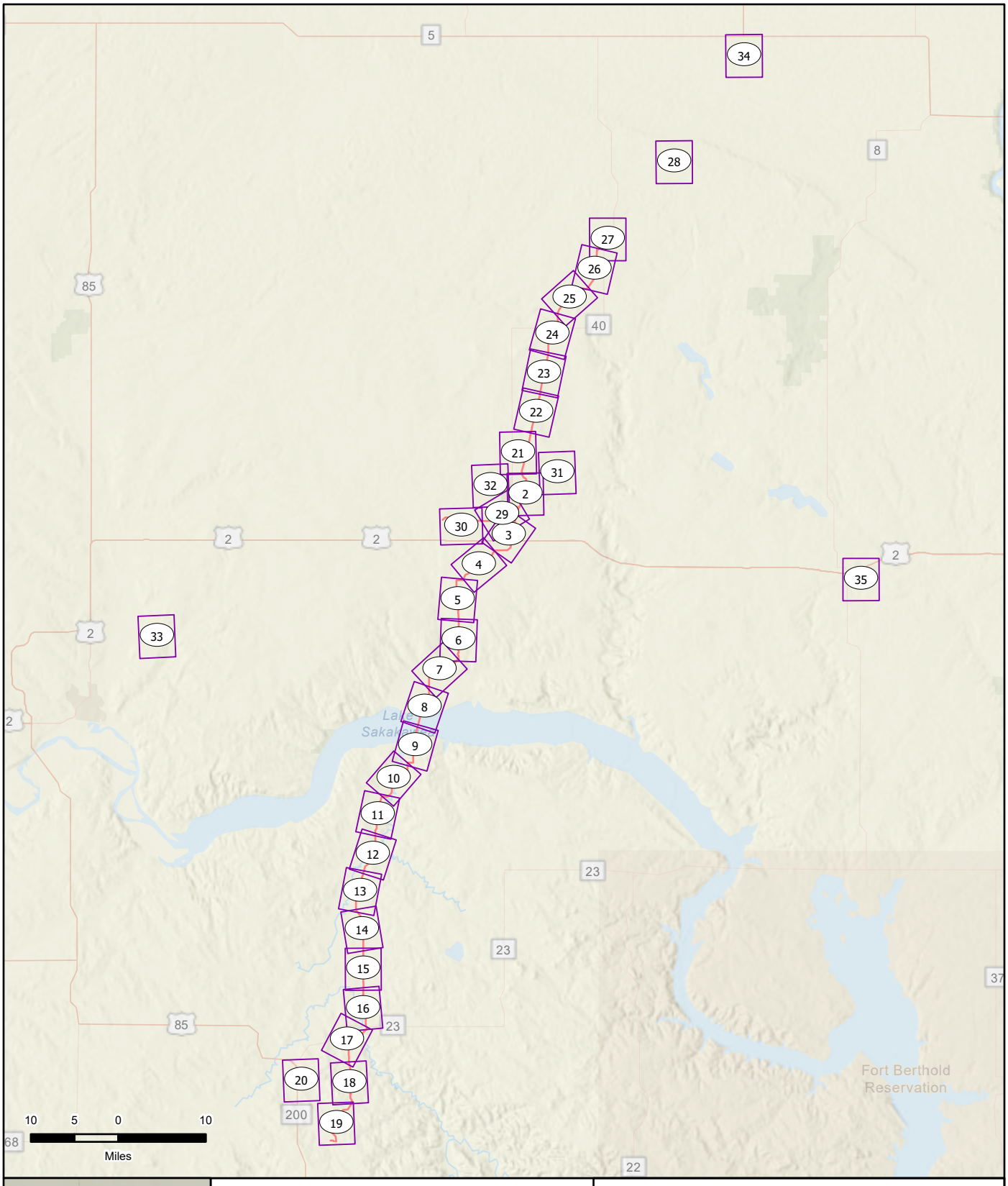
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APPENDIX A

PROJECT ROUTE MAPS (TOPOGRAPHIC)



Appendix A Sheet Page

Preliminary Route

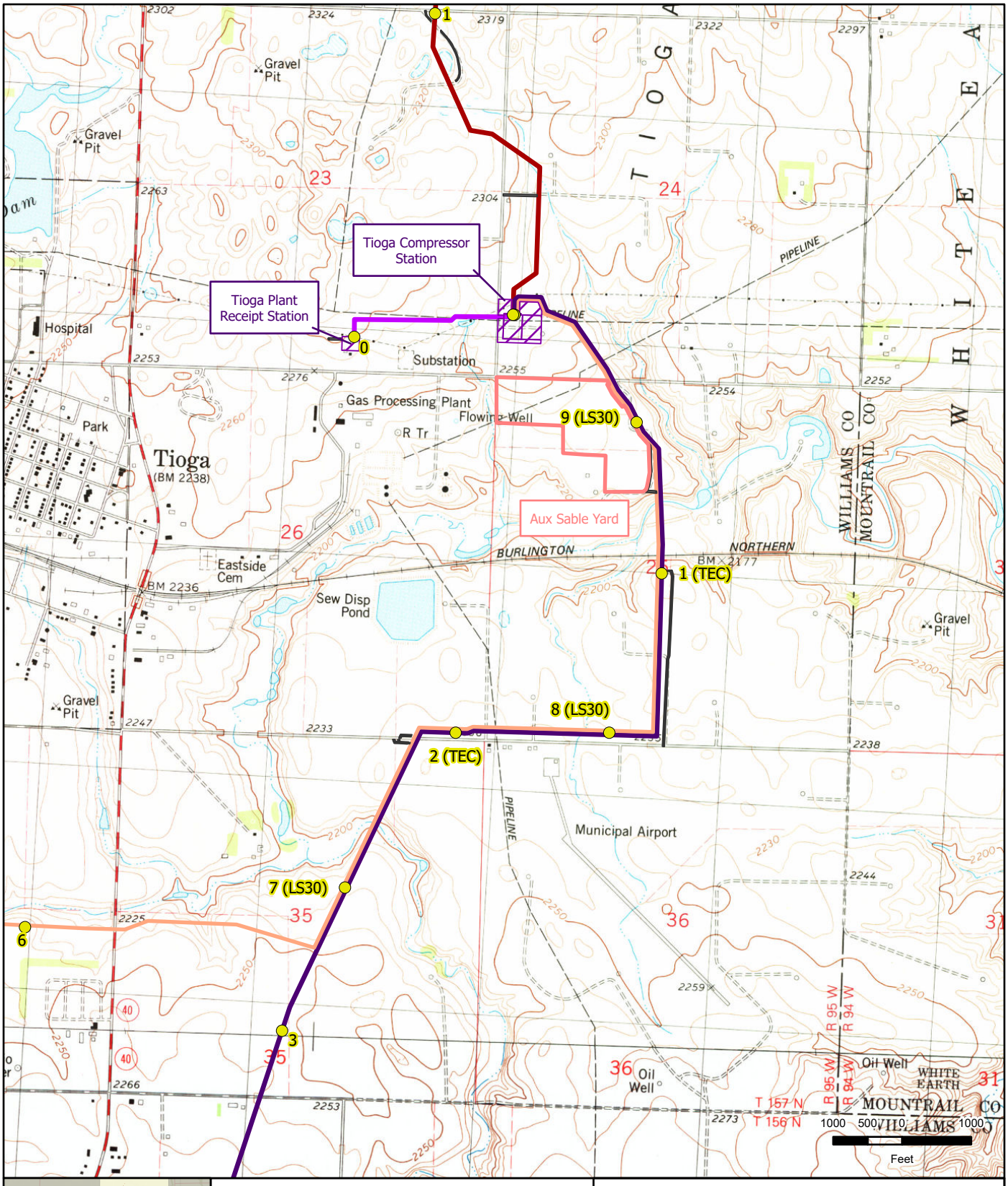
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Appendix A
North Bakken Expansion Project
Project Route Maps
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Revised: 10/27/2020

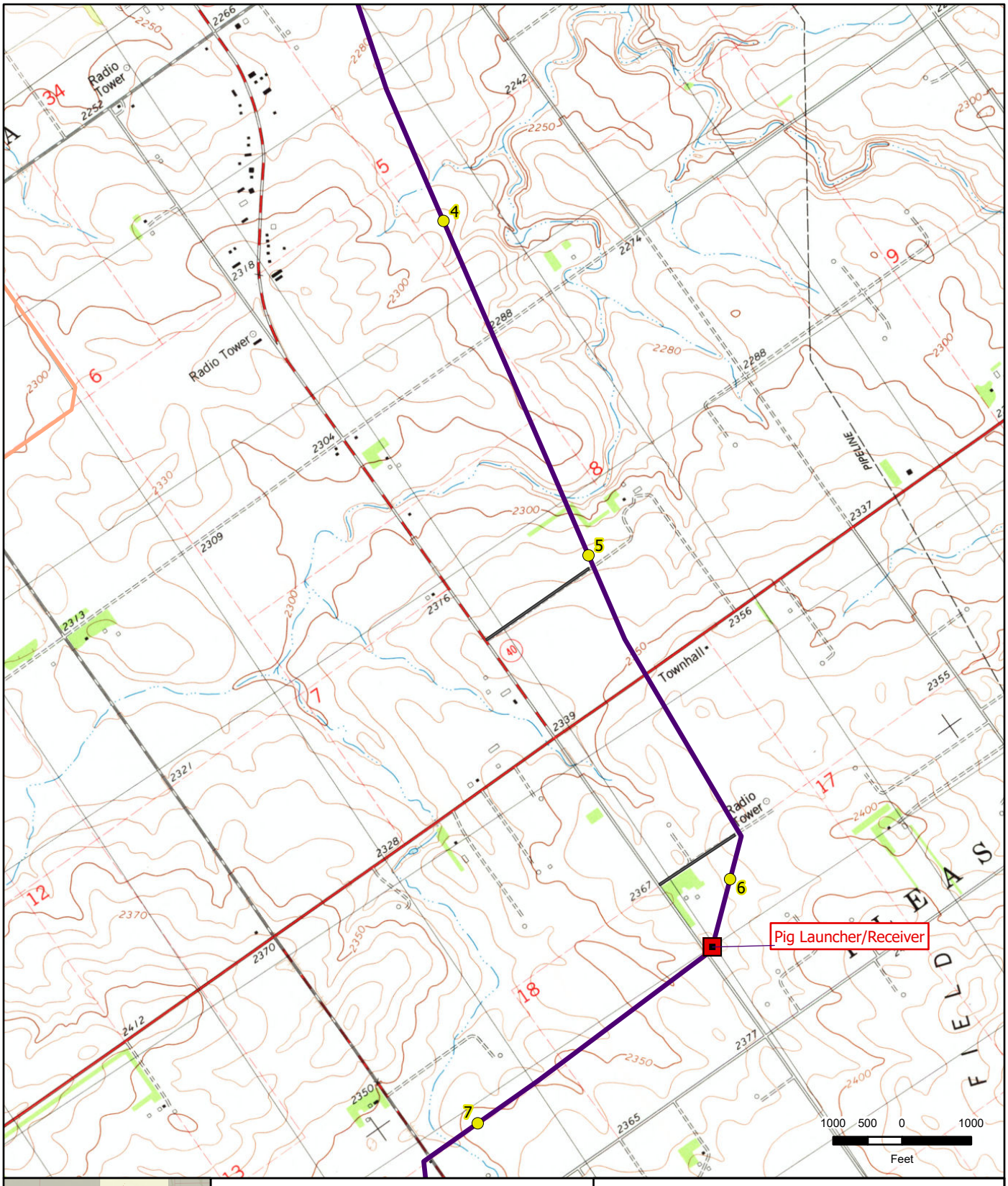
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Project Route Maps
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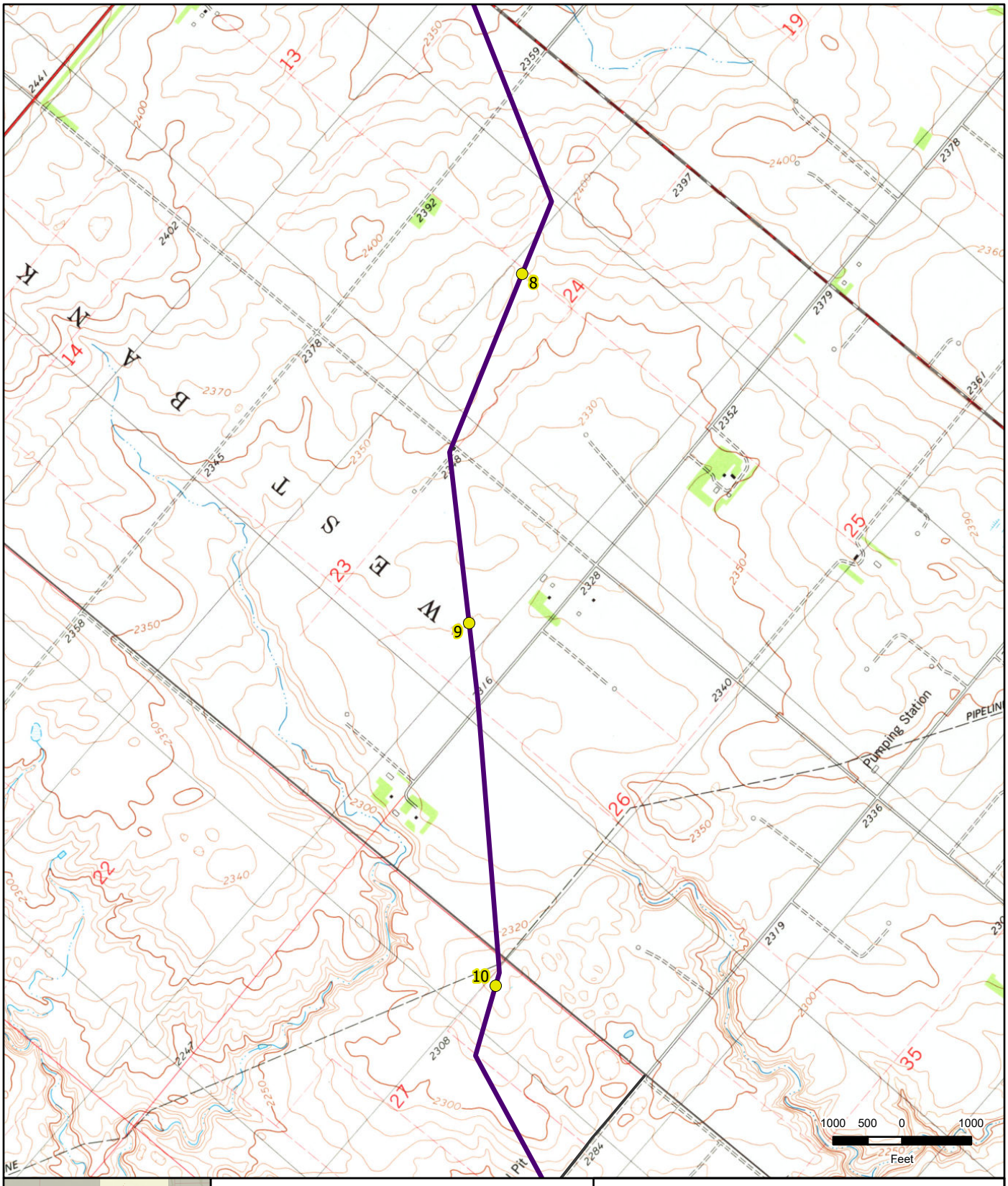
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Project Route Maps
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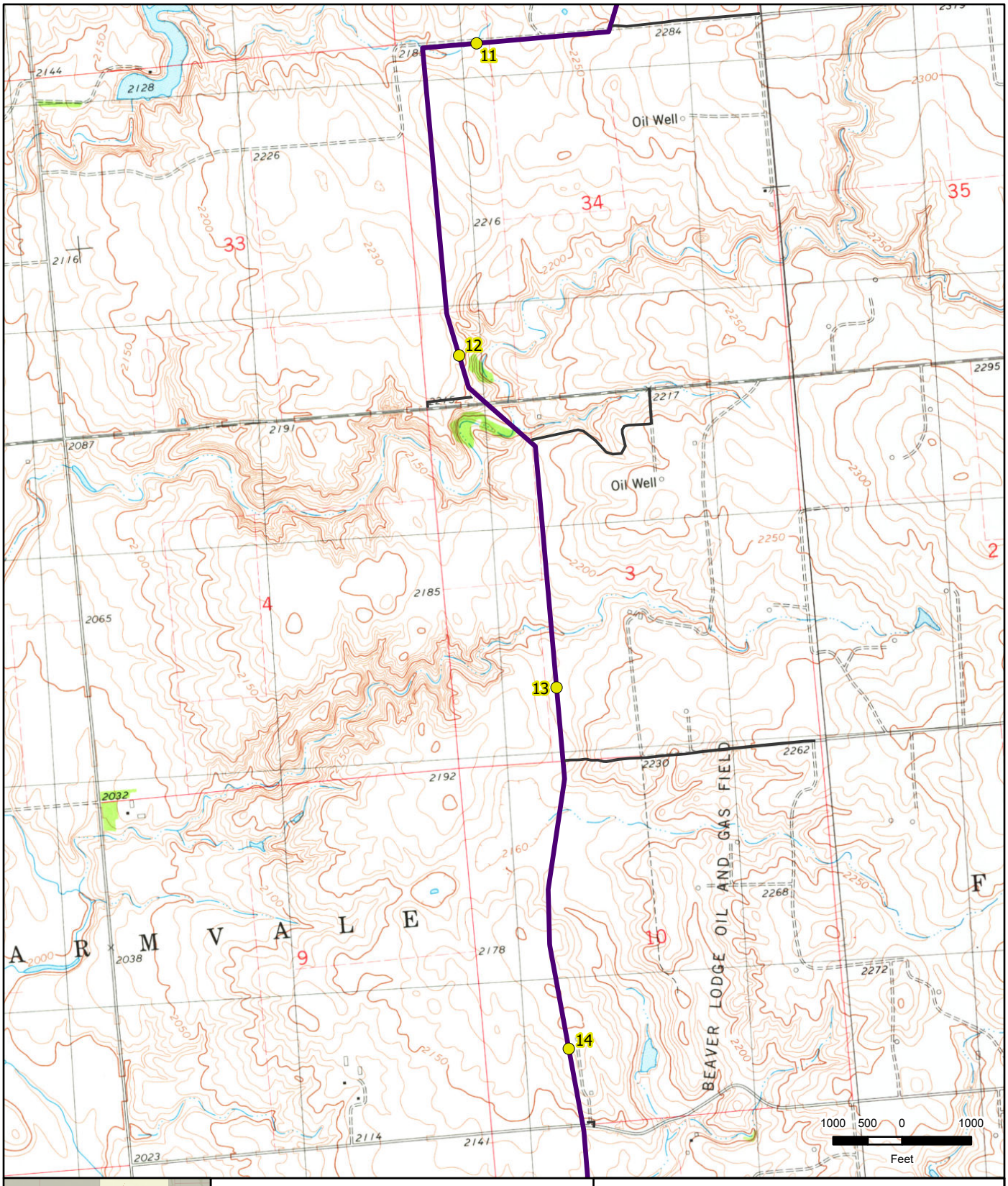
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Milepost
Proposed Tioga-Elkhorn Creek
Access Road

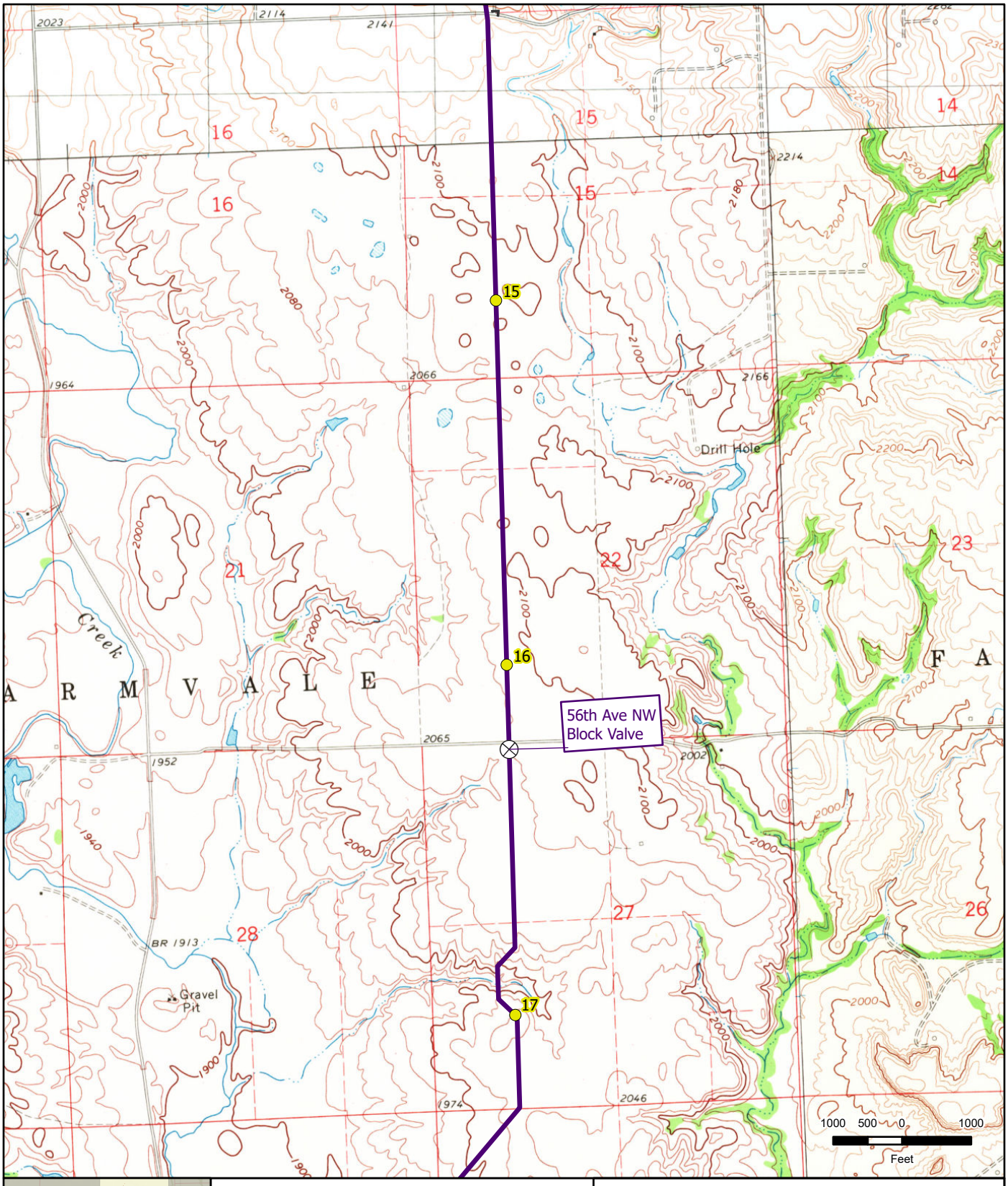
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North Bakken Expansion Project
Project Route Maps
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Revised: 10/27/2020

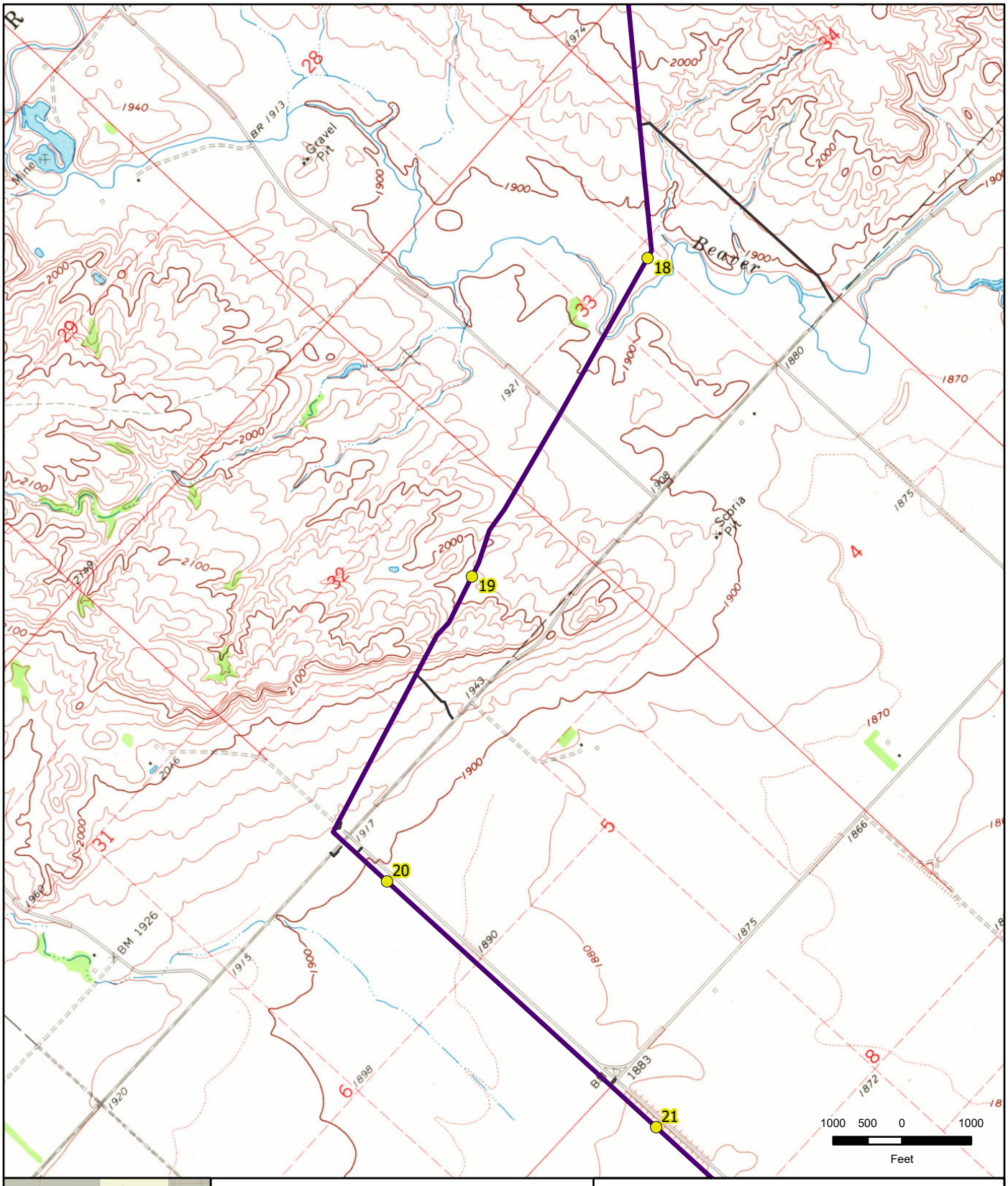
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North Bakken Expansion Project
Project Route Maps
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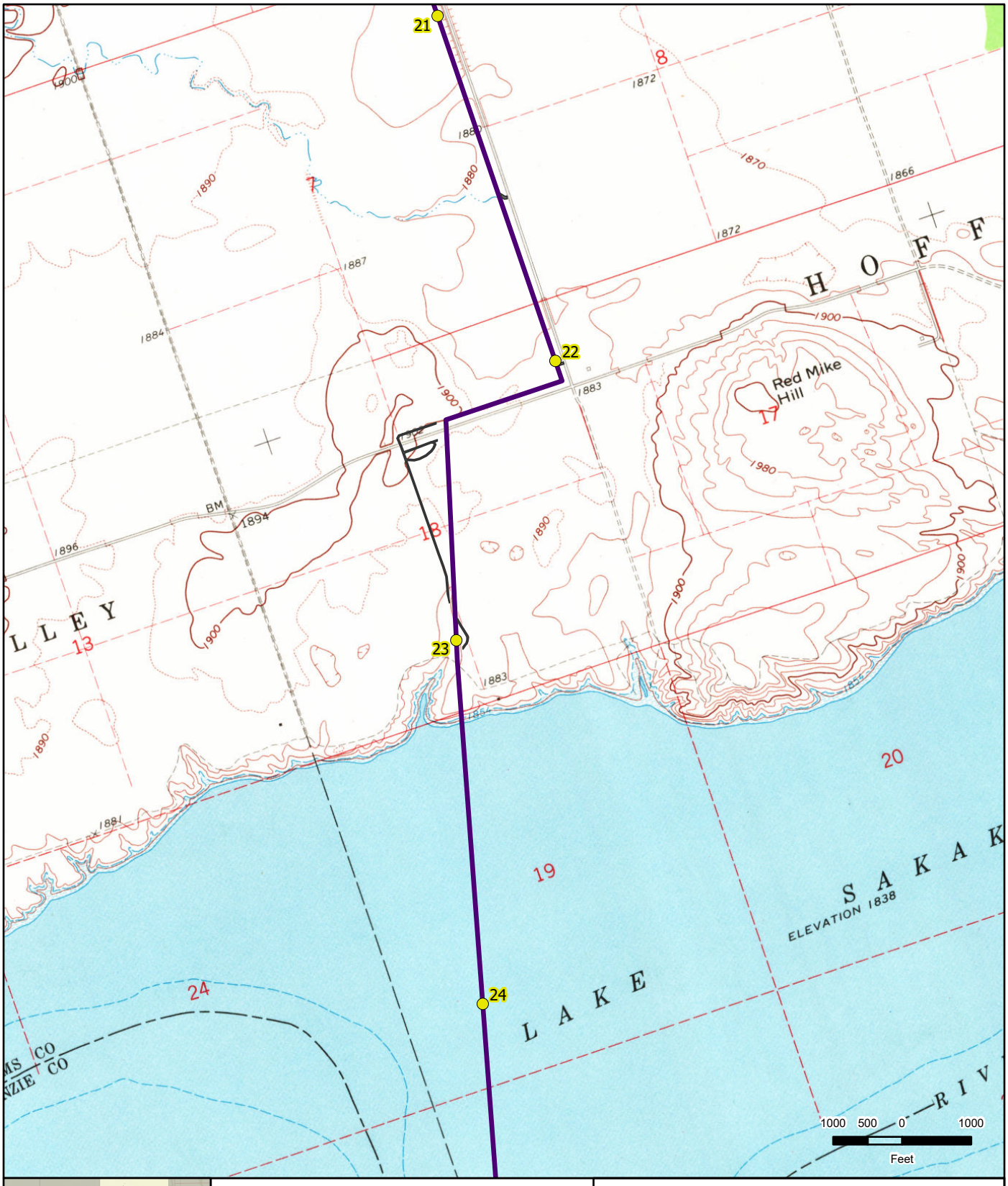
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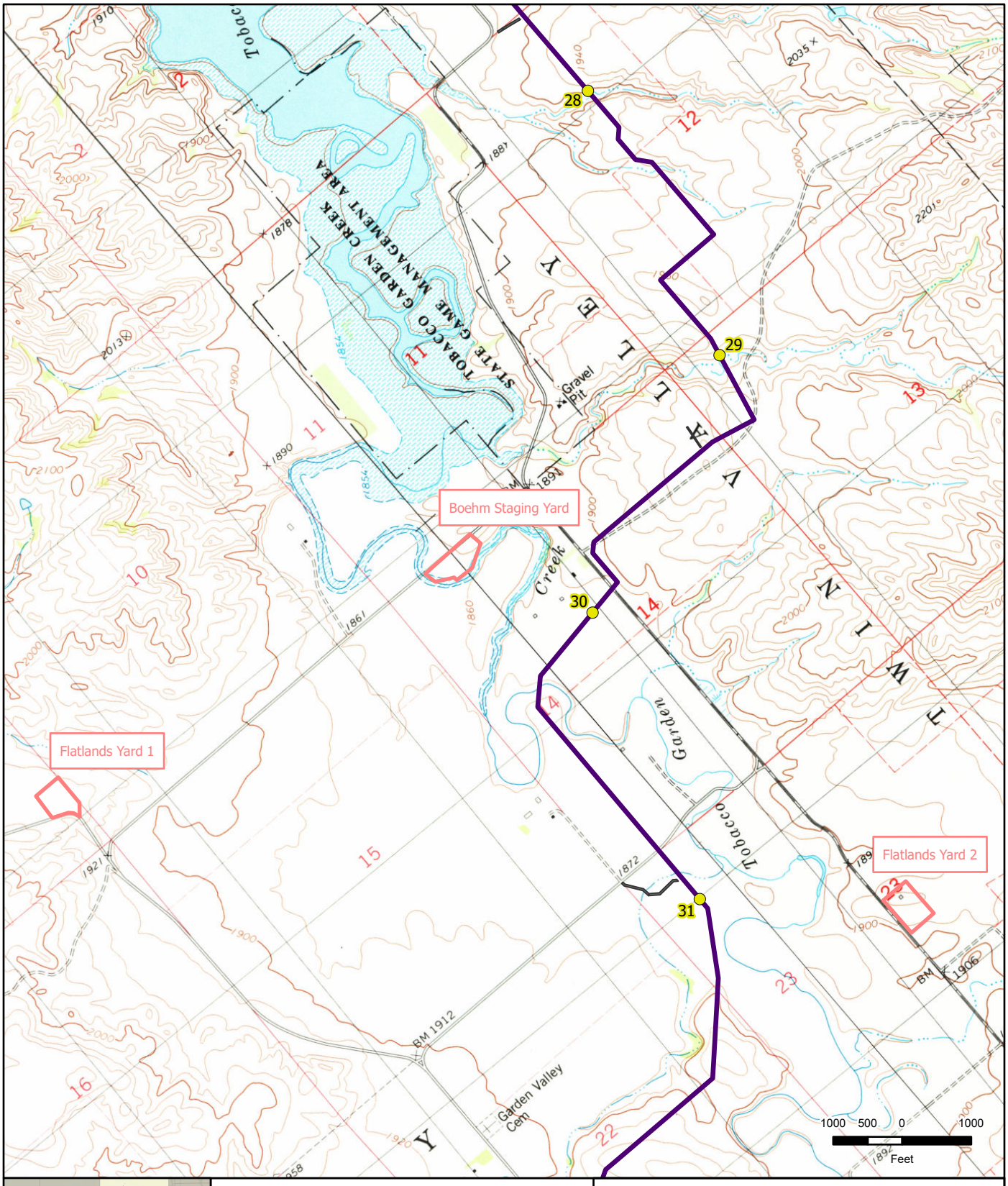
- Milepost
- Valve Site
- Proposed Tioga-Elkhorn Creek
- Access Road

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North Bakken Expansion Project
Project Route Maps
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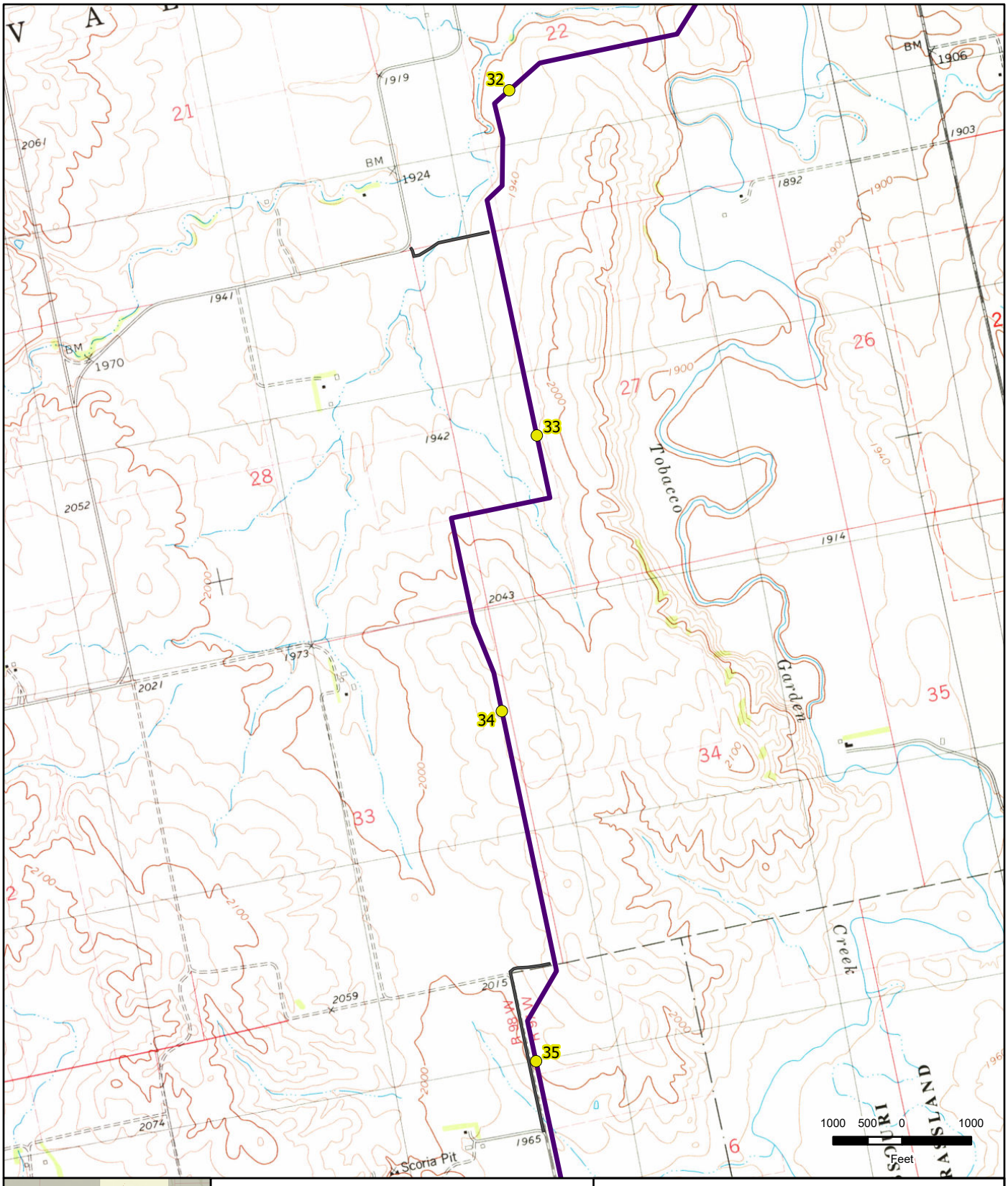
- Milepost
- Proposed Tioga-Elkhorn Creek
- Staging Area
- Access Road

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North Bakken Expansion Project
Project Route Maps
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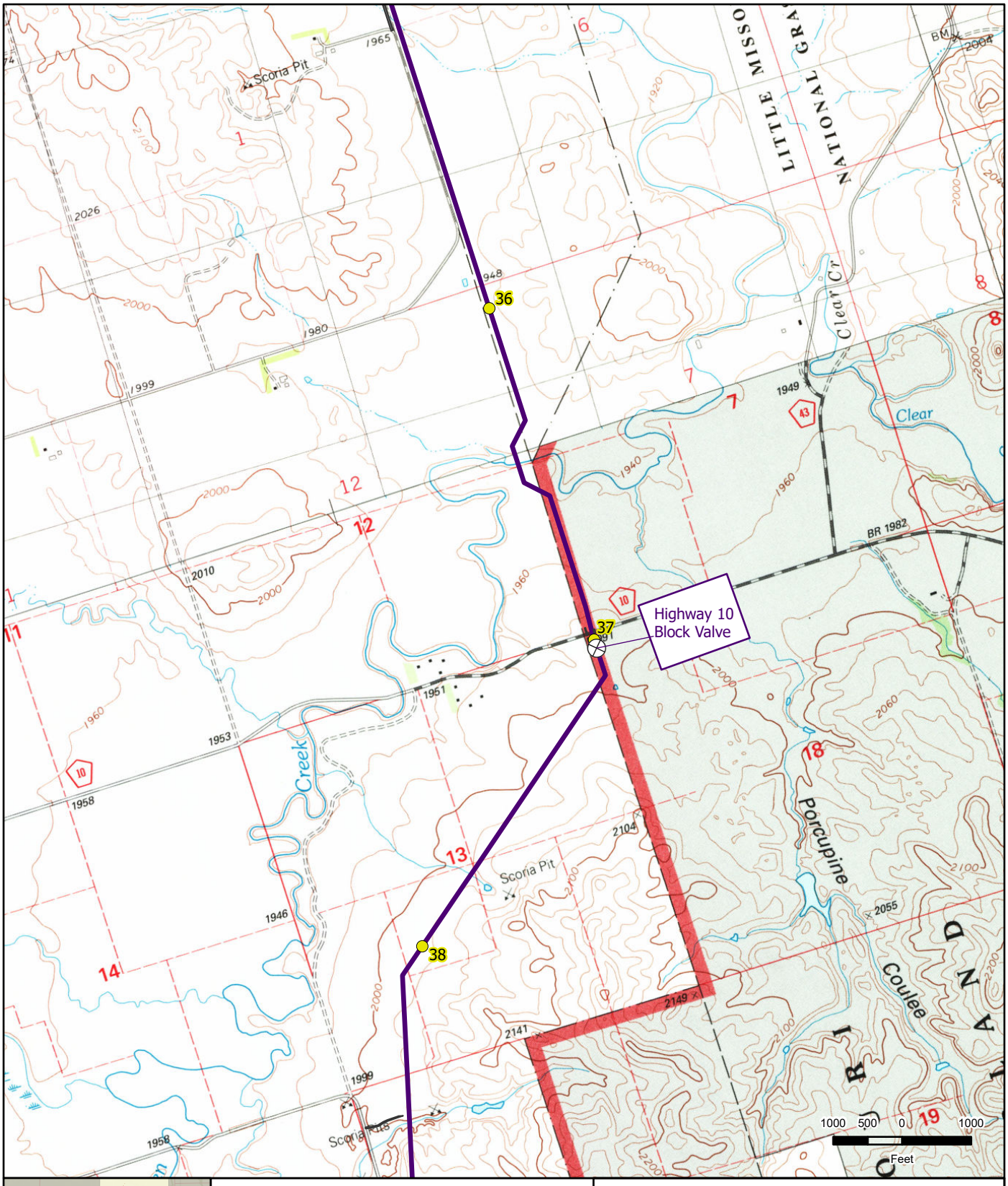
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North Bakken Expansion Project
Project Route Maps
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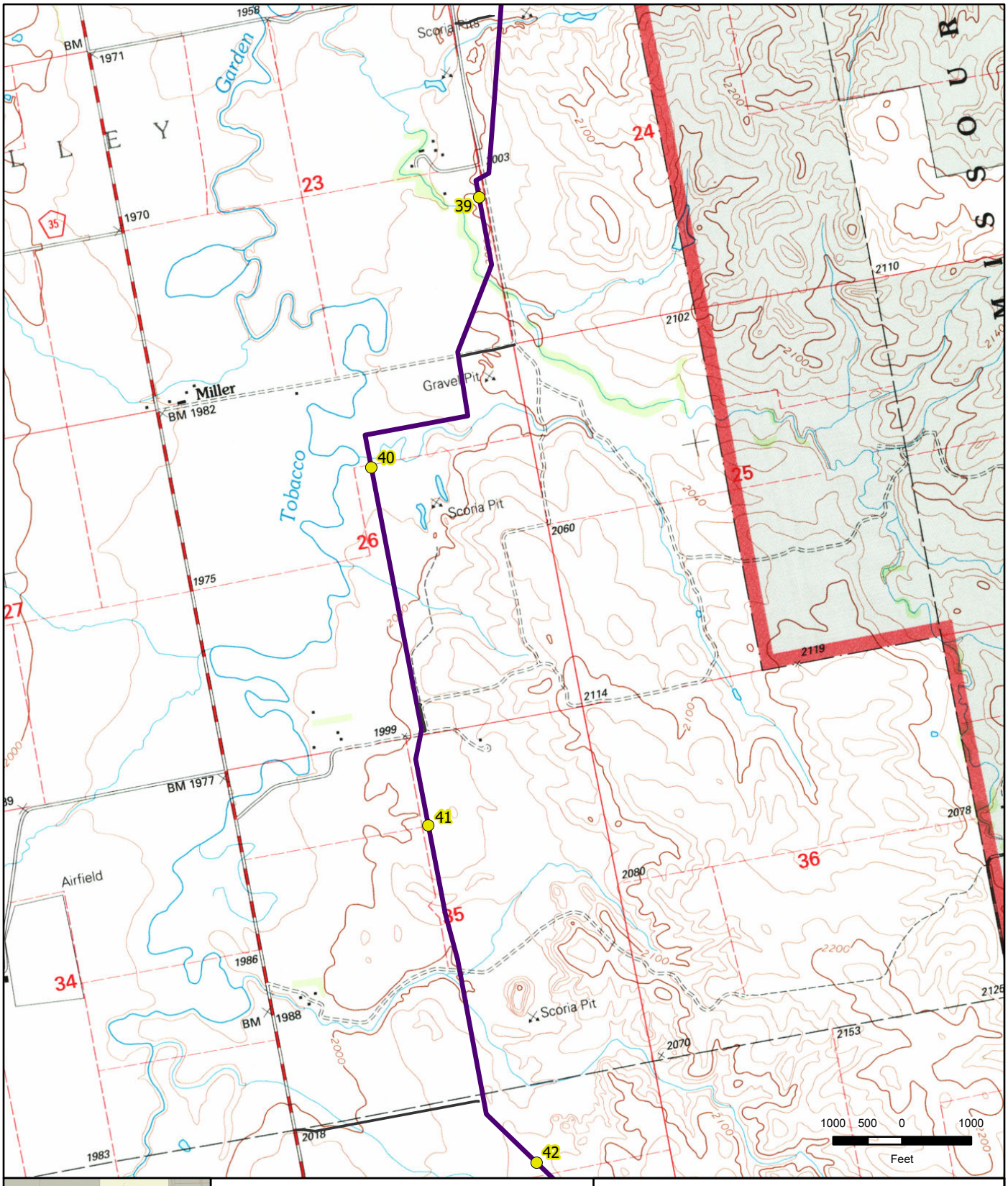
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North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





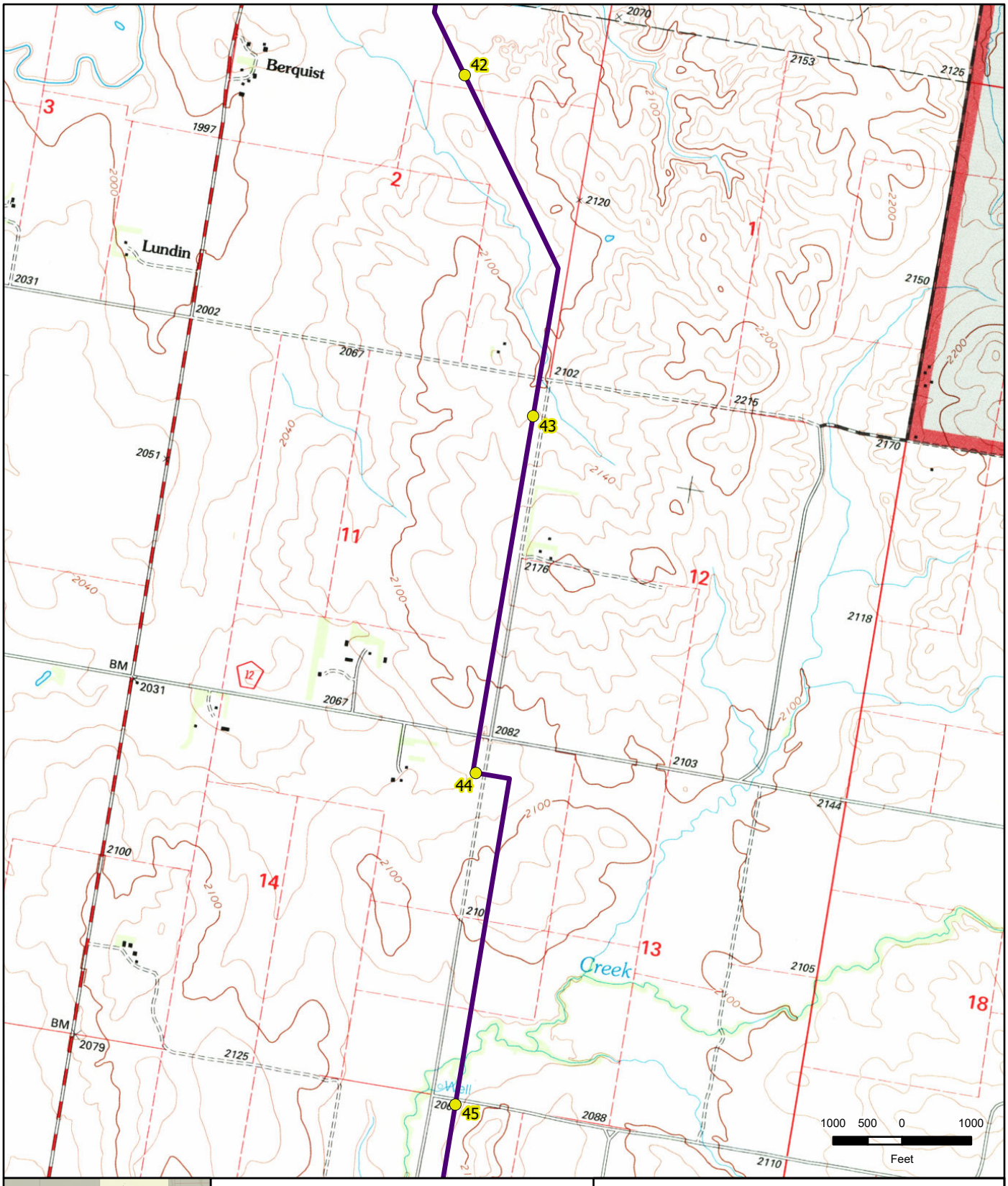
Milepost
Proposed Tioga-Elkhorn Creek
Access Road

