Federal Energy Regulatory Commission

Office of Energy Projects

November 2016

Northern Natural Gas Company **Docket No. CP16-472-000**

Northern Lights 2017 Expansion Project

Environmental Assessment

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 4
Northern Natural Gas Company
Northern Lights 2017 Expansion Project
Docket No. CP16-472-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Northern Lights 2017 Expansion Project (Project), proposed by Northern Natural Gas Company (Northern) in the above-referenced docket. Northern requests authorization to construct, operate, and maintain new natural gas facilities in Sherburne, Isanti, and Rice counties, Minnesota, to provide for approximately 76,000 dekatherms per day to serve increased markets for industrial, commercial, and residential uses.

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 of 1969 (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 proposed Project includes the following facilities:

- approximately 2 miles of 8-inch-diameter pipeline loop in Sherburne County;
- approximately 2.8 miles of 12-inch-diameter pipeline loop in Isanti County; and
- an additional 15,900-horsepower compression unit at Northern's existing Faribault Compressor Station in Rice County.

The FERC staff mailed copies of the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the Project area. In addition, the EA is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link.

A limited number of copies of the EA are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Any person wishing to comment on the EA may do so. Your comments should focus on the 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 Friday, December 9, 2016.**

For your convenience, there are three methods you can use to file your comments with the Commission. In all instances, please reference the Project docket number (CP16-472-000) with your submission. The Commission encourages electronic filing of comments and has expert staff available to assist you at 202-502-8258 or efiling@ferc.gov.

(1) You can file your comments electronically using the eComment feature located on the Commission's website (www.ferc.gov) under the link to Documents and Filings. 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 Documents and Filings. 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 following address:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR § 385.214).[1] Only intervenors have the right to seek rehearing of the Commission's decision. The Commission grants affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

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. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP16-472). 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 eLibrary link also provides access to the texts of 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 http://www.ferc.gov/docs-filing/esubscription.asp.

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[1] See the previous discussion on the methods for filing comments.

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ABBREVIATIONS AND ACRONYMS

Al-Corn	Al-Corn Clean Fuel
Becklin WMA	Becklin Homestead Wildlife Management Area
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	Methane
Certificate	Certificate of Public Convenience and Necessity
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
dBA	decibels on the A-weighted frequency scale
dB	decibel
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EI	Environmental Inspector
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ETWS	extra temporary workspace
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gases
HAP	hazardous air pollutant
HCA	high consequence area
HDD	horizontal directional drilling
hp	horsepower
IPCC	Intergovernmental Panel on Climate Change
L_{dn}	day-night level
L_{eq}	equivalent sound level
MDH	Minnesota Department of Health
MNDNR	Minnesota Department of Natural Resources
MP	milepost
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NNSR	nonattainment area New Source Review
NO_x	nitrogen oxides
N_2O	nitrous oxide
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Planned Northern Lights 2017 Expansion Project, Request for Comments on Environmental Issues*
Northern	Northern Natural Gas Company
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places

NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
PEM	palustrine emergent
PFO	palustrine forested
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	The FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
$PM_{2.5}$	particulate matter with a diameter ≤ 2.5 microns
PM_{10}	particulate matter with a diameter ≤ 10 microns
Princeton Loop	Princeton Branch Line Loop Extension
Procedures	The FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Project	Northern Lights 2017 Expansion Project
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
PUB	palustrine unconsolidated bottom
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention Control and Countermeasures Plan
St. Cloud Loop	St. Cloud Branch Line Loop Extension
SWPPP	Stormwater Pollution Prevention Plan
tpy	tons per year
TWS	temporary work space
USACE	U.S. Army Corps of Engineers
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound

SECTION A – PROPOSED ACTION

A.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental impacts of the proposed Northern Lights 2017 Expansion Project (Project). On June 24, 2016, Northern Natural Gas Company (Northern) filed an application with the Commission (Docket No. CP16-472-000) pursuant to Section 7 of the Natural Gas Act (NGA), as amended, seeking authorization to develop, construct, operate, and maintain about 4.8 miles of 8- and 12-inch-diameter natural gas branch line loop extensions; and to install an additional 15,900-horsepower (hp) compressor unit to an existing compressor station site for the purpose of transporting natural gas in interstate commerce. Prior to filing its application, Northern participated in the Commission's pre-filing process for this Project under Docket No. PF15-33-000.

We[2] prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations for implementing NEPA (Title 40 of the Code of Federal Regulations Parts 1500-1508 [40 CFR 1500-1508]) and the Commission's implementing regulations under 18 CFR 380.

The assessment of environmental impacts is an integral part of our decision on whether to issue Northern a Certificate of Public Convenience and Necessity (Certificate) to construct and operate the proposed facilities. Our 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;
- assess reasonable alternatives to the proposed action that would avoid or minimize adverse effects to the environment; and
- identify and recommend specific mitigation measures, as necessary, to minimize environmental impacts.

The EA will be used by the Commission in its decision-making process to determine whether to authorize Northern's proposal. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public convenience and necessity.