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Appendix A
North Bakken Expansion Project
Project Route Maps
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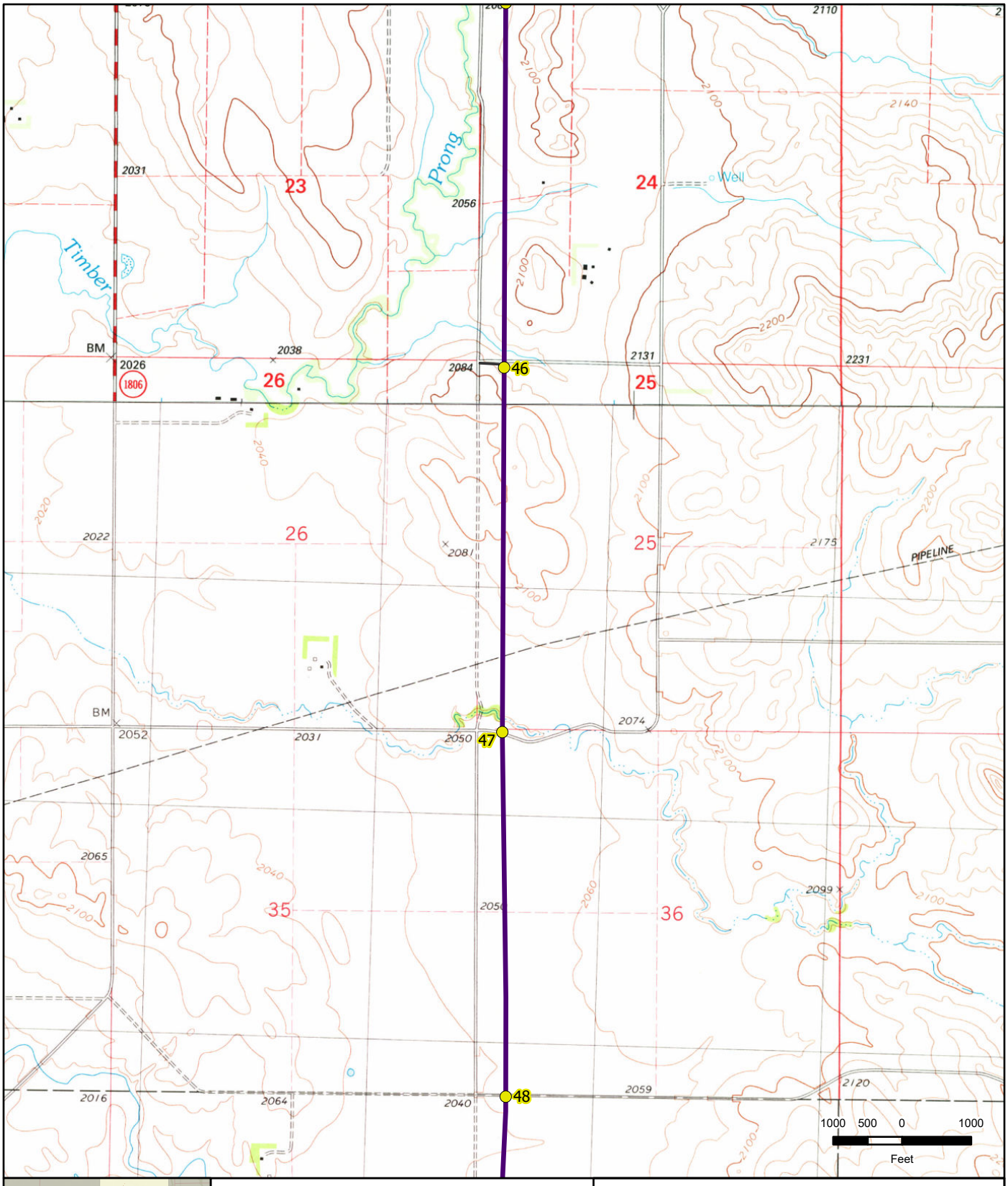
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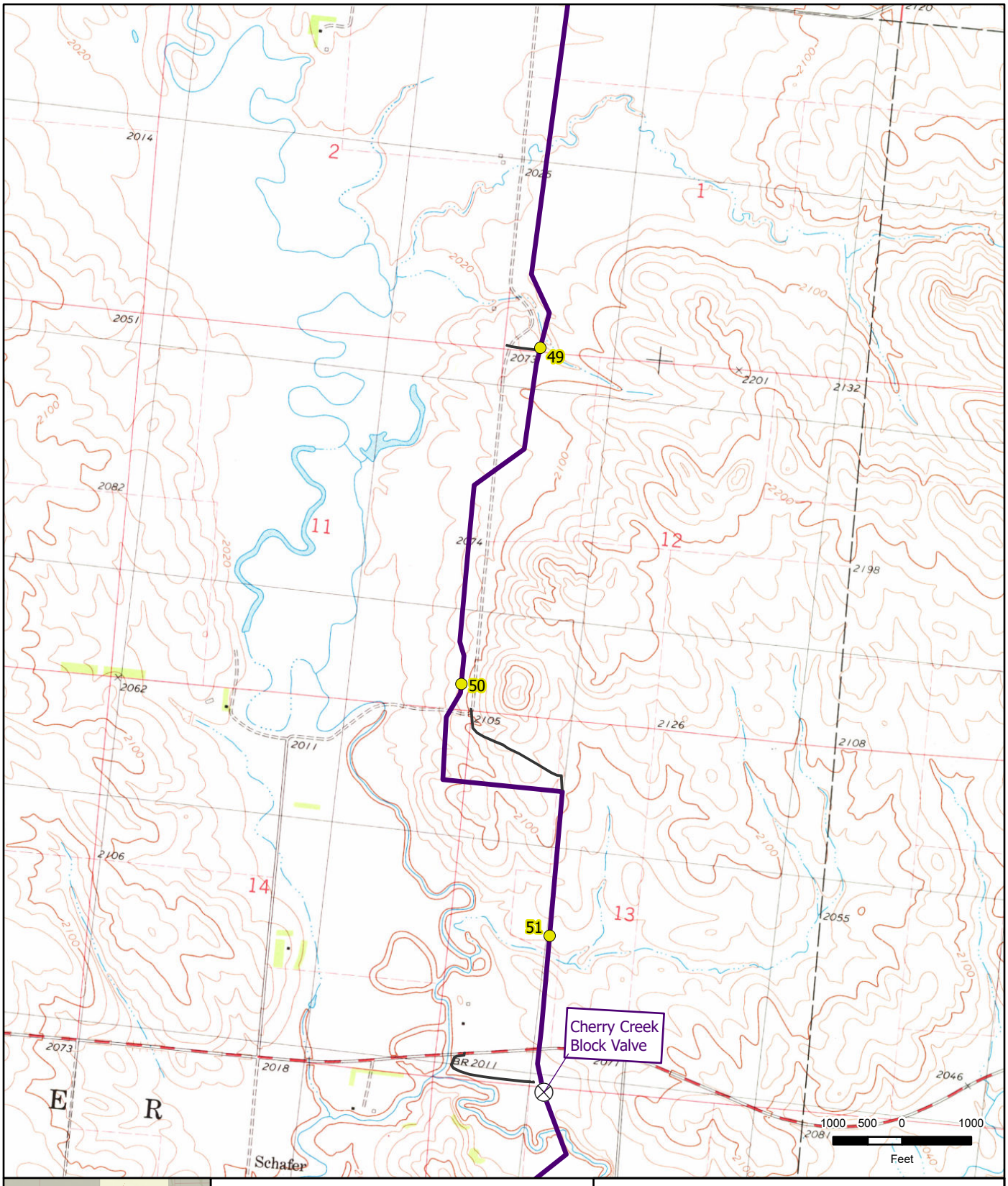
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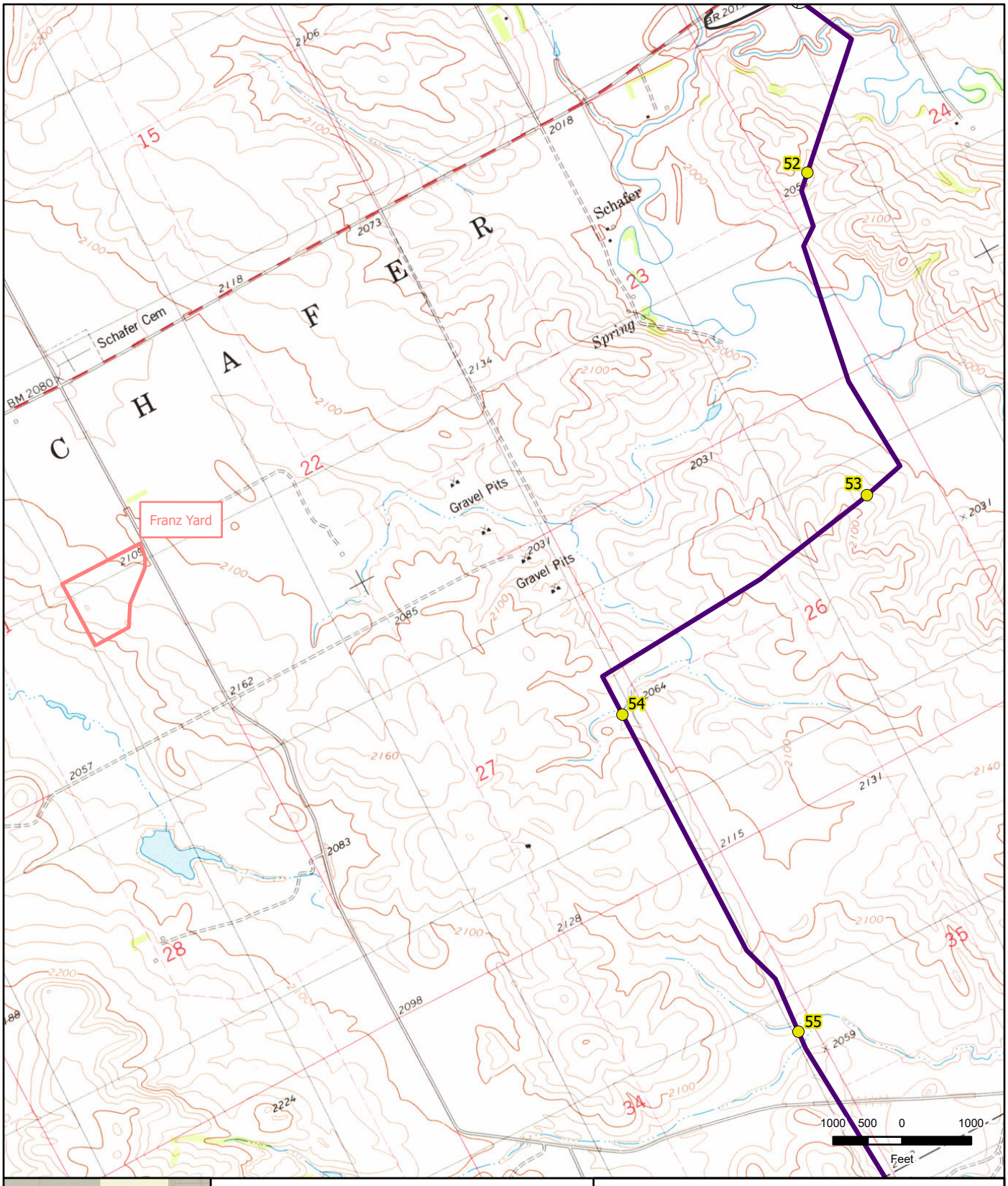
Drawn By: RJC



Appendix A
North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





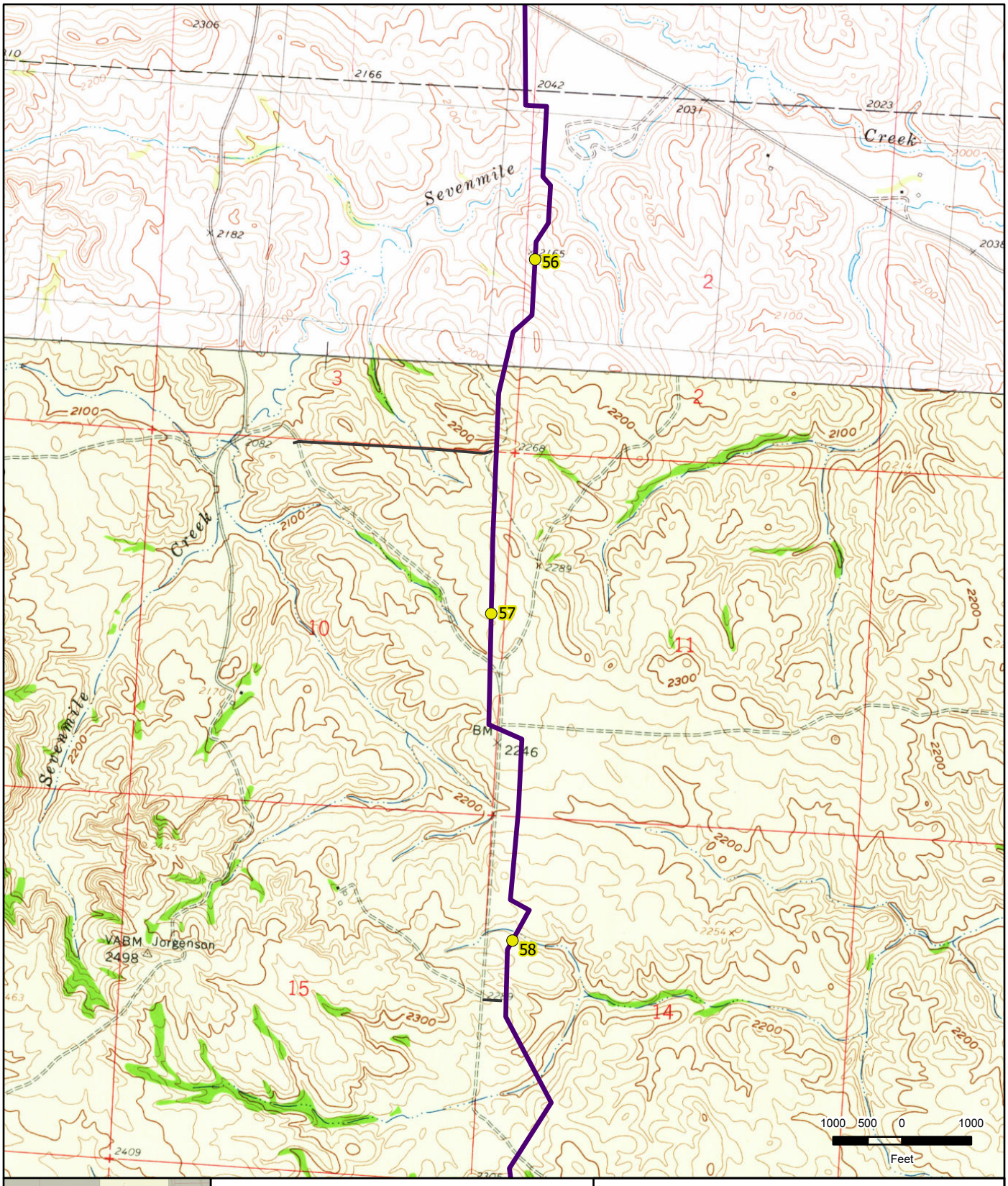
- Milepost
- Valve Site
- Proposed Tioga-Elkhorn Creek
- Staging Area
- Access Road

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North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





Milepost
Proposed Tioga-Elkhorn Creek
Access Road

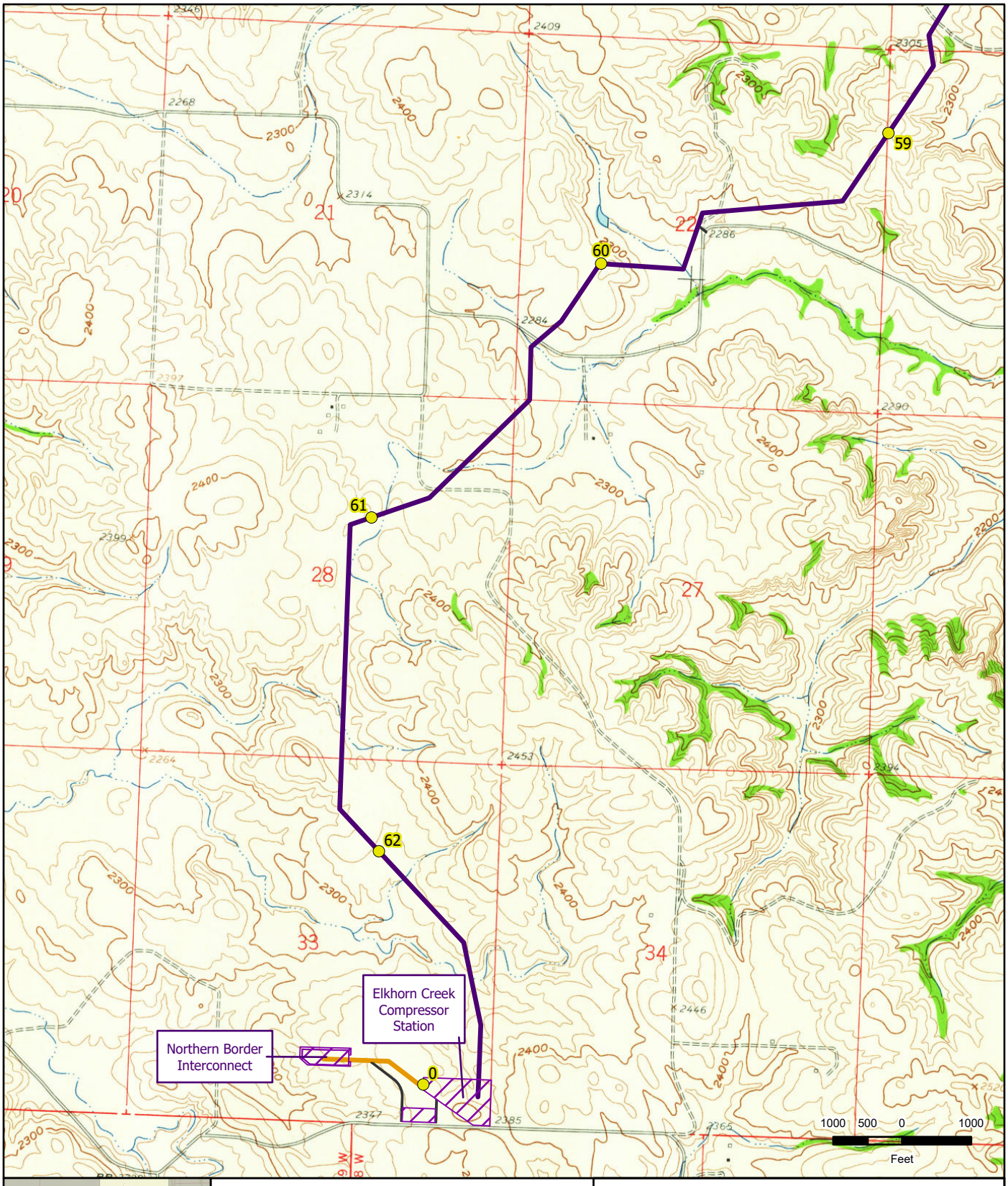
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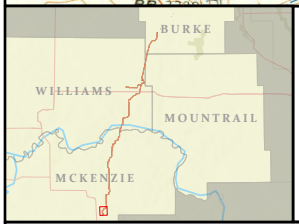
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North Bakken Expansion Project
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Drawn By: RJC





- Milepost
- Proposed Tioga-Elkhorn Creek
- Proposed Elkhorn Creek-Northern Border
- Aboveground Facility
- Access Road

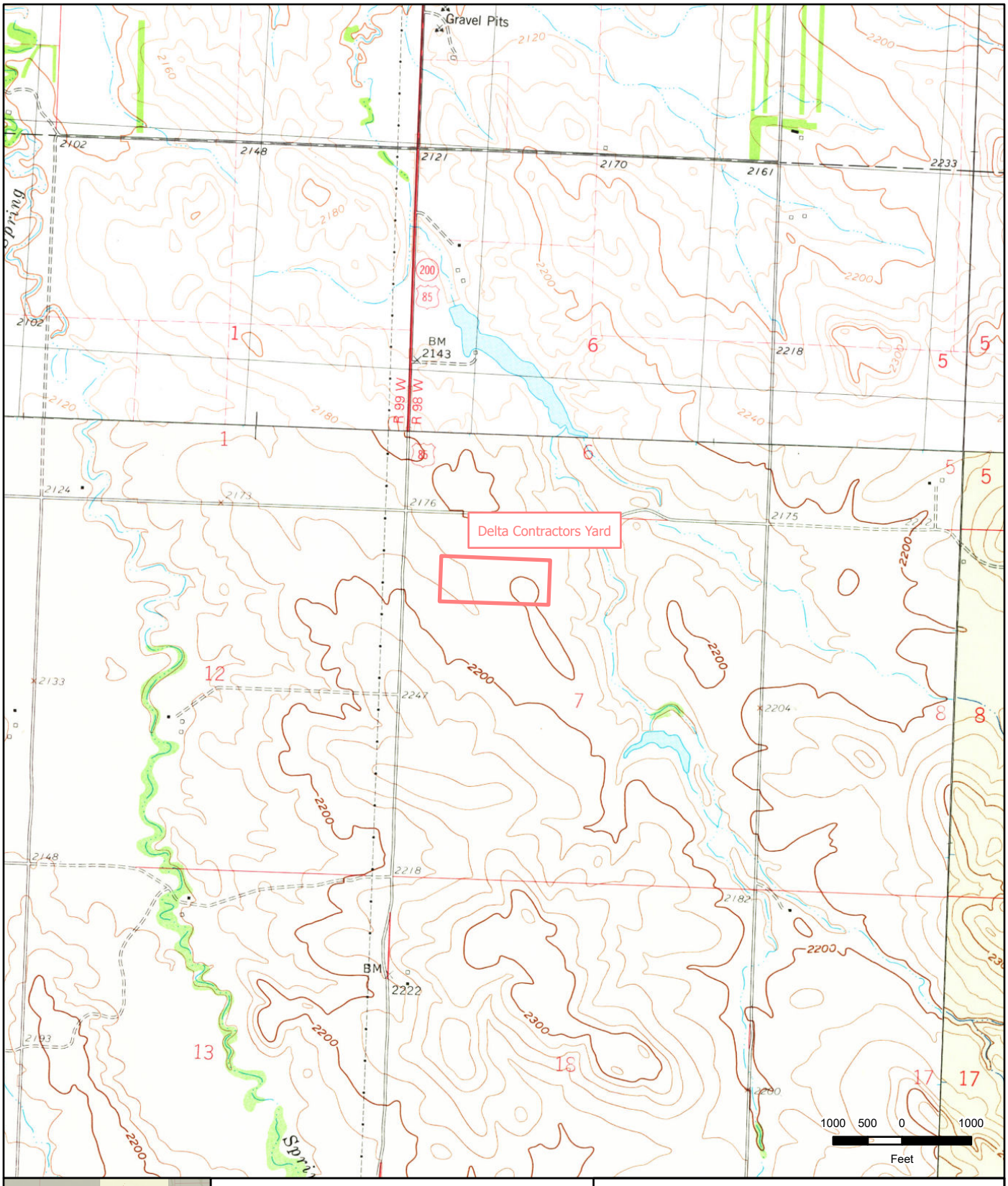
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Appendix A
North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





Staging Area

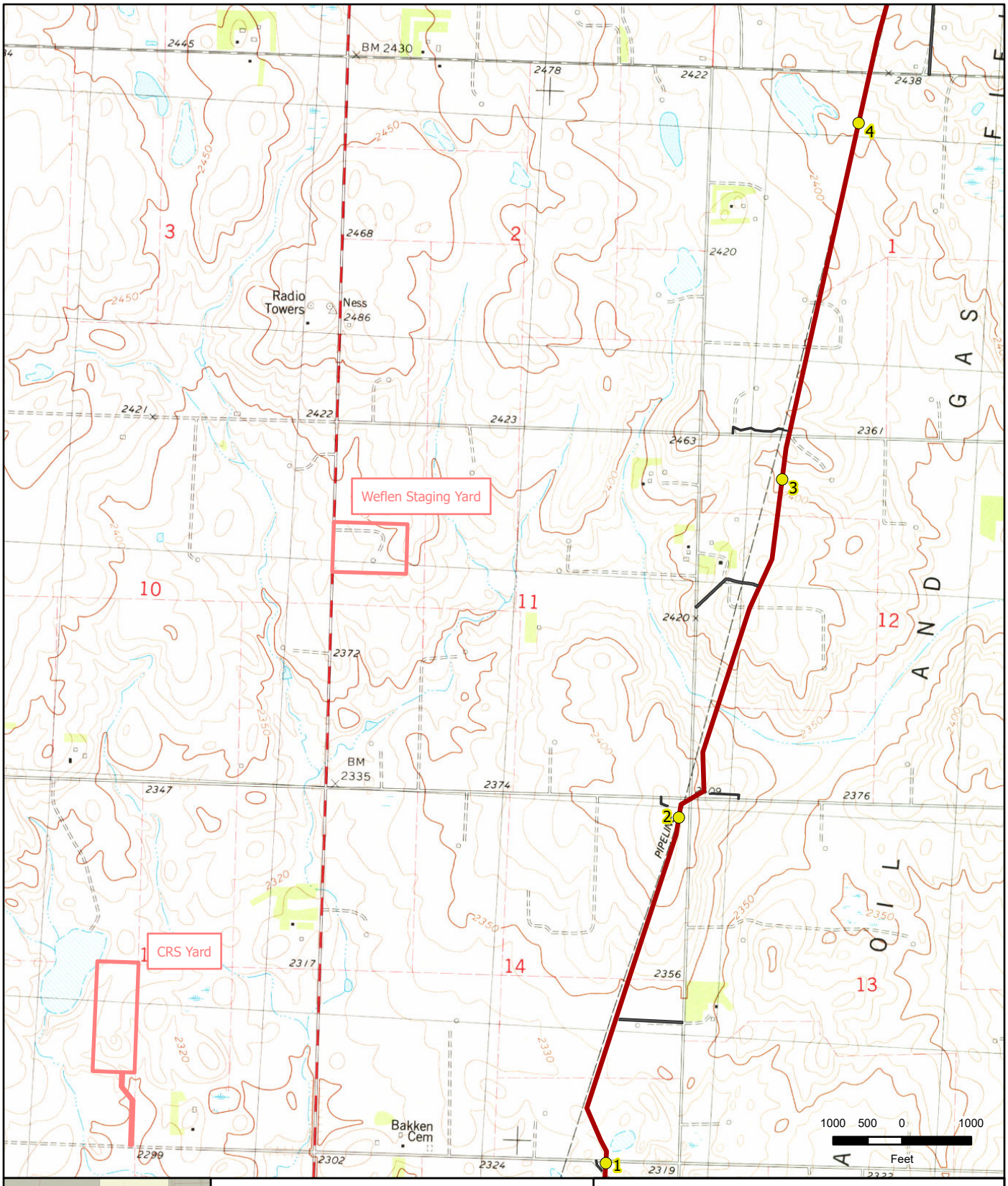
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North Bakken Expansion Project
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- Milepost
- Proposed Line Section 25 Loop
- Staging Area
- Access Road

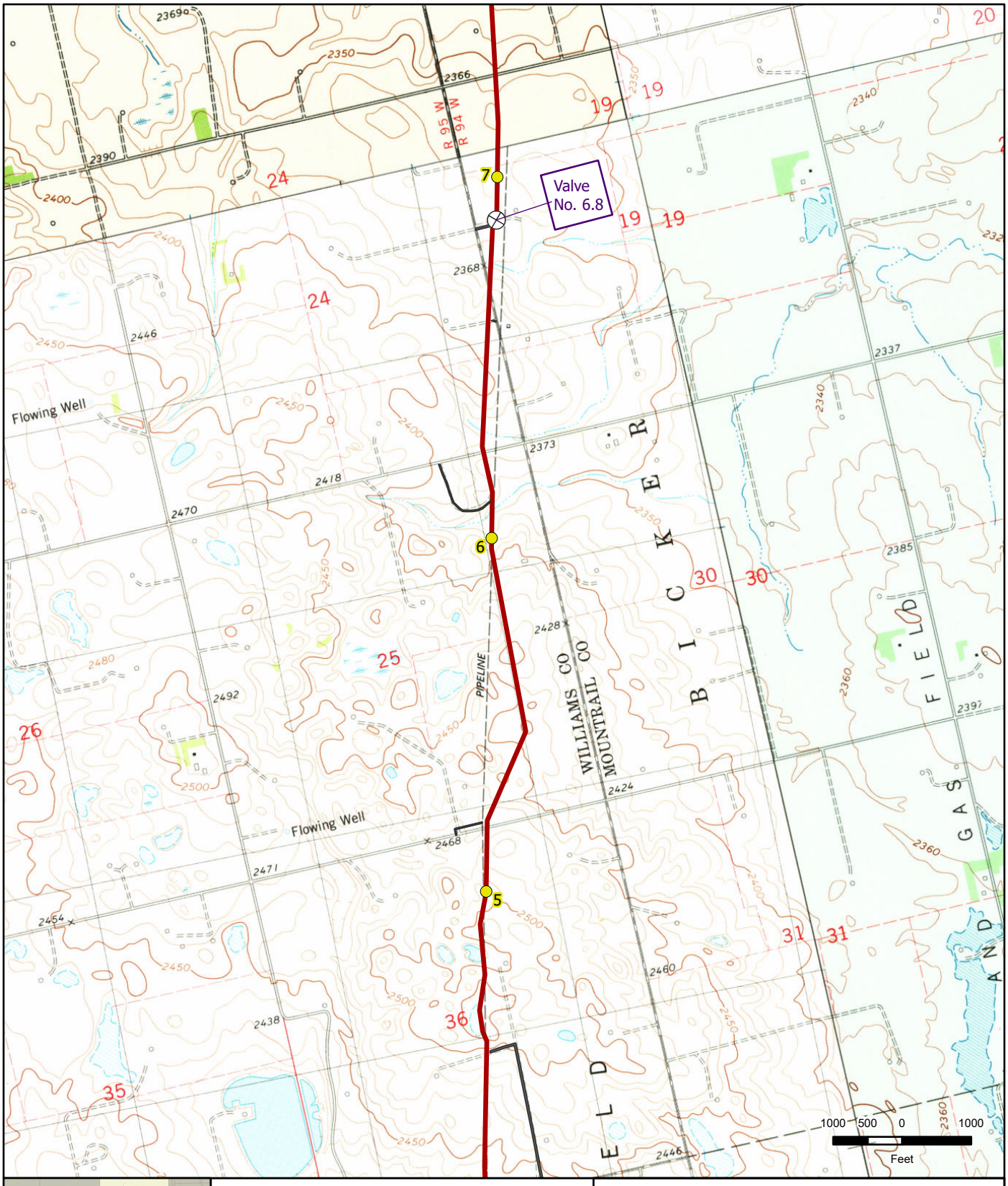
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North Bakken Expansion Project
Project Route Maps
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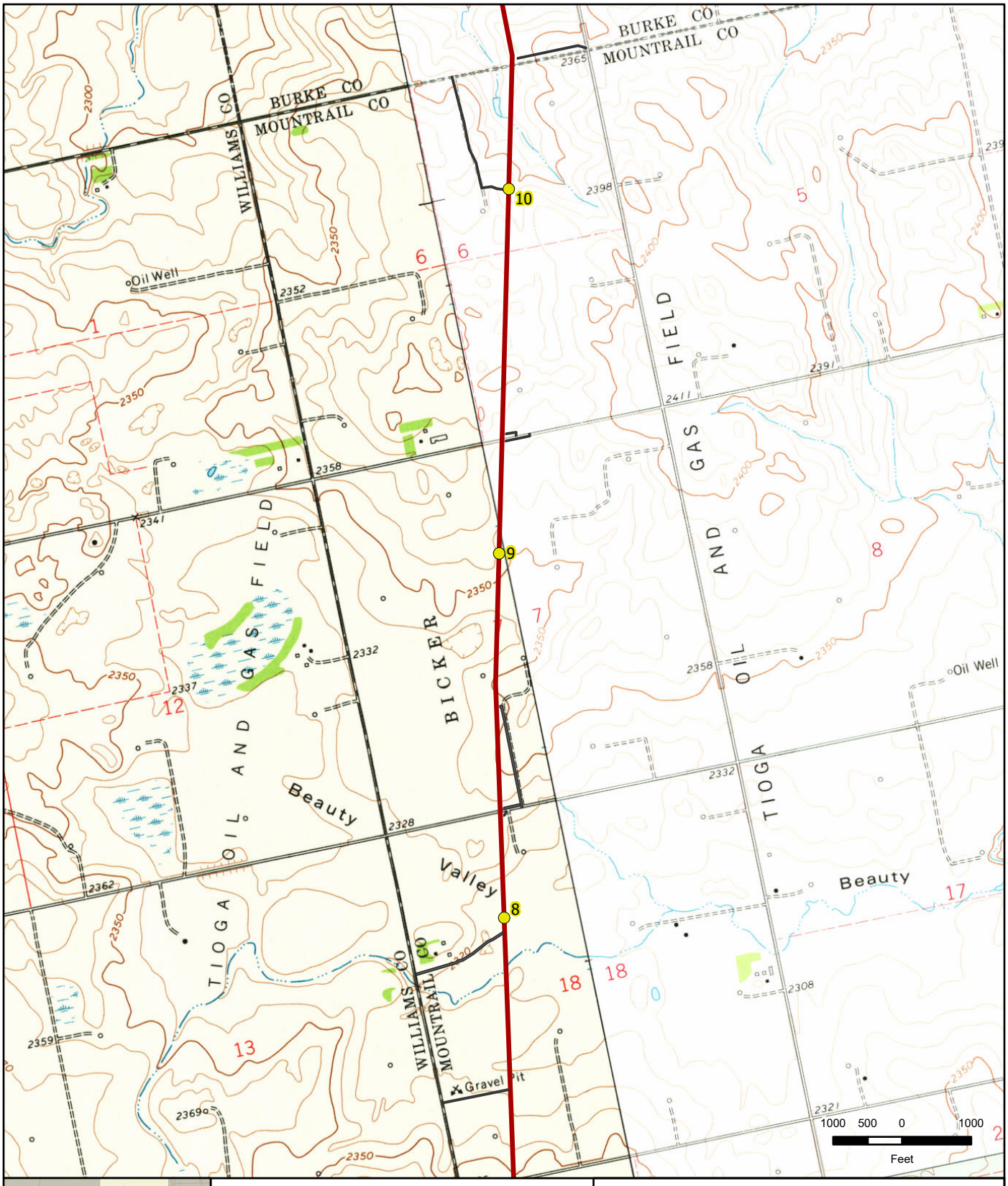
- Milepost
- Valve Site
- Proposed Line Section 25 Loop
- Access Road

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North Bakken Expansion Project
Project Route Maps
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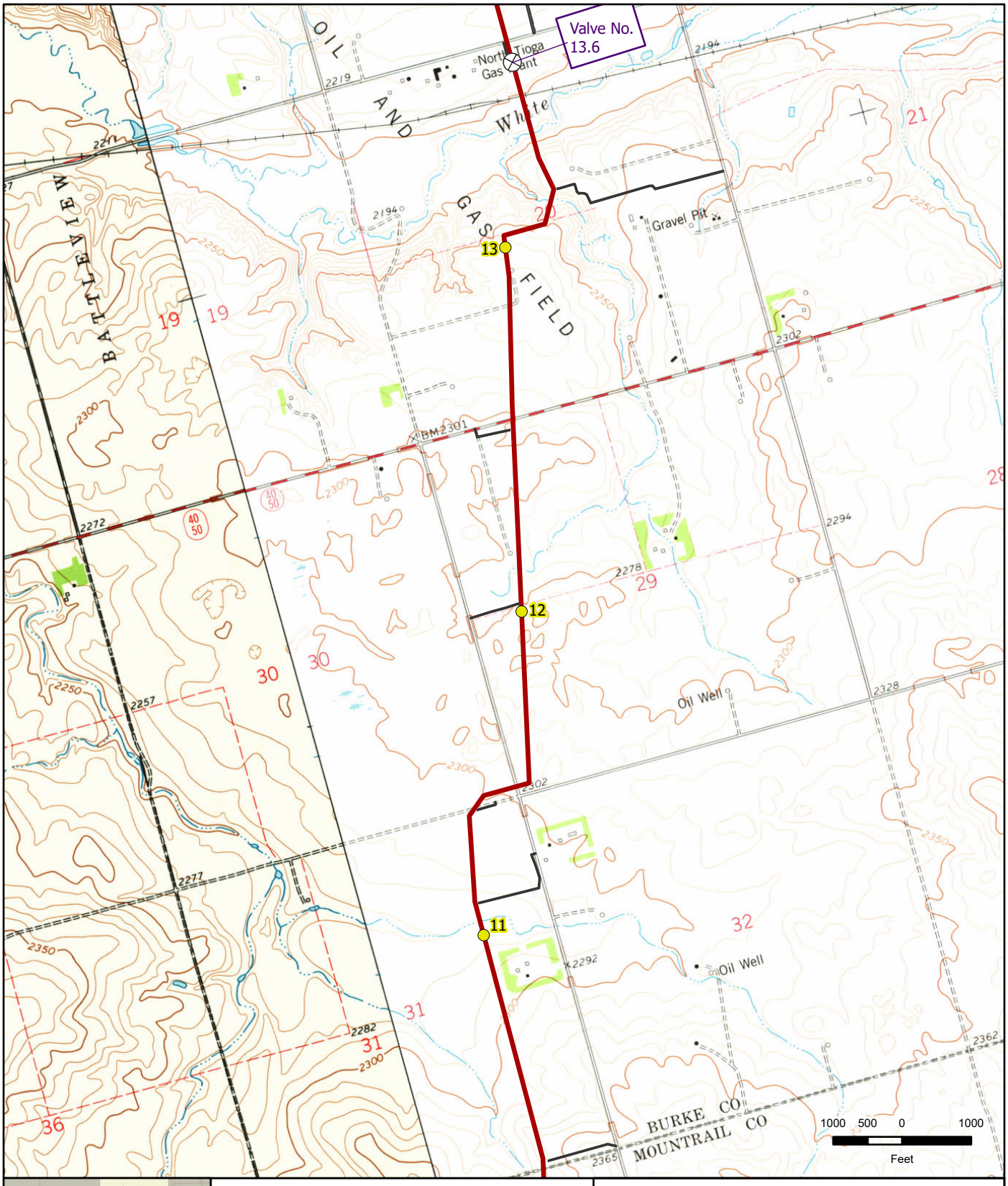
Milepost
Proposed Line Section 25 Loop
Access Road

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Appendix A
North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





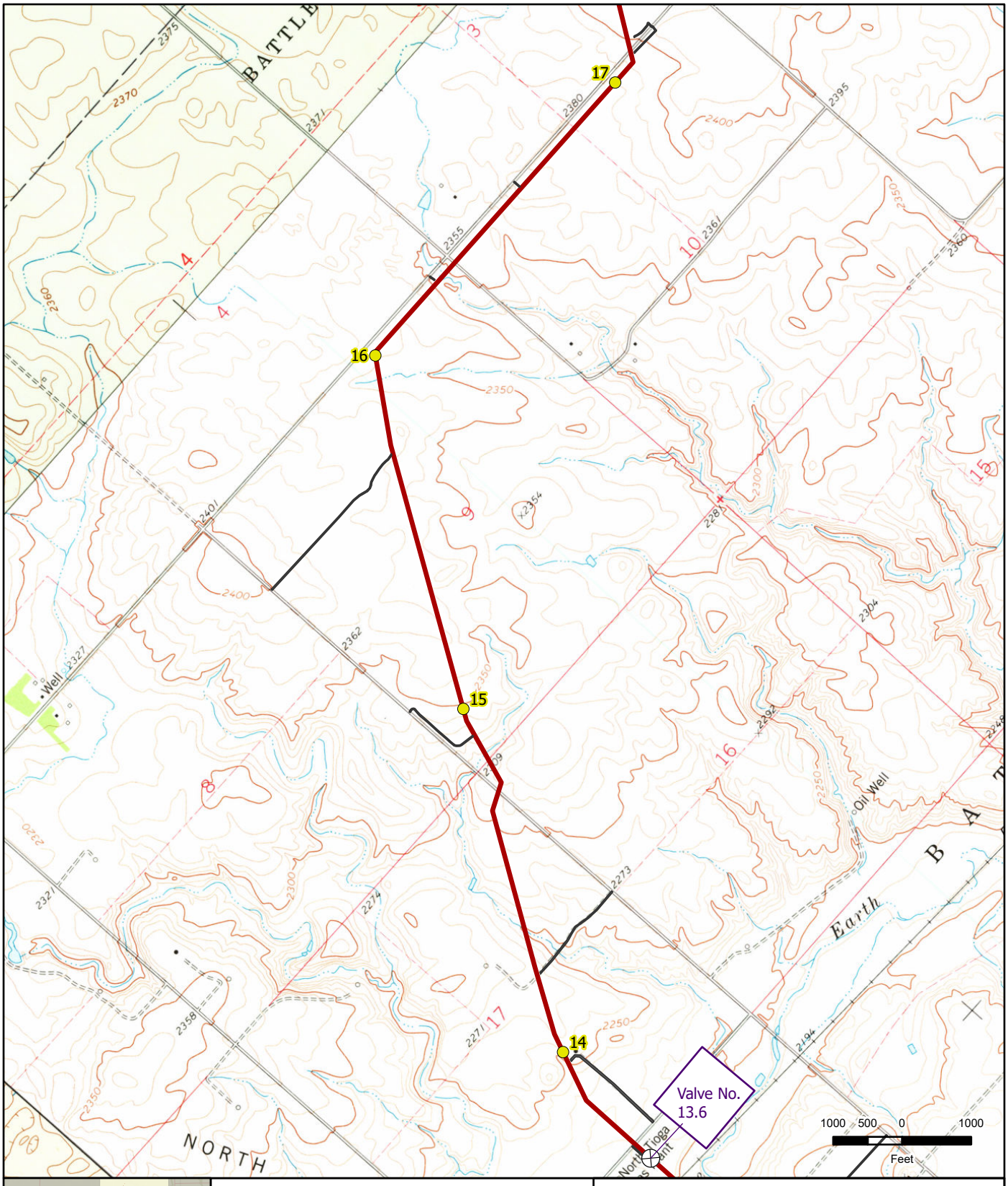
- Milepost
- Valve Site
- Proposed Line Section 25 Loop
- Access Road

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North Bakken Expansion Project
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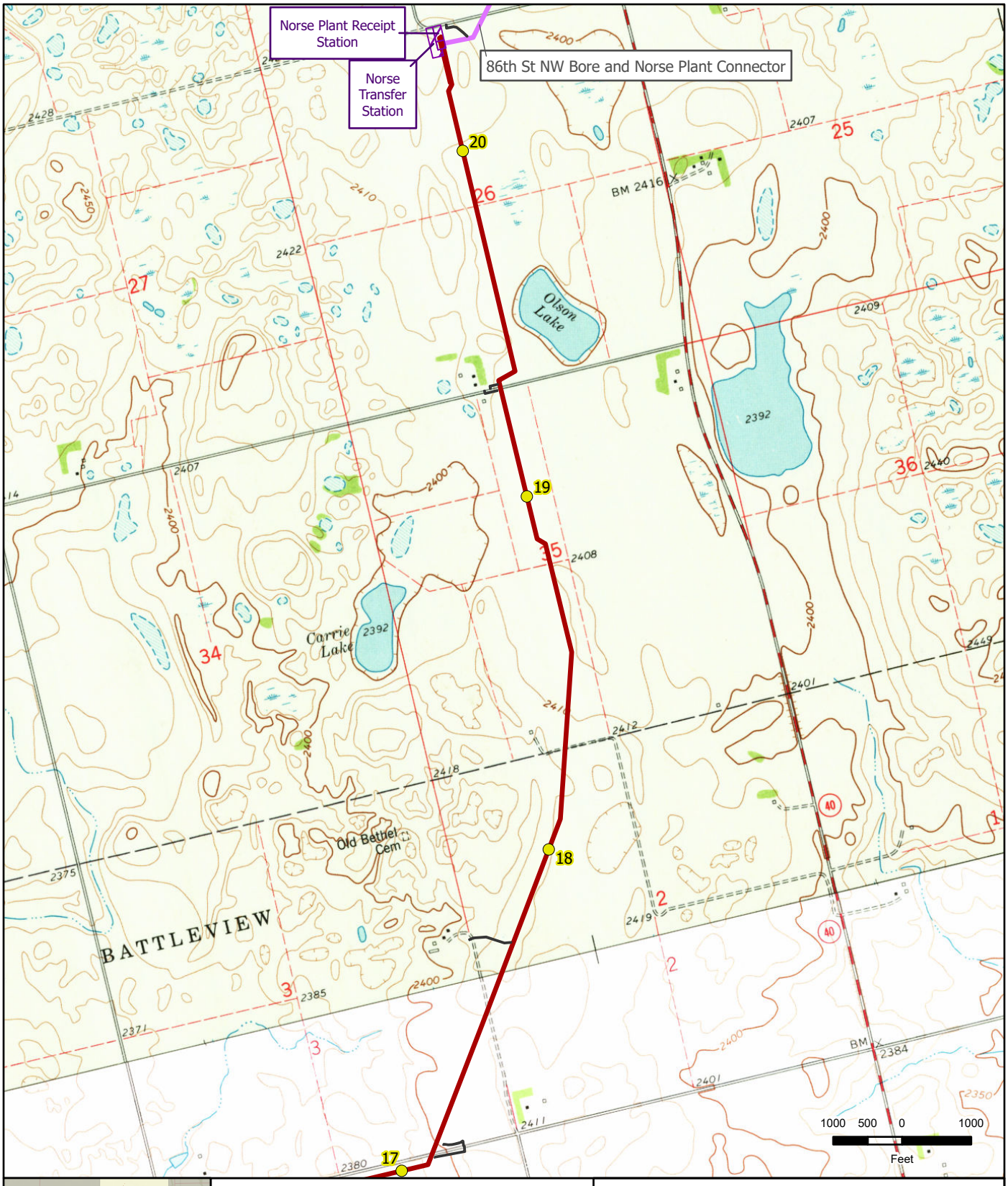
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North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





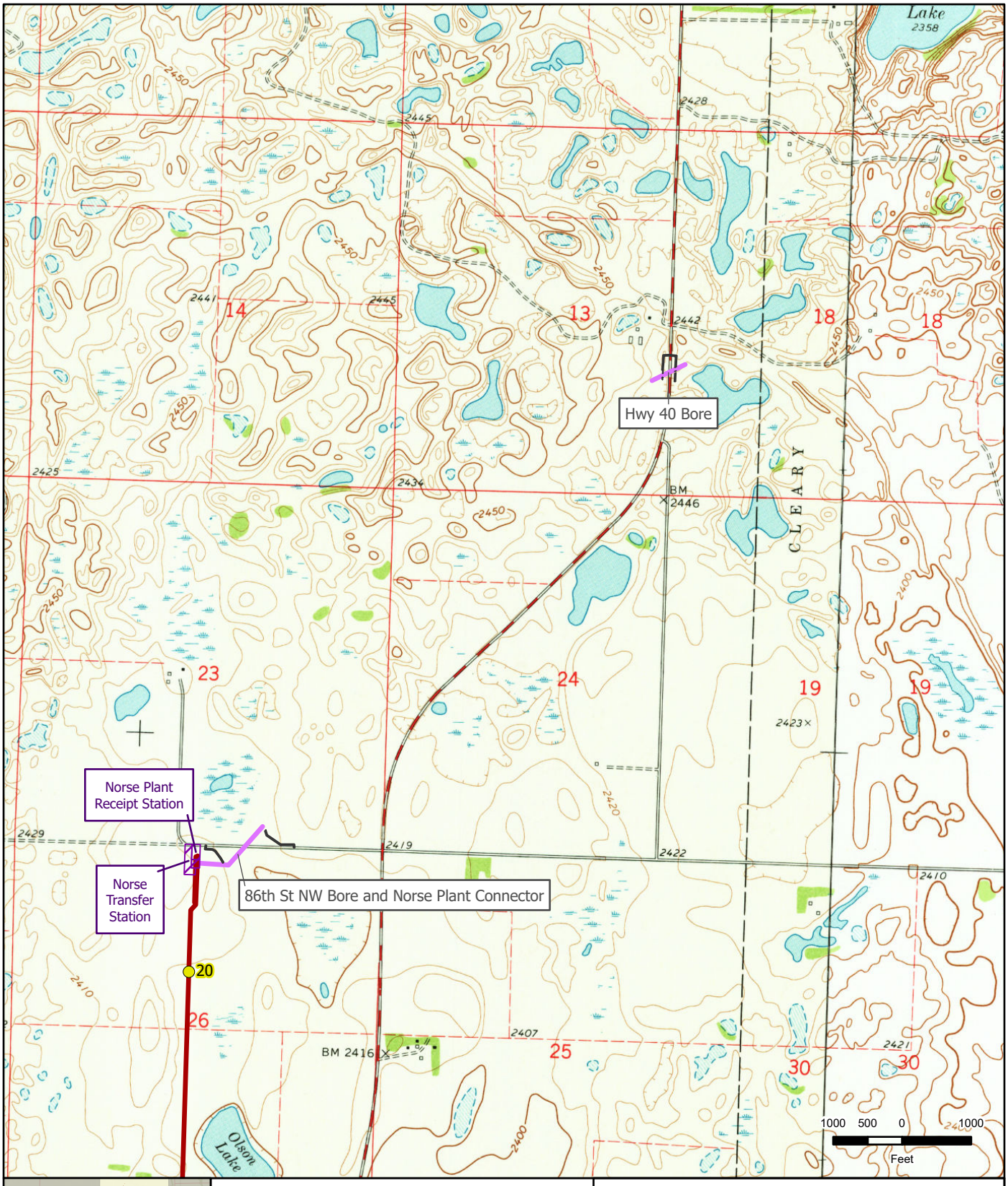
- Milepost
- Proposed Line Section 25 Loop
- Proposed Uprating Site
- Aboveground Facility
- Access Road

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North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC



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North Bakken Expansion Project
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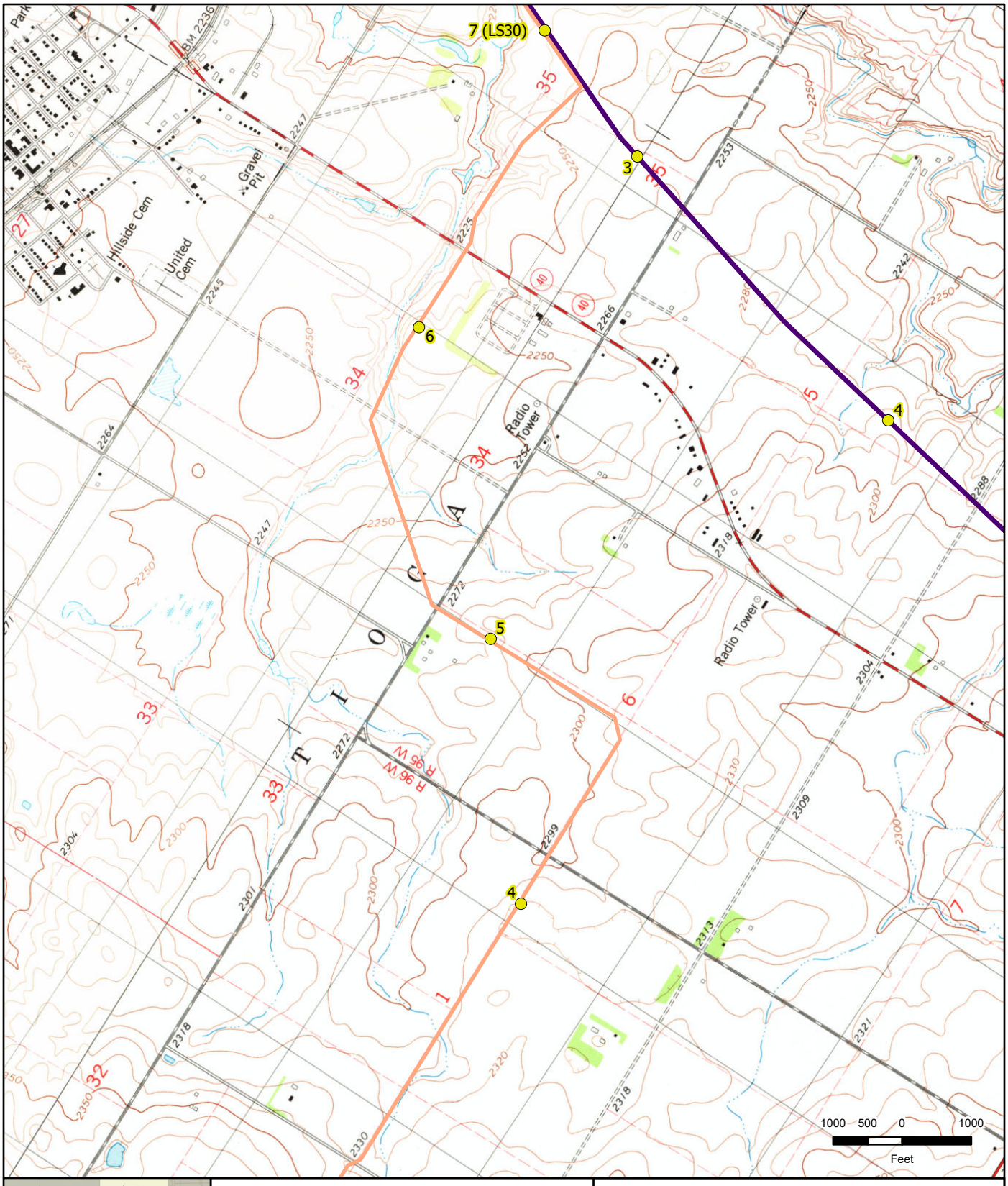
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North Bakken Expansion Project
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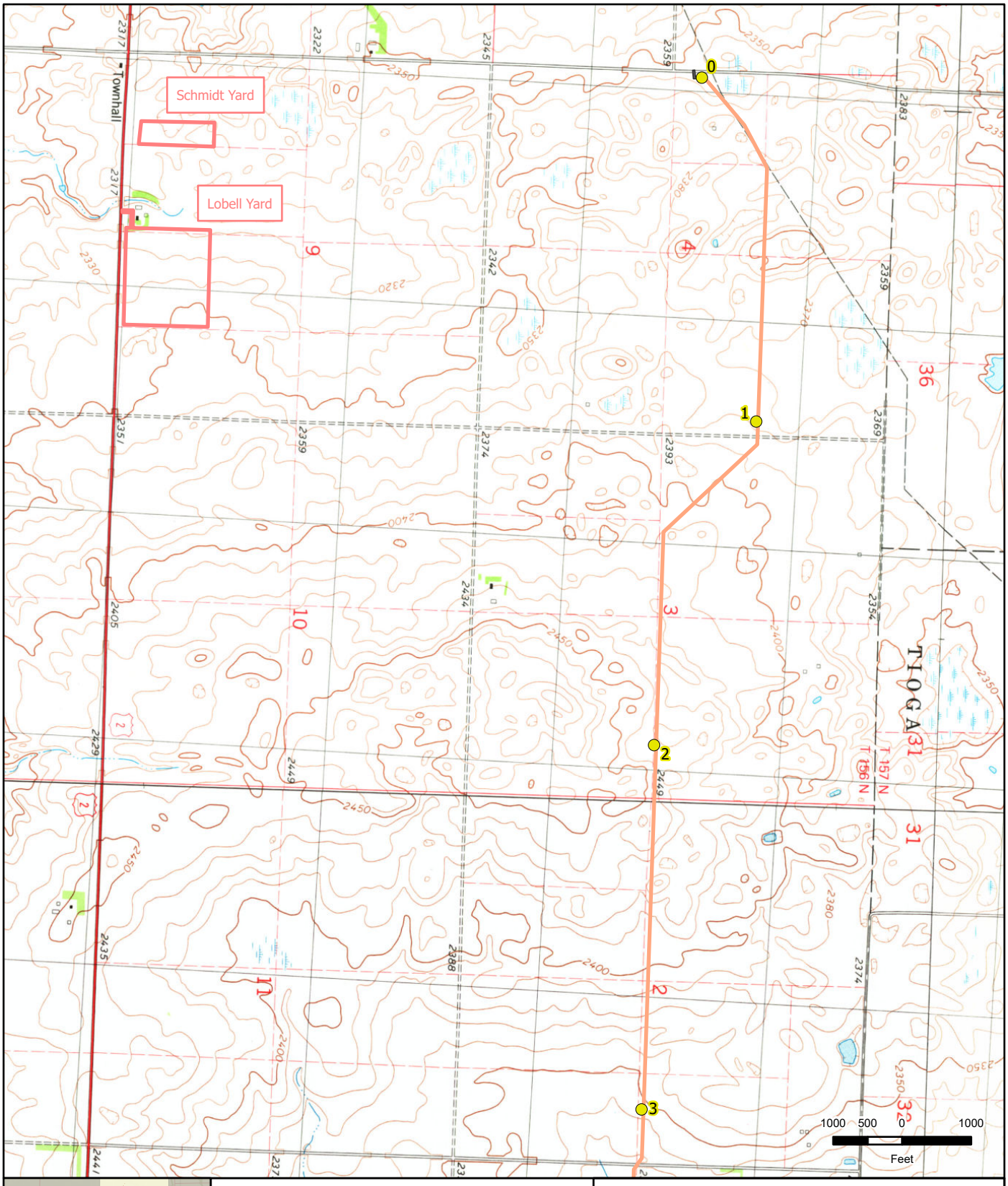
Milepost
Proposed Line Section 30 Loop
Proposed Tioga-Elkhorn Creek

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Appendix A
North Bakken Expansion Project
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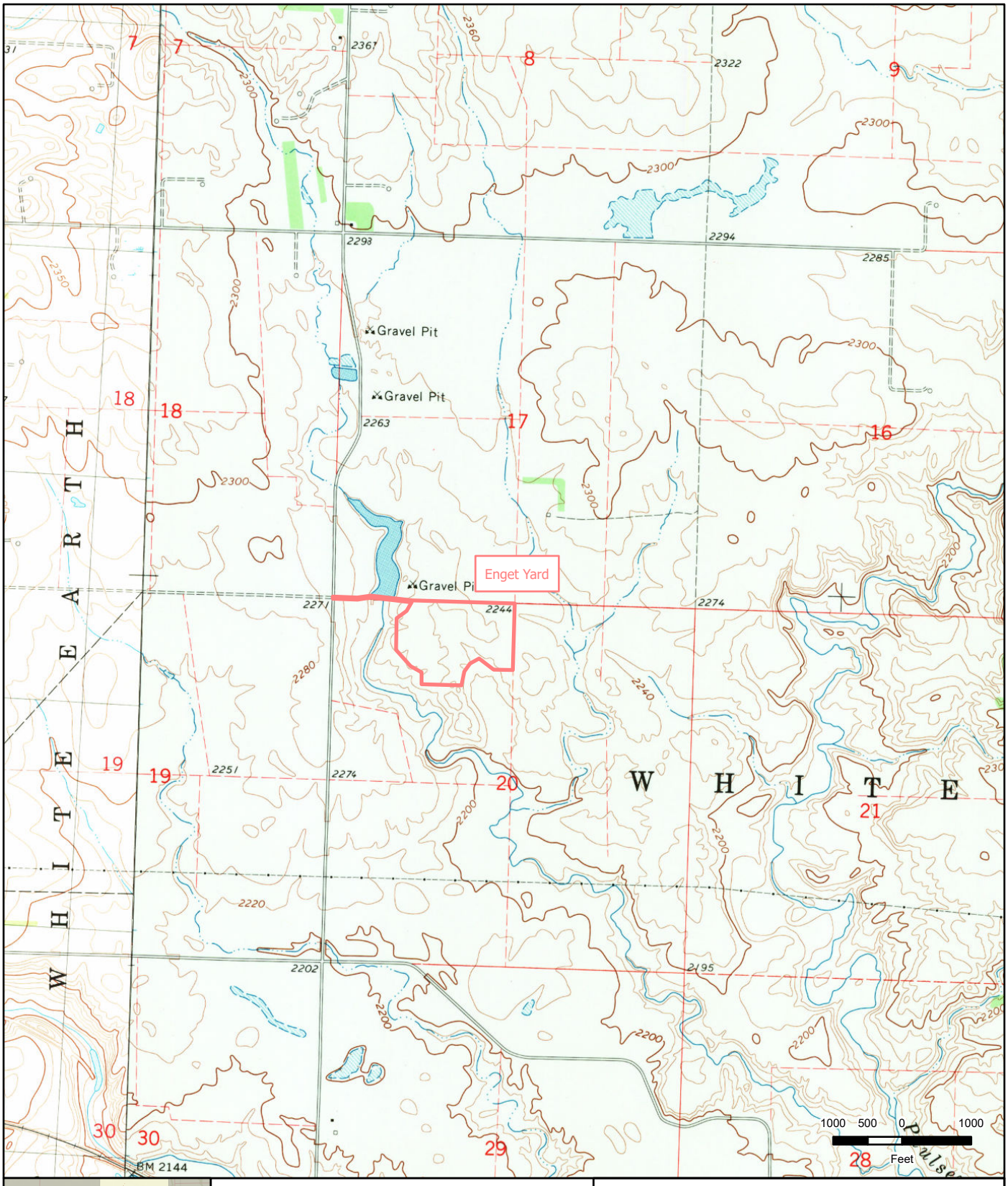
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North Bakken Expansion Project
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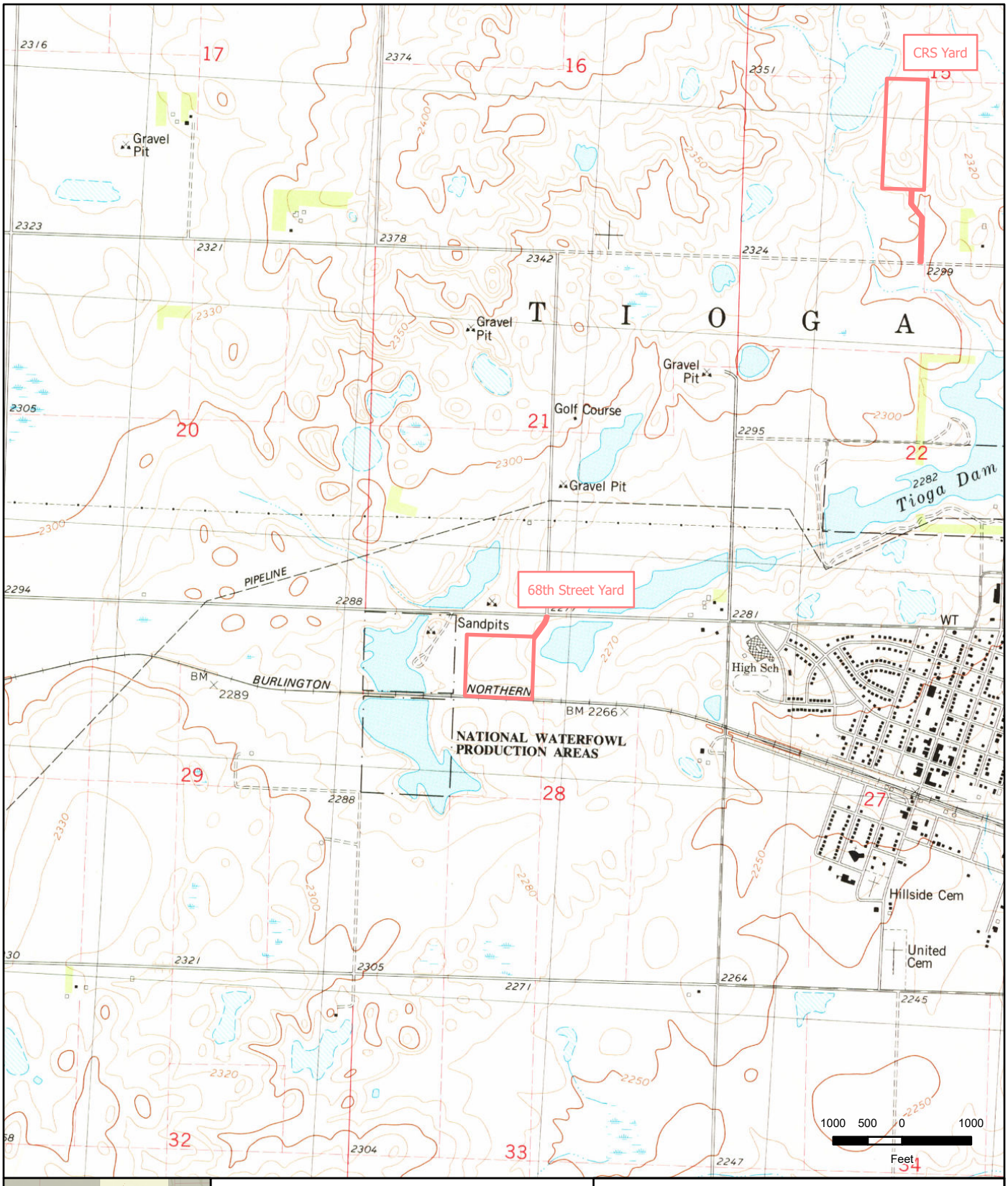
Staging Area

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North Bakken Expansion Project
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Staging Area

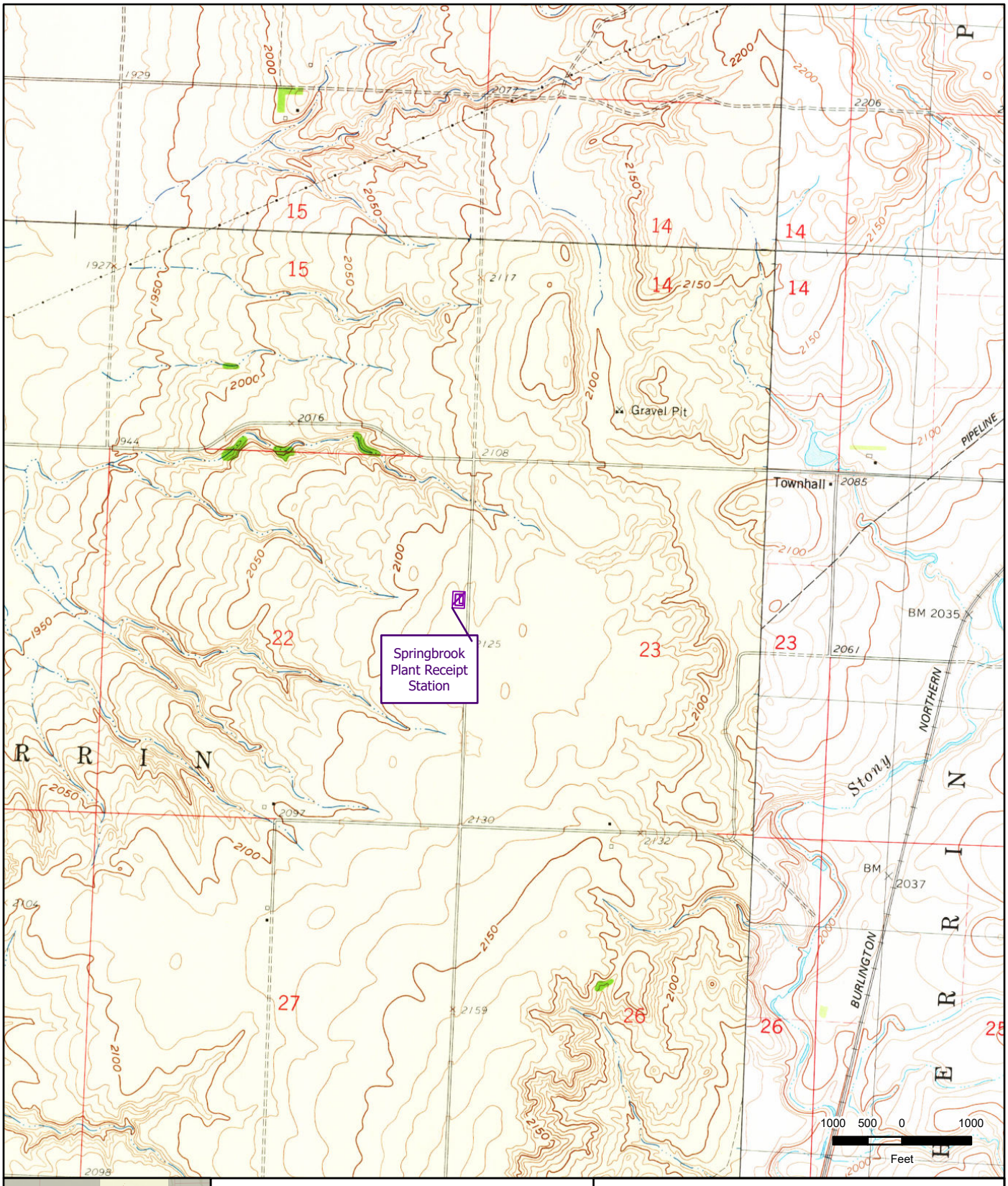
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Appendix A
North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





Aboveground Facility

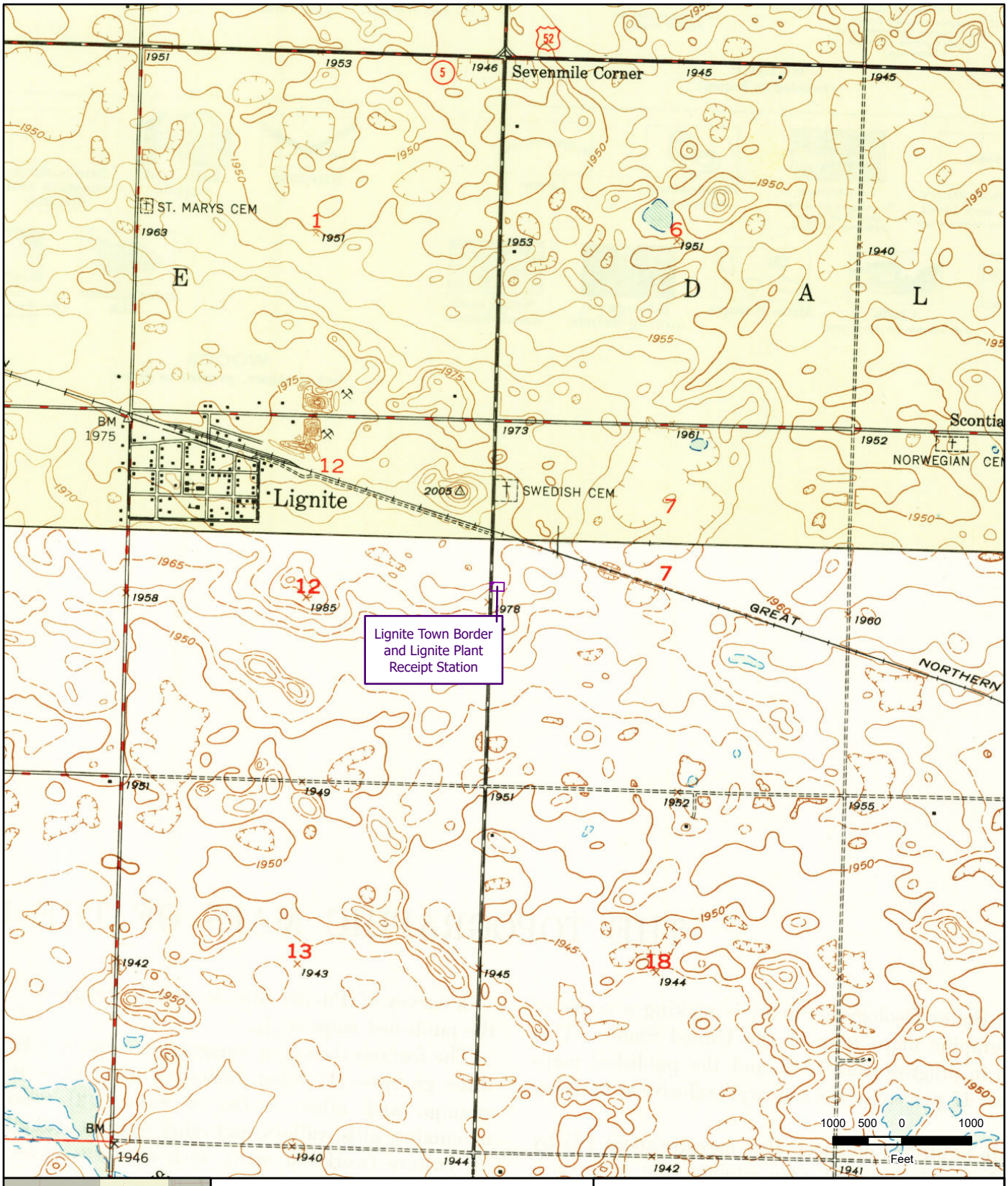
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North Bakken Expansion Project
Project Route Maps
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Drawn By: RJC





Aboveground Facility

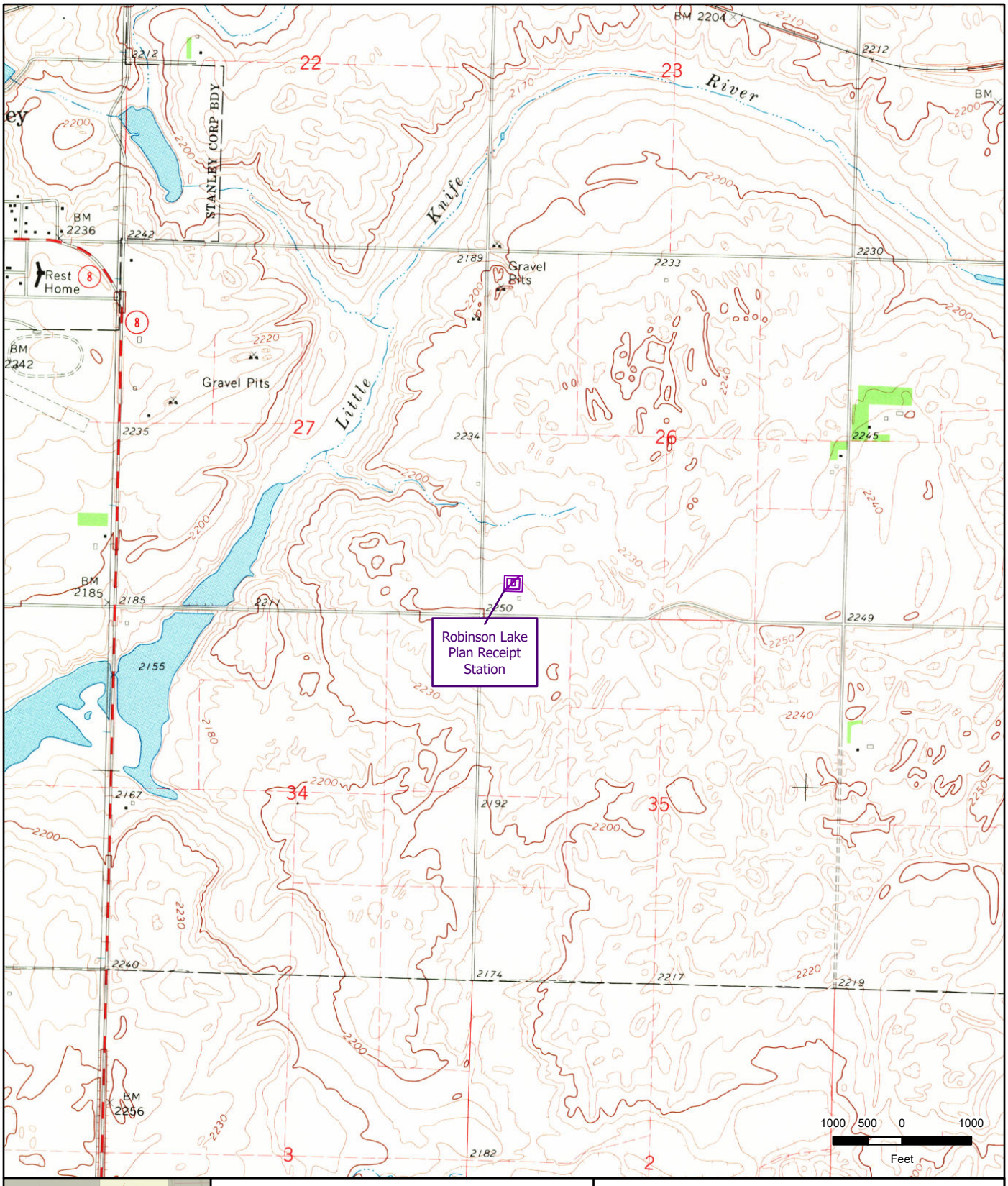
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Aboveground Facility

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North Bakken Expansion Project
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APPENDIX B

SUMMARY OF COLLOCATED FACILITIES

APPENDIX B

North Bakken Expansion Project
Summary of Collocated Facilities

New Pipeline Facility/Collocated Utility Owner	Utility Type	Begin Milepost	End Milepost	Direction to Existing Utility/Road Right-of-Way	Paralleled Length [a]
Tioga-Elkhorn Creek					
WBI Energy Transmission	Natural gas pipeline	0.0	0.3	South	0.3
Road	Road	1.6	2.1	South	0.6
Hess Corporation	Natural gas pipeline	2.4	5.5	West	3.1
Enable Bakken Crude Services, Mountrail-Williams Electric Cooperative	Crude oil pipeline, electric utility, road	19.2	22.4	East/West/South	3.2
ONEOK Inc.	Natural gas pipeline	27.2	27.7	South	0.5
Road	Road	33.4	33.7	East	0.3
ONEOK Inc.	Natural gas pipeline	34.8	35.8	West	1.0
Road	Road	38.8	39.2	East/West	0.5
Kinder Morgan Inc. and Oasis Petroleum Inc.	Crude oil pipeline, natural gas pipeline	43.2	46.1	East/West	3.0
Oasis Midstream Services, LLC, ONEOK Inc., Kinder Morgan Inc., WBI Energy Transmission	Crude oil pipeline, natural gas pipeline	47.5	50.2	East/West	2.7
WBI Energy Transmission, Kinder Morgan Inc., ONEOK Inc.,	Natural gas pipeline	50.3	51.5	West	1.2
Energy Transfer LP Enbridge Inc. , Hess Corporation Global Infrastructure Partners, Kinder Morgan Inc., Marathon Petroleum Corporation, MDU Resources Group Inc., ONEOK Inc., Targa Resources Partners LP The Blackstone Group LP, WBI Energy Transmission	Crude oil pipeline, natural gas pipeline	51.6	56.1	East/West	4.5
MDU Resources Group Inc., ONEOK Inc., road, Targa Resources Partners LP The Blackstone Group LP, WBI Energy Transmission	Crude oil pipeline, natural gas pipeline, road	56.2	58.2	East/West	2.0
MDU Resources Group Inc., Targa Resources Partners LP The Blackstone Group LP, WBI Energy Transmission	Natural gas pipeline	60.3	61.1	West	0.8
Subtotal					**23.6**
Elkhorn Creek-Northern Border					
ONEOK Inc.	Natural gas liquids (unspecified)	0.0	0.2	South/West	0.2
Subtotal					**0.2**

APPENDIX B (cont'd)

North Bakken Expansion Project
Summary of Collocated Facilities

New Pipeline Facility/Collocated Utility Owner	Utility Type	Begin Milepost	End Milepost	Direction to Existing Utility/Road Right-of-Way	Paralleled Length
Line Section 25 Loop					
WBI Energy Transmission	Natural gas pipeline, road	0.0	0.1	West	0.1
Hess Corporation, WBI Energy Transmission	Crude oil pipeline, natural gas pipeline	0.9	5.3	East/West	4.4
Hess Corporation Global Infrastructure Partners, MDU Resources Group Inc., WBI Energy Transmission	Natural gas pipeline, crude oil pipeline	5.7	10.6	East	4.9
Hess Corporation Global Infrastructure Partners, road, WBI Energy Transmission	Natural gas pipeline, crude oil pipeline, road	11.3	13.0	West	1.7
WBI Energy Transmission	Natural gas pipeline	13.7	17.1	North/West	3.4
WBI Energy Transmission	Natural gas pipeline	20.1	20.3	East	0.2
Subtotal					**14.8**
Line Section 30 Loop					
WBI Energy Transmission	Natural gas pipeline	0.0	0.4	North	0.4
Road	Road	2.3	3.1	South	0.9
Hess Corporation	Crude oil pipeline, natural gas pipeline	4.5	7.1	West	2.6
Road	Road	7.4	8.0	South	0.6
WBI Energy Transmissions	Natural gas pipelines	9.3	9.6	North/South	0.3
Subtotal					**4.7**
Tioga Compressor Lateral					
WBI Energy Transmission	Natural gas pipeline, road	0.0	0.5	North/South	0.5
WBI Energy Transmission	Natural gas pipeline, road	0.5	0.5	West	0.1
Subtotal					**0.5**
PROJECT TOTAL					**43.8**

[a] The totals may not match the sum of addends due to rounding.

APPENDIX C

ACCESS ROADS

APPENDIX C

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres) [a]	Area Affected by Operations (acres)
Tioga-Elkhorn Creek										
Access 1	0.8	Gravel	None	Temp.	Existing, New	Agricultural, Open Land	791	30	0.6	0.0
Access 2	1.0	Dirt/Vegetation	None	Temp.	Existing	Agricultural, Developed	2,593	20	1.2	0.0
Access 3_R1	2.1	Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	183	20	0.1	0.0
Access 4_R1	2.1	Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	298	20	0.1	0.0
Access 5	5	Gravel	None	Temp.	Existing	Agricultural, Developed	1,811	30	1.3	0.0
Access 6	5.9	Gravel	None	Temp.	Existing	Agricultural, Developed	1,310	30	0.9	0.0
Access to 104th Ave NW Pig Launcher [b]	6.2	Dirt/Vegetation	Remove Topsoil, add gravel	Perm.	Existing, New	Developed	38	20	0.0	0.0
Access 7	7.2	Vegetation	None	Temp.	Existing	Agricultural, Developed	35	20	<0.1	0.0
Access 8	8.5	Dirt/Vegetation	None	Temp.	Existing	Agricultural, Developed	44	20	<0.1	0.0
Access 9	10.6	Gravel/Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing	Agricultural, Developed, Open Land	2,137	20	1.0	0.0
Access 10	12.1	Vegetation	None	Temp.	Existing, New	Agricultural, Developed, Open Land	755	20	0.3	0.0
Access 10a	12.3	Gravel/Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing	Agricultural, Developed, Open Land	2,766	20	1.3	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access 11_R1	13.2	Gravel/Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing	Agricultural, Developed, Open Land	3,641	20	1.7	0.0
Access 12	14.2	Gravel/Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	168	20	0.1	0.0
Access 13	17.6	Gravel/Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Open Land	3,842	20	1.8	0.0
Access 14	19.3	Gravel/Dirt	None	Temp.	Existing	Developed, Agricultural	823	20	0.4	0.0
Access 15	19.8	Dirt/Vegetation	None	Temp.	Existing, New	Developed	85	20	<0.1	0.0
Access 16	19.8	Dirt/Vegetation	None	Temp.	New	Developed, Open Land	38	20	<0.1	0.0
Access 17	19.8	Vegetation	None	Temp.	Existing, New	Agricultural, Developed	254	20	0.1	0.0
Access 18	19.9	Vegetation	None	Temp.	New	Developed	81	20	<0.1	0.0
Access 19	20.8	Gravel/Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing	Developed	100	30	0.1	0.0
Access 20	21.5	Vegetation	None	Temp.	Existing	Agricultural	98	40	0.1	0.0
Access 21	22.0	Vegetation	None	Temp.	Existing	Agricultural, Developed	74	30	0.1	0.0
Access 22	22.9	Gravel	None	Temp.	Existing, New	Agricultural, Developed, Open Land	4,164	20	1.9	0.0
Access 23	23.0	Dirt	Remove Topsoil, add gravel, restore	Temp.	Existing	Agricultural, Open Land	461	30	0.2	0.0
Access 24	25.9	Dirt/Vegetation	Remove Topsoil, add gravel, restore	Temp.	Existing, New	Agricultural, Developed, Open Land	1,640	30	1.1	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access 24_R1	26.2	Dirt/Vegetation	Remove Topsoil, add gravel	Perm.	New	Agricultural, Developed, Open Land	748	30	0.5	0.5
Access 24b	27.7	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing, New	Agricultural, Open Land	366	30	0.2	0.0
Access 24c	29.4	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing, New	Open Land	354	20	0.2	0.0
Access 24d	30.9	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing, New	Developed, Open Land	926	30	0.6	0.0
Access 24e	32.4	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	Existing	Agricultural, Developed, Open Land	1,280	30	0.9	0.0
Access 25_R1	34.7	Gravel	None	Temp.	Existing	Agricultural, Open Land	2,964	30	2.0	0.0
Highway 10 Block Valve	37.0	Dirt/Vegetation	None	Perm.	Existing, New	Agricultural, Developed	254	20	0.1	0.1
Access 26	37.0	Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	234	20	0.1	0.0
Access 27	38.5	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	New	Developed, Open Land	547	20	0.3	0.0
Access 28	39.5	Gravel	None	Temp.	Existing	Agricultural, Developed	814	20	0.4	0.0
Access 29	40.7	Dirt	None	Temp.	New/Existing	Agricultural	447	20	0.2	0.0
Access 30	41.8	Gravel	None	Temp.	Existing	Agricultural	2,698	30	1.2	0.0
Access 31	46.0	Dirt/Vegetation	None	Temp.	Existing	Agricultural, Developed, Open Land	290	20	0.1	0.0
Access 32	49.0	Gravel	None	Temp.	Existing	Developed	419	20	0.2	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access 33	50.6	Gravel	Remove/Replace Topsoil	Temp.	Existing, New	Developed, Agricultural, Open Land	1,951	20	0.9	0.0
Access 34	51.4	Gravel	None	Perm.	Existing	Developed, Open Land	1,590	20	0.7	0.7
Access 35_R1	56.6	Dirt	None	Temp.	Existing	Agricultural, Open Land	2,878	20	1.3	0.0
Access 35_R2	58.2	Dirt/Vegetation	Remove/Replace Topsoil	Temp.	New	Open Land	263	20	0.1	0.0
Access 36	59.6	Dirt/Vegetation	None	Temp.	New	Agricultural, Open Land	122	20	0.1	0.0
Elkhorn Creek-Northern Border										
Unk_1-Elkhorn Crk CS	0.1	Dirt/Vegetation	New construction, grade/level, add gravel	Perm.	Existing, New	Agricultural, Developed, Open Land	1,038	30	0.5	0.5
Unk_2-Elkhorn Crk CS	0.0	Dirt/Vegetation	New construction, grade/level, add gravel	Perm.	Existing, New	Agricultural	341	30	0.2	0.2
Line Section 25 Loop										
Access Road B	0.4	Gravel (Well Pad Access)	None	Temp.	Existing	Developed, Open Land	491	30	0.3	0.0
Access Road D2	0.8	Dirt/Vegetation (Existing two-track)	None	Temp.	Existing	Open Land	819	10	0.4	
Access Road D1	1.0	Dirt/Vegetation (Existing two-track)	None	Temp.	Existing	Developed, Open Land	117	10	0.1	0.0
Access Road F	1.4	Gravel (Well Pad Access)	None	Temp.	Existing	Agricultural, Open Land	934	30/20 (through field)	0.6	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road G	2.0	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to right-of-way (ROW)	Temp.	New	Agricultural, Developed	223	20	0.1	0.0
Access Road H	2.1	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	493	20	0.2	0.0
Access Road I	2.7	Gravel/Dirt/Vegetation (Well Pad Access + Existing two-track + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	Existing	Agricultural, Developed	1,178	30 (well pad)/20 (two-track & field)	0.7	0.0
Access Road K	3.1	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural	996	20	0.4	0.0
Access Road M1	4.6	Gravel (Well Pad Access)	None	Temp.	Existing	Open Land	2,519	30	1.7	0.0
Access Road N	5.2	Gravel/Dirt/Vegetation (Existing approach & two-track + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural	525	20	0.2	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road O	6.1	Dirt/Vegetation (Existing two-track)	Use existing approach/may need to blade to ROW	Temp.	Existing	Open Land	1,251	20	0.6	0.0
Access Road P	6.6	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	Existing	Agricultural, Developed	43	20	<0.1	0.0
Access Road R	6.9	Gravel (Well Pad Access)	None	Perm.	Existing	Agricultural, Developed	237	30	0.2	0.2
Access Road S	7.5	Dirt/Vegetation (Existing two-track)	May need to blade out ruts and clear of vegetation	Temp.	Existing	Developed, Open Land	989	20	0.5	0.0
Access Road T	8.0	Gravel/Dirt/Vegetation (Well pad access + two-track)	Use existing well pad road/May need to blade two-track to ROW to clear of vegetation	Temp.	New	Agricultural, Developed, Open Land	1,457	30/20 (through field)	1.0	0.0
Access Road U	8.3	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	108	20	<0.1	0.0
Access Road V1	8.3	Gravel (Well Pad Access Approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	273	30/20 (through field)	0.2	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road V2	8.6	Gravel (Well Pad Access Approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural	1,577	30/20 (through field)	1.1	0.0
Access Road W	9.3	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	443	20	0.2	0.0
Access Road X	9.3	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	270	20	0.1	0.0
Access Road Y2	10.0	Dirt/Vegetation (Existing approach + two-track)	May need to blade out ruts and clear of vegetation	Temp.	Existing	Developed, Open Land	2,085	20	1.0	0.0
Access Road Z	10.4	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	1,111	20	0.5	0.0
Access Road BB	11.1	Gravel/Dirt/Vegetation (Existing two-track + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	1,502	20	0.7	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road CC	11.4	Gravel/Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	305	20	0.1	0.0
Access Road FF	12.0	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	759	20	0.3	0.0
Access Road GG	12.5	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Developed, Agricultural	615	20	0.3	0.0
Access Road JJ1-R	13.2	Vegetation/Cultivated	Remove/Replace Topsoil	Temp.	Existing	Agricultural, Developed, Open Land	2,679	10	1.2	0.0
Access Road L1	13.6	Vegetation/Cultivated	New construction, grade/level, add gravel	Perm.	New	Developed, Agricultural, Open Land	341	10	0.2	0.2
Access Road MM	14.0	Gravel/Dirt/Vegetation (Well pad access + farmed field)	Use existing road/May need to blade field clear (if planted)	Temp.	Existing	Agricultural, Developed	1,592	30/20 (through field)	1.1	0.0
Access Road NN	14.2	Dirt/Vegetation	Use existing approach/may need to blade clear of vegetation to ROW, restore	Temp.	Existing	Developed, Open Land	1,588	20	0.7	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road QQ1-R	14.9	Vegetation/Agricultural (Existing approach)	Remove/Replace Topsoil	Temp.	Existing, New	Developed, Open Land	1,194	10	0.6	0.0
Access Road RR	15.7	Dirt/Vegetation (Existing two-track)	May need to blade out ruts and clear of vegetation	Temp.	Existing	Agricultural, Developed	2,657	20	1.2	0.0
Access Road SS	16.3	Dirt/Vegetation (Existing two-track)	None	Temp.	New	Developed, Open Land	90	20	<0.1	0.0
Access Road TT	16.6	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	113	20	0.1	0.0
Access Road UU 1	17.1	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed	607	20	0.2	0.0
Access Road UU 2	17.1	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	Existing	Agricultural, Developed	371	20	0.2	0.0
Access Road VV	17.7	Dirt/Vegetation (Existing two-track)	May need to blade out ruts and clear of vegetation	Temp.	New	Agricultural, Developed, Open Land	676	20	0.3	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Access Road WW	19.3	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Developed, Open Land	333	20	0.1	0.0
Access Road XX	19.3	Dirt/Vegetation (Existing approach + road ditch)	Use existing approach/No changes to road ditch	Temp.	New	Developed, Open Land	193	20	0.1	0.0
Line Section 30 Loop [c]										
NL Access 1	0.0	Gravel/Dirt/Vegetation	Remove Topsoil, add gravel	Perm.	Existing, New	Agricultural, Developed	212	30	0.2	0.2
Access 3_R1-NLL	7.5	Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	183	20	0.1	0.0
Access 4_R1-NLL	7.5	Dirt/Vegetation	None	Temp.	Existing, New	Agricultural, Developed	298	20	0.1	0.0
Access 2-NLL	8.6	Dirt/Vegetation	None	Temp.	Existing	Agricultural, Developed	2,593	20	1.2	0.0
Access 1 - NLL	8.8	Gravel	None	Temp.	Existing, New	Agricultural, Open Land	791	30	0.6	0.0
Tioga Compressor Lateral										
Tioga Plant Access Road	0.0	Dirt/Vegetation	New construction, grade/level, add gravel	Perm.	New	Agricultural, Developed	315	30	0.1	0.1
Uprate Line Section 25										
Access Road YY 2	N/A	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	Existing	Agricultural, Developed, Open Land	472	20	0.2	0.0

APPENDIX C (cont'd)

North Bakken Expansion Project
Access Roads

Access Road Name	Milepost	Existing Road Type	Modification Required	Use (Temp. or Perm.)	Existing or New	Existing Land Uses	Length (feet)	Width (feet)	Area Affected by Construction (acres)	Area Affected by Operations (acres)
Uprating Access Road 1	N/A	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Agricultural, Developed, Open Land	644	20	0.3	0.0
Uprating Access Road 2	N/A	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	New	Developed, Open Land	425	20	0.1	0.0
Uprating Access Road 3	N/A	Dirt/Vegetation (Existing approach + farmed field)	Use existing approach/may need to blade clear of vegetation (if planted) to ROW	Temp.	Existing	Developed, Open Land	464	20	0.2	0.0

[a] Access road acreages were overestimated in the numbers presented in the February 14, 2020 FERC Application with 30 foot widths used for all acre calculations. While the length and widths of the majority of roads have not changed since the applications, the acres have been updated here to reflect the actual widths of roads.

[b] This access road is entirely within the workspaces associated with the pipeline right-of-way and additional temporary workspaces. The area affected by construction of the road is included within those acreages and not counted here.

[c] The following four access roads on Line Section 30 are also identified as access roads for the Tioga-Elkhorn Creek pipeline: Access3_R1-NLL; Access 4_R1-NLL; Access 2-NLL; and Access 1-NLL.