A.2 PROJECT PURPOSE AND NEED

According to Northern, the proposed facilities are required to provide additional gas for industrial, commercial, and residential use that cannot be met by Northern's existing infrastructure. The Project, as proposed, would allow Northern to transport an incremental winter peak day firm service of approximately 76,000 dekatherms per day through the addition

[2] "We," "us," and "our" refers to environmental staff of the Commission's Office of Energy Projects.

of pipeline and compression facilities on Northern's existing system to CenterPoint Energy Minnesota Gas, Xcel Energy, Al-Corn Clean Fuel, and Midwest Natural Gas, Inc.

Northern held an open season in October 2015 to affirm and quantify market growth opportunities, to solicit interest for firm transportation service, and to identify the need to construct facilities necessary to provide firm transportation service on Northern's system north of Ventura, Iowa, commencing on or after November 1, 2017. The open season showed that in the next few years, Northern expects additional demand from its customers and may eventually need to deliver a total of over 209,000 dekatherms per day of natural gas. However this Project only considers the presently contracted firm service for 75,937 dekatherms per day. At this point, additional or future specific customers are unknown. Any expansion to meet future demand would be analyzed under a separate docket.

Under Section 7 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 FERC's Certificate Policy Statement[3] provides guidance as to how the Commission evaluates proposals for new construction, and establishes criteria for determining whether there is a need for a proposed project and whether it would serve the public interest. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project. The Commission does not direct the development of the gas industry's infrastructure regionally or on a project-by-project basis, or redefine an applicant's stated purpose.

A.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The topics addressed in section B of this EA include geology and soils; groundwater, surface water, and wetlands; fisheries, vegetation, wildlife, and special status species; cultural resources; socioeconomics; land use and visual resources; air quality and noise; reliability and safety; and cumulative impacts. The EA also assesses the no-action alternative and several system alternatives (see section C). The EA describes the affected environment as it currently exists, discusses the environmental consequences of the proposed Project, identifies measures proposed by Northern to reduce impacts, and presents our additional recommended mitigation measures, which are summarized in section D.

The environmental consequences of constructing and operating the Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction with the resource returning to preconstruction condition immediately after restoration or within a few months. Short-term impacts could continue for up to 3 years following construction. Long-term impacts would last more than 3 years, but the affected resource would eventually recover to preconstruction conditions. Permanent impacts could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the

[3] The Policy Statement can be found on our website at http://www.ferc.gov/legal/maj-ord-reg/PL99-3-000.pdf. Clarifying statements can be found by replacing "000" in the URL with "001" and "002."

life of the Project, such as the construction of aboveground facilities or permanent removal of forest vegetation. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

A.4 PUBLIC REVIEW AND COMMENT

On April 11, 2016, we issued a *Notice of Intent to Prepare an Environmental Assessment for the Planned Northern Lights 2017 Expansion Project, and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to approximately 330 entities including affected landowners (as defined in the Commission's regulations); federal, state, and local officials; Native American groups; agency representatives; environmental and public interest groups; and local libraries and newspapers.

We received three comment letters in response to the NOI, one from the U.S. Environmental Protection Agency (EPA) and two from the Minnesota Department of Natural Resources (MNDNR). This EA addresses the potential environmental impacts of Northern's proposed Project and the concerns identified by the agencies that responded to the NOI, as well as concerns identified by other permitting or resource agencies, as well as our own independent evaluation of environmental resource impacts and other issues.

The EPA requested that the EA address a number of items. These are listed below, along with the section of the EA where they are addressed. These include requests for a discussion about Northern's existing system (see section A.1 and figure A.4.1); the purpose and need for the Project (see sections A.2 and C); affected environment, and indirect and cumulative impacts (see section B); conformance with the Clean Water Act, Section 401 Water Quality Certification and Section 404(b)(1) Guidelines (see sections B.3.2 and C, respectively); stream crossings (see section B.3.2); impacts on surface water and groundwater quality and quantity, including well head protection zones (see sections B.3.1 and B.3.2); Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES) permitting (see section B.3.2 and B.3.4); hydrostatic testing impacts and alternative testing methods (see section B.3.4); spill response procedures (see sections B.2.2, B.3.1, B.3.2, B.3.3, and B.4.1); waste minimization measures (see section A.8.3); impacts on air quality, and discussion of greenhouse gas emissions, climate change, and air permitting (see section B.8.1); noise impacts on noise sensitive areas and mitigation measures (see section B.8.2); community, social, and economic impacts (see sections B.7.1 and B.7.2), including impacts on environmental justice communities and sensitive receptors (see section B.7.3); wildlife habitat impacts and impacts on federally listed species, critical habitat, migratory birds, national wildlife refuges and state-listed species (see sections B.4.3 and B.4.4); noxious weeds and exotic species (B.4.2); and an analysis of alternatives (see section C).

The MNDNR requested GIS shapefiles for the Project. Northern provided those to the MNDNR on June 3, 2016. The MNDNR also requested the EA include descriptions of possible impacts on the Rum River and its stability, and to describe the best management practices that would be used to protect the Rum River resources. The MNDNR followed up with a second comment noting that its concerns about the Rum River are addressed by the proposed construction methods. Regardless, these issues are discussed in sections B.3.2 and B.5.2.