APPENDIX D

ADDITIONAL TEMPORARY WORKSPACE

APPENDIX D

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	0.4	Developed, Open Land	<0.1	Williams
Tioga-Elkhorn Creek	0.4	Open Land	0.3	Williams
Tioga-Elkhorn Creek	0.4	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	0.5	Agricultural	0.2	Williams
Tioga-Elkhorn Creek	0.9	Agricultural	0.4	Williams
Tioga-Elkhorn Creek	0.9	Agricultural, Open Land	0.8	Williams
Tioga-Elkhorn Creek	1.0	Agricultural	0.8	Williams
Tioga-Elkhorn Creek	1.0	Agricultural	0.4	Williams
Tioga-Elkhorn Creek	1.9	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	1.9	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	1.9	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	2.0	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	2.1	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	2.1	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	2.1	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	2.2	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	3.2	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	3.2	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	3.2	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	3.2	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	4.3	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	4.3	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	4.4	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	4.4	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	5.3	Agricultural	0.2	Williams
Tioga-Elkhorn Creek	5.3	Agricultural	0.7	Williams
Tioga-Elkhorn Creek	5.4	Agricultural	0.2	Williams
Tioga-Elkhorn Creek	5.4	Agricultural	0.7	Williams
Tioga-Elkhorn Creek	6.2	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	6.2	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	6.3	Agricultural	0.3	Williams

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	6.3	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	7.1	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	7.1	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	7.2	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	7.2	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	7.4	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	7.4	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	7.5	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	7.5	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	8.5	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	8.5	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	8.5	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	8.6	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	9.2	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	9.2	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	9.3	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	9.3	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	12.1	Agricultural, Open Land	0.3	Williams
Tioga-Elkhorn Creek	12.1	Agricultural, Open Land	<0.1	Williams
Tioga-Elkhorn Creek	12.2	Open Land	<0.1	Williams
Tioga-Elkhorn Creek	12.2	Open Land	0.3	Williams
Tioga-Elkhorn Creek	14.2	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	14.2	Agricultural	0.3	Williams
Tioga-Elkhorn Creek	14.3	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	14.3	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	16.2	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	16.2	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	16.3	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	16.3	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	18.1	Open Land	0.2	Williams
Tioga-Elkhorn Creek	18.2	Agricultural, Open Land	0.2	Williams
Tioga-Elkhorn Creek	18.3	Agricultural	0.2	Williams

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	18.3	Agricultural	0.7	Williams
Tioga-Elkhorn Creek	18.5	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	18.5	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	18.5	Agricultural, Developed	<0.1	Williams
Tioga-Elkhorn Creek	18.5	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	19.7	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	19.7	Agricultural, Developed, Open Land	<0.1	Williams
Tioga-Elkhorn Creek	19.8	Open Land	<0.1	Williams
Tioga-Elkhorn Creek	19.8	Open Land	0.4	Williams
Tioga-Elkhorn Creek	19.9	Developed	<0.1	Williams
Tioga-Elkhorn Creek	19.9	Agricultural, Developed, Open Land	27.8	Williams
Tioga-Elkhorn Creek	20.8	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	20.9	Agricultural	<0.1	Williams
Tioga-Elkhorn Creek	20.9	Developed	0.3	Williams
Tioga-Elkhorn Creek	22.4	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	22.4	Agricultural, Developed	0.3	Williams
Tioga-Elkhorn Creek	22.9	Agricultural, Open Land	<0.1	Williams
Tioga-Elkhorn Creek	23.0	Agricultural, Open Land	0.6	Williams
Tioga-Elkhorn Creek	23.0	Open Land	1.4	Williams
Tioga-Elkhorn Creek	26.0	Agricultural, Open Land	1.4	McKenzie
Tioga-Elkhorn Creek	26.0	Agricultural, Open Land	0.6	McKenzie
Tioga-Elkhorn Creek	26.3	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	26.3	Agricultural, Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	26.5	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	26.5	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	27.4	Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	27.4	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	27.6	Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	27.6	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	28.6	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	28.6	Open Land	0.3	McKenzie

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	28.7	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	28.7	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	28.9	Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	28.9	Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	29.2	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	29.2	Open Land	1.7	McKenzie
Tioga-Elkhorn Creek	29.2	Open Land	0.1	McKenzie
Tioga-Elkhorn Creek	29.9	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	29.9	Developed, Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	29.9	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	30.0	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	30.2	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	30.2	Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	30.3	Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	30.3	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	30.8	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	30.8	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	30.9	Developed	0.3	McKenzie
Tioga-Elkhorn Creek	30.9	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	34.7	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	34.7	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	34.7	Agricultural	0.5	McKenzie
Tioga-Elkhorn Creek	34.8	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	36.4	Agricultural	0.2	McKenzie
Tioga-Elkhorn Creek	36.4	Agricultural, Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	36.5	Agricultural	0.1	McKenzie
Tioga-Elkhorn Creek	36.5	Agricultural	0.3	McKenzie
Tioga-Elkhorn Creek	36.9	Agricultural, Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	36.9	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	37.0	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	37.0	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	38.5	Agricultural, Open Land	0.3	McKenzie

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	38.5	Agricultural, Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	38.7	Developed, Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	38.7	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	38.9	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	38.9	Open Land	0.7	McKenzie
Tioga-Elkhorn Creek	39.0	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	39.0	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	39.4	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	39.4	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	39.5	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	39.5	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	41.7	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	41.7	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	41.8	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	41.8	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	42.9	Agricultural, Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	42.9	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	42.9	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	42.9	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	43.8	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	43.8	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	43.9	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	43.9	Agricultural, Developed	0.5	McKenzie
Tioga-Elkhorn Creek	44.0	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	44.1	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	44.1	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	44.8	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	44.8	Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	45.0	Agricultural	0.2	McKenzie
Tioga-Elkhorn Creek	45.0	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	46.9	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	46.9	Agricultural, Open Land	0.3	McKenzie

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	47.0	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	47.0	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	47.0	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	47.0	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	48.0	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	48.0	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	48.0	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	48.0	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	49.0	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	49.0	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	49.0	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	49.0	Agricultural, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	49.3	Agricultural, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	49.4	Agricultural	0.3	McKenzie
Tioga-Elkhorn Creek	49.4	Agricultural, Developed	<0.1	McKenzie
Tioga-Elkhorn Creek	49.4	Agricultural, Developed	0.3	McKenzie
Tioga-Elkhorn Creek	50.0	Agricultural, Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	50.0	Agricultural, Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	50.1	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	50.1	Developed, Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	51.2	Agricultural	0.2	McKenzie
Tioga-Elkhorn Creek	51.2	Open Land	0.1	McKenzie
Tioga-Elkhorn Creek	51.3	Agricultural, Developed	0.1	McKenzie
Tioga-Elkhorn Creek	51.4	Agricultural, Open Land	0.6	McKenzie
Tioga-Elkhorn Creek	51.5	Open Land	0.6	McKenzie
Tioga-Elkhorn Creek	51.5	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	51.6	Open Land	0.2	McKenzie
Tioga-Elkhorn Creek	51.6	Open Land	0.7	McKenzie
Tioga-Elkhorn Creek	52.3	Agricultural, Open Land	0.7	McKenzie
Tioga-Elkhorn Creek	52.3	Open Land	0.4	McKenzie
Tioga-Elkhorn Creek	52.4	Agricultural, Developed, Open Land	0.4	McKenzie

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Tioga-Elkhorn Creek	52.4	Agricultural	0.7	McKenzie
Tioga-Elkhorn Creek	55.2	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	55.2	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	55.2	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	55.3	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	57.1	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	57.1	Agricultural	0.3	McKenzie
Tioga-Elkhorn Creek	57.2	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	57.2	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	57.3	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	57.3	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	57.4	Agricultural	<0.1	McKenzie
Tioga-Elkhorn Creek	57.4	Agricultural	0.3	McKenzie
Tioga-Elkhorn Creek	58.2	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	58.2	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	58.5	Open Land	0.7	McKenzie
Tioga-Elkhorn Creek	58.5	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	58.6	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	58.6	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	58.7	Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	58.7	Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	60.2	Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	60.2	Developed, Open Land	<0.1	McKenzie
Tioga-Elkhorn Creek	60.3	Agricultural, Developed, Open Land	0.3	McKenzie
Tioga-Elkhorn Creek	60.3	Agricultural, Open Land	<0.1	McKenzie
Line Section 25 Loop	0.5	Developed, Open Land	0.2	Williams
Line Section 25 Loop	0.6	Open Land	0.1	Williams
Line Section 25 Loop	0.6	Open Land	0.2	Williams
Line Section 25 Loop	0.7	Open Land	0.2	Williams
Line Section 25 Loop	0.7	Open Land	0.1	Williams
Line Section 25 Loop	0.8	Open Land	0.6	Williams
Line Section 25 Loop	0.8	Open Land	0.3	Williams
Line Section 25 Loop	1.0	Developed, Open Land	0.1	Williams

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Line Section 25 Loop	1.0	Developed, Open Land	0.3	Williams
Line Section 25 Loop	1.0	Agricultural, Developed, Open Land	0.1	Williams
Line Section 25 Loop	1.0	Agricultural, Open Land	0.4	Williams
Line Section 25 Loop	2.0	Agricultural, Developed	0.7	Williams
Line Section 25 Loop	2.1	Agricultural, Developed	1.3	Williams
Line Section 25 Loop	3.1	Agricultural	0.2	Williams
Line Section 25 Loop	3.1	Agricultural	0.3	Williams
Line Section 25 Loop	3.2	Agricultural	0.7	Williams
Line Section 25 Loop	3.2	Agricultural	0.5	Williams
Line Section 25 Loop	4.1	Agricultural	0.2	Williams
Line Section 25 Loop	4.1	Agricultural, Open Land	0.3	Williams
Line Section 25 Loop	4.2	Open Land	0.3	Williams
Line Section 25 Loop	4.2	Open Land	0.2	Williams
Line Section 25 Loop	5.1	Open Land	0.1	Williams
Line Section 25 Loop	5.1	Open Land	0.2	Williams
Line Section 25 Loop	5.2	Agricultural, Open Land	<0.1	Williams
Line Section 25 Loop	5.2	Agricultural, Open Land	0.3	Williams
Line Section 25 Loop	6.2	Agricultural	0.1	Williams
Line Section 25 Loop	6.2	Developed, Open Land	0.2	Williams
Line Section 25 Loop	6.3	Agricultural	<0.1	Williams
Line Section 25 Loop	6.3	Agricultural	0.4	Williams
Line Section 25 Loop	6.6	Agricultural, Open Land	0.6	Williams
Line Section 25 Loop	6.6	Agricultural, Developed	<0.1	Williams
Line Section 25 Loop	6.7	Agricultural	0.1	Mountrail
Line Section 25 Loop	6.7	Agricultural	0.1	Mountrail
Line Section 25 Loop	7.2	Agricultural	0.1	Mountrail
Line Section 25 Loop	7.2	Agricultural	0.3	Mountrail
Line Section 25 Loop	7.3	Agricultural, Open Land	0.3	Mountrail
Line Section 25 Loop	7.3	Agricultural	0.1	Mountrail
Line Section 25 Loop	8.2	Agricultural	0.1	Mountrail
Line Section 25 Loop	8.2	Agricultural	0.3	Mountrail
Line Section 25 Loop	8.3	Agricultural	0.3	Mountrail
Line Section 25 Loop	8.3	Agricultural	0.1	Mountrail
Line Section 25 Loop	9.3	Agricultural	0.3	Mountrail
Line Section 25 Loop	9.3	Agricultural	0.1	Mountrail
Line Section 25 Loop	9.4	Agricultural	0.1	Mountrail

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Line Section 25 Loop	9.4	Agricultural	0.3	Mountrail
Line Section 25 Loop	10.3	Open Land	0.5	Mountrail
Line Section 25 Loop	10.3	Open Land	0.2	Mountrail
Line Section 25 Loop	10.4	Agricultural, Developed	0.2	Burke
Line Section 25 Loop	10.4	Agricultural	0.3	Burke
Line Section 25 Loop	11.3	Agricultural, Developed	1.1	Burke
Line Section 25 Loop	11.3	Agricultural	<0.1	Burke
Line Section 25 Loop	11.4	Agricultural	0.5	Burke
Line Section 25 Loop	11.4	Agricultural, Developed	0.2	Burke
Line Section 25 Loop	11.5	Agricultural	0.1	Burke
Line Section 25 Loop	11.5	Agricultural, Developed	0.5	Burke
Line Section 25 Loop	12.5	Agricultural	0.3	Burke
Line Section 25 Loop	12.5	Agricultural	0.2	Burke
Line Section 25 Loop	12.6	Agricultural, Open Land	0.3	Burke
Line Section 25 Loop	12.6	Agricultural, Open Land	0.5	Burke
Line Section 25 Loop	13.3	Open Land	0.2	Burke
Line Section 25 Loop	13.3	Open Land	0.2	Burke
Line Section 25 Loop	13.6	Agricultural, Open Land	0.2	Burke
Line Section 25 Loop	13.6	Developed, Agricultural, Open Land	0.8	Burke
Line Section 25 Loop	13.6	Developed, Agricultural	0.1	Burke
Line Section 25 Loop	13.8	Agricultural, Developed	1.1	Burke
Line Section 25 Loop	13.9	Agricultural, Developed	1.1	Burke
Line Section 25 Loop	14.7	Open Land	0.7	Burke
Line Section 25 Loop	14.7	Open Land	0.2	Burke
Line Section 25 Loop	14.8	Open Land	<0.1	Burke
Line Section 25 Loop	14.8	Open Land	0.5	Burke
Line Section 25 Loop	16.2	Agricultural, Open Land	0.3	Burke
Line Section 25 Loop	16.2	Agricultural, Open Land	0.2	Burke
Line Section 25 Loop	16.4	Agricultural, Developed, Open Land	0.8	Burke
Line Section 25 Loop	16.4	Open Land	0.4	Burke
Line Section 25 Loop	17.1	Agricultural	0.5	Burke
Line Section 25 Loop	17.1	Agricultural	<0.1	Burke
Line Section 25 Loop	17.2	Agricultural	0.2	Burke
Line Section 25 Loop	17.2	Agricultural, Developed	0.4	Burke
Line Section 25 Loop	17.5	Developed, Open Land	0.3	Burke
Line Section 25 Loop	17.5	Open Land	0.2	Burke

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Line Section 25 Loop	17.6	Agricultural, Developed	0.1	Burke
Line Section 25 Loop	17.6	Agricultural	0.3	Burke
Line Section 25 Loop	19.3	Open Land	0.4	Burke
Line Section 25 Loop	19.3	Open Land	0.2	Burke
Line Section 25 Loop	19.3	Agricultural, Developed, Open Land	0.4	Burke
Line Section 30 Loop	3.1	Agricultural	0.2	Williams
Line Section 30 Loop	3.1	Agricultural	0.3	Williams
Line Section 30 Loop	3.2	Agricultural, Developed	0.3	Williams
Line Section 30 Loop	3.2	Agricultural, Developed	0.2	Williams
Line Section 30 Loop	4.1	Agricultural, Developed	0.5	Williams
Line Section 30 Loop	4.1	Agricultural	<0.1	Williams
Line Section 30 Loop	4.2	Agricultural, Developed	0.5	Williams
Line Section 30 Loop	4.2	Agricultural	<0.1	Williams
Line Section 30 Loop	5.1	Agricultural, Developed	0.1	Williams
Line Section 30 Loop	5.1	Agricultural, Developed	0.4	Williams
Line Section 30 Loop	5.2	Agricultural	0.4	Williams
Line Section 30 Loop	5.2	Agricultural, Developed	0.2	Williams
Line Section 30 Loop	6.2	Agricultural, Developed	0.2	Williams
Line Section 30 Loop	6.2	Agricultural, Developed, Open Land	0.3	Williams
Line Section 30 Loop	6.3	Agricultural	0.2	Williams
Line Section 30 Loop	6.3	Agricultural	0.3	Williams
Line Section 30 Loop	7.4	Agricultural, Developed	0.3	Williams
Line Section 30 Loop	7.4	Agricultural, Developed	0.2	Williams
Line Section 30 Loop	7.5	Agricultural	0.4	Williams
Line Section 30 Loop	7.5	Agricultural	0.2	Williams
Line Section 30 Loop	7.6	Agricultural	0.4	Williams
Line Section 30 Loop	7.6	Agricultural	0.3	Williams
Line Section 30 Loop	7.7	Agricultural, Developed	0.3	Williams
Line Section 30 Loop	7.7	Agricultural, Developed	0.4	Williams
Line Section 30 Loop	8.6	Agricultural	0.4	Williams
Line Section 30 Loop	8.6	Agricultural	0.6	Williams
Line Section 30 Loop	8.7	Agricultural, Open Land	0.8	Williams
Line Section 30 Loop	8.7	Agricultural, Open Land	0.4	Williams
Line Section 30 Loop	9.1	Agricultural	0.2	Williams
Line Section 30 Loop	9.1	Agricultural, Developed	0.4	Williams
Line Section 30 Loop	9.2	Open Land	0.2	Williams

APPENDIX D (cont'd)

North Bakken Expansion Project
Additional Temporary Workspaces

Project Facility	Milepost	Existing Land Uses	Area Affected by Construction (acres)	County
Line Section 30 Loop	9.2	Developed, Open Land	0.3	Williams
Tioga Compressor Lateral	0.0	Agricultural	0.1	Williams
Tioga Compressor Lateral	0.4	Open Land	0.2	Williams
Tioga Compressor Lateral	0.4	Open Land	0.1	Williams
Tioga Compressor Lateral	0.5	Open Land	0.1	Williams
Uprate Line Section 25	0.0	Agricultural, Open Land	0.7	Burke
Uprate Line Section 25	0.0	Developed, Open Land	0.8	Burke
Uprate Line Section 25	0.0	Developed, Open Land	2.1	Burke
Uprate Line Section 25	0.0	Agricultural	0.6	Burke
Uprate Line Section 25	0.1	Developed, Open Land	1.4	Burke
Uprate Line Section 25	0.1	Agricultural, Open Land	0.9	Burke
Uprate Line Section 25	0.1	Agricultural, Open Land	0.1	Burke
Uprate Line Section 25	0.1	Developed, Open Land	1.5	Burke
Uprate Line Section 25	0.1	Open Land	0.8	Burke
Uprate Line Section 25	0.2	Agricultural, Open Land	2.5	Burke
Robinson Lake Tract	0.0	Agricultural	0.8	Mountrail
Elkhorn Creek Compressor Station	0.0	Agricultural, Developed	2.2	McKenzie
Northern Border Interconnect	0.3	Agricultural, Open Land	1.0	McKenzie
Springbrook Plant Receipt Station	0.0	Agricultural	0.6	Williams

APPENDIX E

SUMMARY OF PROPOSED GUIDED BORE LOCATIONS AND SURFICIAL GEOLOGY

APPENDIX E

Summary of Proposed Guided Bore Locations and Surficial Geology [a,]

Facility/ Milepost	Feature Crossed	Length (feet)	Max Depth (feet)	Geologic Formation / Deposit Type	Map Unit	Approximate Thickness (feet)
Line Section 25 Loop						
0.6	103rd Ave NW	195	10.9	Coleharbor / Glacial	Qcdn	100
0.7	w-wm-eb-002e	657	20.3	Coleharbor / Glacial	Qccu	100
1.0	69th St NW	316	12.6	Coleharbor / Glacial	Qccu	100
2.0	70th St NW & 103rd Ave NW	308	18.5	Coleharbor / Glacial	Qccu	100
3.1	71st St NW	308	10.7	Coleharbor / Glacial	Qccu	100
4.1	72nd St NW	223	10.5	Coleharbor / Glacial	Qccu	100
5.1	73rd St NW	129	8.7	Coleharbor / Glacial	Qccu	100
6.2	74th St NW	200	12.0	Coleharbor / Glacial	Qccu	100
6.6	102nd Ave NW	449	15.9	Coleharbor / Glacial	Qcdn	100
7.2	75th St NW	271	12.2	Coleharbor / Glacial	Qcdn	100
8.2	76th St NW	270	12.4	Coleharbor / Glacial	Qcdn	100
9.3	77th St NW	272	20.1	Coleharbor / Glacial	Qcdn	100
10.3	78th St NW	264	19.2	Coleharbor / Glacial	Qccu	100
11.3	79th St NW	277	14.0	Coleharbor / Glacial	Qccr	100
11.4	101st Ave NW	260	11.7	Coleharbor / Glacial	Qccr	100
12.5	80th St NW	312	18.3	Coleharbor / Glacial	Qccr	100
13.4	White Earth Creek	TBD	TBD	Coleharbor / Glacial	Qcdn	100
13.6	81st St NW	204	12.7	Coleharbor / Glacial	Qcdn	100
14.8	100th Ave NW	TBD	TBD	Coleharbor / Glacial	Qcdn	100
16.2	99th Ave NW & w-bk-ea-001e	TBD	TBD	Coleharbor / Glacial	Qcdc	100
17.1	83rd St NW	TBD	TBD	Coleharbor / Glacial	Qcdc	100
17.5	98th Ave NW	TBD	TBD	Coleharbor / Glacial	Qcoh	200
19.3	85th St NW	TBD	TBD	Coleharbor / Glacial	Qcoh	200
Uprate Line Section 25						
18.9	86th Ave NW & Wetland	745	22.7	Coleharbor / Glacial	Qccr	100
17.2	HWY 40	381	18.0	Coleharbor / Glacial	Qcch	100
10.8	92nd St NW	351	21.6	Coleharbor / River Sediment	Qcrh	100
9.6	93rd St NW & 89th Ave NW	313	11.1	Coleharbor / Glacial	Qcch	100
Line Section 30 Loop						
3.2	106TH AVE NW	200	7	Coleharbor / Glacial	Qcdn	100
4.2	105TH AVE NW	250	7	Coleharbor / Glacial	Qcdn	100
5.2	66TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
6.3	STATE HWY 40	350	20	Coleharbor / Glacial	Qcdn	100
7.5	67TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
7.7	103RD AVE NW	250	7	Coleharbor / Glacial	Qcdn	100
8.6	Great Northern Railroad	500	12	Coleharbor / Glacial	Qcdn	100
9.2	68TH ST NW	350	7	Coleharbor / Glacial	Qcdn	100
Tioga-Elkhorn Creek						
0.3	68TH ST NW	350	7	Coleharbor / Glacial	Qcdn	100
0.8	Great Northern Railroad	500	12	Coleharbor / Glacial	Qcdn	100
1.8	103RD AVE NW	251	7	Coleharbor / Glacial	Qcdn	100
2.1	67TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
3.2	66TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
4.3	65TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
5.3	US HWY 2	600	15	Coleharbor / Glacial	Qcdn	100
6.2	104TH AVE NW	250	7	Coleharbor / Glacial	Qcdn	100
7.1	105TH AVE NW	350	7	Coleharbor / Glacial	Qcdn	100
7.4	63RD ST NW	250	7	Coleharbor / Glacial	Qcdn	100
8.5	106TH AVE NW	250	7	Coleharbor / Glacial	Qccu	100
9.2	62ND ST NW	350	7	Coleharbor / Glacial	Qcoh	100
12.1	60TH ST NW	350	7	Coleharbor / Glacial	Qccu	100
14.1	58TH ST NW	250	7	Coleharbor / Glacial	Qcdn	100
16.1	56TH ST NW	250	7	Bullion Creek / River, Lake and Swamp	Tb	600

APPENDIX E (cont'd)

Summary of Proposed Guided Bore Locations and Surficial Geology [a,]

Facility/ Milepost	Feature Crossed	Length (feet)	Max Depth (feet)	Geologic Formation / Deposit Type	Map Unit	Approximate Thickness (feet)
18.1	Beaver Creek s-wm-eb-002	630	13	Coleharbor / Glacial	Qcdn	100
18.4	109th AVE NW	250	7	Oahe / River Sediment	Qor	30
19.7	110TH AVE NW	250	7	Oahe / River Sediment	Qor	30
19.7	STATE HWY 1806	278	7	Oahe / River Sediment	Qor	30
20.7	53RD ST NW	250	7	Oahe / River Sediment	Qor	30
22.3	52ND ST NW	250	7	Oahe / Windblown Sediment	Qou	10
22.9	DRIVEWAY	250	7	Oahe / Windblown Sediment	Qou	10
26.2	48TH ST NW	1433	19	Bullion Creek / River, Lake and Swamp	Tb	600
28.8	WETLAND m-mk-ea-002e	800	TBD	Bullion Creek / River, Lake and Swamp	Tb	600
29.7	COUNTY HWY 43	250	10	Bullion Creek / River, Lake and Swamp	Tb	600
30.0	Tobacco Garden Creek s-mk-eb-002	250	TBD	Oahe / River Sediment	Qor	30
30.5	45TH STREET NW	250	7	Oahe / River Sediment	Qor	30
34.5	42ND STREET NW	250	7	Oahe / River Sediment	Qor	30
36.2	PORCUPINE COULEE s-mk-ea-003	250	TBD	Oahe / River Sediment	Qor	30
36.7	COUNTY HWY 10	350	10	Sentinel Butte / River, Lake and Swamp	Ts	600
38.2	WETLAND w-mk-ea-003e	1200		Sentinel Butte / River, Lake and Swamp	Ts	600
38.6	121ST AVE NW	214	6	Sentinel Butte / River, Lake and Swamp	Ts	600
39.2	38TH ST NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
41.3	ACCESS ROAD	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
42.5	35TH ST NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
43.4	COUNTY HWY 12	350	10	Coleharbor / Glacial	Qcdn	25 [b]
43.6	121ST AVE NW	250	7	Coleharbor / Glacial	Qcdn	25 [b]
44.6	31ST ST NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
46.5	31ST ST NW	350	7	Oahe / River Sediment	Qor	30
47.6	30TH ST NW	250	7	Oahe / River Sediment	Qor	30
48.6	29TH ST NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
48.9	121ST AVE NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
49.6	ACCESS ROAD	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
50.8	STATE HWY 23	508	20	Sentinel Butte / River, Lake and Swamp	Ts	600
51.0	Northfork Creek s-mk-eb-005	636	12	Sentinel Butte / River, Lake and Swamp	Ts	600
51.8	Cherry Creek	723	12	Sentinel Butte / River, Lake and Swamp	Ts	600
54.6	COUNTY HWY 37	250	10	Sentinel Butte / River, Lake and Swamp	Ts	600
56.5	112TH AVE NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
56.7	112TH AVE NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
57.7	WATERCOURSE	800	TBD	Sentinel Butte / River, Lake and Swamp	Ts	600
57.9	122ND AVE NW	250	7	Sentinel Butte / River, Lake and Swamp	Ts	600
59.5	COUNTY HWY 37	250	10	Sentinel Butte / River, Lake and Swamp	Ts	600

a, Sourced from Clayton et al. (1980), North Dakota Geological Survey (2015), and Carlson (1985).
Carlson (1985) indicates that the Coleharbor Group in McKenzie County may be closer to 25 feet thick.

APPENDIX F

ROAD AND RAILROAD CROSSINGS

APPENDIX F

North Bakken Expansion Project
Road and Railroad Crossings

Facility/Milepost	Type	Name	Crossing Method	Approximate Crossing Length (feet)
Tioga-Elkhorn Creek				
0.3	Road	68th Street NW	Guided Bore	34
0.5	Road	Private Road	Open Cut	29
0.8	Railroad	BNSF	Guided Bore	51
1.8	Road	103rd Ave NW	Guided Bore	29
2.0	Road	67th Street NW	Guided Bore	24
3.1	Road	66th Street NW	Guided Bore	28
4.2	Road	65th Street NW	Guided Bore	25
4.9	Road	Private Road	Open Cut	19
5.2	Road	64th Street NW/Highway 2	Guided Bore	133
5.8	Road	Private Road	Open Cut	18
6.1	Road	104th Ave NW	Guided Bore	36
7.0	Road	105th Ave NW	Guided Bore	25
7.4	Road	63rd Street NW	Guided Bore	18
8.4	Road	106th Ave NW	Guided Bore	25
9.1	Road	62nd Street NW	Guided Bore	35
10.5	Road	61st Street NW	Open Cut	19
12.0	Road	60th Street NW	Guided Bore	38
13.1	Road	59th Street NW	Open Cut	11
14.1	Road	58th Street NW	Guided Bore	18
16.1	Road	56th Street NW	Guided Bore	20
18.4	Road	109th Ave NW	Guided Bore	27
19.7	Road	110th Ave NW	Guided Bore	26
19.7	Road	54th Street NW	Guided Bore	30
20.7	Road	53th Street NW	Guided Bore	36
21.4	Road	Private Road	Open Cut	16
22.3	Road	51st Street NW	Guided Bore	37
22.8	Road	Private Road	Open Cut	45
22.9	Road	51st Street NW	HDD	10
25.5	Road	Private Road	HDD	17
25.8	Road	Private Road	HDD	18
26.2	Road	Sand Creek Road	Guided Bore	35
26.7	Road	Private Road	Open Cut	22
26.9	Road	Private Road	Guided Bore	17
27.2	Road	(FDR) 8698	Open Cut	40
27.8	Road	Private Road	Open Cut	16
28.0	Road	Private Road	Open Cut	14

APPENDIX F (cont'd)

North Bakken Expansion Project
Road and Railroad Crossings

Facility/Milepost	Type	Name	Crossing Method	Crossing Length (feet)
28.1	Road	Private Road	Open Cut	15
28.6	Road	(FDR) Tobacco Garden – West Sand	Open Cut	40
29.7	Road	115th Ave NW/ (FDR) 8000C43	Guided Bore	25
30.6	Road	45th Street NW	Guided Bore	23
32.2	Road	Private Road	Open Cut	17
33.2	Road	Private Road	Open Cut	11
33.5	Road	43rd Street NW	Open Cut	23
34.5	Road	42nd Street NW	Guided Bore	25
35.0	Road	Private Road	Open Cut	12
36.7	Road	40th Street NW	Guided Bore	34
36.8	Road	Private Road	Open Cut	15
38.5	Road	Private Road	Open Cut	49
38.7	Road	121st Ave NW	Guided Bore	20
39.2	Road	38th Street NW	Guided Bore	24
41.0	Road	Private Road	Open Cut	15
41.5	Road	36th Street NW	Guided Bore	26
41.7	Road	Private Road	Open Cut	12
42.6	Road	35th Street NW	Guided Bore	8
43.6	Road	34th Street NW	Guided Bore	59
43.7	Road	121st Ave NW	Guided Bore	35
44.7	Road	33rd Street NW	Guided Bore	15
45.7	Road	32nd Street NW	Open Cut	24
46.7	Road	31st Street NW	Guided Bore	37
47.7	Road	30th Street NW	Guided Bore	26
48.7	Road	29th Street NW	Guided Bore	25
49.1	Road	121st Ave NW	Guided Bore	34
49.8	Road	28th Street NW	Guided Bore	33
50.8	Road	Private Road	Open Cut	14
51.0	Road	State Highway 23	Guided Bore	33
51.1	Road	Private Road	Open Cut	19
51.9	Road	Private Road	Open Cut	18
52.1	Road	Private Road	Open Cut	42
54.6	Road	Private Road	Open Cut	15
54.8	Road	23rd Street NW	Guided Bore	35
56.1	Road	Private Road	Open Cut	14
56.1	Road	Private Road	Open Cut	14
56.7	Road	122nd Ave NW	Guided Bore	71

APPENDIX F (cont'd)

North Bakken Expansion Project
Road and Railroad Crossings

Facility/Milepost	Type	Name	Crossing Method	Crossing Length (feet)
56.9	Road	122nd Ave NW	Guided Bore	38
57.2	Road	22nd Street NW	Open Cut	24
58.1	Road	122nd Ave NW	Open Cut	68
59.8	Road	21st Street NW	Guided Bore	36
60.6	Road	123rd Ave NW	Open Cut	20
Line Section 25 Loop				
0.3	Road	Private Road	Open Cut	18
0.6	Road	103rd Ave NW	Guided Bore	34
0.8	Road	Private Road	Open Cut	23
1.0	Road	Private Road	Open Cut	23
1.0	Road	69th Street NW	Guided Bore	29
1.4	Road	Private Road	Open Cut	19
2.1	Road	103rd Ave NW	Guided Bore	58
2.1	Road	70th Street NW	Guided Bore	67
3.2	Road	71st Street NW	Guided Bore	32
4.2	Road	72nd Street NW	Guided Bore	24
4.6	Road	Private Road	Open cut	23
5.2	Road	73rd Street NW	Guided Bore	24
6.3	Road	74th Street NW	Guided Bore	32
6.7	Road	102nd Ave NW	Guided Bore	88
6.9	Road	Private Road	Open Cut	25
7.3	Road	75th Street NW	Guided Bore	22
8.3	Road	76th Street NW	Guided Bore	24
9.4	Road	77th Street NW	Guided Bore	17
10.4	Road	78th Street NW	Guided Bore	21
11.4	Road	79th Street NW	Guided Bore	36
11.5	Road	101st Ave NW	Guided Bore	25
12.6	Road	Highway 50	Guided Bore	33
13.7	Road	81st Street NW	Guided Bore	29
14.3	Road	Private Road	Open Cut	19
14.9	Road	100th Ave NW	Guided Bore	42
15.8	Road	Private Road	Open Cut	19
16.4	Road	99th Ave NW	Guided Bore	21
17.1	Road	83rd Street NW	Guided Bore	35
17.6	Road	98th Ave NW	Guided Bore	39
18.3	Road	84th Street NW	Open Cut	17
19.3	Road	County Road 16	Guided Bore	26

APPENDIX F (cont'd)

North Bakken Expansion Project
Road and Railroad Crossings

Facility/Milepost	Type	Name	Crossing Method	Crossing Length (feet)
Line Section 30 Loop				
1.0	Road	108th Ave NW	Open Cut	9
3.2	Road	106th Ave NW	Guided Bore	8
4.2	Road	105th Ave NW	Guided Bore	27
5.2	Road	66th Street NW	Guided Bore	24
5.7	Road	Private Road	Open Cut	10
6.3	Road	State Highway 40	Guided Bore	57
7.5	Road	67th Street NW	Guided Bore	24
7.7	Road	103rd Ave NW	Guided Bore	29
8.6	Railroad	BNSF	Guided Bore	51
9.1	Road	68th Street NW	Guided Bore	34
Tioga Compressor Lateral				
0.5	Road	103rd Ave NW	Guided Bore	25

APPENDIX G

WETLANDS CROSSED OR OTHERWISE AFFECTED BY THE PROJECT

APPENDIX G

North Bakken Expansion Project
Wetlands Crossed or Otherwise Affected by the Project [a, b]

Wetland ID	Cowardin Classification	Milepost	Centerline Distance Crossed (feet)	Construction Impact (acres)	Operation Impact (acres)	Proposed Crossing Method
PIPELINE FACILITIES						
Tioga-Elkhorn Creek						
w-wm-ea-008e	PEM	0.9	36.2	0.1	0.0	Open Cut
w-wm-ee-001e	PEM	12.8	23.4	<0.1	0.0	Open Cut
ww-wm-eg-001	PEM	16.9	20.5	<0.1	0.0	Open Cut
w-wm-eb-008e	PEM	18.0	76.8	0.1	0.0	Open Cut
w-mk-ea-001e	PEM	28.0	14.3	<0.1	0.0	Open Cut
w-mk-eb-002e	PEM	29.3	160.1	0.3	0.0	Open Cut
w-mk-ea-003e	PEM	38.5	19.0	<0.1	0.0	Guided Bore
w-mk-ef-004e	PEM	40.0	11.1	<0.1	0.0	Open Cut
w-mk-eb-003e	PEM	41.5	321.1	0.6	0.0	Open Cut
DSK_NWI_7	PEM	44.9	41.4	0.1	0.0	Guided Bore
w-mk-ea-004e	PEM	47.0	26.3	0.1	0.0	Guided Bore
w-mk-eb-004e	PEM	51.0	109.9	0.2	0.0	Open Cut
w-lbt-003	PEM	52.5	0.0	<0.1	0.0	Open Cut
w-lbt-001b	PEM	52.6	0.0	<0.1	0.0	Open Cut
w-lbt-001a	PEM	52.6	31.3	<0.1	0.0	Open Cut
w-mk-wa-002e	PEM	53.7	35.4	<0.1	0.0	Open Cut
w-mk-ef-007e	PEM	55.0	28.0	<0.1	0.0	Open Cut
w-mk-wa-001e[c]	PEM	55.0	0.0	<0.1	0.0	Open Cut
w-mk-ef-008e	PEM	55.7	9.3	<0.1	0.0	Open Cut
w-mk-eg-001	PEM	62.4	9.0	0.1	0.0	Open Cut
			Subtotal	**1.9**	**0.0**	
Line Section 25 Loop						
w-wm-eb-002e	PEM	0.7	59.4	<0.1	0.0	Guided Bore
w-wm-ea-002e	PEM	4.7	283.3	0.3	0.0	Open Cut
w-wm-ea-001e	PEM	4.8	0	<0.1	0.0	Open Cut
w-mt-ea-001e	PEM	9.8	1.2	<0.1	0.0	Open Cut
w-bk-ea-013	PEM	11.0	98.2	0.2	0.0	Open Cut
w-bk-ea-005e	PEM	11.9	47.6	0.1	0.0	Open Cut
w-bk-ea-006e	PEM	11.9	69.9	0.1	0.0	Open Cut
w-bk-ee-002e	PEM	13.2	28.6	<0.1	0.0	Open Cut
w-bk-eb-001e	PEM	13.5	589.7	1.0	0.0	Guided Bore
w-bk-wa-001e	PEM	14.8	0.0	<0.1	0.0	Guided Bore
w-bk-ea-003e	PEM	16.0	0.0	<0.1	0.0	Open Cut
w-bk-ea-002e	PEM	16.1	0.0	<0.1	0.0	Open Cut
w-bk-ea-001e	PEM	16.3	19.8	<0.1	0.0	Guided Bore
			Subtotal	**1.6**	**0.0**	
Line Section 30 Loop						
w-wm-ee-002e	PEM	0.0	0.0	<0.1	0.0	Open Cut
w-wm-ec-004e	PEM	0.2	0.0	<0.1	0.0	Open Cut
w-wm-ec-005e	PEM	0.3	196.6	0.3	0.0	Open Cut

APPENDIX G (cont'd)

North Bakken Expansion Project
Wetlands Crossed or Otherwise Affected by the Project [a, b]

Wetland ID	Cowardin Classification	Milepost	Centerline Distance Crossed (feet)	Construction Impact (acres)	Operation Impact (acres)	Proposed Crossing Method
w-wm-ef-002e	PEM	0.4	145.7	0.2	0.0	Open Cut
w-wm-ec-003e	PEM	5.8	40.9	0.1	0.0	Open Cut
w-wm-ea-008e [d]	PEM	8.7	34.7	<0.1	0.0	Open Cut
			Subtotal	**0.8**	**0.0**	
Uprating Existing Line						
w-bk-ea-010e	PEM	N/A	394	0.6	0.0	Guided Bore
			Subtotal	**0.6**	**0.0**	
ACCESS ROADS						
w-wm-eb-009e	PEM	NA	NA	<0.1	0.0	N/A - Matting
YARDS						
w-wm-ef-004e	PEM	NA	NA	0.1	0.0	N/A - Matting
w-wm-ef-005e	PEM	NA	NA	0.1	0.0	N/A - Matting
			Subtotal	**0.2**	**0.0**	
TOTAL				**5.1**	**0.0 [e]**	

[a] The numbers in this table have been rounded for presentation purposes. As a result, the subtotals and totals may not reflect the exact sum of the addends in all cases.

[b] PEM = Palustrine emergent wetland

[c] Overlaps wetland w-mk-ef-007e

[d] Wetland is crossed by both the Tioga-Elkhorn Creek Pipeline and Line Section 30 Loop. As construction of the pipelines will be staggered, impacts are presented for each pipeline route.

[e] In wetlands, WBI Energy would not need to maintain a 10-foot strip over the pipeline in an herbaceous condition since all of the wetlands affected by operation of the Project are emergent, and therefore already in an herbaceous state. All wetlands would be able to revert to pre-existing conditions, therefore, no permanent operational impacts on wetlands would occur from the Project.

APPENDIX H

SUMMARY OF COMMUNICATIONS WITH FEDERALLY RECOGNIZED INDIAN TRIBES

APPENDIX H

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
Standing Rock Sioux Tribe	4-15-19	Introductory letter, including a description and map of the North Bakken Expansion Project (Project), and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Tribal Historic Preservation Office (THPO).	2-14-20
	5-10-19	Follow-up phone call to the Chairman's office; voice mailbox full.	2-14-20
	5-10-19	Follow-up phone call to the THPO; voicemail message.	2-14-20
	5-15-19	Follow-up phone call to the Chairman's office and the THPO.	2-14-20
	6-27-19	Follow-up phone call to the THPO; voicemail message.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting a copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy Transmission, Inc.'s (WBI Energy) open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt).	9-28-20
	9-17-20	Minutes from site visits to review features identified at 32MZ3382, 32MZ3383, and 32MZ3385.	9-28-20
	9-23-16	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-10-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-16-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairwoman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	5-10-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	5-15-19	Follow-up email sent to the Chairman transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Follow-up phone call to the THPO; voicemail message left.	2-14-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the Chairwoman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt).	9-28-20
	9-25-16	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-14-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	No Date	Return Receipt for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Turtle Mountain Band of Chippewa Indians	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	5-10-19	Follow-up email to the Chairman transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	5-10-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Follow up phone call to the THPO; the tribe does not plan to comment on the Project.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and delivery confirmation).	9-28-20
	9-22-16	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	10-5-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-13-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Three Affiliated Tribes of the Fort Berthold Reservation	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the Chairman's office, who confirmed receipt of the 4-15-19 introductory letter.	2-14-20
	5-10-19	Follow-up phone call to THPO; no answer.	2-14-20
	5-10-19	Follow-up phone call to THPO; no answer.	2-14-20
	5-15-19	Follow-up email to the THPO transmitting a copy of the 4-15-19 introductory letter.	2-14-20
	6-26-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	6-26-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	8-5-19	Phone call from the Director of the Tree Affiliated Tribes Pipeline Authority (TAT Pipeline Authority) regarding the Project.	2-14-20
	8-6-19	Email from the Director of the TAT Pipeline Authority regarding the Project open houses.	2-14-20
	8-6-19	Email to the Director of the TAT Pipeline Authority requesting a meeting.	2-14-20
	8-7-19	Meeting with the Director of the TAT Pipeline Authority at the Project open house in Watford City, North Dakota, to discuss the Project and pipeline safety.	2-14-20
	8-23-19	Phone call to the THPO regarding tribal participation in the field survey of U.S. Army Corps of Engineers (COE) and other lands in the Project area.	2-14-20
	8-23-19	Email to the THPO regarding tribal participation in the field survey of COE and other lands in the Project area and transmitting copies of previous correspondence.	2-14-20
	9-3-19	Email from the TAT Pipeline Authority requesting plan and profile alignment sheets for the proposed crossing of the Missouri River (Lake Sakakawea).	2-14-20
	9-5-19	Email to the TAT Pipeline Authority transmitting a preliminary bore profile for the proposed crossing of the Missouri River (Lake Sakakawea).	2-14-20
	12-10-19	Email to the Director of the TAT Pipeline Authority regarding the status of the Project and the proposed HDD at the Missouri River (Lake Sakakawea).	4-20-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 2-19-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-3-20	Email to the Director of the TAT Pipeline Authority regarding the status of the Project and the proposed HDD at the Missouri River (Lake Sakakawea).	4-20-20
	3-3-20	Letter to the Director of the TAT Pipeline Authority regarding the filing of WBI Energy's application with FERC.	4-20-20
	3-3-20	Letter to the TAT Pipeline Authority regarding the filing of WBI Energy's application with FERC.	4-20-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Email from the THPO confirming the tribe's interest in participating in the 2020 field surveys.	4-20-20
	3-30-20	Emails with the THPO coordinating a call to discuss the tribe's participation in the 2020 field surveys.	4-20-20
	3-31-20	Invitation email to the THPO for a call on 4-2-20 to discuss the Project and the tribe's participation in the 2020 field surveys.	4-20-20
	3-31-20	Email accepting WBI Energy's invitation to participate in a call on 4-2-20 to discuss the Project and the tribe's participation in the 2020 field surveys.	4-20-20
	4-2-20	Call to the THPO to coordinate a meeting to discuss the Project and the tribe's participation in the 2020 field surveys; voice mail message.	4-20-20
	4-2-20	Email to the THPO to coordinate a meeting to discuss the Project and the tribe's participation in the 2020 field surveys.	4-20-20
	4-8-20	Call to the THPO to coordinate a meeting to discuss the Project and the tribe's participation in the 2020 field surveys; voice mail message.	4-20-20
	4-8-20	Email to the THPO to coordinate a meeting to discuss the Project and the tribe's participation in the 2020 field surveys.	4-20-20
	4-22-20	Email (with read receipt) to the THPO providing an update on the survey plans for 2020.	7-8-20
	9-7-20	Email to the THPO regarding the recovery of bone fragments at 32MZ3313 in 2019.	9-28-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with Fed Ex delivery receipt).	9-28-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-5-20	Delivery confirmation for BCA's report.	11-13-20
	10-7-20	Signed Chain of Custody Letter from THPO	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
Spirit Lake Sioux Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairwoman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; voice mailbox full.	2-14-20
	5-10-19	Follow-up phone call to the Chairwoman; voicemail unavailable.	2-14-20
	5-10-19	Follow-up email to the Chairwoman transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	5-15-19	Follow-up phone call to THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	5-15-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Follow-up phone call to the THPO; voicemail message.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the Chairwoman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-2-20	Call from the THPO; voice mail message requesting a return call.	7-8-20
	3-3-20	Return call to the THPO; voice mail message.	7-8-20
	3-4-20	Call from the THPO requesting an additional copy of WBI Energy's letter dated 2-28-28.	7-8-20
	3-4-20	Email to the THPO transmitting a copy of WBI Energy's letter dated 2-28-20.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and confirmation of availability for pickup).	9-28-20
	9-23-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-8-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-13-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Yankton Sioux Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	5-10-19	Follow-up phone call to the THPO; voicemail message.	2-14-20
	5-10-19	Follow-up phone call to the Chairman; voicemail message.	2-14-20
	6-27-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Phone call from THPO regarding previous email.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter and requesting a copy of the tribe's consultation protocols.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and confirmation of availability for pickup).	9-28-20
	9-26-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-5-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-11-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Northern Cheyenne Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the President.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; message left.	2-14-20
	5-10-19	Follow-up phone call to the President's office, voicemail message.	2-14-20
	5-14-19	Email from the THPO transmitting a response letter.	2-14-20
	5-14-19	Letter from the THPO requesting copies of survey reports for review.	2-14-20
	5-20-19	Email acknowledging receipt of the THPO's 5-14-19 letter.	2-14-20
	7-17-19	Letter inviting the President to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	8-30-19	Email to the THPO regarding tribal involvement in field surveys and reiterating WBI Energy's previous commitment to provide copies of reports.	2-14-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	9-5-19	Phone call to the THPO regarding the Project and survey logistics; voice mail message. (Note: This call is documented in WBI Energy's email to the THPO on 9-5-19.)	2-14-20
	9-5-19	Email to the THPO regarding the Project and survey logistics.	2-14-20
	9-6-19	Phone call to the THPO regarding the Project and survey logistics; message left.	2-14-20
	10-9-19	Email from the THPO regarding the status of field surveys	2-14-20
	10-9-19	Email from the THPO regarding the status of field surveys	2-14-20
	10-10-19	Email to the THPO regarding the status of field surveys	2-14-20
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 2-21-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the President regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-13-20	Phone call from the THPO regarding the status of the tribe's review of the Class III Archaeological Survey Report.	4-20-20
	3-19-20	Phone call from the THPO regarding the status of the tribe's review of the Class III Archaeological Survey Report and the tribe's interest in participating in the 2020 field surveys.	4-20-20
	3-30-20	Phone call to the THPO to confirm contact information for the tribe.	4-20-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field survey and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-31-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20 and to schedule a meeting to discuss the tribe's participation in the 2020 field surveys.	4-20-20
	3-31-20	Invitation email to the THPO for a call on 4-7-20 to discuss the Project and the tribe's participation in the 2020 field surveys.	4-20-20
	4-7-20	Teleconference to discuss the tribe's participation in the 2020 field surveys.	4-20-20
	4-22-20	Email (with read receipt) to the THPO providing an update on the survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and delivery confirmation).	9-28-20
	9-21-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-6-20	Delivery confirmation for BCA's report.	11-13-20
	10-21-20	Email from the THPO commenting on the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report.	11-13-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	10-23-20	Email from the THPO commenting on the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-13-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Cheyenne River Sioux Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; message left.	2-14-20
	5-10-19	Follow-up phone call to the Chairman's office; message left.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 3-4-20, was filed on 4-20-20).	4-20-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	4-8-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-13-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; message left.	4-20-20
	4-22-20	Email to the THPO requesting confirmation of the THPO's receipt of WBI Energy's letter dated 3-3-20 and email sent on 4-8-20 and providing information on the survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and delivery confirmation).	9-28-20
	9-21-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-6-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-17-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
Assiniboine and Sioux Tribes of the Fort Peck Reservation	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to THPO.	2-14-20
	5-10-19	Follow-up email to the Chairman transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	5-15-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	5-15-19	Email from the THPO requesting additional information on the Project and a meeting with WBI Energy.	2-14-20
	5-16-19	Email to the THPO responding to the THPO's request for additional information and transmitting an updated introductory letter dated 5-16-19.	2-14-20
	5-16-19	Updated introductory letter, including a Project description and map, and request for comment on the Project; sent to the THPO.	2-14-20
	6-13-19	Meeting to discuss the Project and cultural resources field surveys. (Note: The THPO from The Fort Belknap Indian Community also participated in this meeting.)	2-14-20
	6-27-19	Email to the THPO transmitting a scope of work (letter dated 6-27-19) for tribal surveys for the Project.	2-14-20
	6-27-19	Letter to the THPO providing a scope of work for tribal surveys for the Project.	2-14-20
	7-15-19	Email from the THPO advising WBI Energy that the tribe will not participate in field surveys for the Project.	2-14-20
	7-17-19	Letter inviting the Chairman to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-18-19	Email to the THPO acknowledging receipt of the THPO's 7-15-19 email regarding field surveys.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	9-4-19	Email from the THPO requesting an update on the status of the cultural resources survey.	2-14-20
	9-5-19	Email to the THPO providing an update on the status of the archaeological survey and advising the THPO of an upcoming survey of COE lands.	2-14-20
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 2-21-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	3-31-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; voice mail message.	4-20-20
	4-8-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-13-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; voice mail message.	4-20-20
	4-22-20	Email to the THPO providing an update on the Project and survey plans for 2020.	7-8-20
	4-27-20	Call with the THPO to discuss the Class III survey reports sent to the THPO on 2-28-20 and the tribe's participation in the 2020 field surveys.	7-8-20
	9-11-20	Minutes from site visits to review features identified at 32MZ3379, 32MZ3380, 32MZ3382, 32MZ3383, and 32MZ3385.	9-28-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and delivery confirmation).	9-28-20
	9-21-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	No Date	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-13-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Rosebud Sioux Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the President.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the President; message left.	2-14-20
	5-10-19	Follow-up phone call to the THPO; message left.	2-14-20
	6-27-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Email response from the THPO; the tribe is interested in the Project and will participate in future Project meetings.	2-14-20
	6-28-19	Email acknowledging receipt of the THPO's request to participate in future meetings and expression of interest in the Project.	2-14-20
	6-28-19	Phone call from the THPO's office requesting information on the Project and an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-28-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the President to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	8-23-19	Phone call to the THPO regarding tribal participation in the field survey of COE and other lands in the Project area; voicemail message.	2-14-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	8-23-19	Phone call to the THPO regarding tribal participation in the field survey of COE and other lands in the Project area; voicemail message.	2-14-20
	8-29-19	Email to the THPO regarding tribal participation in the field survey of COE and other lands in the Project area.	2-14-20
	8-30-19	Email from the THPO confirming the tribe's interest in participating in the field survey of COE lands.	2-14-20
	9-4-19	Phone call from the THPO confirming the tribe's interest in participating in the field survey of COE lands.	2-14-20
	9-5-19	Phone call to the THPO to coordinate the tribe's participation in the field survey of COE lands. (Note: This call is documented in WBI Energy's email to the THPO on 9-5-19.)	2-14-20
	9-5-19	Email to the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-5-19	Email from the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-17-19	Phone call to the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-17-19	Email from the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-17-19	Email to the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-19-19	Email to the THPO (and COE) to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-19-19	Phone call from the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-23-19	Phone call from the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-23-19	Email to the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	9-23-19	Email to the THPO to coordinate the tribe's participation in the field survey of COE lands.	2-14-20
	10-9-19	Phone call to the THPO to coordinate the tribe's participation in field surveys	2-14-20
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 2-21-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the President regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-31-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; voice mail message.	4-20-20
	4-8-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	4-13-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; voice mail message.	4-20-20
	4-22-2	Email to the THPO providing an update on the Project and survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and confirmation of availability for pickup).	9-28-20
	9-17-20	Minutes from site visits to review features identified at 32MZ3382, 32MZ3383, and 32MZ3385.	9-28-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-2-20	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	10-10-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	11-12-20	Delivery confirmation for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Oglala Sioux Tribe	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the President.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO, message left.	2-14-20
	5-10-19	Follow-up phone call to the President's office; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	5-10-19	Follow-up email to the President transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	6-27-19	Follow-up phone call to the THPO.	2-14-20
	6-28-19	Follow-up phone call to the THPO, who confirmed receipt of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the President to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter to the THPO, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 3-16-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the President regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-13-20	Phone call to the THPO to confirm receipt of the Class III reports; voice mail message.	4-20-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	4-8-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-13-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; the was no answer and the voice mailbox was full.	4-20-20
	4-22-20	Email requesting confirmation of the THPO's receipt of WBI Energy's letter dated 3-3-20 and email send on 4-8-20, and providing information on the survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and confirmation of availability for pickup).	9-28-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	No Date	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
	No Date	Return Receipt for the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	12-4-20
Northern Arapaho Tribe of Wind River Indian Reservation	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the Chairman.	2-14-20
	4-15-19	Introductory letter, including a Project description and map, and request for comment on the Project, sent to the THPO.	2-14-20
	5-10-19	Follow-up phone call to the THPO; voicemail message.	2-14-20
	6-27-19	Follow-up phone call to the THPO; an additional copy of the 4-15-19 introductory letter was requested.	2-14-20
	6-27-19	Follow-up email to the THPO transmitting an additional copy of the 4-15-19 introductory letter.	2-14-20
	7-17-19	Letter inviting the President to participate in WBI Energy's open houses.	2-14-20
	7-17-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-28-20	Letter to the Chairman regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	4-22-20	Email to the THPO providing an update on the Project and information on the survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with certified mail receipt and confirmation of availability for pickup).	9-28-20
	No Date	Delivery confirmation for the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report sent on 9-16-20.	11-13-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-2-20	Delivery confirmation for BCA's report.	11-13-20

APPENDIX H (cont'd)

North Bakken Expansion Project
Summary of Communications with Federally Recognized Indian Tribes

Tribe	Date	Summary	Filing Date
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20
Fort Belknap Indian Community	6-13-19	Meeting to discuss the Project and cultural resources field surveys. (Note: This meeting was hosted by the Assiniboine and Sioux Tribes of the Fort Peck Reservation.)	2-14-20
	6-27-19	Email to the THPO transmitting a scope of work (letter dated 6-27-19) for tribal surveys for the Project.	2-14-20
	6-27-19	Letter to the THPO providing a scope of work for tribal surveys for the Project.	2-14-20
	7-29-19	Letter inviting the THPO to participate in WBI Energy's open houses.	2-14-20
	7-30-19	Project update letter, including a Project description and map, and a renewed request for comment on the Project.	2-14-20
	2-14-20	Letter to the THPO transmitting the Class III Archaeological Survey Report, standalone archaeological survey report for USFS lands, and Class III Historic Structures Report. (Note: The delivery receipt for this report, dated 2-19-20, was filed on 4-20-20).	2-14-20
	2-28-20	Letter to the President regarding the filing of WBI Energy's application with FERC.	7-8-20
	2-28-20	Letter to the THPO regarding the filing of WBI Energy's application with FERC.	7-8-20
	3-30-20	Email to the THPO transmitting a letter regarding the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	3-30-20	Letter to the THPO providing an update on the status of the Project and plans for field surveys and site testing in 2020.	4-20-20
	4-8-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-13-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-15-20	Phone call to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-15-20	Email to the THPO to confirm the tribe's receipt of WBI Energy's email and letter sent on 3-30-20.	4-20-20
	4-17-20	Phone call to the THPO confirming the tribe's receipt of WBI Energy's email and letter sent on 3-30-20; the THPO said he had no questions or comments on the 2019 field surveys or Class III reports provided to the tribe in February 2020.	7-8-20
	4-22-20	Email to the THPO providing information the survey plans for 2020.	7-8-20
	9-16-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report, Geomorphology Report, and Addendum Class III Structures Report (with Fed Ex delivery receipt).	9-28-20
	9-30-20	Letter from WBI Energy to the THPO transmitting BCA's report.	11-13-20
	10-5-20	Delivery confirmation for BCA's report.	11-13-20
	11-10-20	Letter to the THPO transmitting the updated Class III Archaeological Survey Report Addendum, Avoidance and Monitoring Plan	11-13-20

APPENDIX I

ARCHAEOLOGICAL SITES AND HISTORIC STRUCTURES IDENTIFIED DURING THE CLASS III SURVEY

APPENDIX I

North Bakken Expansion Project
Archaeological Sites, Isolated Finds, and Site Leads Identified During the Class III Survey

Site No.	Locus No.	Temporal Period	Site Type	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32BK168	HS-DOP-04	P&H	Prehistoric lithic scatter; historic (early to mid 20th century) homestead	Eligible	Fence & Monitor [a]
32BK276	HS-WWD-01	Historic	Historic (20th century) field clearing rock pile and dump	Ineligible	No further work
32BK277	HS-WWD-02	Prehistoric	Prehistoric stone feature (now destroyed)	Ineligible	No further work
32BK278	PS-DOP-01	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32BK279	PS-DOP-03	Prehistoric	Prehistoric stone features	Ineligible	No further work
32BK280	PS-DOP-06	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32BK281	PS-DOP-08	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32BK282	PS-DOP-09	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32BK283	PS-JH-01/PS-KM-07	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32BK285	PS-KM-08	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32BK353	PS-JJZ-01	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32BKX1056	IF-DOP-02	Prehistoric	Debitage	Ineligible	No further work
32BKX254	32BKX254	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32BKX258	32BKX258	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32BKX259	32BKX259	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32BKX555	32BKX555	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32BKX572	32BKX572	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32BKX580	32BKX580	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32MN1305	32MN1305	Historic	Historic (mid to late 20th century) oil well pad and access road	Ineligible	No further work
32MNX1038	IF-WE-08	Prehistoric	Biface preform	Ineligible	No further work
32MNX578	32MNX578	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32MZ144	HS-WE-38	Historic	Historic (early 20th century) homestead	Ineligible	No further work
32MZ145	32MZ145	Historic	Historic field clearing rock pile	Ineligible	No further work
32MZ2346	HS-WE-40	Historic	Historic (early 20th century) homestead	Unevaluated	No further work
32MZ2347	32MZ2347	Historic	Historic depression	Ineligible	No further work
32MZ2939	32MZ2939	Historic	Historic (20th century) animal shelter, corral, and outbuildings	Ineligible	No further work
32MZ3121	32MZ3121	Prehistoric	Cairn	Unevaluated	No further work
32MZ3278	32MZ3278	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3301	PS-WE-39	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32MZ3302	PS-DOP-11	Prehistoric	Prehistoric (Late Woodland) lithic scatter	Ineligible	No further work
32MZ3306	PS-DOP-17	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32MZ3307	PS-DOP-18	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32MZ3308	PS-DOP-20	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3309	PS-DOP-24	P&H	Prehistoric stone features; historic till	Unevaluated	Fence & Monitor [a]

APPENDIX I (cont'd)

North Bakken Expansion Project
Archaeological Sites, Isolated Finds, and Site Leads Identified During the Class III Survey

Site No.	Locus No.	Temporal Period	Site Type	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32MZ3310	PS-DOP-25	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3311	PS-DOP-27	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32MZ3312	PS-DOP-28	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3313	PS-DOP-30	Prehistoric	Prehistoric (Developmental) burial and lithic scatter	Eligible	No further work
32MZ3314	PS-KM-02	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a, b]
32MZ3315	PS-KM-03	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3318	PS-KM-06	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32MZ3319	PS-WE-35	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3320	PS-WE-36	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3321	PHS-WE-33	P&H	Prehistoric stone feature/historic (20th century) homestead	Unevaluated	Fence & Monitor [a, b]
32MZ3322	PHS-WE-37	P&H	Prehistoric stone features and lithic scatter/historic stone features and artifact scatter	Unevaluated	Fence & Monitor [a, b]
32MZ3323	HS-DOP-31	Historic	Historic (20th century) homestead or outbuilding	Ineligible	No further work
32MZ3324	HS-WE-34	Historic	Historic (early 20th century) homestead	Unevaluated	No further work
32MZ3325	PS-WE-12	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32MZ3326	PS-WE-16	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32MZ3327	PS-WE-17	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32MZ3328	PS-WE-18	Prehistoric	Prehistoric lithic scatter and stone features	Unevaluated	Fence & Monitor [a]
32MZ3329	PS-WE-19	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32MZ3331	PHS-WE-14	Prehistoric	Prehistoric lithic scatter; historic (early to mid 20th century) homestead	Eligible	Fence & Monitor [a]
32MZ3378	BCA20-1080-CHFM Site 1	Historic	Irrigation Gateway	Eligible	Fence & Monitor [c]
32MZ3379	PS-DOP-42	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3380	PS-DOP-43	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a, b]
32MZ3381	PS-JJZ-06	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32MZ3382	PS-JJZ-09	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [b, d]
32MZ3383	PS-JJZ-10	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a, b]
32MZ3384	PS-JJZ-11	Prehistoric	Prehistoric stone features	Unevaluated	No further work

APPENDIX I (cont'd)

North Bakken Expansion Project
Archaeological Sites, Isolated Finds, and Site Leads Identified During the Class III Survey

Site No.	Locus No.	Temporal Period	Site Type	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32MZ3385	PS-JJZ-12	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32MZ3386	PS-JJZ-14	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32MZ3387	PS-JJZ-16	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a, b]
32MZ3388	PS-JJZ-17	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32MZ3389	PS-JJZ-18	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a, b]
32MZ3390	PS-JJZ-19	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [b, d]
32MZ598	PHS-KM-09	P&H	Potential prehistoric bison kill site/historic (20th century) homestead	Unevaluated	No further work
32MZX1339	32MZX1339	Prehistoric	Unifacial scraper	Ineligible	No further work
32MZX1531	32MZX1531	Prehistoric	Biface fragment	Ineligible	No further work
32MZX1744	IF-WE-41	Prehistoric	Projectile point/knife fragment	Ineligible	No further work
32MZX1745	IF-DOP12	Prehistoric	Flake / Debitage	Ineligible	No further work
32MZX1747	IF-DOP-21	Prehistoric	Bifaces / Flake tool	Ineligible	No further work
32MZX1748	IF-DOP-22	Prehistoric	Scraper / Debitage	Ineligible	No further work
32MZX1749	IF-DOP-23	Prehistoric	Biface / Debitage	Ineligible	No further work
32MZX1750	IF-DOP-26	Prehistoric	Core	Ineligible	No further work
32MZX1753	IF-DOP-32	Prehistoric	Debitage	Ineligible	No further work
32MZX1754	IF-WE-15	Prehistoric	Flake	Ineligible	No further work
32MZX1768	IF-JJZ-04	Prehistoric	Biface fragment	Ineligible	No further work
32MZX1769	IF-JJZ-05	Prehistoric	Flake fragment	Ineligible	No further work
32MZX1770	IF-JJZ-07	Prehistoric	Biface fragment	Ineligible	No further work
32MZX1771	IF-JJZ-08	Prehistoric	Debitage	Ineligible	No further work
32MZX1772	IF-JJZ-13	Historic	Tractor parts	Ineligible	No further work
32MZX187	32MZX187	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32MZX381	32MZX381	Historic	Skogheim Coal Mine	Unevaluated	No further work
32MZX79	32MZX79	Historic	Percheron Horse Company	Unevaluated	No further work
32WI1101	32WI1101	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI1102	PS-JJZ-25	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI1103	32WI1103	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI1145	32WI1145	Historic	Historic (mid to late 20th century) rock pile/former grain bin	Ineligible	No further work
32WI1494	PS-WE-05	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI1495	HS-WE-04	Historic	Historic (early to late 20th century) trash dump	Ineligible	No further work
32WI1497	HS-WE-06	Historic	Historic (early to mid 20th century) homestead	Ineligible	No further work
32WI1630	PS-WWD-05	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI1775	32WI1775	P&H	Prehistoric stone features/historic (20th century) field clearing rock pile and trash dump	Unevaluated	No further work
32WI2144	PS-WE-01	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2352	PS-DOP-10	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI2388	PS-DOP-34	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]

APPENDIX I (cont'd)

North Bakken Expansion Project
Archaeological Sites, Isolated Finds, and Site Leads Identified During the Class III Survey

Site No.	Locus No.	Temporal Period	Site Type	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32WI2389	PS-WE-03	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2390	PS-WWD-03	Prehistoric	Prehistoric lithic scatter and stone features	Unevaluated	Fence & Monitor [a]
32WI2391	PS-WWD-04	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2392	PS-WWD-06	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2393	PS-WWD-07	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32WI2394	PS-WWD-08	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32WI2398	PS-DOP-35	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32WI2399	PS-JH-02	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32WI2404	PS-WE-21	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32WI2405	PS-WE10	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32WI2406	PS-WE-20	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2407	HS-WE-23	Historic	Historic (early to mid 20th century) homestead	Ineligible	No further work
32WI2408	PHS-WE-22	P&H	Prehistoric isolated find/historic (early to mid 20th century) homestead	Unevaluated	No further work
32WI2409	PS-WE-09	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32WI2410	PS-WWD-14	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32WI2428	PS-DOP-38	Prehistoric	Prehistoric lithic scatter	Ineligible	No further work
32WI2429	PS-DOP-39	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2430	PS-DOP-40	Prehistoric	Prehistoric stone feature	Unevaluated	Fence & Monitor [a]
32WI2431	PS-JJZ-02/PS-WE-02	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI2432	PS-JJZ-20	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI2433	PS-JJZ-21	Prehistoric	Prehistoric stone features	Unevaluated	Fence & Monitor [a]
32WI2434	PS-JJZ-22	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32WI2435	PS-JJZ-23	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI2436	PS-JJZ-24	Prehistoric	Prehistoric stone features	Unevaluated	No further work
32WI2437	PS-JJZ-26	Prehistoric	Prehistoric stone feature	Unevaluated	No further work
32WI319	32WI319	Historic	Historic (mid to late 20th century) pole barn	Ineligible	No further work
32WI897	32WI897	Historic	Historic (mid to late 20th century) residence	Ineligible	No further work
32WI970	32WI970	P&H	Prehistoric stone features/historic depression (dugout)	Unevaluated	Fence & Monitor [a]
32WI976	PS-KM-01	Prehistoric	Prehistoric lithic scatter	Eligible	Avoid [e, f]
32WIX234	32WIX234	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32WIX358	32WIX358	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32WIX44	32WIX44	Prehistoric	Prehistoric site lead	Unevaluated	No further work
32WIX52	32WIX52	Historic	Historic battle site	Unevaluated	No further work
32WIX803	IF-WWD-12	Prehistoric	Flake fragment	Ineligible	No further work
32WIX808	IF-WE-07	Prehistoric	Cobble tool/chopper	Ineligible	No further work
32WIX809	IF-WE-11	Prehistoric	Projectile point/knife fragment	Ineligible	No further work
32WIX812	IF-JJZ-03	Prehistoric	Debitage	Ineligible	No further work

APPENDIX I (cont'd)

North Bakken Expansion Project
Archaeological Sites, Isolated Finds, and Site Leads Identified During the Class III Survey

Site No.	Locus No.	Temporal Period	Site Type	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32WIX813	IF-JJZ-15	Prehistoric	Projectile point/knife	Ineligible	No further work
32WIX814	IF-VG-01	Prehistoric	Projectile points/knives	Ineligible	No further work
32WIX818	IF-JJZ-29	Prehistoric	Lithic isolate	Ineligible	No further work
32WIX819	IF-JJZ-30	Prehistoric	Lithic isolates	Ineligible	No further work
32WIX820	IF-JJZ-31	Prehistoric	Lithic isolate	Ineligible	No further work

[a] These sites would not be affected by the Project, but they are within 100 feet of construction workspace. Fencing of the edge of the construction right-of-way where it passes near these sites and archaeological monitoring is recommended.
[b] Site is located on lands managed by the USFS.
[c] The site is located within 50 feet of the Project workspace, but a larger buffer was not required by the SHSND.
[d] The site is located within 150 foot buffer of the Project workspace required by the USFS.
[e] The site is crossed by the Project workspace.
[f] The site is located on lands managed by the USACE.

APPENDIX I (cont'd)

North Bakken Expansion Project
Historic Structures Identified During the Class III Survey

Site Number	Project Component c	Date of Construction	Site Description	WBI Energy Recommended NRHP Evaluation	WBI Energy Recommended Future Action
32BK293	LS25 Loop	c. 1910	Vernacular dwelling and farmstead	Unevaluated	No further work
32BK294	LS25 Loop	c. 1960	Oil tanks and associated machinery	Unevaluated	No further work
32BK295	LS25 Loop	c. 1960	Hunt Compressor Station	Unevaluated	No further work
32BK296	LS25 Uprate	c. 1930	Vernacular dwelling and farmstead	Unevaluated	No further work
32BK297	LS25 Loop	c. 1930	Ranch dwelling and farmstead	Unevaluated	No further work
32BKX1068	LS25 Loop	c. 1910	Vernacular dwelling and farmstead	Unevaluated	No further work
32MN1338	RLPRS	c. 1930–1945	Granaries and grain bin	Unevaluated	No further work
32MN1584	LS25 Loop	c. 1930	Dwelling (replaced in 2005) and farmstead	Unevaluated	No further work
32MN1585	LS25 Loop	c. 1910	Granary and grain bins	Unevaluated	No further work
32MZ2405 a, b	T-EC Pipeline	c. 1955	Bridge (replaced in 1987)	Ineligible	No further work
32MZ2939 a, b	T-EC Pipeline	c. 1915	Animal shelter and corral	Ineligible	No further work
32MZ3336	T-EC Pipeline	c. 1930	Outbuilding	Unevaluated	No further work
33MZ3337	T-EC Pipeline	c. 1965	Ranch dwelling and cattle ranch	Unevaluated	No further work
32MZ3151 a	T-EC Pipeline	c. 1960	Bridge	Ineligible	No further work
32WI424	LY	c. 1915–1930	Sheds and Butler bins	Ineligible	No further work
32WI897 a, b	TPRS	c. 1880–1920	Plain Residential-style dwelling and farmstead – no longer extant	Ineligible	No further work
32WI1497 a, b	LS25 Loop	c. 1915–1930	Blomquist Homestead windmill	Ineligible	No further work
32WI2411	LS25 Loop	c. 1950	Plain Residential dwellings and farmstead	Ineligible	No further work

APPENDIX J

PRE-CONSTRUCTION NOISE SURVEY AND ACOUSTICAL ANALYSIS

WBI ENERGY TRANSMISSION, INC.

North Bakken Expansion Project

Pre-Construction Noise Survey and Acoustical Analysis

December 2019

December 2019

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WBI Energy Transmission, Inc.
North Bakken Expansion Project
Pre-Construction Noise Survey and Noise Impact Analysis
McKenzie and Williams Counties, North Dakota

1.0 INTRODUCTION

Between July 22, and 25, 2019, Environmental Resources Management, Inc. (ERM) conducted pre-construction noise surveys at select sites located near Noise Sensitive Areas (NSAs) adjacent to the proposed WBI Energy Transmission, Inc. (WBI Energy) North Bakken Expansion Project (Project) located in northwest North Dakota (see figure 1 in Appendix A). This report presents the results of the pre-construction noise surveys and ERM's acoustical analysis of the noise impact to nearby NSAs.

The proposed Project would involve the construction and operation of approximately 60 miles of a 20-inch-diameter steel natural gas pipeline from WBI Energy's existing Tioga Compressor Station near Tioga, North Dakota, to a new interconnect with Northern Border Pipeline Company's mainline pipeline south of Watford City, North Dakota. The proposed pipeline route crosses portions of McKenzie and Williams Counties. In addition to the pipeline, the Project will include construction and operation of a new 3,750 horsepower compressor station (Elkhorn Creek Compressor Station) at the new interconnect in McKenzie County; as well as the addition of 18,750 horsepower to the existing compressor station (Tioga Compressor Station) in Williams County.

The purpose of the noise survey was to measure ambient noise levels at existing NSAs near the proposed compressor station and existing Tioga compressor station and at locations where construction is planned to be conducted using the horizontal directional drilling (HDD) methodology. An acoustical analysis was also completed to evaluate whether the contribution of Project-related noise would comply with a day/night (L_{dn}) sound pressure level of 55 A-weighted decibels (dBA) noise guidance set forth by the Federal Energy Regulatory Commission (FERC).

2.0 NOISE SURVEY METHODS AND LOCATIONS

2.1 Noise Measurement Equipment and Methodology

Sound pressure levels were measured using two Bruel & Kjaer Type 2250-S hand-held analyzers (Serial Numbers 3011887 and 3011939) equipped with a Bruel & Kjaer preamplifier (Serial Numbers 27164 and 27012), and a Bruel & Kjaer Type 4189 1/2 inch free field microphone (Serial Numbers 3130964 and 3130955) with a windscreen. Field calibration was performed before and after monitoring using a Bruel & Kjaer Type 4231 calibrator. All equipment has current certificate of calibration from the manufacturer. Sound measurements were recorded at 1-second intervals for a period of one hour during daytime (7:00 am to 10:00 pm) measurements and 15 minutes during nighttime (10:00 pm to 7:00 am) measurements. For quality control purposes, instantaneous sound pressure levels were also recorded manually every 15 minutes. Unweighted octave band center and an A-weighted time-equivalent sound pressure levels (L_{eq}) were measured on both slow and fast response with the sound level meter set at a height of approximately 4 feet above ground level.

2.2 Location Descriptions

2.2.1 Compressor Stations

The Elkhorn Creek Compressor Station is proposed to be located at the south end of the proposed pipeline route (approximate milepost (MP) 61.9) in McKenzie County, North Dakota approximately 9 miles southeast of Watford City. The nearest NSAs to the approximate center of the compressor station site are:

NSA #1: Residence located on County Road 34, approximately 4,253 feet to the southwest;

NSA #2: Residence located on 125th Avenue Northwest, approximately 3,465 feet to the east;

NSA #3: Residence located on 125th Avenue Northwest, approximately 3,895 feet to the northeast.

There are additional buildings located within a 1-mile radius of the proposed compressor. These buildings were confirmed to be industrial facilities during the field survey and, as such, are not considered NSAs. The locations of the NSAs associated with the Elkhorn Creek Compressor Station are provided on Figure 1.

The Tioga Compressor station is located at the north end of the proposed pipeline route (approximate MP 0.0) in Williams County, North Dakota, approximately one mile east of Tioga and one mile north of the Tioga Municipal Airport. The nearest NSAs to the approximate center of the existing Tioga compressor station site are:

NSA #1: Residence located on 69th Street Northwest, approximately 3,974 feet to the north;

NSA #2: Residence located on 102nd Avenue Northwest, approximately 4,076 feet to the northeast;

NSA #3: Residence located on 102nd Avenue Northwest, approximately 4,920 feet to the east;

NSA #4: Residence located on County Highway 10, approximately 2,221 feet to the east;

NSA #5: Residence located on County Highway 10, approximately 4,940 feet to the southeast;

NSA #6: Residence located on State Highway 40, approximately 5,229 feet to the west;

NSA #7: Residence located on State Highway 40, approximately 4,862 feet to the northwest; and

There are additional buildings within a one-mile radius of the compressor. These buildings were confirmed to be office buildings and industrial facilities during the field survey and, as such, are

not considered NSAs. The locations of the NSAs associated with the Tioga Compressor Station are provided on Figure 2.

2.2.2 HDD Sites

The following are descriptions of the nearest NSAs to the proposed HDD locations.

The proposed Lake Sakakawea HDD crossing (MP 23 to 26) will be approximately at the border of McKenzie and Williams Counties. The HDD crossing is proposed to use the "Intersect" method in which drilling (entry) occurs from both ends of the crossing and intersects near the middle of Lake Sakakawea. An "exit" noise evaluation is not applicable when using the Intersect method. The nearest NSAs to the approximate centers of the proposed north and south HDD entry sites are:

North HDD Entry

NSA #1: Approximately 13 residences located on 51st Street Northwest, with the closest residence approximately 492 feet southeast of the north entry of the HDD crossing;

NSA #2: Residence located on the 111th Avenue Northwest, approximately 2,597 feet northwest of the north entry of the HDD crossing.

South HDD Entry

NSA #1: Residence located on County Road 2, approximately 2,240 feet southwest of the south entry of the HDD crossing.

There are additional buildings within a 0.5-mile radius of the HDD entry sites. These buildings were confirmed to be industrial facilities during the field survey and, as such, are not considered NSAs. The locations of the NSAs associated with the north and south HDD entry sites are provided on Figures 3 and 4, respectively.

2.3 Weather Conditions During the Noise Survey

The weather conditions for the survey period are summarized in table 1 and included on the Field Monitoring Forms attached as Appendix B.

TABLE 1

Summary of Weather Conditions during Field Survey

Condition	Minimum	Maximum	Average
Temperature ^{0}F	59	88	74
Relative Humidity %	27	85	65
Wind Direction	--	--	S
Wind Speed (miles per hour)	1	10	4
Barometric Pressure inches. Hg	29.9	30.3	30.0

3.0 NOISE REGULATIONS

In 1974, the U.S. Environmental Protection Agency (EPA) published its document entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety." This publication evaluated the effects of environmental noise with respect to health and safety. As set forth in that publication, the EPA has determined that noise levels should not exceed an L_{dn} of 55 dBA, which is the level that protects the public from outdoor activity interference. This noise level has been useful for state and federal agencies to establish noise limitations for various noise sources. A 55 dBA L_{dn} noise level equates to a L_{eq} of 48.6 dBA (i.e., a facility that does not exceed a continuous noise impact of 48.6 dBA will not exceed 55 dBA L_{dn}).

WBI's proposed compressor stations must comply with the FERC's noise regulations for interstate pipelines. These regulations state:

1) The 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 NSAs such as schools, hospitals, or residences.

2) New compressor stations or modifications of existing stations shall not result in a perceptible increase in vibration at any NSA (18 CFR § 380.12(k)(4)(v)).

HDD activities must also comply with FERC's noise guidance for construction activity performed during nighttime hours. This guidance states:

1) Construction activity that would or may occur during nighttime hours should be performed with the goal that the activity contribute noise levels below 55 dBA L_{dn} and 48.6 L_{eq}, or no more than 10 dBA over background if ambient noise levels are above 55 dBA L_{dn} (FERC, 2017).

North Dakota does not have noise regulations regarding the proposed compressor station or HDD activities. The state regulates noise using public nuisance laws, but does not impose NSA property-line decibel noise limits for new facilities.

McKenzie County does not have any pertinent noise regulations regarding the proposed compressor station or HDD activities.

Williams County maintains the following general noise regulations:

1) Maximum Noise Standards by District

Zone of Property Receiving Noise	Maximum Noise Level dB
Residential Districts: Urban Residential (UR), Rural Residential (UR)	60
Commercial Districts: Urban Commercial (UC), Rural Residential (RC)	65
Industrial Districts: Light Industrial (LI), Heavy Industrial (HI)	70
Planned Development:	PUD In accordance with base district

2) Duration and Timing
The noise standards above shall be modified as follows to account for the effects of time and duration on the impact of noise levels:

a. In the UR and RR districts, the noise standards shall be 5 dB lower between 10:00 p.m. and 7:00 a.m.
b. Noise that is produced for no more than a cumulative period of five minutes in any hour may exceed the standards above by 10 dB (Williams County, 2015).

Zoning designations are not shown at NSAs in Williams County's zoning maps. However, as identified NSAs are houses, it is assumed that the "Residential Districts" regulation of a 60 dB maximum noise level applies. Williams County's noise regulations are less strict than FERC regulations; therefore meeting FERC's regulations will be sufficient to meet Williams County regulations.

4.0 NOISE SURVEY RESULTS AND ACOUSTICAL ANALYSIS

Compressor Stations

Proposed Elkhorn Creek Compression Station

The significant noise-producing equipment associated with the proposed compressor station will include:

- One Ariel KBZ-4 compressor and 3,750 horsepower Caterpillar 3612 reciprocating natural gas driven engine,
- after gas and auxiliary coolers, and
- piping.

To mitigate noise impacts at the nearby NSAs, the following noise control measures will be implemented:

- The compressor engine will be fitted with a catalyst silencer.
- The compressor and engine will be housed inside a building with 26-gauge steel walls and a 24-gauge steel roof, both with 6-inches of fiberglass insulation and a vapor barrier.

The results of the baseline sound level analysis for the Elkhorn Creek Compressor Station are summarized in Table 2

TABLE 2

Baseline Sound Level Analysis for the Elkhorn Creek Compressor Station

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (dBA)	Estimated L_{dn} of Station (dBA) at NSA	Station L_{dn} Plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
NSA 1 (House)	4,253 feet SW	55.6	41.1	55.7	0.1
NSA 2 (House)	3,465 feet E	41.0	42.9	45.1	4.1
NSA 3 (House)	3,895 feet NE	41.0	41.9	44.5	3.5

Existing Tioga Compressor Station Upgrade

The significant noise-producing equipment associated with the compressor station upgrade will include the addition of:

- Six Ariel KBZ-4 compressors and 3,750 horsepower Caterpillar 3612 reciprocating natural gas driven engines,
- after gas and auxiliary coolers
- piping.

To mitigate noise impacts at the nearby NSAs, the following noise control measures will be implemented:

- The six compressor engines will be fitted with catalyst silencers.
- The compressors and engines will be housed inside a building with 26-gauge steel walls and a 24-gauge steel roof, both with 6-inches of fiberglass insulation and a vapor barrier.

The results of the baseline sound level analysis are summarized in Table 3. The surveyed ambient sound level represents the existing station at approximately 81% load.

TABLE 3

Baseline Sound Level Analysis for the Tioga Compressor Station

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (dBA)	Estimated L_{dn} of Station (dBA) at NSA[1]	Station L_{dn} Plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
NSA 1 (House)	3,974 feet N	57.2	49.5	58.0	0.8
NSA 2 (House)	4,076 feet NE	58.2	49.3	58.8	0.6
NSA 3 (House)	4,920 feet E	54.0	47.7	55.0	1.0
NSA 4 (House)	2,221 feet E	55.6	54.6	58.2	2.8
NSA 5 (House)	4,940 feet SE	54.0	47.6	55.0	1.0
NSA 6 (House)	5,229 feet W	61.3	47.2	61.4	0.1
NSA 7 (House)	4,862 feet NW	61.3	47.8	61.4	0.1

[1]Estimated L_{dn} of the existing equipment and additional equipment at 100% load

Horizontal Directional Drilling

Noise contributions due to HDD activity were estimated based on a noise survey evaluating noise barrier performance for a similar project, provided by Michels Corporation. The HDD drilling methodology will utilize the “intersect” method. The intersect method utilizes the same “entry”

HDD drilling equipment on both sides of the drill. Entry site drilling equipment typically is louder than exit equipment, as the drilling rig and associated power unit are the predominant noise sources at the entry site. The significant noise producing equipment associated with the HDD entry site will include:

- Drilling Rig
- Mud Rig
- Shaker
- Crane
- Power Unit

The noise contributed by this equipment equates to an estimated sound power level of 125.2 dBA. The estimated noise impact to the nearest NSAs resulting from each HDD is summarized in Table 4. Estimated noise levels that exceed regulations are shown in bold and italics in the table.

TABLE 4

Noise Quality Analysis for HDD Operations

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (dBA)	Estimated L_{dn} of HDD Operations (dBA)	Estimated L_{dn} of HDD Operations plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dBA)
HDD North Entry					
NSA 1 (13 Houses)	492 feet SE	44.7	***84.8***	***84.8***	***40.1***
NSA 2 (House)	2,597 feet NW	48.7	***69.1***	***69.2***	***20.5***
HDD South Entry					
NSA 3 (House)	2,240 feet SW	54.7	***70.4***	***70.5***	***15.8***

The estimated noise impact to the nearest NSAs resulting from each HDD with temporary acoustical noise barriers in place is summarized in Table 5. Estimated noise levels that exceed regulations are shown in bold and italics in the table. In order to achieve maximum noise reduction, noise barriers should be positioned as close as reasonably possible to the predominant noise-producing equipment and have at a minimum, a Sound Transmission Class (STC)-32 rating.

TABLE 5

Noise Barrier Analysis for HDD Operations

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (dBA)	Estimated L_{dn} of HDD Operations (dBA)	Estimated L_{dn} of HDD Operations plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dBA)
HDD North Entry					
NSA 1 (13 Houses)	492 feet SE	44.7	***78.3***	***78.3***	***33.6***
NSA 2 (House)	2,597 feet NW	48.7	***62.7***	***62.8***	***14.1***
HDD South Entry					
NSA 3 (House)	2,240 feet SW	54.7	***63.9***	***64.4***	9.7

Note: Estimated mitigated noise levels assume equipment is positioned optimally to shield noise, and that noise barriers are placed within line-of-sight between noise-producing equipment and NSAs.

Based on this evaluation, HDD operations will contribute to noise levels exceeding Williams County and FERC noise guidance at all of the thirteen (13) residences associated with NSA 1 as well as at NSAs 2 and 3. Although nighttime construction is only proposed during pullback operations, which will occur for less than one week, WBI would like the flexibility to operate 24 hours per day, seven days per week. During drilling operations, which are expected to last approximately 6 months, construction will be limited to daytime hours unless site conditions necessitate 24-hour work.

Due to the proximity of the drilling operations to NSAs, on-Site acoustical monitoring should be completed during startup to evaluate the actual noise impact to the nearby NSA and help evaluate if additional noise mitigation will be required to meet FERC's guidance of 55 dBA $L_{dn.}$ at the NSAs. If nighttime drilling will only be completed during pullback which is estimated to last less than one week, temporary relocation of residents may be an option. If needed, additional noise mitigation measures may include; use of additional or higher temporary acoustical noise barriers, residential grade silencers or mufflers on engines, and use of gear box and other mechanical noise dampening blankets.

Blowdown Events

Compressor unit blowdowns (venting of gas) can happen during startup and shutdown of the compressor, maintenance activities, or for emergency purposes. During startup and commissioning, there will be 2 full station blowdowns for each compressor station and 5 compressor unit blowdowns for each compressor unit. During annual operation, there will be one emergency shutdown full station blowdown test for each compressor station and 24 compressor unit blowdowns for each compressor unit.

Blowdown noise analysis was based on a sound power level of 120.2 dB from a project of similar size, with sound pressure levels at NSAs calculated using hemispherical attenuation (Hoover & Keith, 2007). The results of this analysis are summarized in Tables 6 and 7.

TABLE 6

Noise Quality Analysis for Blowdown Events at the Elkhorn Creek Compressor Station

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (via measured L_{eq}) (dBA)	Estimated L_{dn} of Station Blowdown(dBA)	Station Blowdown L_{dn} Plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
NSA 1 (House)	4,253 feet SW	55.6	53.2	57.6	2.0
NSA 2 (House)	3,465 feet E	41.0	55.0	55.1	14.1
NSA 3 (House)	3,895 feet NE	41.0	53.9	54.1	13.1

TABLE 7

Noise Quality Analysis for Blowdown Events at the Tioga Compressor Station

Station and Closest NSA(s)	Distance and Direction of NSA	Surveyed Ambient L_{dn} (via measured L_{eq}) (dBA)	Estimated L_{dn} of Station Blowdown(dBA)	Station Blowdown L_{dn} Plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
NSA 1 (House)	3,974 feet N	57.2	54.0	58.9	1.7
NSA 2 (House)	4,076 feet NE	58.2	53.7	59.5	1.3
NSA 3 (House)	4,920 feet E	54.0	52.1	56.2	2.2

NSA 4 (House)	2,221 feet E	55.6	59.0	60.6	5.0
NSA 5 (House)	4,940 feet SE	54.0	52.1	56.2	2.2
NSA 6 (House)	5,229 feet W	61.3	51.6	61.7	0.4
NSA 7 (House)	4,862 feet NW	61.3	52.2	61.8	0.5

5.0 ACOUSTICAL ANALYSIS METHODOLOGY

Compressor Stations

Predicted noise contributions due to compressor station operations were estimated based on the measured ambient noise data and provided equipment information. To complete this evaluation, the octave band sound power levels for each piece of equipment were calculated using the following equation:

$$L_w = L_p + 20 * Log(d) + 0.7$$

where L_w is the sound power level and L_p the sound pressure level at a distance (*d)* from the equipment. Total power levels of the indoor equipment for each octave band were then calculated by performing a logarithmic sum of the individual equipment sound power levels. The transmission loss at each octave band contributed by the roof and insulated metal walls of the buildings were subtracted from these totals. The mitigated octave band sound power levels were then A-weighted to determine an overall sound power level for the buildings.

Next, the mitigated overall building sound power level was logarithmically added to the sound power levels of each piece of outdoor equipment to determine the facility total sound power level, which was then attenuated for distance according to a hemispherical sound propagation model using the following equation:

$$L_{eq\ NSA} = L_{w\ Facility} - 20 * \text{Log}\ (D_{NSA}) - 0.7$$

Where $L_{eq,\ NSA}$ is the sound pressure level associated with all equipment at the NSA distance (D_{NSA}) from the compressor station.

The L_{dn} was then calculated for ambient noise measurements and predicted noise contribution of the compressor stations using the following formula:

$$L_{dn} = 10 * Log\left({}^{15}/_{24} * 10^{L_{eq,day}/10} + {}^{9}/_{24} * 10^{(L_{eq,night}+10)/10}\right)$$

The two L_{dn} values were logarithmically added to obtain the predicted day-night noise level at each NSA while the compressor station is in operation.

Note that attenuation from foliage, obstructions, and atmospheric absorption are not included in the predicted noise levels, but would likely provide additional attenuation of noise in higher frequency ranges.

HDD Operations

Predicted noise contributions due to HDD activity at NSAs were also estimated according to a hemispherical sound propagation model as described above. Sound power levels were calculated

based on sound pressure levels measured by Michels Corporation at a similar project. The provided measurements and calculated sound power levels are provided in Table 4 above.

Note that attenuation from foliage, obstructions, and atmospheric absorption are not included in the predicted noise levels, but would likely provide additional attenuation of noise in higher frequency ranges.

6.0 CONCLUSION

Based on the measured data and proposed equipment specifications, The new Elkhorn Creek compressor station and expanded Tioga compressor station operation would not contribute to an exceedance the FERC 55 dBA L_{dn} noise limit. During blowdown events at the compressor stations the noise would exceed the FERC 55 dBA L_{dn} noise limit for short periods of time for maintenance activities and emergencies. During planned blowdown events, the blowdown rate will be controlled to not exceed the FERC 55 dBA L_{dn} noise impact at nearby NSAs.

Based on the measured data and HDD entry equipment noise levels, unmitigated noise from HDD operations would exceed both the Williams County and FERC noise limits at the nearest NSAs to the HDD sites. Placement of a temporary acoustical barrier is recommended to help reduce noise impacts at NSAs, but when used alone will not provide adequate attenuation to be in compliance with the FERC 55 dBA L_{dn} noise guidance.

To ensure compliance with FERC limits, on-Site acoustical monitoring should be completed during startup to evaluate the actual noise impact to the nearby NSA and help evaluate if additional noise mitigation will be required to meet FERC's guidance of 55 dBA $L_{dn.}$ at the NSAs. If nighttime drilling will only be completed during pullback which is estimated to last less than one week, temporary relocation of residents may be an option. If needed, additional noise mitigation measures may include; use of additional or higher temporary acoustical noise barriers, residential grade silencers or mufflers on engines, and use of gear box and other mechanical noise dampening blankets.

References:

Federal Energy Regulatory Commission. “Guidance Manual for Environmental Report Preparation”. February 2017.

Hoover & Keith, Inc. “Results of an Ambient Site Sound Survey and Acoustical Analyses for an New Natural Gas Compressor Station Associated with the Proposed Gulf Crossing Project.” June 14, 2007.

Williams County. “Zoning Ordinance and Subdivision Regulations. September 15, 2015. https://www.williamsnd.com/usrfiles/dept/122/forms/Zoning%20Ordinance%20and%20Subdivision%20Regulations%20Final.pdf

NORTH BAKKEN EXPANSION PROJECT

Pre-Construction Noise Survey and Acoustical Analysis
McKenzie and Williams Counties, North Dakota

APPENDIX A
Figures

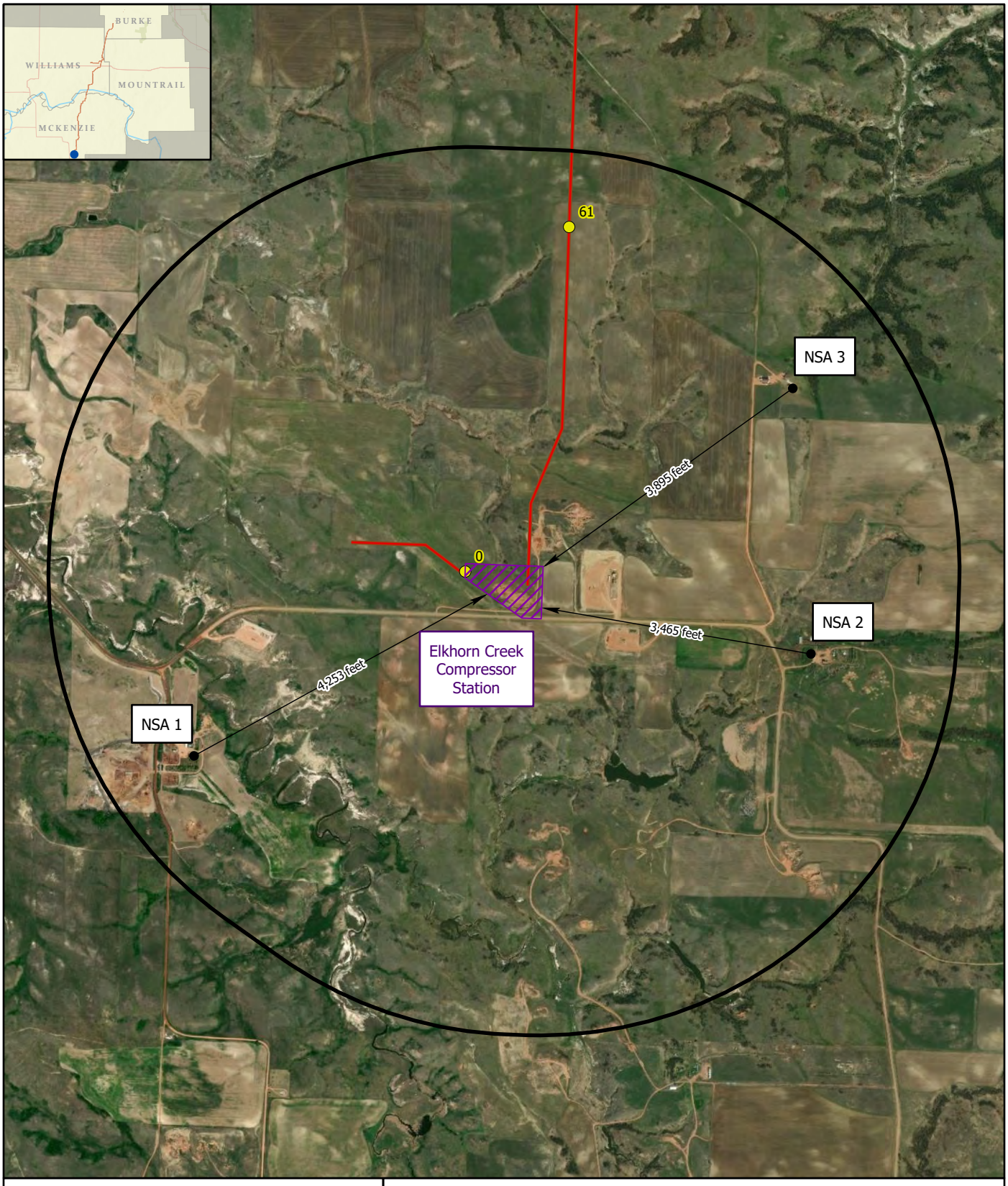
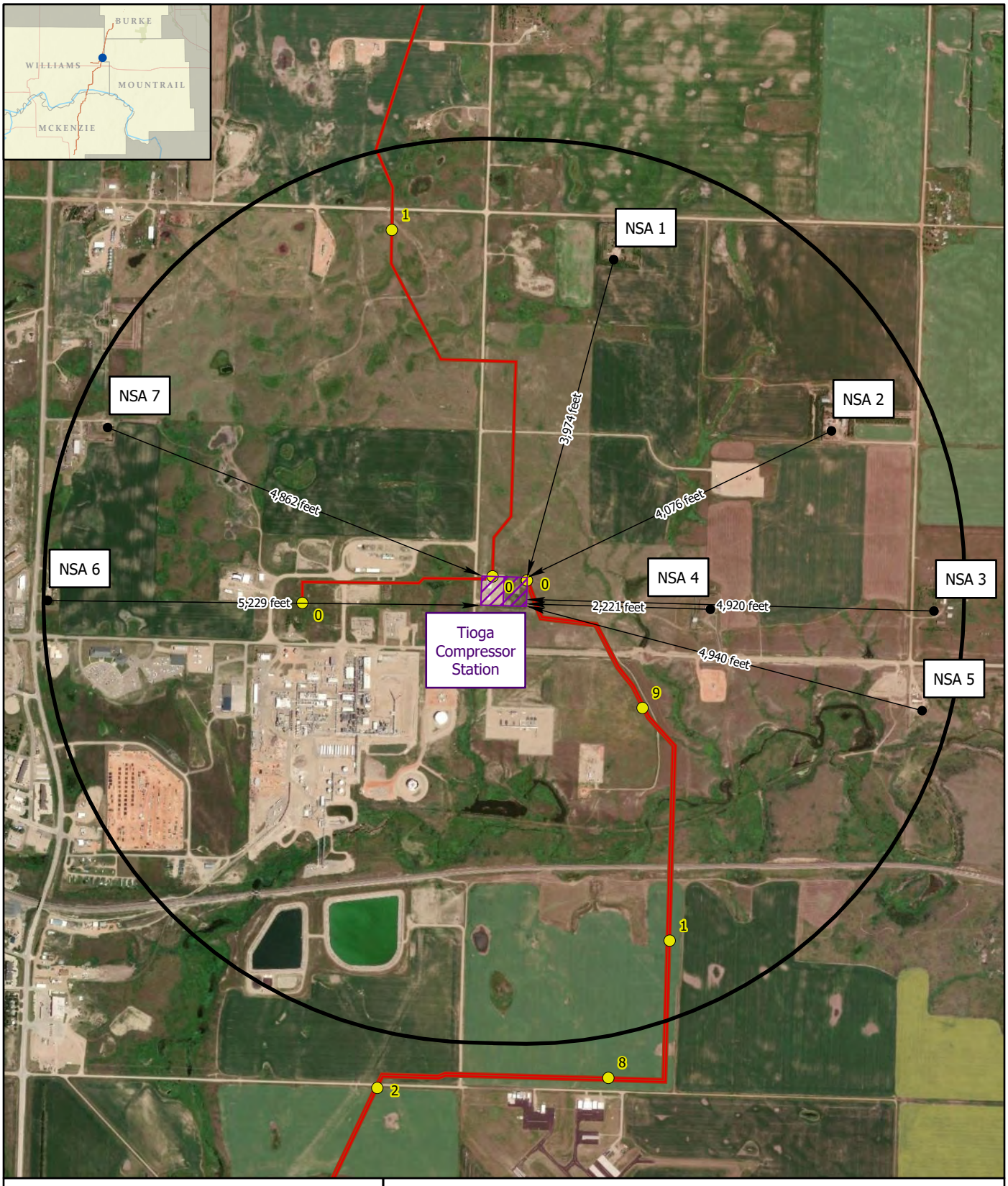


Figure 1
NSAs within 1.0 mile of Elkhorn Creek Compressor Station
North Bakken Expansion Project
McKenzie County, North Dakota

WBI ENERGY TRANSMISSION

File: M:\Clients\V-X\WBI\North_Bakken_Expansion_ArcGIS\FERC_ResourceReportMaps_FERC_RR_FERC_RR.aprx | Revised: 12/19/2019 | Scale 1:21,000 Drawn By: RJC



Milepost
NSA Point
NSA Radius
Preliminary Route
Aboveground Facility

N

0.15 0.07 0 0.15
Miles

Figure 2
NSAs within 1.0 mile of Tioga Compressor Station
North Bakken Expansion Project
Williams County, North Dakota

WBI ENERGY TRANSMISSION

File: M:\Clients\V-X\WBI\North_Bakken_Expansion_ArcGIS\FERC_ResourceReportMaps_FERC_RR_FERC_RR.aprx | Revised: 12/19/2019 | Scale 1:20,000 Drawn By: RJC



Figure 3
NSAs within 0.5 mile of Lake Sakakawea HDD – North Side
North Bakken Expansion Project
Williams County, North Dakota

File: M:\Clients\V-X\WBI\North_Bakken_Expansion_ArcGIS\FERC_ResourceReportMaps_FERC_RR_FERC_RR.aprx | Revised: 12/19/2019 | Scale 1:10,000 Drawn By: RJC

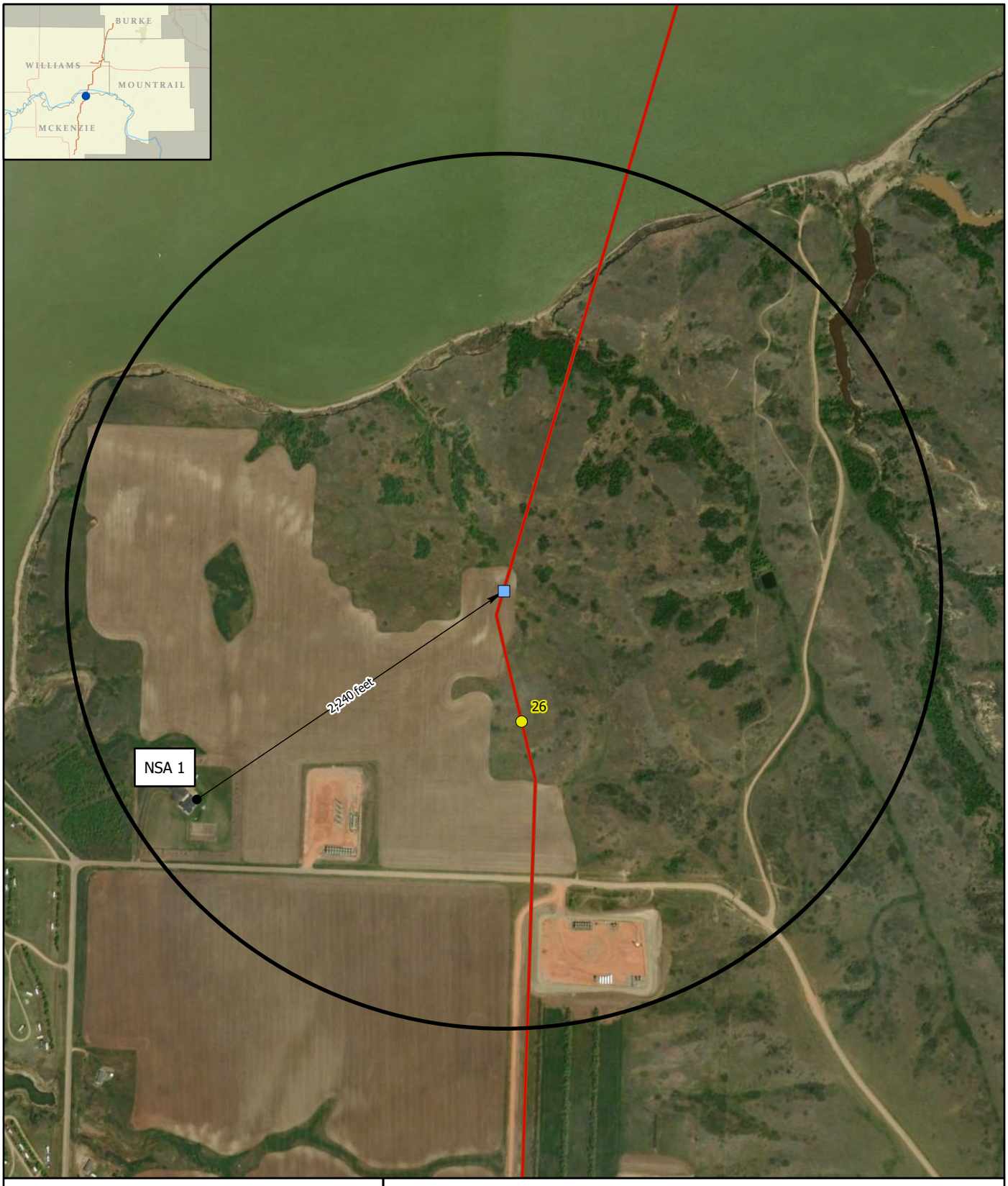


Figure 4
NSAs within 0.5 mile of Lake Sakakawea HDD – South Side
North Bakken Expansion Project
McKenzie County, North Dakota

WBI ENERGY TRANSMISSION

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NORTH BAKKEN EXPANSION PROJECT

Pre-Construction Noise Survey and Acoustical Analysis
McKenzie and Williams Counties, North Dakota

APPENDIX B
Field Monitoring Forms

Noise Survey Data Sheet

Location: Elkhorn Creek Compressor Station NSA 1 (47.670899,-103.237866)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/22/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.3 dB deviation from last -0.06 dB

Final Calibration:

Meteorological Conditions

Wind Speed: 2-4 mph

Direction: South

Temperature: 72°F

RH %: 64%

Barometric Pressure in mmHg:

Predominant noise source(s): Construction south of project, trucks on Hwy 34

Other noise source(s): Birds

Time start: 0924

Time end: 1024

Comments: Instantaneous Leq was 40-45 dBA w/o construction

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											Leq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
0939	46.5	40.3	47.2	45.7	42.4	43.4	43.4	37.5	35.4	29.8	23.0	51.0
0954	56.6	47.7	50.9	36.6	30.6	31.8	32.2	28.9	25.5	18.1	15.2	53.2
1009	44.9	50.5	49.6	49.2	44.4	49.9	46.6	41.2	33.9	26.3	20.6	40.4
1024	46.1	45.9	53.4	52.0	53.9	49.2	47.8	42.6	36.9	34.1	18.2	58.4

Noise Survey Data Sheet

Location: Elkhorn Creek Compressor Station NSA 1 (47.670899,-103.237866)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/22/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last 0.00 dB

Final Calibration: 93.9 dB, deviation from last 0.09 dB

Meteorological Conditions

Wind Speed: 2 mph

Direction: South

Temperature: 59°F

RH %: 82%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects

Other noise source(s): Minor traffic, ~ 4 cars

Time start: 2230

Time end: 2247

Comments:

	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq
Time	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	(dBA)
2247	47.7	43.8	32.8	26.3	27.2	20.4	19.0	13.5	16.1	18.4	16.5	32.2

Noise Survey Data Sheet

Location: Elkhorn Creek Compressor Station NSA 2 (47.674509,-103.207512)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/22/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last 0.01dB

Final Calibration: 93.4 dB, deviation from last -0.02 dB

Meteorological Conditions

Wind Speed: 2-2.5 mph

Direction: South

Temperature: 88°F

RH %: 30%

Barometric Pressure in mmHg:

Predominant noise source(s): Birds, insects, traffic

Other noise source(s):

Time start: 1110

Time end: 1210

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1128	55.8	44.6	36.0	28.9	22.0	18.7	18.9	19.0	28.3	25.4	27.9	29.4
1140	65.3	54.8	39.1	27.9	22.6	20.7	20.1	16.8	21.6	25.9	23.3	27.7
1155	45.1	50.7	41.	32.0	19.2	26.4	20.4	20.8	22.1	19.4	22.4	30.9
1210	54.3	49.5	44.0	31.5	34.6	23.5	25.4	28.1	15.3	23.0	21.6	25.8

Noise Survey Data Sheet

Location: Elkhorn Creek Compressor Station NSA 2 (47.674509,-103.207512)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/22/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last 0.01dB

Final Calibration: 93.9 dB, deviation from last 0.00 dB

Meteorological Conditions

Wind Speed: 2.5-3.8 mph

Direction: South

Temperature: 59°F

RH %: 73%

Barometric Pressure in mmHg:

Predominant noise source(s): Wind, insects,

Other noise source(s): Very quiet traffic, far off over hill

Time start: 2332

Time end: 2347

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2332	45.6	43.0	35.5	29.8	23.8	23.8	31.6	18.6	17.3	18.7	20.4	26.8

Noise Survey Data Sheet

Location: HDD NSA 1 (48.154528,-103.076141)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/23/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 94.9 dB, deviation from last -0.05 dB

Final Calibration: 93.9, dB, deviation from last 0.05 dB

Meteorological Conditions

Wind Speed: 0-2 mph

Direction: South

Temperature: 88°F

RH %: 44%

Barometric Pressure in mmHg:

Predominant noise source(s): Rustling trees, insects

Other noise source(s):

Time start: 1506

Time end: 1606

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1521	48.0	45.1	41.9	39.2	32.8	35.5	34.7	39.4	33.7	29.0	27.6	42.2
1537	51.8	49.4	48.1	42.1	42.7	41.6	40.4	37.0	38.1	34.1	26.2	44.2
1551	49.1	45.0	41.9	49.1	33.8	33.5	34.3	32.9	30.6	27.6	30.0	40.3
1606	49.8	46.0	43.9	42.	45.2	50.9	35.2	33.0	26.1	29.1	27.0	42.8

Noise Survey Data Sheet

Location: HDD NSA 1 (48.154528,-103.076141)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011887

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 94.4 dB, deviation from last -0.06 dB

Final Calibration: 93.8 dB, deviation from last 0.02 dB

Meteorological Conditions

Wind Speed: 1-2 mph

Direction: Southeast

Temperature: 70°F

RH %: 81%

Barometric Pressure in mmHg:

Predominant noise source(s): Rustling trees

Other noise source(s):

Time start: 0121

Time end: 0136

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
0136	53.9	51.9	50.7	43.4	32.1	30.7	23.0	22.2	27.5	29.4	34.9	34.0

Noise Survey Data Sheet

Location: HDD NSA 2 (48.155231,-103.087188)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/23/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last 0.07 dB

Final Calibration: 93.8, dB, deviation from last 0.08 dB

Meteorological Conditions

Wind Speed: 8-12 mph

Direction: Southeast

Temperature: 81°F

RH %: 52%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects, wind

Other noise source(s):

Time start: 1351

Time end: 1451

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1406	78.3	71.9	70.2	47.1	41.2	34.9	33.6	30.2	27.7	37.2	39.8	44.6
1421	69.0	62.7	48.1	44.6	32.6	30.1	29.5	27.8	22.3	37.7	40.7	40.8
1436	78.2	67.5	52.1	45.7	28.8	31.0	29.2	28.4	24.8	37.4	40.4	42.1
1451	70.6	66.8	50.5	41.8	30.9	30.2	29.8	29.7	24.0	37.1	36.8	40.6

Noise Survey Data Sheet

Location: HDD NSA 2 (48.155231,-103.087188)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011887

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.7 dB, deviation from last -0.07 dB

Final Calibration: 94.0 dB, deviation from last 0.10 dB

Meteorological Conditions

Wind Speed: 1.8-2.7 mph

Direction: Southeast

Temperature: 70°F

RH %: 85%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects

Other noise source(s):

Time start: 0052

Time end: 0107

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
0107	61.6	52.4	50.6	40.5	28.7	28.3	23.1	17.9	15.7	41.1	46.6	44.4

Noise Survey Data Sheet

Location: HDD NSA 3 (48.110783,-103.099304)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/23/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 94.0 dB, deviation from last 0.01dB

Final Calibration: 93.4 dB, deviation from last 0.00 dB

Meteorological Conditions

Wind Speed: 9 mph, gust up to 11 mph

Direction: South

Temperature: 72°F

RH %: 64%

Barometric Pressure in mmHg:

Predominant noise source(s): Wind, insects

Other noise source(s): Traffic

Time start: 1049

Time end: 1149

Comments: Idling truck ~200' away for first 5-10 minutes, associated with oil drills near NSA

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1104	76.7	66.0	51.9	50.3	40.1	34.2	30.9	33.3	33.5	40.8	27.1	40.5
1119	77.2	64.8	59.0	50.7	41.9	38.0	37.0	34.1	34.3	34.7	29.8	45.3
1134	83.7	75.1	64.4	52.1	40.2	38.1	35.0	35.2	36.6	33.2	31.6	43.8
1149	78.3	68.2	59.7	61.1	38.9	30.9	42.5	31.8	32.9	32.2	25.7	49.2

Noise Survey Data Sheet

Location: HDD NSA 3 (48.110783,-103.099304)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/23/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011887

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 94.0 dB, deviation from last -0.06 dB

Final Calibration: 94.0 dB, deviation from last 0.08 dB

Meteorological Conditions

Wind Speed: 5.5-6.5 mph

Direction: Southeast

Temperature: 73°F

RH %: 69%

Barometric Pressure in mmHg: _____

Predominant noise source(s): Insects, wind, tank battery ~ 600' east w/ 4 tanks

Other noise source(s): Minor traffic,

Time start: 2246

Time end: 2301

Comments: _____

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2301	74.3	59.1	49.6	44.5	39.1	31.4	31.4	29.0	25.8	37.9	21.8	41.2

Noise Survey Data Sheet

Location: Tioga NSAs 1 & 8 (48.416102,-102.907314)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011887

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last 0.02 dB

Final Calibration: 93.3 dB, deviation from last -0.11 dB

Meteorological Conditions

Wind Speed: 2-5 mph, gusts up to 7 mph

Direction: South

Temperature: 72°F

RH %: 72%

Barometric Pressure in mmHg:

Predominant noise source(s): Rustling grass

Other noise source(s): Minor traffic (2 cars)

Time start: 1310

Time end: 1502

Comments: Measurement taken about 1000' from NSAs 1 & 8. 8 is to north, 1 is to east, both in sight from location. Paused run from 1330-1422 for rain.

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1325	60.5	58.1	53.6	47.7	45.1	36.6	31.8	30.7	25.2	19.7	17.2	41.4
1432	57.5	57.2	51.4	48.8	43.2	37.3	32.1	26.9	21.2	35.5	37.8	41.7
1448	62.4	57.4	54.7	57.6	50.3	43.7	37.6	29.5	21.5	38.6	41.0	45.9
1502	61.3	60.1	53.6	51.9	50.6	38.5	38.9	28.1	22.8	39.9	43.0	44.4

Noise Survey Data Sheet

Location: Tioga NSAs 1 & 8 (48.416102,-102.907314)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.9 dB, deviation from last 0.03 dB

Final Calibration: 93.9 dB, deviation from last -0.01 dB

Meteorological Conditions

Wind Speed: 2-3 mph

Direction: South

Temperature: 72°F

RH %: 83%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects, compressor station

Other noise source(s):

Time start: 2323

Time end: 2339

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2339	58.0	62.9	55.8	51.4	44.5	41.5	35.8	29.6	19.8	41.4	45.4	47.3

Noise Survey Data Sheet

Location: Tioga NSA 2 (48.408438,-102.885868)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/25/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.8 dB, deviation from last 0.02 dB

Final Calibration: 93.9 dB, deviation from last 0.01 dB

Meteorological Conditions

Wind Speed: 7-9 mph

Direction: North

Temperature: 68°F

RH %: 58%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects, wind

Other noise source(s): Minor traffic

Time start: 0959

Time end: 1059

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1014	65.9	52.0	47.6	39.2	24.7	22.4	28.4	27.0	25.3	41.4	46.3	43.9
1029	59.9	51.1	43.9	35.3	28.2	20.8	18.8	16.4	22.6	41.1	45.9	49.9
1044	59.7	55.3	42.7	37.7	26.8	21.5	26.0	19.9	30.	41.5	44.9	43.1
1059	73.4	60.1	46.0	34.9	27.5	22.1	22.6	22.5	20.5	39.8	45.0	45.1

Noise Survey Data Sheet

Location: Tioga NSA 2 (48.408438,-102.885868)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.8 dB, deviation from last 0.02 dB

Final Calibration: 93.9 dB, deviation from last -0.03 dB

Meteorological Conditions

Wind Speed: 5.0-7.5 mph

Direction: South

Temperature: 73°F

RH %: 70%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects

Other noise source(s):

Time start: 2255

Time end: 2310

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2310	58.8	54.1	49.4	45.5	36.7	32.5	26.3	19.8	21.8	49.9	56.0	51.0

Noise Survey Data Sheet

Location: Tioga NSAs 3 & 5 (48.402277,-102.885672)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.4 dB, deviation from last -0.02 dB

Final Calibration: 93.9 dB, deviation from last 0.06 dB

Meteorological Conditions

Wind Speed: 3-4 mph, increased during measurement

Direction: South

Temperature: 73°F

RH %: 72%

Barometric Pressure in mmHg:

Predominant noise source(s): Traffic, wind, insects

Other noise source(s): Plane, compressor station

Time start: 1535

Time end: 1635

Comments: Measurement taken about 500' from NSAs 3 & 5. 3 is to north, 5 is to south, both in sight from monitoring location.

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1550	67.0	53.8	50.3	44.4	37.1	31.6	24.1	18.5	19.4	40.9	50.1	45.7
1605	70.9	63.8	47.4	44.5	34.6	28.4	24.4	23.9	22.5	44.6	49.6	48.7
1620	83.6	72.2	63.9	56.6	41.1	33.6	34.2	31.2	32.3	47.3	51.1	56.8
1635	75.5	65.0	52.1	41.8	40.0	30.3	25.0	24.1	35.0	46.1	50.0	46.8

Noise Survey Data Sheet

Location: Tioga NSAs 3 & 5 (48.402277,-102.885672)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.9 dB, deviation from last 0.00 dB

Final Calibration: 93.9 dB, deviation from last 0.01 dB

Meteorological Conditions

Wind Speed: 1-2 mph

Direction: South

Temperature: 77°F

RH %: 72%

Barometric Pressure in mmHg:

Predominant noise source(s): Insects, wind,

Other noise source(s): Cows, 1 car, compressor

Time start: 2230

Time end: 2246

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2246	57.2	55.1	48.7	44.5	38.9	30.1	28.2	22.3	29.5	45.1	48.6	49.4

Noise Survey Data Sheet

Location: Tioga NSA 4 (48.401697,-102.893168)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.9 dB, deviation from last -0.02 dB

Final Calibration: 93.9 dB, deviation from last 0.05 dB

Meteorological Conditions

Wind Speed: 8-11 mph

Direction: South

Temperature: 79°F

RH %: 66%

Barometric Pressure in mmHg:

Predominant noise source(s): Traffic, train, oil well, compressor station

Other noise source(s): Horses

Time start: 1654

Time end: 1754

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1709	81.2	63.7	52.5	49.4	40.8	50.4	48.2	38.7	28.7	40.4	45.9	69.2
1724	71.9	62.9	56.3	45.9	41.0	34.7	30.0	28.0	30.3	34.6	44.3	49.3
1739	77.3	55.1	52.2	44.4	35.9	34.8	33.2	29.8	36.9	43.2	39.8	46.2
1754	77.7	70.7	58.6	53.6	33.4	32.0	64.3	51.4	30.5	42.2	41.1	45.0

Noise Survey Data Sheet

Location: Tioga NSA 4 (48.401697,-102.893168)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.8 dB, deviation from last -0.05 dB

Final Calibration: 93.9 dB, deviation from last -0.03 dB

Meteorological Conditions

Wind Speed: 2 mph

Direction: South

Temperature: 79°F

RH %: 67%

Barometric Pressure in mmHg:

Predominant noise source(s): Traffic, oil well, compressor station

Other noise source(s): Horses

Time start: 2207

Time end: 2222

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
2222	59.6	58.3	54.0	51.0	37.7	35.9	33.7	31.2	33.3	26.3	19.4	40.1

Noise Survey Data Sheet

Location: Tioga NSA 6 & 7(48.408634,-102.928193)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011887

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 94.0 dB, deviation from last 0.05 dB

Final Calibration: 93.4 dB, deviation from last 0.05 dB

Meteorological Conditions

Wind Speed: 5.5-7.5 mph

Direction: South

Temperature: 81°F

RH %: 57%

Barometric Pressure in mmHg:

Predominant noise source(s): Traffic

Other noise source(s):

Time start: 1154

Time end: 1254

Comments: Measurement taken about 500'from NSAs 6 and 7, 2000' from NSA 6. No safe parking closer to 6.

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
1209	67.0	63.4	59.1	50.0	45.3	44.2	44.6	41.2	35.5	40.8	38.3	54.7
1224	65.0	57.2	57.0	61.3	47.3	42.0	37.9	43.4	31.1	32.1	36.4	44.2
1239	66.9	59.3	56.2	47.8	42.1	55.4	66.7	45.9	31.4	33.1	39.7	55.1
1254	67.7	57.1	54.1	60.1	47.2	42.8	42.2	34.9	27.7	37.4	37.1	56.9

Noise Survey Data Sheet

Location: Tioga NSAs 6 & 7 (48.408634,-102.928193)

Investigator Name: Patrick Buffington, Nic Kuzola

Date: 07/24/2019

Meter Manufacturer and Model Number: Bruel & Kjaer 2250

Serial Number: 3011939

Calibrator Manufacturer, Model, and dB: Bruel & Kjaer 421, 94 dB

Calibrator Serial Number: 27012

Initial Calibration: 93.8 dB, deviation from last 0.05 dB

Final Calibration: 94.0 dB, deviation from last -0.01dB

Meteorological Conditions

Wind Speed: 4-6 mph

Direction: South

Temperature: 72°F

RH %: 77%

Barometric Pressure in mmHg:

Predominant noise source(s): Traffic, insects

Other noise source(s): Compressor station

Time start: 2354

Time end: 07/25/2019 0010

Comments:

Time	Unweighted Sound Pressure Level (dB) at each Octave Band Center Frequency (Hz)											LAeq (dBA)
	16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
0010	68.9	61.0	64.8	53.1	48.8	42.0	33.2	26.9	22.3	42.4	48.2	62.1

NORTH BAKKEN EXPANSION PROJECT

Pre-Construction Noise Survey and Acoustical Analysis
McKenzie and Williams Counties, North Dakota

APPENDIX C
Sound Level Meter Data

Project Name	Start Time	Elapsed Time	Persistent Overload	LAFTeq	LAFmax	LASmax	LAImax	LCFmax	LCSmax	LCImax	LAFmin
Project 004	7/22/2019 9:24	01:02:22	0	62.55	78.32	76.77	79.07	82.56	81.19	83.34	27.04
Project 002 (1)	7/22/2019 9:23	01:01:44	0	62.09	78.39	77.16	79.02	82.34	80.98	83.37	26.86
Project 003	7/22/2019 11:09	01:00:00	0	46.02	65.46	57.27	70.01	76.06	71.9	78.52	21.93
Project 004	7/22/2019 12:40	01:00:00	0	68.26	91.89	90.51	92.88	102.16	99.62	103.3	21.45
Project 005	7/22/2019 22:28	00:17:07	0	44.37	64.33	62.39	65.59	72.82	70.94	74.82	23.46
Project 006	7/22/2019 23:02	00:15:01	0	53.72	72.82	70.41	74.95	78.11	76.86	78.7	18.6
Project 007	7/22/2019 23:31	00:15:02	0	37.8	48.73	47.56	53.96	59.65	57.66	61.55	21.97
Project 008	7/23/2019 10:49	01:00:00	0	60.85	83.34	81.17	84.68	92.43	87.31	95.11	35.68
Project 009	7/23/2019 13:50	01:00:00	0	47.36	61.97	55.75	65.31	88.77	82.56	92.39	35.08
Project 010	7/23/2019 15:05	01:00:00	0	48.29	63.76	57.08	68.67	76.28	68.43	79.77	34.26
Project 011	7/23/2019 16:19	00:32:03	0	49.77	64.55	58.32	69.04	83.68	78.18	86.8	35.22
Project 012	7/23/2019 17:00	00:30:04	0	57.61	78.98	74.31	81.44	87.67	80.47	91.66	34.01
Project 013	7/23/2019 22:45	00:15:00	0	50.52	70.56	67.19	75.17	82.92	77.39	85.6	34.79
Project 014	7/24/2019 0:52	00:15:00	0	44.8	55.26	48.02	60.25	74.26	71.2	76.69	35.5
Project 015	7/24/2019 1:21	00:15:00	0	40.43	56.19	47.63	61.29	60.84	57.42	62.78	31.34
Project 016	7/24/2019 1:48	00:15:00	0	41.08	50.75	46.07	53.65	63.6	60.66	65.68	34.48
Project 017	7/24/2019 11:54	01:00:00	0	65.31	83.24	79.95	87.71	89.96	86.73	91.8	39.41
Project 018	7/24/2019 13:10	01:00:00	0	65.91	92.44	89.58	93.36	102.83	99.36	103.58	37.56
Project 005	7/24/2019 15:34	01:02:21	0	54.92	77.6	75.52	78.46	90.45	86.82	93	40.19
Project 006	7/24/2019 16:53	01:01:18	0	60.1	78.47	76.49	79.12	94.19	88.77	98.14	34.81
Project 007	7/24/2019 22:07	00:15:17	0	52.49	69.33	65.22	73.78	70.64	67.94	74.57	38.61
Project 008	7/24/2019 22:29	00:17:00	0	49.39	59.32	56.46	63.57	81.62	74.34	84.75	41.6
Project 009	7/24/2019 22:54	00:15:18	0	53.33	57.37	54.35	61.03	74.17	69.94	77.47	49.66
Project 010	7/24/2019 23:22	00:17:00	0	47.8	52.64	50.07	55.16	68.92	65.26	72.58	43.45
Project 011	7/24/2019 23:53	00:16:17	0	55.33	68.26	66.96	69.01	86.93	82.93	89.52	44.76
Project 012	7/25/2019 9:58	01:01:00	0	50.89	73.67	70.58	74.74	81.76	76.39	86.03	37.7

Project Name	LASmin	LAImin	LCFmin	LCSmin	LCImin	LApeak	LAIeq	LCIeq	LAeq	Lep,d	Lep,d,v	LCeq	LAE	LCE	LAIeq-LAeq
Project 004	27.97	27.52	42.64	44.98	45.98	90.6	60.2	64.34	57.39	57.11	57.11	62.18	93.12	97.9	2.81
Project 002 (1)	29.12	29	41.47	44.7	45.89	92.09	59.76	64.19	57.15	56.87	56.87	62.19	92.83	97.87	2.61
Project 003	22.9	22.43	36.35	39.5	40.78	86.44	44.96	56.19	36.56	36.28	36.28	52.59	72.12	88.15	8.4
Project 004	22.25	21.49	33.38	35.31	35.41	108.42	65.99	77.14	63.23	62.95	62.95	74.26	98.79	109.82	2.76
Project 005	23.99	23.65	38.54	41.73	42.78	87.1	42.53	55.32	39.95	39.67	39.67	52.92	70.06	83.04	2.58
Project 006	18.97	18.56	33.21	35.25	36.27	89.92	52.28	60.57	48.58	48.3	48.3	58.91	78.13	88.46	3.7
Project 007	22.7	22.12	37.14	39.63	40.67	75.03	36.89	47.86	34.21	33.93	33.93	45.76	63.76	75.31	2.68
Project 008	36.67	35.81	50.57	54.33	56.46	95.92	58.64	80.1	54.86	54.58	54.58	74.48	90.42	110.04	3.78
Project 009	38.14	37.66	47.57	51.13	52.74	85.4	46.39	76.16	43.02	42.74	42.74	70.89	78.57	106.45	3.37
Project 010	34.63	34.46	44.32	46.31	46.73	88.17	47.27	56.1	43.91	43.63	43.63	51.44	79.47	87	3.36
Project 011	36.69	36.12	53.47	55.23	55.92	87.57	48.43	73.18	43.07	42.79	42.79	68.2	75.91	101.04	5.36
Project 012	36.54	35.67	51.99	55.15	55.46	92.28	55.23	73.27	49.1	48.82	48.82	67.82	81.66	100.38	6.13
Project 013	35.56	35.35	50.87	54.19	54.93	92.07	49.34	69.9	44.32	44.04	44.04	64.37	73.86	93.91	5.02
Project 014	37.29	36.63	49.75	52.13	53.29	77.29	43.91	59.47	42.14	41.86	41.86	56.22	71.67	85.76	1.77
Project 015	31.93	31.51	47.73	49.74	50.41	82.07	39.58	55.81	35.7	35.42	35.42	53.21	65.24	82.75	3.88
Project 016	35.19	34.84	52.75	54.64	55.14	67.94	40.29	59.42	39.52	39.24	39.24	56.8	69.06	86.34	0.77
Project 017	40.23	39.89	55.47	58.68	59.91	104.89	62.98	71.73	60.51	60.23	60.23	69.29	96.07	104.85	2.47
Project 018	37.93	37.73	51.7	54.31	55.54	104	60.99	71.59	57.59	57.31	57.31	67.92	93.15	103.48	3.4
Project 005	41.63	40.5	49.99	51.97	52.86	94.02	52.5	74.37	50.56	50.28	50.28	68.84	86.29	104.57	1.94
Project 006	40.36	40.17	52.04	57.51	58.99	96.9	57.37	81.88	55.29	55.01	55.01	76.37	90.95	112.02	2.08
Project 007	39.77	39.41	54.94	57.35	58.45	88.89	50.48	62.38	46	45.72	45.72	59.75	75.62	89.37	4.48
Project 008	42.25	41.65	52.22	54.61	55.31	78.62	48.32	61.64	46.85	46.57	46.57	57.49	76.93	87.57	1.47
Project 009	50.4	50.05	53.69	55.26	55.84	79.63	52.74	61.27	52.31	52.03	52.03	58.35	81.93	87.98	0.43
Project 010	43.87	43.74	55.88	57.98	58.43	74.67	47.15	63.65	46.46	46.18	46.18	61.3	76.54	91.38	0.69
Project 011	45.28	44.94	56.13	58.33	59.73	82.2	53.41	70.25	52.26	51.98	51.98	66.7	82.16	96.6	1.15
Project 012	39.82	38.95	47.16	50.5	51.48	91.29	49.09	68	45.97	45.69	45.69	61.88	81.6	97.51	3.12

Project Name	LCeq-LAeq	LAFTeq-LAeq	Overload	LAF1.0	LAF5.0	LAF10.0	LAF50.0	LAF90.0	LAF95.0	LAF99.0	StdDev	LavS5	TWA	TWAv
Project 004	4.79	5.16	0	69.92	63.71	59.98	45.81	36.45	34.3	30.57	8.78	53.76	23.58	23.58
Project 002 (1)	5.04	4.94	0	69.81	63.44	59.28	45.71	36.54	34.39	30.53	8.62	53.43	22.98	22.98
Project 003	16.03	9.46	0	47.41	41.63	38.75	30.12	25.77	24.71	23.41	5.26	34.51		
Project 004	11.03	5.03	0	74.31	64.05	52.71	31.63	25.33	24.32	23.08	11.76	53.88	35.84	35.84
Project 005	12.97	4.42	0	51.4	43.2	38.48	27.58	24.82	24.45	24	6.14	34.83		
Project 006	10.33	5.14	0	60.97	50.07	44.81	24.93	20.51	20.02	19.24	9.89	40.87	-7.36	-7.36
Project 007	11.55	3.59	0	46.55	42.05	36.77	26.54	24.57	24.11	23.21	5.26	31.52		
Project 008	19.62	5.99	0	65.39	52.59	49.59	43.3	39.88	39.17	37.9	4.94	48.69	23.16	23.16
Project 009	27.87	4.34	0	49.27	46.38	45.13	42.05	39.9	39.25	38.03	2.2	42.78		
Project 010	7.53	4.38	0	52.3	49.47	47.7	40.86	37.02	36.2	35.24	4.02	43		
Project 011	25.13	6.7	0	49.69	46.67	45.4	41.39	38.53	37.92	36.86	2.8	42.63		
Project 012	18.72	8.51	0	59.76	54.56	46.96	41.61	38.74	38.06	36.9	4.55	45.59	2.51	2.51
Project 013	20.05	6.2	0	51.21	44.32	42.26	39.1	37.05	36.59	35.71	3.05	41.24		
Project 014	14.08	2.66	0	44.76	44.05	43.69	42.06	39.05	38.35	37.09	1.78	42.05		
Project 015	17.51	4.73	0	40.52	38.96	38.09	34.25	32.78	32.53	32.07	2.19	35.39		
Project 016	17.28	1.56	0	44.1	42.28	41.52	38.94	36.78	36.37	35.72	1.84	39.34		
Project 017	8.78	4.8	0	71.08	66.55	63.73	52.07	42.72	41.82	40.8	8.05	57.61	27.78	27.78
Project 018	10.33	8.32	0	59.59	50.16	47.71	42.92	40.54	39.97	39.05	3.87	47.61	24.04	24.04
Project 005	18.28	4.36	0	57.7	54.51	51.41	48.02	45.48	44.68	43.43	2.84	49.26	7.63	7.63
Project 006	21.08	4.81	0	68.45	58.03	53.96	46.98	42.93	41.88	39.81	5.27	51.53	21.81	21.81
Project 007	13.75	6.49	0	55.69	47.56	46.91	42.28	40.69	40.3	39.65	2.99	44.38		
Project 008	10.64	2.54	0	50.97	48.97	48.61	46.43	43.66	43.26	42.53	2.02	46.67		
Project 009	6.04	1.02	0	53.54	53.24	53.08	52.38	51.24	51	50.53	0.7	52.28		
Project 010	14.84	1.34	0	49.01	47.99	47.61	46.29	45.16	44.81	44.12	0.99	46.4		
Project 011	14.44	3.07	0	64.66	57.95	53.25	47.26	46.2	45.91	45.43	3.85	50.34		
Project 012	15.91	4.92	0	48.82	46.66	46.09	44.38	42.46	41.77	40.41	1.89	44.92	-5.08	-5.08

Project Name	E	Dose	DoseS5	ProjDose	ProjDoseS5	#APeaks(>140dB)	#APeaks(>137dB)	#APeaks(>135dB)
Project 004	0.000228259	0	0.02	0.05	0.15	0	0	0
Project 002 (1)	0.000213778	0	0.01	0.05	0.14	0	0	0
Project 003	1.8131E-06					0	0	0
Project 004	0.000842752	0.07	0.1	0.61	0.87	0	0	0
Project 005	1.12907E-06					0	0	0
Project 006	7.22722E-06	0	0	0	0	0	0	0
Project 007	2.64424E-07					0	0	0
Project 008	0.00012263	0	0.01	0.07	0.15	0	0	0
Project 009	8.0256E-06					0	0	0
Project 010	9.8508E-06					0	0	0
Project 011	4.33658E-06					0	0	0
Project 012	1.63106E-05	0	0	0	0.01	0	0	0
Project 013	2.7066E-06					0	0	0
Project 014	1.6384E-06					0	0	0
Project 015	3.71813E-07					0	0	0
Project 016	8.9615E-07					0	0	0
Project 017	0.000450458	0.01	0.03	0.12	0.28	0	0	0
Project 018	0.000229952	0.02	0.02	0.16	0.17	0	0	0
Project 005	4.73394E-05	0	0	0	0.01	0	0	0
Project 006	0.000138325	0	0.01	0.04	0.12	0	0	0
Project 007	4.06048E-06					0	0	0
Project 008	5.49304E-06					0	0	0
Project 009	1.73824E-05					0	0	0
Project 010	5.02112E-06					0	0	0
Project 011	1.82877E-05					0	0	0
Project 012	1.60951E-05	0	0	0	0	0	0	0

Project Name	LAeq,15,mov,max	LAeq,60,mov,max	LCeq,15,mov,max	LCeq,60,mov,max	ΔLeq,15,mov,max	ΔLeq,60,mov,max
Project 004	61.19	57.55	64.29	62.24	3.1	4.69
Project 002 (1)	60.57	57.27	64.25	62.22	3.68	4.95
Project 003	38.46	36.56	54.37	52.59	15.91	16.03
Project 004	67.55	63.23	77.15	74.26	9.6	11.03
Project 005	40.32		53.4		13.08	
Project 006	48.59		58.92		10.33	
Project 007	34.22		45.76		11.54	
Project 008	57.64	54.86	76.13	74.48	18.49	19.62
Project 009	44.62	43.02	73.66	70.89	29.04	27.87
Project 010	45.6	43.91	53.86	51.44	8.26	7.53
Project 011	43.61		69.23		25.62	
Project 012	51.54		68.77		17.23	
Project 013	44.32		64.37		20.05	
Project 014	42.14		56.22		14.08	
Project 015	35.7		53.21		17.51	
Project 016	39.52		56.8		17.28	
Project 017	63.94	60.51	71.69	69.29	7.75	8.78
Project 018	63.37	57.59	73.39	67.92	10.02	10.33
Project 005	52.34	50.67	72.87	68.99	20.53	18.32
Project 006	58.94	55.33	78.66	76.43	19.72	21.1
Project 007	46.05		59.76		13.71	
Project 008	47.08		57.57		10.49	
Project 009	52.33		58.36		6.03	
Project 010	46.51		61.37		14.86	
Project 011	52.42		66.9		14.48	
Project 012	48.54	46.01	62.6	61.91	14.06	15.9

Project Name	Wind Dir. avg	Wind Dir. min	Wind Dir. max	Wind Speed avg	Wind Speed min	Wind Speed max	Amb. Temperature
Project 004							
Project 002 (1)							
Project 003							
Project 004							
Project 005							
Project 006							
Project 007							
Project 008							
Project 009							
Project 010							
Project 011							
Project 012							
Project 013							
Project 014							
Project 015							
Project 016							
Project 017							
Project 018							
Project 005							
Project 006							
Project 007							
Project 008							
Project 009							
Project 010							
Project 011							
Project 012							

Project Name	Amb. Humidity	Amb. Pressure	Amb. Rain Gauge	Full Scale Level	Max. Input Level	Avg. RPM	CIC 1 Result	CIC 1 Ratio
Project 004				142.6300049	141.3300018		Undefined	
Project 002 (1)				142.6999969	141.3999939		Undefined	
Project 003				142.6900024	141.3899994		Undefined	
Project 004				142.6999969	141.3999939		Undefined	
Project 005				142.7100067	141.4100037		Undefined	
Project 006				142.6999969	141.3999939		Undefined	
Project 007				142.6999969	141.3999939		Undefined	
Project 008				142.6999969	141.3999939		Undefined	
Project 009				142.7599945	141.4600067		Undefined	
Project 010				142.7299957	141.4299927		Undefined	
Project 011				142.7200012	141.4199982		Undefined	
Project 012				142.6699982	141.3699951		Undefined	
Project 013				142.6699982	141.3699951		Undefined	
Project 014				142.5899963	141.2899933		Undefined	
Project 015				142.5599976	141.2599945		Undefined	
Project 016				142.5899963	141.2899933		Undefined	
Project 017				142.6300049	141.3300018		Undefined	
Project 018				142.5899963	141.2899933		Undefined	
Project 005				142.7400055	141.4400024		Undefined	
Project 006				142.6900024	141.3899994		Undefined	
Project 007				142.6900024	141.3899994		Undefined	
Project 008				142.7200012	141.4199982		Undefined	
Project 009				142.6900024	141.3899994		Undefined	
Project 010				142.6999969	141.3999939		Undefined	
Project 011				142.6600037	141.3600006		Undefined	
Project 012				142.6499939	141.3500061		Undefined	

Project Name	CIC 1 Background Level Before	CIC 1 Measurement Level	CIC 1 Generator Level	CIC 1 Background Level After
Project 004				
Project 002 (1)				
Project 003				
Project 004				
Project 005				
Project 006				
Project 007				
Project 008				
Project 009				
Project 010				
Project 011				
Project 012				
Project 013				
Project 014				
Project 015				
Project 016				
Project 017				
Project 018				
Project 005				
Project 006				
Project 007				
Project 008				
Project 009				
Project 010				
Project 011				
Project 012				

Project Name	CIC 1 Dev. from Reference	CIC 2 Result	CIC 2 Ratio	CIC 2 Background Level Before	CIC 2 Measurement Level
Project 004		Undefined			
Project 002 (1)		Undefined			
Project 003		Undefined			
Project 004		Undefined			
Project 005		Undefined			
Project 006		Undefined			
Project 007		Undefined			
Project 008		Undefined			
Project 009		Undefined			
Project 010		Undefined			
Project 011		Undefined			
Project 012		Undefined			
Project 013		Undefined			
Project 014		Undefined			
Project 015		Undefined			
Project 016		Undefined			
Project 017		Undefined			
Project 018		Undefined			
Project 005		Undefined			
Project 006		Undefined			
Project 007		Undefined			
Project 008		Undefined			
Project 009		Undefined			
Project 010		Undefined			
Project 011		Undefined			
Project 012		Undefined			

Project Name	CIC 2 Generator Level	CIC 2 Background Level After	CIC 2 Dev. from Reference	SIL	PSIL	SIL3	LZeq (16 Hz-250 Hz)
Project 004				50.18	52.15	49.56	62.22
Project 002 (1)				50.21	52.05	49.34	62.32
Project 003				29.78	30.48	29.12	57.13
Project 004				53.49	56.73	50.37	75.1
Project 005				32.45	34.33	30.95	54.34
Project 006				40.79	43.43	39.28	60.45
Project 007				26.36	28.66	25.14	48.29
Project 008				47.85	49.43	46.64	80.67
Project 009				32.32	32.92	31.52	77.05
Project 010				37.32	37.04	37.18	54.84
Project 011				35.43	36.41	34.98	74.33
Project 012				42.08	43.83	40.53	73.77
Project 013				37.32	38.71	36.23	70.54
Project 014				23.44	25.28	21.69	61.71
Project 015				26.45	26.42	26.09	57.94
Project 016				32.46	33.5	31.45	61.01
Project 017				53.07	55.29	51.65	71.64
Project 018				47.81	49.79	45.25	68.99
Project 005				39.73	42.21	37.66	74.83
Project 006				46.92	49.37	45.7	82.53
Project 007				37.95	39.2	37.67	63.35
Project 008				30.39	32.9	28.78	61.5
Project 009				26.87	28.36	24.48	63.29
Project 010				31.22	34.39	28.2	64.5
Project 011				43.12	45.85	41.65	72.11
Project 012				34.03	35.69	32.51	68.23

Project Name	NC	NCDecisiveBand	NR	NRDecisiveBand	NCB	NCBCriteria	RC	RCCriteria	Loudness	Loudness_Level
Project 004	53	2000	55	2000	50	(H)		(HF) Objectionable		
Project 002 (1)	52	1000	54	2000	50	(H)		(HF) Objectionable		
Project 003	30		33	4000	30	(H)	30	(HF) Objectionable		
Project 004	60	500	60	500	53	(R) (RV)		(MF) Marginal		
Project 005	35	1000	36	1000	32	(H)	34	(HF) Marginal		
Project 006	45	1000	46	1000	41	(H)	43	(HF) Objectionable		
Project 007	29	1000	31	1000	26	(H)	29	(HF) Marginal		
Project 008	50	1000	51	1000	48	(H) (RV)	49	(HF) Marginal		
Project 009	42	8000	46	8000	32	(R) (H) (RV)	33	(LFVA) Objectionable		
Project 010	41	4000	44	4000	37	(H)	37	(HF) Objectionable		
Project 011	37	1000	39	2000	35	(H) (RV)	36	(LFVB) Objectionable		
Project 012	43	500	44	500	42	(H) (RV)	44	(HF) Marginal		
Project 013	39	1000	40	1000	37	(H) (RV)	39	(HF) Marginal		
Project 014	44	8000	47	8000	23	(H)	25	(LF) Marginal		
Project 015	33	8000	37	8000	26	(H)	26	(HF) Marginal		
Project 016	33	1000	35	1000	32	(H)	34	(HF) Marginal		
Project 017	57	1000	58	1000	53	(H) (RV)		(HF) Objectionable		
Project 018	55	250	54	250	48	(R)	50	(MF) Objectionable		
Project 005	49	8000	52	8000	40	(H) (RV)	42	(LFVB) Marginal		
Project 006	51	1000	52	1000	47	(H) (RV)	49	(LFVA) Marginal		
Project 007	41	8000	45	8000	38	(H)	39	(HF) Marginal		
Project 008	47	8000	51	8000	30	(H)	33	(N) Acceptable		
Project 009	54	8000	57	8000	27	(H)	28	(N) Acceptable		
Project 010	46	8000	49	8000	31	(R) (H)	34	(N) Acceptable		
Project 011	47	1000	51	8000	43	(H) (RV)	46	(N) Marginal		
Project 012	46	8000	50	8000	34	(H) (RV)	36	(LFVB) Marginal		

Project Name	LZFmax_O 16Hz	LZFmax_O 31.5Hz	LZFmax_O 63Hz	LZFmax_O 125Hz	LZFmax_O 250Hz	LZFmax_O 500Hz	LZFmax_O 1kHz
Project 004	74.5	68.48	82.7	77.55	76.84	77.93	73.43
Project 002 (1)	74.25	69.2	81.65	77.47	78.11	78.74	72.19
Project 003	79.32	72.79	72.81	55.92	55.15	57.45	57.97
Project 004	92.22	101.03	97.47	94.54	95.09	92.09	84.95
Project 005	68.88	68.01	73.39	66.33	64.38	62.85	60.32
Project 006	63.96	80.5	72.92	72.42	71.44	69.81	70.07
Project 007	53.12	56.14	56.91	49.26	48.57	45.8	47.26
Project 008	94.52	89.61	85.41	82.21	84.84	80.96	78.58
Project 009	89.33	84.68	78.41	65.92	57.78	50.1	55.23
Project 010	72.22	73.43	73.91	64.89	66.98	57.19	56.45
Project 011	86.12	79.31	74.48	65.7	56.05	52.28	56.94
Project 012	87.19	84.59	79.79	69.87	71.38	77.98	76.58
Project 013	85.3	78.3	72.2	64.17	62.84	69.38	67.29
Project 014	76.23	74	67.06	53.17	48.46	48.58	53.07
Project 015	64.49	55.91	57.56	51.33	42.71	47.7	49.67
Project 016	65.58	61.05	57.08	49.24	40.95	46.71	46.42
Project 017	82.85	78.54	84.2	83.13	88.34	82.55	78.55
Project 018	77.32	82.89	93.87	100.89	96.49	89.34	84.36
Project 005	88.89	87.76	88.14	82.76	76.51	75.7	73.89
Project 006	95.89	90.16	90.45	90.37	79.72	77.16	76.46
Project 007	65.14	63.48	66.19	61.28	61.97	59.93	65.72
Project 008	79.58	78.91	74.9	65.21	62.53	57.89	55.41
Project 009	77.69	70.39	66.86	61.05	52.95	50.2	50.96
Project 010	72.38	63.94	64.1	63.61	59.18	49.01	49.76
Project 011	90.64	83.38	75.52	78.39	72.32	69.21	64.58
Project 012	85.43	79.48	74.65	73.42	70.63	72.14	71.23

Project Name	LZFmax_O 2kHz	LZFmax_O 4kHz	LZFmax_O 8kHz	LZFmax_O 16kHz	LZSmax_O 16Hz	LZSmax_O 31.5Hz	LZSmax_O 63Hz
Project 004	74.56	69.09	55.95	47.1	72.79	66.6	81.27
Project 002 (1)	73.75	69.71	55.47	44.61	72.66	66.79	80.43
Project 003	61.22	59.43	50.37	39.15	77.68	70.06	71.36
Project 004	75.05	69.04	70.64	59.25	91.76	98.57	96.03
Project 005	55.45	54.43	51.55	40.35	66.45	64.09	71.4
Project 006	64.16	58.97	58.15	49.89	62.49	79.42	71.56
Project 007	43.71	45.04	38.49	35.48	52.46	54.87	55.42
Project 008	76.14	73.24	68.34	61.9	92.57	85.53	78.5
Project 009	57.76	58.5	47.5	49.03	87.42	81.92	73.84
Project 010	54.88	60.34	56.05	44.02	70.96	68.26	66.04
Project 011	60.63	60.78	53.72	43.75	84.14	76.67	70.44
Project 012	70.89	63.53	57.68	45.34	85.86	80.46	72.39
Project 013	63.21	59.02	50.91	41.12	83.04	75.47	68.94
Project 014	49.47	40.99	43.92	47.92	75.37	72.16	61.75
Project 015	52.91	49.84	44.79	37.55	62.72	54.77	55.67
Project 016	40.9	49.66	38.78	39.04	64.11	58.99	55.19
Project 017	77.65	73.72	68.08	52.32	80.86	74.92	83.46
Project 018	81.4	78.52	72.21	65.1	75.95	80.31	90.39
Project 005	67.66	62.73	56.49	55.28	87.16	83.38	83.72
Project 006	70.76	65.42	59.09	53.28	94.13	85.88	87.16
Project 007	64.62	58.12	55.56	51.28	64.02	61.8	63.72
Project 008	50.57	45.87	47.48	53.46	77.04	74.19	67.03
Project 009	50.21	45.19	51.96	57.18	76.49	66.39	60.19
Project 010	45.6	41.05	45.77	48.79	70.59	62.09	61.76
Project 011	60.27	52.21	50.25	50.99	89.09	80.73	73.63
Project 012	63.96	61.88	54.59	51.22	83.17	74.25	71.01

Project Name	LZSmax_O 125Hz	LZSmax_O 250Hz	LZSmax_O 500Hz	LZSmax_O 1kHz	LZSmax_O 2kHz	LZSmax_O 4kHz	LZSmax_O 8kHz
Project 004	74.86	75.2	76.55	71.47	70.81	66.5	54.66
Project 002 (1)	74.87	76.64	76.98	71.16	69.99	66.9	53.99
Project 003	53.98	52.55	51.31	49.83	53.05	51.14	42.54
Project 004	91.85	94.12	90.65	82.72	72.58	63.95	62.16
Project 005	63.77	61.48	60.49	58.14	53.24	48.38	43.81
Project 006	70.43	68	66.91	67.23	61.74	56.08	52
Project 007	46.8	46.92	44.55	45.97	38.95	36.27	30.7
Project 008	79.62	81.45	78.64	76.25	72.88	69.42	63.84
Project 009	61.8	49.9	43.81	48.78	51.15	51.03	43.36
Project 010	62.22	58.5	49.33	48.71	46.76	55.08	49.33
Project 011	62.21	51.9	45.21	49.91	53.44	53.81	45.85
Project 012	67.04	66.89	74.05	69.78	65.86	56.01	50.22
Project 013	62.64	60.63	64.44	62.91	60.02	54.87	47.34
Project 014	50.25	40.83	41.12	44.57	40.89	35.51	43.01
Project 015	49.7	39.92	41.02	43.17	44.15	41.05	36.62
Project 016	47.09	38.77	41	40.72	39.45	44.53	33.81
Project 017	80.88	84.32	79.35	76.5	74.46	70.97	65.8
Project 018	96.88	93.61	86.93	81.29	77.81	74.8	68.11
Project 005	79.98	74.52	73.04	71.93	65.79	58.63	51.6
Project 006	87.91	76.64	73.53	73.09	67.87	62.38	55.02
Project 007	58.21	55.38	57.03	60.48	60.88	54.41	51.71
Project 008	58	54.41	54.12	53.45	44.36	39.38	46.83
Project 009	53.95	45.71	42.5	43.22	42.83	38.01	51.42
Project 010	61.84	55.98	46.68	44.34	40.86	34.11	44.65
Project 011	77.42	70.86	67.01	62.97	57.91	50.75	46.1
Project 012	70.83	67.39	69.14	67.57	58.74	53.95	48.16

Project Name	LZSmax_O 16kHz	LZFmin_O 16Hz	LZFmin_O 31.5Hz	LZFmin_O 63Hz	LZFmin_O 125Hz	LZFmin_O 250Hz	LZFmin_O 500Hz
Project 004	44.93	40.47	36.61	35.72	29.93	22.34	20.3
Project 002 (1)	43.05	40	38.26	34.95	29.01	22.85	20.79
Project 003	31.95	39.47	33.72	28.17	20.59	16.67	15.14
Project 004	50.84	30.95	29.08	26.61	21.09	16.23	15.13
Project 005	34.72	39.8	38.8	29.74	23.34	18.4	16.66
Project 006	43.97	33.02	32.55	25.95	18.32	17.89	11.66
Project 007	29.01	38.63	35.72	30.19	22.14	12.43	13.2
Project 008	56.82	55.7	47.59	41.48	36.79	30.63	28.32
Project 009	44.44	53.29	44.8	39.24	30.36	21.95	25.49
Project 010	36.68	40.86	40.33	37.72	34.93	27.78	28.34
Project 011	39.01	50.62	45.5	52.2	42.26	26.51	26.72
Project 012	40.26	50.58	46.66	50.47	40.45	26.79	26.03
Project 013	39.53	52.76	48.64	45.09	39.68	31.36	29.23
Project 014	46.94	51.84	48.17	43.49	35.13	26.34	23.76
Project 015	35.55	47.77	44.38	43.36	37.2	27.24	21.59
Project 016	34.19	52.23	50.08	48.47	40.64	29.88	29.96
Project 017	49.8	57.65	53.53	45.94	42.37	36.53	34.2
Project 018	59.93	53.64	50.75	43.25	42.85	37.8	29.35
Project 005	53.28	49.03	46.94	41.09	36.33	30.62	24.85
Project 006	51.22	55.61	50.55	45.51	40.78	30.22	26.6
Project 007	50.39	53.82	53.09	49.59	43.96	33.64	32.21
Project 008	52.47	51.82	50.7	44.53	40.44	33.35	27.82
Project 009	56.62	52.09	49.42	44.06	38.18	32.31	28.88
Project 010	47.93	54.88	52.26	50.37	46.36	40.29	35.04
Project 011	49.8	58.77	53.55	46.46	43.71	38.28	35.68
Project 012	49.91	49.69	45.05	37.84	29.28	21.02	17.82

Project Name	LZFmin_O 1kHz	LZFmin_O 2kHz	LZFmin_O 4kHz	LZFmin_O 8kHz	LZFmin_O 16kHz	LZSmin_O 16Hz	LZSmin_O 31.5Hz
Project 004	17.89	14.44	13.65	15.14	13.91	41.26	38.93
Project 002 (1)	17.97	15.38	13.63	14.74	13.81	41.77	39.58
Project 003	13.38	10.92	11.57	14.29	13.83	40.53	36.5
Project 004	12.74	10.47	11.48	12.88	13.18	32.69	32.23
Project 005	15.17	11.56	11.54	16.42	15.03	41.49	41.45
Project 006	7.46	7.43	9.93	11.87	12.6	34.79	34.22
Project 007	12.96	11.26	11.63	13.81	13.7	39.85	38.01
Project 008	27.18	27.06	27.61	25.43	19.49	58.05	50.81
Project 009	24.79	19.96	17.4	30.24	31.74	54.81	46.96
Project 010	28.6	25.51	21.13	20.21	18.29	42.84	42.66
Project 011	25.9	22.44	21.74	18.85	16.74	52.27	48.49
Project 012	26.35	22.52	21.25	18.47	17.14	52.35	48.15
Project 013	26.76	23.5	22.51	20.47	17.19	54.44	51.07
Project 014	19.14	14.02	13.22	32.99	36.14	52.8	50.05
Project 015	18.16	14.65	12.77	26.59	29.16	49.1	46.74
Project 016	25.94	21.41	18.54	15.51	13.92	53.23	52.03
Project 017	29.86	24.91	19.15	29.24	29.53	59.95	55.15
Project 018	24.75	17.46	15.27	17.16	15.53	54.77	52.91
Project 005	19.39	15.04	16.05	34.22	36.48	50.55	48.87
Project 006	24.05	22.88	22.01	25.61	25.73	60.55	54.81
Project 007	29.96	26.8	21.13	17.15	13.43	54.88	56.27
Project 008	25.11	19.08	15.61	37.05	41.44	53.25	52.63
Project 009	23.68	16.71	19.58	46.73	52.09	54.76	51.3
Project 010	29.58	22.18	17.02	39.09	41.77	55.51	54.39
Project 011	29.97	25.19	19.87	40.08	44.35	60.1	54.94
Project 012	14.92	12.71	16.34	35.63	38.8	51.46	47.96

Project Name	LZSmin_O 63Hz	LZSmin_O 125Hz	LZSmin_O 250Hz	LZSmin_O 500Hz	LZSmin_O 1kHz	LZSmin_O 2kHz	LZSmin_O 4kHz
Project 004	38.17	32.54	24.99	21.76	18.06	15.05	17.13
Project 002 (1)	37.83	32.28	24.26	22.46	20.01	17.58	17.47
Project 003	31.13	22.78	18.15	16.17	14.41	11.96	12.48
Project 004	29.42	23.24	17.53	16.47	13.94	10.94	12.46
Project 005	32.67	25.9	19.23	18.07	16.05	12.48	13.78
Project 006	28.66	20.43	19.66	13.03	8.53	8.15	10.39
Project 007	34.09	23.98	14.27	14.2	14.29	12.13	12.16
Project 008	44.45	39.23	32.53	29.32	28.53	27.87	28.42
Project 009	42.47	33.46	23.76	26.48	25.69	21.49	20
Project 010	40.86	37.12	30.29	29.31	29.44	26.13	21.79
Project 011	52.92	43.25	29.31	29.07	27.48	23.87	23.12
Project 012	52.34	42.7	28.79	29.34	29	25.92	23.34
Project 013	48.06	42.21	33.54	30.56	27.98	24.9	23.1
Project 014	46.45	37.76	27.61	24.72	19.92	14.87	13.88
Project 015	45.45	40.51	28.76	22.73	18.92	15.35	13.24
Project 016	51.27	42.6	31.35	30.99	26.9	22.11	19.37
Project 017	48.38	44.03	38.2	35.41	30.77	25.73	19.87
Project 018	45.61	45.08	39.66	30.73	25.84	18.38	16.06
Project 005	44.3	38.59	31.98	25.89	20.26	15.93	17.86
Project 006	48.76	43.3	32.22	27.95	25.58	24.62	24.24
Project 007	52.17	46.48	34.97	33.54	30.65	28.27	23.35
Project 008	47.16	42.03	34.92	28.87	25.99	20.07	16.42
Project 009	46.04	40.19	34.13	30.47	24.56	17.34	20.02
Project 010	52.33	48.57	42.59	36.34	30.64	22.96	17.4
Project 011	49.57	45.32	39.54	36.69	30.41	26.16	20.3
Project 012	40.39	31.09	22.82	18.72	15.88	13.7	17.24

Project Name	LZSmin_O 8kHz	LZSmin_O 16kHz	LZeq_O 16Hz	LZeq_O 31.5Hz	LZeq_O 63Hz	LZeq_O 125Hz	LZeq_O 250Hz	LZeq_O 500Hz
Project 004	15.86	14.43	56.51	51.43	58.35	53.5	52.4	52.05
Project 002 (1)	15.56	14.23	56.97	51.6	58.15	53.03	53.24	52.83
Project 003	15.24	14.65	55.41	49.22	48.88	37.5	32.37	31.75
Project 004	14.69	13.66	66.22	68.81	70.84	67.25	65	62.84
Project 005	16.84	15.44	46.36	46.5	51.99	42.62	38.57	36.96
Project 006	12.18	12.83	46.6	58.38	53.9	49.53	45.95	45.31
Project 007	14.43	14.72	43.81	42.16	43.63	33.93	31.42	30.03
Project 008	25.95	20.39	79.82	72.46	63.73	56.69	53.13	51.47
Project 009	34	35.81	75.98	69.95	60.24	49.2	38.88	34.71
Project 010	21.93	19.96	52.72	47.86	45.43	42.44	36.56	37.72
Project 011	21.41	19.45	73.55	65.56	58.85	49.88	39.39	36.78
Project 012	21.74	21.17	72.86	65.22	59.76	52.71	44.29	46.7
Project 013	21.03	18.16	69.78	61.81	54.01	46.93	40.47	40.61
Project 014	35.12	38.57	60.27	54.87	49.94	41.11	30.18	28.67
Project 015	27.51	30.41	56.06	50.63	48.92	43.67	31.86	27.54
Project 016	17.46	17.06	58.44	55.26	52.93	44.42	34.54	35.48
Project 017	30.62	31.15	68.3	63.13	65.97	60.49	58.5	57.32
Project 018	18.58	16.79	63.1	58.56	59.36	64.48	61.73	55.47
Project 005	35.6	37.4	73.88	67	58.9	52.23	48.22	45.94
Project 006	30.93	30.31	81.74	73.67	66.7	62.46	52.58	50.59
Project 007	20.19	13.77	59.76	59.01	54.86	50.28	39.25	38.78
Project 008	38.07	42.16	58.75	56.63	51.47	47.44	39	35.23
Project 009	48.22	53.13	62.21	54.92	51.05	44.28	37.59	34.04
Project 010	39.6	42.35	61.11	58.56	56.97	54.14	47.21	40.28
Project 011	41.63	45.98	70.84	64.4	58.13	57.72	50.82	47.54
Project 012	38.06	41.7	67.62	58.8	49.39	44.12	38.89	38.58

Project Name	LZeq_O 1kHz	LZeq_O 2kHz	LZeq_O 4kHz	LZeq_O 8kHz	LZeq_O 16kHz	Application	[System] Serial Number
Project 004	52.88	51.53	44.26	33.19	22.4	BZ7224 Version 4.7.5	3011887
Project 002 (1)	52.38	50.93	44.7	32.63	21.17	BZ7224 Version 4.7.5	3011939
Project 003	30.99	28.71	27.66	25.87	23.1	BZ7224 Version 4.7.5	3011939
Project 004	56.79	50.55	43.76	36.23	26.72	BZ7224 Version 4.7.5	3011939
Project 005	35.74	30.29	26.82	21.27	18.17	BZ7224 Version 4.7.5	3011939
Project 006	45.21	39.77	32.85	26.81	19.19	BZ7224 Version 4.7.5	3011939
Project 007	30.98	24.98	19.46	21.28	21.79	BZ7224 Version 4.7.5	3011939
Project 008	50.3	46.52	43.09	37.98	31.34	BZ7224 Version 4.7.5	3011939
Project 009	33.33	30.72	30.51	38.55	40.96	BZ7224 Version 4.7.5	3011939
Project 010	37.81	35.59	38.14	33.03	28.21	BZ7224 Version 4.7.5	3011939
Project 011	37.32	35.12	32.51	28.39	30.62	BZ7224 Version 4.7.5	3011939
Project 012	43.83	40.97	36.8	31.72	32.96	BZ7224 Version 4.7.5	3011887
Project 013	39.43	36.1	33.15	32.4	31.86	BZ7224 Version 4.7.5	3011887
Project 014	25.26	21.91	17.91	40.28	44.23	BZ7224 Version 4.7.5	3011887
Project 015	26.09	25.63	26.54	29.81	32.68	BZ7224 Version 4.7.5	3011887
Project 016	34.18	30.85	29.32	26.33	29.47	BZ7224 Version 4.7.5	3011887
Project 017	57.03	51.53	46.4	40.67	38.16	BZ7224 Version 4.7.5	3011887
Project 018	49.04	44.85	41.86	38.78	39.53	BZ7224 Version 4.7.5	3011887
Project 005	43.35	37.35	32.29	45.52	49.88	BZ7224 Version 4.7.5	3011939
Project 006	51.12	46.39	39.58	41.78	45.7	BZ7224 Version 4.7.5	3011939
Project 007	39.94	38.89	34.17	37.47	42.67	BZ7224 Version 4.7.5	3011939
Project 008	35	28.46	22.87	43.99	49.32	BZ7224 Version 4.7.5	3011939
Project 009	28.57	22.46	22.42	50.24	55.42	BZ7224 Version 4.7.5	3011939
Project 010	34.74	28.15	21.7	42.44	45.68	BZ7224 Version 4.7.5	3011939
Project 011	47.47	42.54	34.93	43.58	47.9	BZ7224 Version 4.7.5	3011939
Project 012	37.21	31.28	29.03	42.83	46.63	BZ7224 Version 4.7.5	3011939

Project Name	[System] User	[System] Instrument Type	[Transducer] Micr Used	[Transducer] Transducer Serial No
Project 004	2250	Type2250	4189(3130964)	3130964
Project 002 (1)	2250	Type2250	4189(3130955)	3130955
Project 003	2250	Type2250	4189(3130955)	3130955
Project 004	2250	Type2250	4189(3130955)	3130955
Project 005	2250	Type2250	4189(3130955)	3130955
Project 006	2250	Type2250	4189(3130955)	3130955
Project 007	2250	Type2250	4189(3130955)	3130955
Project 008	2250	Type2250	4189(3130955)	3130955
Project 009	2250	Type2250	4189(3130955)	3130955
Project 010	2250	Type2250	4189(3130955)	3130955
Project 011	2250	Type2250	4189(3130955)	3130955
Project 012	2250	Type2250	4189(3130964)	3130964
Project 013	2250	Type2250	4189(3130964)	3130964
Project 014	2250	Type2250	4189(3130964)	3130964
Project 015	2250	Type2250	4189(3130964)	3130964
Project 016	2250	Type2250	4189(3130964)	3130964
Project 017	2250	Type2250	4189(3130964)	3130964
Project 018	2250	Type2250	4189(3130964)	3130964
Project 005	2250	Type2250	4189(3130955)	3130955
Project 006	2250	Type2250	4189(3130955)	3130955
Project 007	2250	Type2250	4189(3130955)	3130955
Project 008	2250	Type2250	4189(3130955)	3130955
Project 009	2250	Type2250	4189(3130955)	3130955
Project 010	2250	Type2250	4189(3130955)	3130955
Project 011	2250	Type2250	4189(3130955)	3130955
Project 012	2250	Type2250	4189(3130955)	3130955

Project Name	[Transducer] Transducer Name	[Transducer] Transducer Family	[Transducer] Microphone Type
Project 004	4189	Microphone	4189
Project 002 (1)	4189	Microphone	4189
Project 003	4189	Microphone	4189
Project 004	4189	Microphone	4189
Project 005	4189	Microphone	4189
Project 006	4189	Microphone	4189
Project 007	4189	Microphone	4189
Project 008	4189	Microphone	4189
Project 009	4189	Microphone	4189
Project 010	4189	Microphone	4189
Project 011	4189	Microphone	4189
Project 012	4189	Microphone	4189
Project 013	4189	Microphone	4189
Project 014	4189	Microphone	4189
Project 015	4189	Microphone	4189
Project 016	4189	Microphone	4189
Project 017	4189	Microphone	4189
Project 018	4189	Microphone	4189
Project 005	4189	Microphone	4189
Project 006	4189	Microphone	4189
Project 007	4189	Microphone	4189
Project 008	4189	Microphone	4189
Project 009	4189	Microphone	4189
Project 010	4189	Microphone	4189
Project 011	4189	Microphone	4189
Project 012	4189	Microphone	4189

Project Name	[Transducer] Accelerometer Type	[Transducer] Nominal Sensitivity	[Transducer] Unit	[Transducer] Micr Capacitance
Project 004	Unknown	50	mV/Pa	13.5
Project 002 (1)	Unknown	50	mV/Pa	13.5
Project 003	Unknown	50	mV/Pa	13.5
Project 004	Unknown	50	mV/Pa	13.5
Project 005	Unknown	50	mV/Pa	13.5
Project 006	Unknown	50	mV/Pa	13.5
Project 007	Unknown	50	mV/Pa	13.5
Project 008	Unknown	50	mV/Pa	13.5
Project 009	Unknown	50	mV/Pa	13.5
Project 010	Unknown	50	mV/Pa	13.5
Project 011	Unknown	50	mV/Pa	13.5
Project 012	Unknown	50	mV/Pa	13.5
Project 013	Unknown	50	mV/Pa	13.5
Project 014	Unknown	50	mV/Pa	13.5
Project 015	Unknown	50	mV/Pa	13.5
Project 016	Unknown	50	mV/Pa	13.5
Project 017	Unknown	50	mV/Pa	13.5
Project 018	Unknown	50	mV/Pa	13.5
Project 005	Unknown	50	mV/Pa	13.5
Project 006	Unknown	50	mV/Pa	13.5
Project 007	Unknown	50	mV/Pa	13.5
Project 008	Unknown	50	mV/Pa	13.5
Project 009	Unknown	50	mV/Pa	13.5
Project 010	Unknown	50	mV/Pa	13.5
Project 011	Unknown	50	mV/Pa	13.5
Project 012	Unknown	50	mV/Pa	13.5

Project Name	[Transducer] Accelerometer Weight	[Transducer] Polarization Voltage	[Transducer] Free-field	[Transducer] CCLD
Project 004	0	0	1	0
Project 002 (1)	0	0	1	0
Project 003	0	0	1	0
Project 004	0	0	1	0
Project 005	0	0	1	0
Project 006	0	0	1	0
Project 007	0	0	1	0
Project 008	0	0	1	0
Project 009	0	0	1	0
Project 010	0	0	1	0
Project 011	0	0	1	0
Project 012	0	0	1	0
Project 013	0	0	1	0
Project 014	0	0	1	0
Project 015	0	0	1	0
Project 016	0	0	1	0
Project 017	0	0	1	0
Project 018	0	0	1	0
Project 005	0	0	1	0
Project 006	0	0	1	0
Project 007	0	0	1	0
Project 008	0	0	1	0
Project 009	0	0	1	0
Project 010	0	0	1	0
Project 011	0	0	1	0
Project 012	0	0	1	0

Project Name	[Transducer] Preamplifier ID No	[Transducer] Transd Descr	[Calibration] CalibrationTimeUTC Date Time
Project 004	27164	Free-field 1/2"	7/22/2019 14:16
Project 002 (1)	27012	Free-field 1/2"	7/22/2019 14:17
Project 003	27012	Free-field 1/2"	7/22/2019 16:07
Project 004	27012	Free-field 1/2"	7/22/2019 17:35
Project 005	27012	Free-field 1/2"	7/23/2019 3:24
Project 006	27012	Free-field 1/2"	7/23/2019 3:59
Project 007	27012	Free-field 1/2"	7/23/2019 4:28
Project 008	27012	Free-field 1/2"	7/23/2019 15:41
Project 009	27012	Free-field 1/2"	7/23/2019 18:49
Project 010	27012	Free-field 1/2"	7/23/2019 20:02
Project 011	27012	Free-field 1/2"	7/23/2019 21:19
Project 012	27164	Free-field 1/2"	7/23/2019 21:59
Project 013	27164	Free-field 1/2"	7/24/2019 3:43
Project 014	27164	Free-field 1/2"	7/24/2019 5:51
Project 015	27164	Free-field 1/2"	7/24/2019 6:20
Project 016	27164	Free-field 1/2"	7/24/2019 6:46
Project 017	27164	Free-field 1/2"	7/24/2019 16:52
Project 018	27164	Free-field 1/2"	7/24/2019 18:08
Project 005	27012	Free-field 1/2"	7/24/2019 20:29
Project 006	27012	Free-field 1/2"	7/24/2019 21:51
Project 007	27012	Free-field 1/2"	7/25/2019 3:04
Project 008	27012	Free-field 1/2"	7/25/2019 3:27
Project 009	27012	Free-field 1/2"	7/25/2019 3:51
Project 010	27012	Free-field 1/2"	7/25/2019 4:19
Project 011	27012	Free-field 1/2"	43671.20169
Project 012	27012	Free-field 1/2"	7/25/2019 14:57

Project Name	[Calibration] CalibrationTimeUTC Time Zone	[Calibration] CalibrationTimeUTC Daylight Saving
Project 004	Central Standard Time	TRUE
Project 002 (1)	Central Standard Time	TRUE
Project 003	Central Standard Time	TRUE
Project 004	Central Standard Time	TRUE
Project 005	Central Standard Time	TRUE
Project 006	Central Standard Time	TRUE
Project 007	Central Standard Time	TRUE
Project 008	Central Standard Time	TRUE
Project 009	Central Standard Time	TRUE
Project 010	Central Standard Time	TRUE
Project 011	Central Standard Time	TRUE
Project 012	Central Standard Time	TRUE
Project 013	Central Standard Time	TRUE
Project 014	Central Standard Time	TRUE
Project 015	Central Standard Time	TRUE
Project 016	Central Standard Time	TRUE
Project 017	Central Standard Time	TRUE
Project 018	Central Standard Time	TRUE
Project 005	Central Standard Time	TRUE
Project 006	Central Standard Time	TRUE
Project 007	Central Standard Time	TRUE
Project 008	Central Standard Time	TRUE
Project 009	Central Standard Time	TRUE
Project 010	Central Standard Time	TRUE
Project 011	Central Standard Time	TRUE
Project 012	Central Standard Time	TRUE

Project Name	[Calibration] CalibrationTime	[Calibration] Calibration Sensitivity	[Calibration] Unit
Project 004	7/22/2019 9:16	45.90447247	mV/Pa
Project 002 (1)	7/22/2019 9:17	47.51546681	mV/Pa
Project 003	7/22/2019 11:07	47.5849919	mV/Pa
Project 004	7/22/2019 12:35	47.51765728	mV/Pa
Project 005	7/22/2019 22:24	47.4684462	mV/Pa
Project 006	7/22/2019 22:59	47.48046771	mV/Pa
Project 007	7/22/2019 23:28	47.48702794	mV/Pa
Project 008	7/23/2019 10:41	47.51984403	mV/Pa
Project 009	7/23/2019 13:49	47.18457162	mV/Pa
Project 010	7/23/2019 15:02	47.35000059	mV/Pa
Project 011	7/23/2019 16:19	47.39472643	mV/Pa
Project 012	7/23/2019 16:59	45.91504484	mV/Pa
Project 013	7/23/2019 22:43	45.44750229	mV/Pa
Project 014	7/24/2019 0:51	45.49932852	mV/Pa
Project 015	7/24/2019 1:20	45.724608	mV/Pa
Project 016	7/24/2019 1:46	45.70198059	mV/Pa
Project 017	7/24/2019 11:52	46.08982056	mV/Pa
Project 018	7/24/2019 13:08	46.6680862	mV/Pa
Project 005	7/24/2019 15:29	47.28027433	mV/Pa
Project 006	7/24/2019 16:51	47.53407091	mV/Pa
Project 007	7/24/2019 22:04	47.56198823	mV/Pa
Project 008	7/24/2019 22:27	47.39854485	mV/Pa
Project 009	7/24/2019 22:51	47.5477539	mV/Pa
Project 010	7/24/2019 23:19	47.52367362	mV/Pa
Project 011	43670.99336	47.72270098	mV/Pa
Project 012	7/25/2019 9:57	47.75512591	mV/Pa

Project Name	[Calibration] Calibration Preamp ID No	[Calibration] Calibration User	[Calibration] Calibration Input
Project 004	27164	2250	TopSocket
Project 002 (1)	27012	2250	TopSocket
Project 003	27012	2250	TopSocket
Project 004	27012	2250	TopSocket
Project 005	27012	2250	TopSocket
Project 006	27012	2250	TopSocket
Project 007	27012	2250	TopSocket
Project 008	27012	2250	TopSocket
Project 009	27012	2250	TopSocket
Project 010	27012	2250	TopSocket
Project 011	27012	2250	TopSocket
Project 012	27164	2250	TopSocket
Project 013	27164	2250	TopSocket
Project 014	27164	2250	TopSocket
Project 015	27164	2250	TopSocket
Project 016	27164	2250	TopSocket
Project 017	27164	2250	TopSocket
Project 018	27164	2250	TopSocket
Project 005	27012	2250	TopSocket
Project 006	27012	2250	TopSocket
Project 007	27012	2250	TopSocket
Project 008	27012	2250	TopSocket
Project 009	27012	2250	TopSocket
Project 010	27012	2250	TopSocket
Project 011	27012	2250	TopSocket
Project 012	27012	2250	TopSocket

Project Name	[Calibration] Calibration Type	[Calibration] Calibration Comment	[Calibration] Deviation from initial
Project 004	External reference		-0.451400189
Project 002 (1)	External reference		0.119500182
Project 003	External reference		0.132200171
Project 004	External reference		0.119900594
Project 005	External reference		0.110900496
Project 006	External reference		0.113099943
Project 007	External reference		0.114299964
Project 008	External reference		0.120300306
Project 009	External reference		0.058800507
Project 010	External reference		0.089199951
Project 011	External reference		0.097400591
Project 012	External reference		-0.449399951
Project 013	External reference		-0.538299804
Project 014	External reference		-0.528400459
Project 015	External reference		-0.485500388
Project 016	External reference		-0.489799776
Project 017	External reference		-0.41639986
Project 018	External reference		-0.308100379
Project 005	External reference		0.076399931
Project 006	External reference		0.12290037
Project 007	External reference		0.128000199
Project 008	External reference		0.098100354
Project 009	External reference		0.1254003
Project 010	External reference		0.121000269
Project 011	External reference		0.157300489
Project 012	External reference		0.163200065

Project Name	[Calibration] Deviation from last	[Calibration] CIC Reference Ratio	[Calibration] CIC Ref. DateUTC Date Time
Project 004	-0.06470036	-36.81	1/30/2018 7:14
Project 002 (1)	0.184999661	-37.19	1/30/2018 7:14
Project 003	0.012699989	-37.19	1/30/2018 7:14
Project 004	0.011100554	-37.19	1/30/2018 7:14
Project 005	-0.003199816	-37.19	1/30/2018 7:14
Project 006	-0.089100118	-37.19	1/30/2018 7:14
Project 007	0.006599781	-37.19	1/30/2018 7:14
Project 008	0.008300358	-37.19	1/30/2018 7:14
Project 009	-0.065999549	-37.19	1/30/2018 7:14
Project 010	-0.049300109	-37.19	1/30/2018 7:14
Project 011	-0.046599639	-37.19	1/30/2018 7:14
Project 012	0.002000239	-36.81	1/30/2018 7:14
Project 013	-0.062599925	-36.81	1/30/2018 7:14
Project 014	-0.068900163	-36.81	1/30/2018 7:14
Project 015	-0.057200317	-36.81	1/30/2018 7:14
Project 016	-0.022599989	-36.81	1/30/2018 7:14
Project 017	0.048900537	-36.81	1/30/2018 7:14
Project 018	0.023399569	-36.81	1/30/2018 7:14
Project 005	-0.02100066	-37.19	1/30/2018 7:14
Project 006	-0.016799605	-37.19	1/30/2018 7:14
Project 007	-0.048200162	-37.19	1/30/2018 7:14
Project 008	-0.001800008	-37.19	1/30/2018 7:14
Project 009	0.016200037	-37.19	1/30/2018 7:14
Project 010	0.025299824	-37.19	1/30/2018 7:14
Project 011	0.051200223	-37.19	43130.30184
Project 012	0.017799706	-37.19	1/30/2018 7:14

Project Name	[Calibration] CIC Ref. DateUTC Time Zone	[Calibration] CIC Ref. DateUTC Daylight Saving	[Calibration] CIC Ref. Date
Project 004	Romance Standard Time	FALSE	1/30/2018 8:14
Project 002 (1)	Romance Standard Time	FALSE	1/30/2018 8:14
Project 003	Romance Standard Time	FALSE	1/30/2018 8:14
Project 004	Romance Standard Time	FALSE	1/30/2018 8:14
Project 005	Romance Standard Time	FALSE	1/30/2018 8:14
Project 006	Romance Standard Time	FALSE	1/30/2018 8:14
Project 007	Romance Standard Time	FALSE	1/30/2018 8:14
Project 008	Romance Standard Time	FALSE	1/30/2018 8:14
Project 009	Romance Standard Time	FALSE	1/30/2018 8:14
Project 010	Romance Standard Time	FALSE	1/30/2018 8:14
Project 011	Romance Standard Time	FALSE	1/30/2018 8:14
Project 012	Romance Standard Time	FALSE	1/30/2018 8:14
Project 013	Romance Standard Time	FALSE	1/30/2018 8:14
Project 014	Romance Standard Time	FALSE	1/30/2018 8:14
Project 015	Romance Standard Time	FALSE	1/30/2018 8:14
Project 016	Romance Standard Time	FALSE	1/30/2018 8:14
Project 017	Romance Standard Time	FALSE	1/30/2018 8:14
Project 018	Romance Standard Time	FALSE	1/30/2018 8:14
Project 005	Romance Standard Time	FALSE	1/30/2018 8:14
Project 006	Romance Standard Time	FALSE	1/30/2018 8:14
Project 007	Romance Standard Time	FALSE	1/30/2018 8:14
Project 008	Romance Standard Time	FALSE	1/30/2018 8:14
Project 009	Romance Standard Time	FALSE	1/30/2018 8:14
Project 010	Romance Standard Time	FALSE	1/30/2018 8:14
Project 011	Romance Standard Time	FALSE	43130.34351
Project 012	Romance Standard Time	FALSE	1/30/2018 8:14

Project Name	[Input] Input	[Input] Sound Field Correction	[Input] Loudness	[Input] Windscreen Auto Detect
Project 004	Top Socket	Free-field	Auto	Off
Project 002 (1)	Top Socket	Free-field	Auto	Off
Project 003	Top Socket	Free-field	Auto	Off
Project 004	Top Socket	Free-field	Auto	Off
Project 005	Top Socket	Free-field	Auto	Off
Project 006	Top Socket	Free-field	Auto	Off
Project 007	Top Socket	Free-field	Auto	Off
Project 008	Top Socket	Free-field	Auto	Off
Project 009	Top Socket	Free-field	Auto	Off
Project 010	Top Socket	Free-field	Auto	Off
Project 011	Top Socket	Free-field	Auto	Off
Project 012	Top Socket	Free-field	Auto	Off
Project 013	Top Socket	Free-field	Auto	Off
Project 014	Top Socket	Free-field	Auto	Off
Project 015	Top Socket	Free-field	Auto	Off
Project 016	Top Socket	Free-field	Auto	Off
Project 017	Top Socket	Free-field	Auto	Off
Project 018	Top Socket	Free-field	Auto	Off
Project 005	Top Socket	Free-field	Auto	Off
Project 006	Top Socket	Free-field	Auto	Off
Project 007	Top Socket	Free-field	Auto	Off
Project 008	Top Socket	Free-field	Auto	Off
Project 009	Top Socket	Free-field	Auto	Off
Project 010	Top Socket	Free-field	Auto	Off
Project 011	Top Socket	Free-field	Auto	Off
Project 012	Top Socket	Free-field	Auto	Off

Project Name	[Input] Windscreen Correction	[Input] Trigger Input	[Frequency Weightings] Broadband (excl. Peak)
Project 004	UA-1650	MATRON Handswitch	AC
Project 002 (1)	UA-1650	None/Tacho	AC
Project 003	UA-1650	None/Tacho	AC
Project 004	UA-1650	None/Tacho	AC
Project 005	UA-1650	None/Tacho	AC
Project 006	UA-1650	None/Tacho	AC
Project 007	UA-1650	None/Tacho	AC
Project 008	UA-1650	None/Tacho	AC
Project 009	UA-1650	None/Tacho	AC
Project 010	UA-1650	None/Tacho	AC
Project 011	UA-1650	None/Tacho	AC
Project 012	UA-1650	None/Tacho	AC
Project 013	UA-1650	None/Tacho	AC
Project 014	UA-1650	None/Tacho	AC
Project 015	UA-1650	None/Tacho	AC
Project 016	UA-1650	None/Tacho	AC
Project 017	UA-1650	None/Tacho	AC
Project 018	UA-1650	None/Tacho	AC
Project 005	UA-1650	None/Tacho	AC
Project 006	UA-1650	None/Tacho	AC
Project 007	UA-1650	None/Tacho	AC
Project 008	UA-1650	None/Tacho	AC
Project 009	UA-1650	None/Tacho	AC
Project 010	UA-1650	None/Tacho	AC
Project 011	UA-1650	None/Tacho	AC
Project 012	UA-1650	None/Tacho	AC

Project Name	[Frequency Weightings] Broadband Peak	[Frequency Weightings] Spectrum	[Frequency Weightings] Bandwidth
Project 004	A	Z	1/1-octave
Project 002 (1)	A	Z	1/1-octave
Project 003	A	Z	1/1-octave
Project 004	A	Z	1/1-octave
Project 005	A	Z	1/1-octave
Project 006	A	Z	1/1-octave
Project 007	A	Z	1/1-octave
Project 008	A	Z	1/1-octave
Project 009	A	Z	1/1-octave
Project 010	A	Z	1/1-octave
Project 011	A	Z	1/1-octave
Project 012	A	Z	1/1-octave
Project 013	A	Z	1/1-octave
Project 014	A	Z	1/1-octave
Project 015	A	Z	1/1-octave
Project 016	A	Z	1/1-octave
Project 017	A	Z	1/1-octave
Project 018	A	Z	1/1-octave
Project 005	A	Z	1/1-octave
Project 006	A	Z	1/1-octave
Project 007	A	Z	1/1-octave
Project 008	A	Z	1/1-octave
Project 009	A	Z	1/1-octave
Project 010	A	Z	1/1-octave
Project 011	A	Z	1/1-octave
Project 012	A	Z	1/1-octave

Project Name	[Frequency Weightings] Low Frequency	[Frequency Weightings] Bottom F. for Special Leq
Project 004	Normal	16 Hz
Project 002 (1)	Normal	16 Hz
Project 003	Normal	16 Hz
Project 004	Normal	16 Hz
Project 005	Normal	16 Hz
Project 006	Normal	16 Hz
Project 007	Normal	16 Hz
Project 008	Normal	16 Hz
Project 009	Normal	16 Hz
Project 010	Normal	16 Hz
Project 011	Normal	16 Hz
Project 012	Normal	16 Hz
Project 013	Normal	16 Hz
Project 014	Normal	16 Hz
Project 015	Normal	16 Hz
Project 016	Normal	16 Hz
Project 017	Normal	16 Hz
Project 018	Normal	16 Hz
Project 005	Normal	16 Hz
Project 006	Normal	16 Hz
Project 007	Normal	16 Hz
Project 008	Normal	16 Hz
Project 009	Normal	16 Hz
Project 010	Normal	16 Hz
Project 011	Normal	16 Hz
Project 012	Normal	16 Hz

Project Name	[Frequency Weightings] Top Freq. for Special Leq	[Statistics] Broadband Statistics based on
Project 004	250 Hz	LAF
Project 002 (1)	250 Hz	LAF
Project 003	250 Hz	LAF
Project 004	250 Hz	LAF
Project 005	250 Hz	LAF
Project 006	250 Hz	LAF
Project 007	250 Hz	LAF
Project 008	250 Hz	LAF
Project 009	250 Hz	LAF
Project 010	250 Hz	LAF
Project 011	250 Hz	LAF
Project 012	250 Hz	LAF
Project 013	250 Hz	LAF
Project 014	250 Hz	LAF
Project 015	250 Hz	LAF
Project 016	250 Hz	LAF
Project 017	250 Hz	LAF
Project 018	250 Hz	LAF
Project 005	250 Hz	LAF
Project 006	250 Hz	LAF
Project 007	250 Hz	LAF
Project 008	250 Hz	LAF
Project 009	250 Hz	LAF
Project 010	250 Hz	LAF
Project 011	250 Hz	LAF
Project 012	250 Hz	LAF

Project Name	[Statistics] Spectral Statistics based on	[Statistics] Percentile 1	[Statistics] Percentile 2	[Statistics] Percentile 3
Project 004	LXF	1	5	10
Project 002 (1)	LXF	1	5	10
Project 003	LXF	1	5	10
Project 004	LXF	1	5	10
Project 005	LXF	1	5	10
Project 006	LXF	1	5	10
Project 007	LXF	1	5	10
Project 008	LXF	1	5	10
Project 009	LXF	1	5	10
Project 010	LXF	1	5	10
Project 011	LXF	1	5	10
Project 012	LXF	1	5	10
Project 013	LXF	1	5	10
Project 014	LXF	1	5	10
Project 015	LXF	1	5	10
Project 016	LXF	1	5	10
Project 017	LXF	1	5	10
Project 018	LXF	1	5	10
Project 005	LXF	1	5	10
Project 006	LXF	1	5	10
Project 007	LXF	1	5	10
Project 008	LXF	1	5	10
Project 009	LXF	1	5	10
Project 010	LXF	1	5	10
Project 011	LXF	1	5	10
Project 012	LXF	1	5	10

Project Name	[Statistics] Percentile 4	[Statistics] Percentile 5	[Statistics] Percentile 6	[Statistics] Percentile 7
Project 004	50	90	95	99
Project 002 (1)	50	90	95	99
Project 003	50	90	95	99
Project 004	50	90	95	99
Project 005	50	90	95	99
Project 006	50	90	95	99
Project 007	50	90	95	99
Project 008	50	90	95	99
Project 009	50	90	95	99
Project 010	50	90	95	99
Project 011	50	90	95	99
Project 012	50	90	95	99
Project 013	50	90	95	99
Project 014	50	90	95	99
Project 015	50	90	95	99
Project 016	50	90	95	99
Project 017	50	90	95	99
Project 018	50	90	95	99
Project 005	50	90	95	99
Project 006	50	90	95	99
Project 007	50	90	95	99
Project 008	50	90	95	99
Project 009	50	90	95	99
Project 010	50	90	95	99
Project 011	50	90	95	99
Project 012	50	90	95	99

Project Name	[Measurement Control] Preset Logging Time	[Measurement Control] LoggingPeriodTimespan
Project 004	1.01:00:00	0:00:01
Project 002 (1)	1.01:00:00	0:00:01
Project 003	1:00:00	0:00:01
Project 004	1:00:00	0:00:01
Project 005	1:00:00	0:00:01
Project 006	1:00:00	0:00:01
Project 007	1:00:00	0:00:01
Project 008	1:00:00	0:00:01
Project 009	1:00:00	0:00:01
Project 010	1:00:00	0:00:01
Project 011	1:00:00	0:00:01
Project 012	1:00:00	0:00:01
Project 013	0:15:00	0:00:01
Project 014	0:15:00	0:00:01
Project 015	0:15:00	0:00:01
Project 016	0:15:00	0:00:01
Project 017	1:00:00	0:00:01
Project 018	1:00:00	0:00:01
Project 005	1.01:00:00	0:00:01
Project 006	1.01:00:00	0:00:01
Project 007	1.01:00:00	0:00:01
Project 008	1.01:00:00	0:00:01
Project 009	1.01:00:00	0:00:01
Project 010	1.01:00:00	0:00:01
Project 011	1.01:00:00	1.15741E-05
Project 012	1.01:00:00	0:00:01

Project Name	[Measurement Control] Synchronize with Clock	[Measurement Control] T for LAeq,T,mov
Project 004	1	1:00:00
Project 002 (1)	1	1:00:00
Project 003	1	1:00:00
Project 004	1	1:00:00
Project 005	1	1:00:00
Project 006	1	1:00:00
Project 007	1	1:00:00
Project 008	1	1:00:00
Project 009	1	1:00:00
Project 010	1	1:00:00
Project 011	1	1:00:00
Project 012	1	1:00:00
Project 013	1	1:00:00
Project 014	1	1:00:00
Project 015	1	1:00:00
Project 016	1	1:00:00
Project 017	1	1:00:00
Project 018	1	1:00:00
Project 005	1	1:00:00
Project 006	1	1:00:00
Project 007	1	1:00:00
Project 008	1	1:00:00
Project 009	1	1:00:00
Project 010	1	1:00:00
Project 011	1	0.041666667
Project 012	1	1:00:00

Project Name	[Measurement Control] Charge Injection Calibration	[Logged Broadband] FullStatisticsLogged
Project 004	Off	1
Project 002 (1)	Off	0
Project 003	Off	0
Project 004	Off	0
Project 005	Off	0
Project 006	Off	0
Project 007	Off	0
Project 008	Off	0
Project 009	Off	0
Project 010	Off	0
Project 011	Off	0
Project 012	Off	0
Project 013	Off	0
Project 014	Off	0
Project 015	Off	0
Project 016	Off	0
Project 017	Off	0
Project 018	Off	0
Project 005	Off	0
Project 006	Off	0
Project 007	Off	0
Project 008	Off	0
Project 009	Off	0
Project 010	Off	0
Project 011	Off	0
Project 012	Off	0

Project Name	[Logged Broadband] Broadband Parameters	[Logged Broadband] Parameter 1	[Logged Broadband] Parameter 2
Project 004	Selected	LAeq	LCeq
Project 002 (1)	Selected	LAeq	LCeq
Project 003	Selected	LAeq	LCeq
Project 004	Selected	LAeq	LCeq
Project 005	Selected	LAeq	LCeq
Project 006	Selected	LAeq	LCeq
Project 007	Selected	LAeq	LCeq
Project 008	Selected	LAeq	LCeq
Project 009	Selected	LAeq	LCeq
Project 010	Selected	LAeq	LCeq
Project 011	Selected	LAeq	LCeq
Project 012	Selected	LAeq	LCeq
Project 013	Selected	LAeq	LCeq
Project 014	Selected	LAeq	LCeq
Project 015	Selected	LAeq	LCeq
Project 016	Selected	LAeq	LCeq
Project 017	Selected	LAeq	LCeq
Project 018	Selected	LAeq	LCeq
Project 005	Selected	LAeq	LCeq
Project 006	Selected	LAeq	LCeq
Project 007	Selected	LAeq	LCeq
Project 008	Selected	LAeq	LCeq
Project 009	Selected	LAeq	LCeq
Project 010	Selected	LAeq	LCeq
Project 011	Selected	LAeq	LCeq
Project 012	Selected	LAeq	LCeq

Project Name	[Logged Broadband] Parameter 3	[Logged Broadband] Parameter 4	[Logged Broadband] Parameter 5
Project 004	LAIeq-LAeq	LCFmax	LCFmin
Project 002 (1)	LAFmax	LAFmin	LCeq
Project 003	LAFmax	LAFmin	LCeq
Project 004	LAFmax	LAFmin	LCeq
Project 005	LAFmax	LAFmin	LCeq
Project 006	LAFmax	LAFmin	LCeq
Project 007	LAFmax	LAFmin	LCeq
Project 008	LAFmax	LAFmin	LCeq
Project 009	LAFmax	LAFmin	LCeq
Project 010	LAFmax	LAFmin	LCeq
Project 011	LAFmax	LAFmin	LCeq
Project 012	LAFmax	LAFmin	LCeq
Project 013	LAFmax	LAFmin	LCeq
Project 014	LAFmax	LAFmin	LCeq
Project 015	LAFmax	LAFmin	LCeq
Project 016	LAFmax	LAFmin	LCeq
Project 017	LAFmax	LAFmin	LCeq
Project 018	LAFmax	LAFmin	LCeq
Project 005	LAFmax	LAFmin	LCeq
Project 006	LAFmax	LAFmin	LCeq
Project 007	LAFmax	LAFmin	LCeq
Project 008	LAFmax	LAFmin	LCeq
Project 009	LAFmax	LAFmin	LCeq
Project 010	LAFmax	LAFmin	LCeq
Project 011	LAFmax	LAFmin	LCeq
Project 012	LAFmax	LAFmin	LCeq

Project Name	[Logged Broadband] Parameter 6	[Logged Broadband] Parameter 7	[Logged Broadband] Parameter 8
Project 004	Overload	None	None
Project 002 (1)	LAIeq	None	None
Project 003	LAIeq	None	None
Project 004	LAIeq	None	None
Project 005	LAIeq	None	None
Project 006	LAIeq	None	None
Project 007	LAIeq	None	None
Project 008	LAIeq	None	None
Project 009	LAIeq	None	None
Project 010	LAIeq	None	None
Project 011	LAIeq	None	None
Project 012	LAIeq	None	None
Project 013	LAIeq	None	None
Project 014	LAIeq	None	None
Project 015	LAIeq	None	None
Project 016	LAIeq	None	None
Project 017	LAIeq	None	None
Project 018	LAIeq	None	None
Project 005	LAIeq	None	None
Project 006	LAIeq	None	None
Project 007	LAIeq	None	None
Project 008	LAIeq	None	None
Project 009	LAIeq	None	None
Project 010	LAIeq	None	None
Project 011	LAIeq	None	None
Project 012	LAIeq	None	None

Project Name	[Logged Broadband] Parameter 9	[Logged Broadband] Parameter 10	[Logged Spectrum] Full Statistics
Project 004	None	None	0
Project 002 (1)	None	None	0
Project 003	None	None	0
Project 004	None	None	0
Project 005	None	None	0
Project 006	None	None	0
Project 007	None	None	0
Project 008	None	None	0
Project 009	None	None	0
Project 010	None	None	0
Project 011	None	None	0
Project 012	None	None	0
Project 013	None	None	0
Project 014	None	None	0
Project 015	None	None	0
Project 016	None	None	0
Project 017	None	None	0
Project 018	None	None	0
Project 005	None	None	0
Project 006	None	None	0
Project 007	None	None	0
Project 008	None	None	0
Project 009	None	None	0
Project 010	None	None	0
Project 011	None	None	0
Project 012	None	None	0

Project Name	[Logged Spectrum] Spectrum Parameters	[Logged Spectrum] Spectrum 1	[Logged Spectrum] Spectrum 2
Project 004	All	LZeq	None
Project 002 (1)	All	LZeq	None
Project 003	All	LZeq	None
Project 004	All	LZeq	None
Project 005	All	LZeq	None
Project 006	All	LZeq	None
Project 007	All	LZeq	None
Project 008	All	LZeq	None
Project 009	All	LZeq	None
Project 010	All	LZeq	None
Project 011	All	LZeq	None
Project 012	All	LZeq	None
Project 013	All	LZeq	None
Project 014	All	LZeq	None
Project 015	All	LZeq	None
Project 016	All	LZeq	None
Project 017	All	LZeq	None
Project 018	All	LZeq	None
Project 005	All	LZeq	None
Project 006	All	LZeq	None
Project 007	All	LZeq	None
Project 008	All	LZeq	None
Project 009	All	LZeq	None
Project 010	All	LZeq	None
Project 011	All	LZeq	None
Project 012	All	LZeq	None

Project Name	[Logged Spectrum] Spectrum 3	[Logged Broadband (100 ms)] Parameter 1	[Logged Broadband (100 ms)] Parameter 2
Project 004	None	None	None
Project 002 (1)	None	None	None
Project 003	None	None	None
Project 004	None	None	None
Project 005	None	None	None
Project 006	None	None	None
Project 007	None	None	None
Project 008	None	None	None
Project 009	None	None	None
Project 010	None	None	None
Project 011	None	None	None
Project 012	None	None	None
Project 013	None	None	None
Project 014	None	None	None
Project 015	None	None	None
Project 016	None	None	None
Project 017	None	None	None
Project 018	None	None	None
Project 005	None	None	None
Project 006	None	None	None
Project 007	None	None	None
Project 008	None	None	None
Project 009	None	None	None
Project 010	None	None	None
Project 011	None	None	None
Project 012	None	None	None

Project Name	[Logged Broadband (100 ms)] Parameter 3	[Logged Broadband (100 ms)] Spectrum Par. 1	[Markers] Marker 1
Project 004	None	None	Exclude
Project 002 (1)	None	None	Exclude
Project 003	None	None	Exclude
Project 004	None	None	Exclude
Project 005	None	None	Exclude
Project 006	None	None	Exclude
Project 007	None	None	Exclude
Project 008	None	None	Exclude
Project 009	None	None	Exclude
Project 010	None	None	Exclude
Project 011	None	None	Exclude
Project 012	None	None	Exclude
Project 013	None	None	Exclude
Project 014	None	None	Exclude
Project 015	None	None	Exclude
Project 016	None	None	Exclude
Project 017	None	None	Exclude
Project 018	None	None	Exclude
Project 005	None	None	Exclude
Project 006	None	None	Exclude
Project 007	None	None	Exclude
Project 008	None	None	Exclude
Project 009	None	None	Exclude
Project 010	None	None	Exclude
Project 011	None	None	Exclude
Project 012	None	None	Exclude

Project Name	[Markers] Marker 2	[Markers] Marker 3	[Markers] Marker 4	[Markers] Marker 5	[Markers] Marker 6
Project 004	Manual	Level	Marker4	Marker5	Sound
Project 002 (1)	Manual	Level	Marker4	Marker5	Sound
Project 003	Manual	Level	Marker4	Marker5	Sound
Project 004	Manual	Level	Marker4	Marker5	Sound
Project 005	Manual	Level	Marker4	Marker5	Sound
Project 006	Manual	Level	Marker4	Marker5	Sound
Project 007	Manual	Level	Marker4	Marker5	Sound
Project 008	Manual	Level	Marker4	Marker5	Sound
Project 009	Manual	Level	Marker4	Marker5	Sound
Project 010	Manual	Level	Marker4	Marker5	Sound
Project 011	Manual	Level	Marker4	Marker5	Sound
Project 012	Manual	Level	Marker4	Marker5	Sound
Project 013	Manual	Level	Marker4	Marker5	Sound
Project 014	Manual	Level	Marker4	Marker5	Sound
Project 015	Manual	Level	Marker4	Marker5	Sound
Project 016	Manual	Level	Marker4	Marker5	Sound
Project 017	Manual	Level	Marker4	Marker5	Sound
Project 018	Manual	Level	Marker4	Marker5	Sound
Project 005	Manual	Level	Marker4	Marker5	Sound
Project 006	Manual	Level	Marker4	Marker5	Sound
Project 007	Manual	Level	Marker4	Marker5	Sound
Project 008	Manual	Level	Marker4	Marker5	Sound
Project 009	Manual	Level	Marker4	Marker5	Sound
Project 010	Manual	Level	Marker4	Marker5	Sound
Project 011	Manual	Level	Marker4	Marker5	Sound
Project 012	Manual	Level	Marker4	Marker5	Sound

Project Name	[Markers] Pre-marker Time	[Level Trigger] Trigger	[Level Trigger] Start Slope	[Level Trigger] Start Level
Project 004	3	Off	Rising	80
Project 002 (1)	3	Off	Rising	80
Project 003	3	Off	Rising	80
Project 004	3	Off	Rising	80
Project 005	3	Off	Rising	80
Project 006	3	Off	Rising	80
Project 007	3	Off	Rising	80
Project 008	3	Off	Rising	80
Project 009	3	Off	Rising	80
Project 010	3	Off	Rising	80
Project 011	3	Off	Rising	80
Project 012	3	Off	Rising	80
Project 013	3	Off	Rising	80
Project 014	3	Off	Rising	80
Project 015	3	Off	Rising	80
Project 016	3	Off	Rising	80
Project 017	3	Off	Rising	80
Project 018	3	Off	Rising	80
Project 005	3	Off	Rising	80
Project 006	3	Off	Rising	80
Project 007	3	Off	Rising	80
Project 008	3	Off	Rising	80
Project 009	3	Off	Rising	80
Project 010	3	Off	Rising	80
Project 011	3	Off	Rising	80
Project 012	3	Off	Rising	80

Project Name	[Level Trigger] Start Duration	[Level Trigger] Stop Level	[Level Trigger] Stop Duration	[Level Trigger] Parameter
Project 004	2	70	2	None
Project 002 (1)	2	70	2	None
Project 003	2	70	2	None
Project 004	2	70	2	None
Project 005	2	70	2	None
Project 006	2	70	2	None
Project 007	2	70	2	None
Project 008	2	70	2	None
Project 009	2	70	2	None
Project 010	2	70	2	None
Project 011	2	70	2	None
Project 012	2	70	2	None
Project 013	2	70	2	None
Project 014	2	70	2	None
Project 015	2	70	2	None
Project 016	2	70	2	None
Project 017	2	70	2	None
Project 018	2	70	2	None
Project 005	2	70	2	None
Project 006	2	70	2	None
Project 007	2	70	2	None
Project 008	2	70	2	None
Project 009	2	70	2	None
Project 010	2	70	2	None
Project 011	2	70	2	None
Project 012	2	70	2	None

Project Name	[Sound Recording] Recording Control	[Sound Recording] Recording Quality	[Sound Recording] Recorded Signal
Project 004	Automatic	Fair	Input Z-weighted
Project 002 (1)	Automatic	High	Input Z-weighted
Project 003	Automatic	High	Input Z-weighted
Project 004	Automatic	High	Input Z-weighted
Project 005	Automatic	High	Input Z-weighted
Project 006	Automatic	High	Input Z-weighted
Project 007	Automatic	High	Input Z-weighted
Project 008	Automatic	High	Input Z-weighted
Project 009	Automatic	High	Input Z-weighted
Project 010	Automatic	High	Input Z-weighted
Project 011	Automatic	High	Input Z-weighted
Project 012	Automatic	High	Input Z-weighted
Project 013	Automatic	High	Input Z-weighted
Project 014	Automatic	High	Input Z-weighted
Project 015	Automatic	High	Input Z-weighted
Project 016	Automatic	High	Input Z-weighted
Project 017	Automatic	High	Input Z-weighted
Project 018	Automatic	High	Input Z-weighted
Project 005	Automatic	High	Input Z-weighted
Project 006	Automatic	High	Input Z-weighted
Project 007	Automatic	High	Input Z-weighted
Project 008	Automatic	High	Input Z-weighted
Project 009	Automatic	High	Input Z-weighted
Project 010	Automatic	High	Input Z-weighted
Project 011	Automatic	High	Input Z-weighted
Project 012	Automatic	High	Input Z-weighted

Project Name	[Sound Recording] Automatic Gain Control	[Sound Recording] Resolution	[Sound Recording] Peak Rec. Level
Project 004	On	16 bit	145.6400018
Project 002 (1)	On	16 bit	145.7099939
Project 003	On	16 bit	145.6999994
Project 004	On	16 bit	145.7099939
Project 005	On	16 bit	145.7200037
Project 006	On	16 bit	145.7099939
Project 007	On	16 bit	145.7099939
Project 008	On	16 bit	145.7099939
Project 009	On	16 bit	145.7700067
Project 010	On	16 bit	145.7399927
Project 011	On	16 bit	145.7299982
Project 012	On	16 bit	145.6799951
Project 013	On	16 bit	145.6799951
Project 014	On	16 bit	145.5999933
Project 015	On	16 bit	145.5699945
Project 016	On	16 bit	145.5999933
Project 017	On	16 bit	145.6400018
Project 018	On	16 bit	145.5999933
Project 005	On	16 bit	145.7500024
Project 006	On	16 bit	145.6999994
Project 007	On	16 bit	145.6999994
Project 008	On	16 bit	145.7299982
Project 009	On	16 bit	145.6999994
Project 010	On	16 bit	145.7099939
Project 011	On	16 bit	145.6700006
Project 012	On	16 bit	145.6600061

Project Name	[Sound Recording] Pre-recording Time	[Sound Recording] Post-recording Time	[Sound Recording] Duration Limit
Project 004	0:00:10	0:00:02	Off
Project 002 (1)	0:00:10	0:00:02	Off
Project 003	0:00:10	0:00:02	Off
Project 004	0:00:10	0:00:02	Off
Project 005	0:00:10	0:00:02	Off
Project 006	0:00:10	0:00:02	Off
Project 007	0:00:10	0:00:02	Off
Project 008	0:00:10	0:00:02	Off
Project 009	0:00:10	0:00:02	Off
Project 010	0:00:10	0:00:02	Off
Project 011	0:00:10	0:00:02	Off
Project 012	0:00:10	0:00:02	Off
Project 013	0:00:10	0:00:02	Off
Project 014	0:00:10	0:00:02	Off
Project 015	0:00:10	0:00:02	Off
Project 016	0:00:10	0:00:02	Off
Project 017	0:00:10	0:00:02	Off
Project 018	0:00:10	0:00:02	Off
Project 005	0:00:10	0:00:02	Off
Project 006	0:00:10	0:00:02	Off
Project 007	0:00:10	0:00:02	Off
Project 008	0:00:10	0:00:02	Off
Project 009	0:00:10	0:00:02	Off
Project 010	0:00:10	0:00:02	Off
Project 011	0.000115741	2.31481E-05	Off
Project 012	0:00:10	0:00:02	Off

Project Name	[Sound Recording] Minimum Duration	[Sound Recording] Maximum Duration	[Output Socket Signal] Source
Project 004	0:00:30	0:00:31	Off
Project 002 (1)	0:00:05	0:02:00	Off
Project 003	0:00:05	0:02:00	Off
Project 004	0:00:05	0:02:00	Off
Project 005	0:00:05	0:02:00	Off
Project 006	0:00:05	0:02:00	Off
Project 007	0:00:05	0:02:00	Off
Project 008	0:00:05	0:02:00	Off
Project 009	0:00:05	0:02:00	Off
Project 010	0:00:05	0:02:00	Off
Project 011	0:00:05	0:02:00	Off
Project 012	0:00:05	0:02:00	Off
Project 013	0:00:05	0:02:00	Off
Project 014	0:00:05	0:02:00	Off
Project 015	0:00:05	0:02:00	Off
Project 016	0:00:05	0:02:00	Off
Project 017	0:00:05	0:02:00	Off
Project 018	0:00:05	0:02:00	Off
Project 005	0:00:05	0:02:00	Off
Project 006	0:00:05	0:02:00	Off
Project 007	0:00:05	0:02:00	Off
Project 008	0:00:05	0:02:00	Off
Project 009	0:00:05	0:02:00	Off
Project 010	0:00:05	0:02:00	Off
Project 011	5.78704E-05	0.001388889	Off
Project 012	0:00:05	0:02:00	Off

Project Name	[Output Socket Signal] Gain	[Output Socket Signal] DC Output (20mV/dB)	[Occupational Health] Exposure Time
Project 004	0	0	7:30:00
Project 002 (1)	0	0	7:30:00
Project 003	0	0	7:30:00
Project 004	0	0	7:30:00
Project 005	0	0	7:30:00
Project 006	0	0	7:30:00
Project 007	0	0	7:30:00
Project 008	0	0	7:30:00
Project 009	0	0	7:30:00
Project 010	0	0	7:30:00
Project 011	0	0	7:30:00
Project 012	0	0	7:30:00
Project 013	0	0	7:30:00
Project 014	0	0	7:30:00
Project 015	0	0	7:30:00
Project 016	0	0	7:30:00
Project 017	0	0	7:30:00
Project 018	0	0	7:30:00
Project 005	0	0	7:30:00
Project 006	0	0	7:30:00
Project 007	0	0	7:30:00
Project 008	0	0	7:30:00
Project 009	0	0	7:30:00
Project 010	0	0	7:30:00
Project 011	0	0	0.3125
Project 012	0	0	7:30:00

Project Name	[Occupational Health] Reference Time	[Occupational Health] Threshold Level	[Occupational Health] Criterion Level
Project 004	8:00:00	70	85
Project 002 (1)	8:00:00	70	85
Project 003	8:00:00	70	85
Project 004	8:00:00	70	85
Project 005	8:00:00	70	85
Project 006	8:00:00	70	85
Project 007	8:00:00	70	85
Project 008	8:00:00	70	85
Project 009	8:00:00	70	85
Project 010	8:00:00	70	85
Project 011	8:00:00	70	85
Project 012	8:00:00	70	85
Project 013	8:00:00	70	85
Project 014	8:00:00	70	85
Project 015	8:00:00	70	85
Project 016	8:00:00	70	85
Project 017	8:00:00	70	85
Project 018	8:00:00	70	85
Project 005	8:00:00	70	85
Project 006	8:00:00	70	85
Project 007	8:00:00	70	85
Project 008	8:00:00	70	85
Project 009	8:00:00	70	85
Project 010	8:00:00	70	85
Project 011	0.333333333	70	85
Project 012	8:00:00	70	85

Project Name	[Occupational Health] PeaksOver Level	[Occupational Health] Exchange Rate for Lav
Project 004	140	5 dB
Project 002 (1)	140	5 dB
Project 003	140	5 dB
Project 004	140	5 dB
Project 005	140	5 dB
Project 006	140	5 dB
Project 007	140	5 dB
Project 008	140	5 dB
Project 009	140	5 dB
Project 010	140	5 dB
Project 011	140	5 dB
Project 012	140	5 dB
Project 013	140	5 dB
Project 014	140	5 dB
Project 015	140	5 dB
Project 016	140	5 dB
Project 017	140	5 dB
Project 018	140	5 dB
Project 005	140	5 dB
Project 006	140	5 dB
Project 007	140	5 dB
Project 008	140	5 dB
Project 009	140	5 dB
Project 010	140	5 dB
Project 011	140	5 dB
Project 012	140	5 dB

Project Name	[Occupational Health] Time Weighting for Lav	[Tone Assessment] Tone Assessment	[Tone Assessment] Tone Standard
Project 004	S	Off	ISO 1996-2:2007
Project 002 (1)	S	Off	ISO 1996-2:2007
Project 003	S	Off	ISO 1996-2:2007
Project 004	S	Off	ISO 1996-2:2007
Project 005	S	Off	ISO 1996-2:2007
Project 006	S	Off	ISO 1996-2:2007
Project 007	S	Off	ISO 1996-2:2007
Project 008	S	Off	ISO 1996-2:2007
Project 009	S	Off	ISO 1996-2:2007
Project 010	S	Off	ISO 1996-2:2007
Project 011	S	Off	ISO 1996-2:2007
Project 012	S	Off	ISO 1996-2:2007
Project 013	S	Off	ISO 1996-2:2007
Project 014	S	Off	ISO 1996-2:2007
Project 015	S	Off	ISO 1996-2:2007
Project 016	S	Off	ISO 1996-2:2007
Project 017	S	Off	ISO 1996-2:2007
Project 018	S	Off	ISO 1996-2:2007
Project 005	S	Off	ISO 1996-2:2007
Project 006	S	Off	ISO 1996-2:2007
Project 007	S	Off	ISO 1996-2:2007
Project 008	S	Off	ISO 1996-2:2007
Project 009	S	Off	ISO 1996-2:2007
Project 010	S	Off	ISO 1996-2:2007
Project 011	S	Off	ISO 1996-2:2007
Project 012	S	Off	ISO 1996-2:2007

Project Name	[Tone Assessment] Adjustment	[Tone Assessment] Low Freq. Last Band	[Tone Assessment] Middle Freq. Last Band
Project 004	5	Hz125	Hz400
Project 002 (1)	5	Hz125	Hz400
Project 003	5	Hz125	Hz400
Project 004	5	Hz125	Hz400
Project 005	5	Hz125	Hz400
Project 006	5	Hz125	Hz400
Project 007	5	Hz125	Hz400
Project 008	5	Hz125	Hz400
Project 009	5	Hz125	Hz400
Project 010	5	Hz125	Hz400
Project 011	5	Hz125	Hz400
Project 012	5	Hz125	Hz400
Project 013	5	Hz125	Hz400
Project 014	5	Hz125	Hz400
Project 015	5	Hz125	Hz400
Project 016	5	Hz125	Hz400
Project 017	5	Hz125	Hz400
Project 018	5	Hz125	Hz400
Project 005	5	Hz125	Hz400
Project 006	5	Hz125	Hz400
Project 007	5	Hz125	Hz400
Project 008	5	Hz125	Hz400
Project 009	5	Hz125	Hz400
Project 010	5	Hz125	Hz400
Project 011	5	Hz125	Hz400
Project 012	5	Hz125	Hz400

Project Name	[Tone Assessment] Level Difference Low	[Tone Assessment] Level Difference Middle
Project 004	15	8
Project 002 (1)	15	8
Project 003	15	8
Project 004	15	8
Project 005	15	8
Project 006	15	8
Project 007	15	8
Project 008	15	8
Project 009	15	8
Project 010	15	8
Project 011	15	8
Project 012	15	8
Project 013	15	8
Project 014	15	8
Project 015	15	8
Project 016	15	8
Project 017	15	8
Project 018	15	8
Project 005	15	8
Project 006	15	8
Project 007	15	8
Project 008	15	8
Project 009	15	8
Project 010	15	8
Project 011	15	8
Project 012	15	8

Project Name	[Tone Assessment] Level Difference High	[Tone Assessment] ISO 226	[Tacho] Tacho	[Tacho] RPM Gear Ratio
Project 004	5	1987 Free-field	Off	1
Project 002 (1)	5	1987 Free-field	Off	1
Project 003	5	1987 Free-field	Off	1
Project 004	5	1987 Free-field	Off	1
Project 005	5	1987 Free-field	Off	1
Project 006	5	1987 Free-field	Off	1
Project 007	5	1987 Free-field	Off	1
Project 008	5	1987 Free-field	Off	1
Project 009	5	1987 Free-field	Off	1
Project 010	5	1987 Free-field	Off	1
Project 011	5	1987 Free-field	Off	1
Project 012	5	1987 Free-field	Off	1
Project 013	5	1987 Free-field	Off	1
Project 014	5	1987 Free-field	Off	1
Project 015	5	1987 Free-field	Off	1
Project 016	5	1987 Free-field	Off	1
Project 017	5	1987 Free-field	Off	1
Project 018	5	1987 Free-field	Off	1
Project 005	5	1987 Free-field	Off	1
Project 006	5	1987 Free-field	Off	1
Project 007	5	1987 Free-field	Off	1
Project 008	5	1987 Free-field	Off	1
Project 009	5	1987 Free-field	Off	1
Project 010	5	1987 Free-field	Off	1
Project 011	5	1987 Free-field	Off	1
Project 012	5	1987 Free-field	Off	1

Project Name	[Tacho] External Level	[Tacho] Hysteresis	[Tacho] Slope	[Tacho] CCLD	Start TimeUTC Date Time
Project 004	18.1	0.1	Falling	On	7/22/2019 14:24
Project 002 (1)	18.1	0.1	Falling	On	7/22/2019 14:23
Project 003	18.1	0.1	Falling	On	7/22/2019 16:09
Project 004	18.1	0.1	Falling	On	7/22/2019 17:40
Project 005	18.1	0.1	Falling	On	7/23/2019 3:28
Project 006	18.1	0.1	Falling	On	7/23/2019 4:02
Project 007	18.1	0.1	Falling	On	7/23/2019 4:31
Project 008	18.1	0.1	Falling	On	7/23/2019 15:49
Project 009	18.1	0.1	Falling	On	7/23/2019 18:50
Project 010	18.1	0.1	Falling	On	7/23/2019 20:05
Project 011	18.1	0.1	Falling	On	7/23/2019 21:19
Project 012	18.1	0.1	Falling	On	7/23/2019 22:00
Project 013	18.1	0.1	Falling	On	7/24/2019 3:45
Project 014	18.1	0.1	Falling	On	7/24/2019 5:52
Project 015	18.1	0.1	Falling	On	7/24/2019 6:21
Project 016	18.1	0.1	Falling	On	7/24/2019 6:48
Project 017	18.1	0.1	Falling	On	7/24/2019 16:54
Project 018	18.1	0.1	Falling	On	7/24/2019 18:10
Project 005	18.1	0.1	Falling	On	7/24/2019 20:34
Project 006	18.1	0.1	Falling	On	7/24/2019 21:53
Project 007	18.1	0.1	Falling	On	7/25/2019 3:07
Project 008	18.1	0.1	Falling	On	7/25/2019 3:29
Project 009	18.1	0.1	Falling	On	7/25/2019 3:54
Project 010	18.1	0.1	Falling	On	7/25/2019 4:22
Project 011	18.1	0.1	Falling	On	7/25/2019 4:53
Project 012	18.1	0.1	Falling	On	7/25/2019 14:58

Project Name	Start TimeUTC Time Zone	Start TimeUTC Daylight Saving	Start Time	Stop TimeUTC Date Time
Project 004	Central Standard Time	TRUE	7/22/2019 9:24	7/22/2019 15:27
Project 002 (1)	Central Standard Time	TRUE	7/22/2019 9:23	7/22/2019 15:25
Project 003	Central Standard Time	TRUE	7/22/2019 11:09	7/22/2019 17:09
Project 004	Central Standard Time	TRUE	7/22/2019 12:40	7/22/2019 18:40
Project 005	Central Standard Time	TRUE	7/22/2019 22:28	7/23/2019 3:45
Project 006	Central Standard Time	TRUE	7/22/2019 23:02	7/23/2019 4:17
Project 007	Central Standard Time	TRUE	7/22/2019 23:31	7/23/2019 4:46
Project 008	Central Standard Time	TRUE	7/23/2019 10:49	7/23/2019 16:49
Project 009	Central Standard Time	TRUE	7/23/2019 13:50	7/23/2019 19:50
Project 010	Central Standard Time	TRUE	7/23/2019 15:05	7/23/2019 21:05
Project 011	Central Standard Time	TRUE	7/23/2019 16:19	7/23/2019 21:51
Project 012	Central Standard Time	TRUE	7/23/2019 17:00	7/23/2019 22:30
Project 013	Central Standard Time	TRUE	7/23/2019 22:45	7/24/2019 4:00
Project 014	Central Standard Time	TRUE	7/24/2019 0:52	7/24/2019 6:07
Project 015	Central Standard Time	TRUE	7/24/2019 1:21	7/24/2019 6:36
Project 016	Central Standard Time	TRUE	7/24/2019 1:48	7/24/2019 7:03
Project 017	Central Standard Time	TRUE	7/24/2019 11:54	7/24/2019 17:54
Project 018	Central Standard Time	TRUE	7/24/2019 13:10	7/24/2019 20:01
Project 005	Central Standard Time	TRUE	7/24/2019 15:34	7/24/2019 21:36
Project 006	Central Standard Time	TRUE	7/24/2019 16:53	7/24/2019 22:55
Project 007	Central Standard Time	TRUE	7/24/2019 22:07	7/25/2019 3:22
Project 008	Central Standard Time	TRUE	7/24/2019 22:29	7/25/2019 3:46
Project 009	Central Standard Time	TRUE	7/24/2019 22:54	7/25/2019 4:09
Project 010	Central Standard Time	TRUE	7/24/2019 23:22	7/25/2019 4:39
Project 011	Central Standard Time	TRUE	7/24/2019 23:53	7/25/2019 5:10
Project 012	Central Standard Time	TRUE	7/25/2019 9:58	7/25/2019 15:59

Project Name	Stop TimeUTC Time Zone	Stop TimeUTC Daylight Saving	Stop Time	TApeakUTC Date Time	TApeakUTC Time Zone
Project 004	Central Standard Time	TRUE	7/22/2019 10:27	7/22/2019 15:23	Central Standard Time
Project 002 (1)	Central Standard Time	TRUE	7/22/2019 10:25	7/22/2019 14:55	Central Standard Time
Project 003	Central Standard Time	TRUE	7/22/2019 12:09	7/22/2019 16:27	Central Standard Time
Project 004	Central Standard Time	TRUE	7/22/2019 13:40	7/22/2019 18:13	Central Standard Time
Project 005	Central Standard Time	TRUE	7/22/2019 22:45	7/23/2019 3:44	Central Standard Time
Project 006	Central Standard Time	TRUE	7/22/2019 23:17	7/23/2019 4:16	Central Standard Time
Project 007	Central Standard Time	TRUE	7/22/2019 23:46	7/23/2019 4:32	Central Standard Time
Project 008	Central Standard Time	TRUE	7/23/2019 11:49	7/23/2019 16:38	Central Standard Time
Project 009	Central Standard Time	TRUE	7/23/2019 14:50	7/23/2019 19:06	Central Standard Time
Project 010	Central Standard Time	TRUE	7/23/2019 16:05	7/23/2019 20:23	Central Standard Time
Project 011	Central Standard Time	TRUE	7/23/2019 16:51	7/23/2019 21:34	Central Standard Time
Project 012	Central Standard Time	TRUE	7/23/2019 17:30	7/23/2019 22:14	Central Standard Time
Project 013	Central Standard Time	TRUE	7/23/2019 23:00	7/24/2019 3:52	Central Standard Time
Project 014	Central Standard Time	TRUE	7/24/2019 1:07	7/24/2019 5:52	Central Standard Time
Project 015	Central Standard Time	TRUE	7/24/2019 1:36	7/24/2019 6:22	Central Standard Time
Project 016	Central Standard Time	TRUE	7/24/2019 2:03	7/24/2019 7:00	Central Standard Time
Project 017	Central Standard Time	TRUE	7/24/2019 12:54	7/24/2019 17:12	Central Standard Time
Project 018	Central Standard Time	TRUE	7/24/2019 15:01	7/24/2019 19:40	Central Standard Time
Project 005	Central Standard Time	TRUE	7/24/2019 16:36	7/24/2019 21:18	Central Standard Time
Project 006	Central Standard Time	TRUE	7/24/2019 17:55	7/24/2019 22:38	Central Standard Time
Project 007	Central Standard Time	TRUE	7/24/2019 22:22	7/25/2019 3:18	Central Standard Time
Project 008	Central Standard Time	TRUE	7/24/2019 22:46	7/25/2019 3:45	Central Standard Time
Project 009	Central Standard Time	TRUE	7/24/2019 23:09	7/25/2019 3:56	Central Standard Time
Project 010	Central Standard Time	TRUE	7/24/2019 23:39	7/25/2019 4:22	Central Standard Time
Project 011	Central Standard Time	TRUE	7/25/2019 0:10	7/25/2019 5:10	Central Standard Time
Project 012	Central Standard Time	TRUE	7/25/2019 10:59	7/25/2019 15:58	Central Standard Time

Project Name	TApeakUTC Daylight Saving	TApeak	CIC 1 Ratio DateUTC Date Time	CIC 1 Ratio DateUTC Time Zone
Project 004	TRUE	7/22/2019 10:23	12:00:00 AM	Central Standard Time
Project 002 (1)	TRUE	7/22/2019 9:55	12:00:00 AM	Central Standard Time
Project 003	TRUE	7/22/2019 11:27	12:00:00 AM	Central Standard Time
Project 004	TRUE	7/22/2019 13:13	12:00:00 AM	Central Standard Time
Project 005	TRUE	7/22/2019 22:44	12:00:00 AM	Central Standard Time
Project 006	TRUE	7/22/2019 23:16	12:00:00 AM	Central Standard Time
Project 007	TRUE	7/22/2019 23:32	12:00:00 AM	Central Standard Time
Project 008	TRUE	7/23/2019 11:38	12:00:00 AM	Central Standard Time
Project 009	TRUE	7/23/2019 14:06	12:00:00 AM	Central Standard Time
Project 010	TRUE	7/23/2019 15:23	12:00:00 AM	Central Standard Time
Project 011	TRUE	7/23/2019 16:34	12:00:00 AM	Central Standard Time
Project 012	TRUE	7/23/2019 17:14	12:00:00 AM	Central Standard Time
Project 013	TRUE	7/23/2019 22:52	12:00:00 AM	Central Standard Time
Project 014	TRUE	7/24/2019 0:52	12:00:00 AM	Central Standard Time
Project 015	TRUE	7/24/2019 1:22	12:00:00 AM	Central Standard Time
Project 016	TRUE	7/24/2019 2:00	12:00:00 AM	Central Standard Time
Project 017	TRUE	7/24/2019 12:12	12:00:00 AM	Central Standard Time
Project 018	TRUE	7/24/2019 14:40	12:00:00 AM	Central Standard Time
Project 005	TRUE	7/24/2019 16:18	12:00:00 AM	Central Standard Time
Project 006	TRUE	7/24/2019 17:38	12:00:00 AM	Central Standard Time
Project 007	TRUE	7/24/2019 22:18	12:00:00 AM	Central Standard Time
Project 008	TRUE	7/24/2019 22:45	12:00:00 AM	Central Standard Time
Project 009	TRUE	7/24/2019 22:56	12:00:00 AM	Central Standard Time
Project 010	TRUE	7/24/2019 23:22	12:00:00 AM	Central Standard Time
Project 011	TRUE	7/25/2019 0:10	12:00:00 AM	Central Standard Time
Project 012	TRUE	7/25/2019 10:58	12:00:00 AM	Central Standard Time

Project Name	CIC 1 Ratio DateUTC Daylight Saving	CIC 1 Ratio Date	CIC 2 Ratio DateUTC Date Time	CIC 2 Ratio DateUTC Time Zone
Project 004	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 002 (1)	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 003	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 004	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 005	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 006	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 007	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 008	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 009	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 010	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 011	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 012	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 013	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 014	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 015	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 016	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 017	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 018	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 005	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 006	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 007	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 008	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 009	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 010	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 011	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time
Project 012	TRUE	12:00:00 AM	12:00:00 AM	Central Standard Time

Project Name	CIC 2 Ratio DateUTC Daylight Saving	CIC 2 Ratio Date	[Spectrum] Base	[Spectrum] Bandwidth	[Spectrum] First Index
Project 004	TRUE	12:00:00 AM	10	1/1	4
Project 002 (1)	TRUE	12:00:00 AM	10	1/1	4
Project 003	TRUE	12:00:00 AM	10	1/1	4
Project 004	TRUE	12:00:00 AM	10	1/1	4
Project 005	TRUE	12:00:00 AM	10	1/1	4
Project 006	TRUE	12:00:00 AM	10	1/1	4
Project 007	TRUE	12:00:00 AM	10	1/1	4
Project 008	TRUE	12:00:00 AM	10	1/1	4
Project 009	TRUE	12:00:00 AM	10	1/1	4
Project 010	TRUE	12:00:00 AM	10	1/1	4
Project 011	TRUE	12:00:00 AM	10	1/1	4
Project 012	TRUE	12:00:00 AM	10	1/1	4
Project 013	TRUE	12:00:00 AM	10	1/1	4
Project 014	TRUE	12:00:00 AM	10	1/1	4
Project 015	TRUE	12:00:00 AM	10	1/1	4
Project 016	TRUE	12:00:00 AM	10	1/1	4
Project 017	TRUE	12:00:00 AM	10	1/1	4
Project 018	TRUE	12:00:00 AM	10	1/1	4
Project 005	TRUE	12:00:00 AM	10	1/1	4
Project 006	TRUE	12:00:00 AM	10	1/1	4
Project 007	TRUE	12:00:00 AM	10	1/1	4
Project 008	TRUE	12:00:00 AM	10	1/1	4
Project 009	TRUE	12:00:00 AM	10	1/1	4
Project 010	TRUE	12:00:00 AM	10	1/1	4
Project 011	TRUE	12:00:00 AM	10	1/1	4
Project 012	TRUE	12:00:00 AM	10	1/1	4

Project Name	[Spectrum] Number Of Data
Project 004	11
Project 002 (1)	11
Project 003	11
Project 004	11
Project 005	11
Project 006	11
Project 007	11
Project 008	11
Project 009	11
Project 010	11
Project 011	11
Project 012	11
Project 013	11
Project 014	11
Project 015	11
Project 016	11
Project 017	11
Project 018	11
Project 005	11
Project 006	11
Project 007	11
Project 008	11
Project 009	11
Project 010	11
Project 011	11
Project 012	11

NORTH BAKKEN EXPANSION PROJECT

Pre-Construction Noise Survey and Acoustical Analysis
McKenzie and Williams Counties, North Dakota

APPENDIX D
Noise Calculations for Compressor Station Sound Power Levels

Elkhorn Creek

Indoor Equipment	**Quantity**	**32**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total L_W**
Compressor Engine Mechanical (CAT G3612 A4)	1	108	121.3	125.7	119.6	119.6	118.9	119.7	118.8	110.9	125.7
Engine Exhaust	1	107.9	122.9	121	120.5	122.5	127.5	132.8	139	140.3	143.3
Catalyst Insertion Loss	1	30	30	30	30	30	30	30	30	30	---
Mitigated Exhaust Noise	1	77.9	92.9	91	90.5	92.5	97.5	102.8	109	110.3	113.3
Compressor (Ariel KBU-4)	1	0.0	99.0	99.0	109.0	99.0	95.0	91.0	89.0	85.0	103.2
Total	**---**	**108.0**	**121.3**	**125.7**	**120.0**	**119.6**	**118.9**	**119.8**	**119.2**	**113.6**	**126.0**
Wall and Roof Transmission Loss	---	0.0	0.0	12.0	16.0	26.0	33.0	36.0	47.0	0.0	---
Total Outside Compressor Building	**---**	**108.0**	**121.3**	**113.7**	**104.0**	**93.6**	**85.9**	**83.8**	**72.2**	**113.6**	**112.9**

Outdoor Equipment	**Quantity**	**Single L_P (dBA)**	**d (m)**	**Single L_W (dBA)**	**Total L_W (dBA)**	**Overall Station L_W**
Gas Cooler	1	71.9	15	106.4	106.4	**114.4**
Aux Cooler	1	71.1	15	105.6	105.6	

Tioga

Indoor Equipment	**Quantity**	**32**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total L_W**
Compressor Engine Mechanical (CAT G3612 A4)	6	108	121.3	125.7	119.6	119.6	118.9	119.7	118.8	110.9	125.7
Engine Exhaust	6	107.9	122.9	121	120.5	122.5	127.5	132.8	139	140.3	143.3
Catalyst Insertion Loss	6	30	30	30	30	30	30	30	30	30	---
Mitigated Exhaust Noise	6	77.9	92.9	91	90.5	92.5	97.5	102.8	109	110.3	113.3
Compressor (Ariel KBU-4)	6	0.0	99.0	99.0	109.0	99.0	95.0	91.0	89.0	85.0	103.2
Generator Mechanical (L5794GSI)	1	94.7	112.7	113.7	110.7	109.7	107.7	106.7	106.7	104.7	114.3
Generator Exhaust	1	112.7	130.7	132.7	122.7	119.7	114.7	111.7	104.7	91.7	122.3
Silencer Insertion Loss	1	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	---
Mitigated Exhaust Noise	1	80.7	98.7	100.7	90.7	87.7	82.7	79.7	72.7	59.7	90.3
Total	**---**	**115.8**	**129.2**	**133.5**	**127.8**	**127.5**	**126.8**	**127.6**	**127.1**	**121.5**	**133.8**
Wall and Roof Transmission Loss	---	0.0	0.0	12.0	16.0	26.0	33.0	36.0	47.0	0.0	---
Total Outside Compressor Building	**---**	**115.8**	**129.2**	**121.5**	**111.8**	**101.5**	**93.8**	**91.6**	**80.1**	**121.5**	**120.7**

Outdoor Equipment	**Quantity**	**Single L_P (dBA)**	**d (m)**	**Single L_W (dBA)**	**Total L_W (dBA)**	**Overall Station L_W**
Gas Cooler	6	71.9	15	106.4	114.2	**122.2**
Aux Cooler	6	71.1	15	105.6	113.4	

APPENDIX K

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE PROJECTS EVALUATED FOR POTENTIAL CUMULATIVE IMPACTS WITH THE NORTH BAKKEN EXPANSION PROJECT

APPENDIX K

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Montana-Dakota Utilities Transmission Line	Energy	Montana-Dakota Utilities is seeking to purchase a 50-foot-wide strip of land from Stenehjem Holdings for the purpose of constructing an overhead electric transmission line in or near Watford City.	Early permitting phases	Unknown	Unknown	Williams	Franz Yard	3 W	0	WW, VG, WF, TE, SO, LU, VS	(Watford City Planning and Zoning Commission, 2015)
Aurora Wind Electric Transmission Line	Energy	The Aurora Wind electric transmission line is an approximately 20-mile-long 345-kilovolt aboveground transmission line. It would extend from the proposed Aurora Wind Project substation in Williams County to the existing Basin Electric Power Cooperative Tande Substation located in Mountrail County.	Under construc-tion	3Q 2019	4Q 2020	Mountrail, Williams	CRS Yard	0	<1	WW, VG, WF, TE, CR, GS, N-con, N-op, SO, LU, RS, VS	(Burns & McDonnell, 2018a; Aurora Wind Project, LLC, 2020)
Aurora Wind Project	Energy	The Aurora Wind Project is a proposed wind energy development that would generate up to 300 megawatts of electricity at rated capacity.	Under construc-tion	3Q 2019	4Q 2020	Williams, Mountrail	Weflen Staging Yard	4 W	0	N-op, SO, LU, VS	(Burns & McDonnell, 2018b; Aurora Wind Project, LLC, 2020)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
		It would include construction of up to 121 wind turbines located on a 48,000-acre site approximately 5 miles northwest of Tioga.									
Demicks Lake Plant II	Energy	ONEOK is constructing the Demicks Lake Plant II, a 200-million cubic feet per day natural gas processing facility northeast of Watford City and about 14 miles east of the proposed Tioga-Elkhorn Creek pipeline MP 45.	Completed	3Q 2019	1Q 2020	McKenzie	MP 44.9 Tioga-Elkhorn Creek	14 E	0	AQ-op, SO	(ONEOK, 2019)
Nesson Gathering Gas Plant (LU-0036-19)	Energy	Nesson Gathering Inc. proposes to construct a natural gas gathering plant on 76 acres and located in the SE/4 of section 35, T154N R102W.	Permit obtained	Unknown	Unknown	Williams	Springbrook Plant Receipt Station	17 W	0	AQ-op, SO	(Williams County Planning and Zoning Commission, 2019b)
Nesson Gathering Gas Plant (LU-0001-19)	Energy	Nesson Gathering Inc. proposes to construct a natural gas gathering plant on a 158 acre property, located NE/4 of Section 1, T153N R104W.	Permit obtained	Unknown	Unknown	Williams	Springbrook Plant Receipt Station	26 SW	0	AQ-op, SO	(Williams County Planning and Zoning Commission, 2019b)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Natural Gas Plant Expansion (LU-0191-18)	Energy	An existing gas plant located about 5 miles south-southwest of Tioga will expand to include additional laydown space. The property is 73 acres and located in NW/4 of Section 4.	Permit obtained	Unknown	Unknown	Williams	MP 8.3 Tioga-Elkhorn Creek	Under 1 N	0	WW, VG, SO	(Williams County Planning and Zoning Commission, 2019c)
Kinder Morgan Roosevelt Gas Plant Expansion	Energy	The expansion would increase the capacity to process 150 million cubic feet per day; located about 7 miles south of Watford City and about 10 miles west of proposed project MP 37.	Approved by ND PSC 4Q 2018	Unknown	Unknown	McKenzie	Springbrook Plant Receipt Station	25 SW	0	WW, AQ-op, SO	(Hilland Partners, 2018a)
Arrow Bear Den Gas Processing Plant II	Energy	McKenzie Arrow Field Services, LLC proposes to construct the Arrow Bear Den Gas Processing Plant II, a 200mcfd capacity processing plant. The proposed site is within 1 mile of MP 59 of the proposed Tioga-Elkhorn Creek pipeline.	Completed	1Q 2018	3Q 2019	McKenzie	MP 60.0 Tioga-Elkhorn Creek	Under 1 NW	0	AQ-op, SO, LU, RS, VS	(Arrow Field Services, LLC, 2017, 2020)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Robinson Lake Gas Plant	Energy	The Robinson Lake Gas Plant Expansion is located 32 miles west of the proposed Tioga-Elkhorn Creek pipeline MP 30. This proposal is to increase the capacity of the existing plant from 97.5 to 110 million standard cubic feet per day.	Unknown	Unknown	Unknown	McKenzie	Robinson Lake Plant Receipt Station	16 S	0	AQ-op, SO	(Whiting Oil and Gas Corporation, 2013 and PSC, 2019)
Demicks Lake - Cherry Creek Pipeline Project	Energy	WBI Energy's Demicks Lake - Cherry Creek Pipeline Project will carry gas from ONEOK Rockies Midstream LLC's Demicks Lake gas processing plant near Keene, North Dakota, to an interconnect with Northern Border Pipeline Co.'s mainline outside of Watford City, North Dakota. The proposed Tioga-Elkhorn Creek pipeline would cross the 12.2 mile pipeline near MP 47.	Completed	1Q 2019	3Q 2019	McKenzie	MP 0.1 Elkhorn Creek-Northern Border	0	2	WW, VG, WF, TE, CR, SO, LU	(WBI Energy Trans-mission, Inc., 2018)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Wild Basin to Sax Valve Looped Pipeline	Energy	WBI Energy's Wild Basin to Sax Valve Looped Pipeline consists of approximately 2 miles of 20-inch-diameter natural gas pipeline in McKenzie County, North Dakota. Project falls under WBI Energy's Blanket Authorization.	Completed	4Q 2019	1Q 2020	McKenzie	MP 48.7 Tioga-Elkhorn Creek	Under 1 W	0	WW, VG, WF, TE, CR, GS, SO, LU, VS	(WBI Energy Trans-mission, Inc., 2019)
Bakken Pipeline LLC	Energy	The ONEOK Bakken Pipeline Project is a 10.8-mile, 12-inch-diameter steel natural gas liquids pipeline that would originate at the Targa Badlands, LLC. Little Missouri Gas Processing Plant and terminate at an interconnection with ONEOK's Demicks Lake Plant. The Project would be located in McKenzie County, and is approximately 2 miles west of the proposed Tioga-Elkhorn Creek pipeline MP 60.	Completed	2Q 2019	4Q 2019	McKenzie, Richland	MP 61.3 Tioga-Elkhorn Creek	2 W	0	WW, VG, WF, TE, CR, GS, AR-con, N-con, SO	(ONEOK Bakken Pipeline, LLC, 2019a, 2019b)

APPENDIX K (cont'd)

North Bakken Expansion Project
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Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Bakken Missouri River Crossing Project	Energy	Kinder Morgan's Bakken Missouri River Crossing Project plans to connect the existing Kinder Morgan Brogger compressor station located in Williams County, North Dakota, to a Kinder Morgan natural gas gathering system located in McKenzie County, North Dakota. The project will include the installation of approximately 10 miles of 20-inch diameter pipeline between the Brogger compressor station and Kinder Morgan natural gas gathering system.	Unknown	2Q 2019	Unknown	Williams	Access Road 25_R1 (MP 34.9 Tioga-Elkhorn Creek)	7 W	0	SO	(Hilland Partners, 2018b)
Gunslinger Federal and Gladstone Oil and Gas Well Pads	Energy	The Gunslinger Federal well pad would have 10 wells and be operated by Slawson. The Gladstone well pad would have seven wells and be operated by Burlington. The proposed project also includes construction of a new access road and corridor for associated oil and gas equipment and utilities. The well pads would	Decision Notice and Finding of No Significant Impacts received	Under Construction	Unknown	McKenzie	MP 28.6 Tioga-Elkhorn Creek	0	<1	WW, VG, WF, CR, LU	(U.S. Forest Service, 2019)

APPENDIX K (cont'd)

North Bakken Expansion Project
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Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
		be constructed on the Little Missouri National Grasslands (LMNG), which are part of the Dakota Prairie Grasslands (DPG) managed by the USFS in the Tobacco Gardens Area of McKenzie County, North Dakota.									
Other Oil and Gas Well Develop-ments (various)	Energy	Various oil and gas developments including well pads, directional drill (horizontal) wells, and access roads are planned throughout McKenzie county.	Analysis and document prepar-ation	Unknown	Unknown	McKenzie	Unknown – Exact locations of projects are not known, only the land sale areas	Unknown – Exact locations of projects are not known, only the land sale areas	Unknown – Exact locations of projects are not known, only the land sale areas	WW, VG, AQ-con, SO	(U.S. Bureau of Land Manage-ment, 2019)
Hess Non-jurisdictional Pipeline Lateral	Energy	Approximately 900 feet of 20-inch-diameter pipeline lateral from the existing Hess plant in Tioga, across 68th Street NW, to WBI Energy's proposed Tioga Plant Receipt Station.	Under Develop-ment	Spring/ Summer 2021	November 2021	Williams	Tioga Plant Receipt Station	0	<1	AQ-con, GS; CR, N-con, VG	N/A

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
North Bakken Expansion Project Customer Tie-In Facilities	Energy	Customer tie-in facilities at the proposed transfer/receipt/deliver y stations that are part of the proposed North Bakken Expansion Project.	Under Develop-ment	2020-2021	2021	Various	Various	0	Unknown	WW, VG, WF, CR, LU	N/A
Lower Sundhagen Scoria Mine Reclamation	Energy	Reclamation of scoria (clinker) pits in Williams County would require backfill of 6,300 cubic yards of soil and revegetation of 3 acres.	Decision and Appeal	Unknown	Unknown	Williams	Access Road 13 (MP 17.6 Tioga-Elkhorn Creek)	4 SE	0	N/A	(U.S. Bureau of Land Manage-ment, 2016)
Williston Basin International Airport	Commer-cial	The Williston Basin International Airport will have 2 runways and 110,000 square foot terminal building and will be located about 10 miles NW of Williston.	Completed	2018	4Q 2019	Williams	Springbrook Plant Receipt Station	12 W	0	AQ-op, N-op, SO	(KLJ, 2015)
Cenex Pipeline	Energy	Cenex Pipeline, LLC plans to construct a 10" refined fuels pipeline from Sidney, Montana, to Minot, North Dakota, to replace a portion of an existing 8-inch pipeline system, while adding throughput capacity. The proposed route is in the early permitting phase and would	Under construc-tion	2019	2020	Williams, Mountrail	MP 12.9 Tioga-Elkhorn Creek	0	<1	WW, VG, WF, CR, GS, N-con, SO, LU, RS, VS	(KLJ, 2017)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
		intersect the proposed Tioga-Elkhorn Creek pipeline near MP 10.									
Elkhorn Creek Compressor Station Non-jurisdictional Electric Utilities	Utilities (Non Energy)	Electric service will be obtained from McKenzie Electric Cooperative from an overhead powerline that crosses the southern portion of the tract, and all ground disturbance will be within the facility workspace.	Under develop-ment	Summer/ Fall 2021	November 2021	McKenzie	Elkhorn Creek Compressor Station	0	<1	GS, LU, VG, CR, WF, N-con	N/A
Elkhorn Creek Compressor Station Non-jurisdictional Utilities (Water Supply)	Utilities (Non Energy)	Water will be provided by McKenzie County Water Resource District from an existing 6-inch-diameter water line in an easement that abuts the station to the south. A 2-inch-diameter poly line will run from the new compressor station to the existing water line.	Under develop-ment	Summer/ Fall 2021	November 2021	McKenzie	Elkhorn Creek Compressor Station	0	<1	GS, LU, VG, CR, WF, N-con	N/A
Norse Transfer Station Non-jurisdictional Third-Party Utility Tap	Utilities (Non Energy)	A tap will be installed to connect the existing third-party utilities to the WBI Energy's proposed Norse Transfer Station	Under develop-ment	Summer/ Fall 2021	November 2021	Burke	Norse Transfer Station	0	<1	GS, LU, VG, CR, WF, N-con	N/A

APPENDIX K (cont'd)

North Bakken Expansion Project
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Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
Northern Border Interconnect Non-jurisdictional Third-Party Utility Tap	Utilities (Non Energy)	A tap will be installed to connect the existing third-party utilities to WBI Energy's proposed Northern Border Interconnect	Under develop-ment	Summer/ Fall 2021	November 2021	McKenzie	Northern Border Interconnect	0	<1	GS, LU, VG, CR, WF, N-con	N/A
Water Transmission Line in Watford City	Utilities (Non Energy)	A proposed water transmission line in Watford City pipeline would furnish water to "The Crossings at Watford City" and to support the oil industry.	Early permitting phases	Unknown	Unknown	McKenzie	Franz Yard	Less than 1 E	0	WW, VG, WF, TE, CR, GS, AR-con, N-con, SO	(Watford City Planning and Zoning Commission, 2019)
Western Area Water Supply Project	Utilities (Non Energy)	The Western Area Water Supply Project (WAWSP) was developed to supply drinking water from the Missouri River supplemented with groundwater from the R&T Water Supply Commerce Authority (WSCA) to meet the municipal, rural, and industrial water needs for all or parts of McKenzie, Williams, Divide, Burke, and Mountrail Counties. Two of the development areas, East White Earth and System I Spring Creek,	Under construc-tion	Under construction	Unknown	Mountrail, McKenzie	Unknown – Exact locations of projects are not known, only the develop-ment areas	Unknown – Exact locations of projects are not known, only the develop-ment areas	Unknown – Exact locations of projects are not known, only the develop-ment areas	WW, VG, WF, TE, CR, GS, AR-con, N-con, SO, LU	(Western Area Water Supply Authority, 2019)

APPENDIX K (cont'd)

North Bakken Expansion Project
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Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
		intersect the proposed Tioga-Elkhorn Creek pipeline near MP 61.9.									
Route 9 Reconstruc-tion	Transpor-tation	USACE has issued a permit for reconstruction of Route 9 approximately 6 miles east of the proposed Tioga-Elkhorn Creek pipeline MP 6.	Permit issued by USACE 4Q 2018	Unknown	Unknown	Mountrail	MP 5.9 Tioga-Elkhorn Creek Pipeline	6 E	0	WW, TE	(U.S. Army Corps of Engineers, 2018)
DOT Road Improve-ments - Red Mike Area to County Road 42	Transpor-tation	Improvements are planned along ND 1804 from Red Mike Area to CR 42 (Epping Road). Improvements include increasing structural capacity, widening the shoulders, improving the road surface and installing a stop light.	Unknown	2020	2020	Williams	MP 23.4 Tioga-Elkhorn Creek	2 W	0	WW, VG, AQ-op, SO, VS	(North Dakota Department of Transpor-tation, 2019a)
US 85 – I-94 to Watford City Bypass	Transpor-tation	The U.S. Highway 85 Project encompasses approximately 62 miles of roadway in Stark, Billings, and McKenzie counties, North Dakota. The project begins at the Interstate 94 (I-94) interchange and extends north to the Watford City Bypass (McKenzie County Road 30). The proposed action is to	Record of Decision 2Q 2019	2019	2020	McKenzie	Northern Border Interconnect	3 W	0	WW, VG, WF, TE, AQ-op, SO, VS	(North Dakota Department of Transpor-tation, 2019b)

APPENDIX K (cont'd)

North Bakken Expansion Project
Past, Present, and Reasonably Foreseeable Future Projects Evaluated for Potential Cumulative Impacts with the North Bakken Expansion Project [a,b]

Project Name	Category	Project Description	Status	Construction Commences	Operation Commences	County(ies)	Closest Project Facility/ Milepost	Distance and Direction from Project (miles)	Approx-imate Acres of Overlap	Resources with Potential for Cumula-tive Impacts	Citation
		expand this segment of U.S. Highway 85 from a two-lane highway to a four-lane highway. The north end of the improvements are approximately 3 miles west of the south end of the proposed Tioga-Elkhorn pipeline.									
Pine Ridge Develop-ment	Residen-tial	The Pine Ridge Development would include curbs, gutters, paved streets, and the addition of single-family homes and additional duplexes and a four-plex in Tioga.	Unknown	Unknown	2019	Williams	Tioga Plant Access Road – Tioga Compressor Lateral	Under 1 SW	0	WW, VG, WF, TE, CR, GS, N-con, SO, VS	(Landgrid, 2016)
Homestead at Watford City First Addition	Residen-tial	Homestead at Watford City First Addition is a development of six single family homes in Watford City.	Unknown	Unknown	Unknown	McKenzie	Franz Yard	3 NW	0	VG, SO	(Homestead at Watford City, 2015)
Aspen Heights Condominiu ms	Residen-tial	Aspen Heights Condominiums would include 48 new apartment units at 1000 South Pheasant Ridge Street.	Early permitting phases	Unknown	Unknown	McKenzie	Franz Yard	3 NW	0	VG, SO	(Orange Property Management , 2019)

APPENDIX K (cont'd)

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Elementary School	Govern-ment	McKenzie County School District is proposes to build a new elementary school in Watford City, in the Fox Hills Village Subdivision.	Rezoning process	Unknown	Unknown	McKenzie	Franz Yard	1 NW	0	WW, VG, CR, GS, N-con, VS	(McKenzie County, 2019)

AQ-con = air quality (construction); AQ-op = air quality (operations); CR = cultural resources; GS = geology and soils; LU = land use; N/A = Not available; N-con = noise (construction); N-op = noise (operation); RS = recreation and special interest areas; SO = socioeconomics; TE = threatened and endangered species; VG = vegetation; VS = visual resources; WF = wildlife, fish; WW = wetlands, water resources

[a] The impacts of past actions are expressed as the baseline environmental conditions and are not included in this table, although recent past actions that continue to contribute to discernable impacts on a resource are included.

[b] A description of the geographic and temporal scope of the analysis for each resource is provided tables 1.10-1 and 1.10-2 of Resource Report 1.

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