A.5 PROPOSED FACILITIES

The proposed Project includes a 2.0-mile-long Princeton Branch Line Loop Extension (Princeton Loop) in Sherburne County, a 2.8-mile-long St. Cloud Branch Line Loop Extension (St. Cloud Loop) in Isanti County, and an addition of a 15,900-hp compressor unit at the existing Faribault Compressor Station in Rice County, all in Minnesota. New valve settings would be installed at the end of each pipeline loop. The general location of the facilities is shown in figure A.5-1; detailed maps are provided in appendix A.

In its FERC application, Northern identified various ancillary facilities it plans on constructing or installing at its existing facilities in Minnesota and Iowa, as allowed under its blanket certificate and under 18 CFR 2.55(a). These include various regulator settings, valve modifications, and heater and station piping modifications.[4] None of these facilities are dependent on the proposed Project, and, according to Northern, will be installed regardless of the outcome of this proceeding.

A.6 LAND REQUIREMENTS

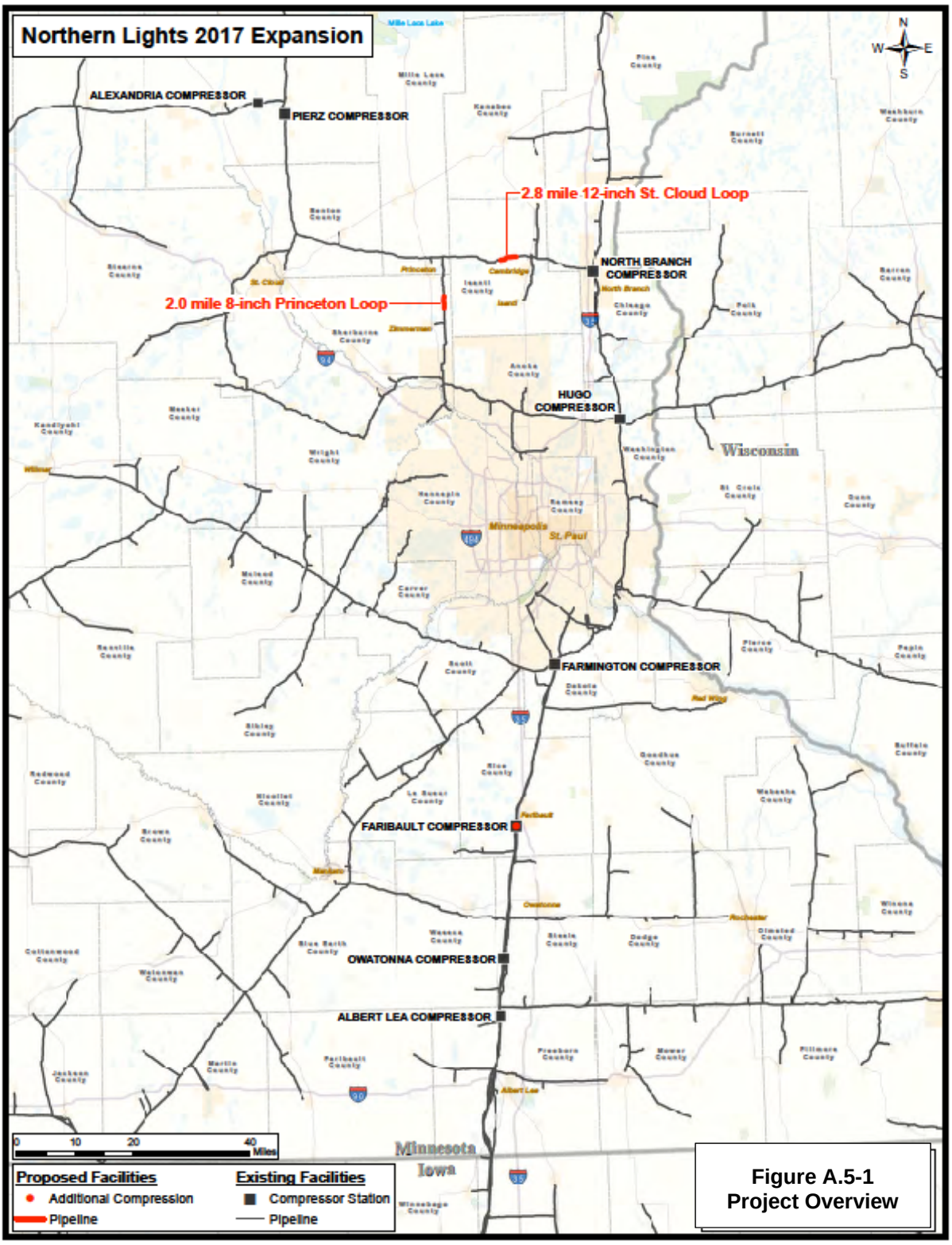
Construction of the Project would disturb approximately 104.0 acres of land, including 84.6 acres for construction of the pipeline loops and 19.4 acres for construction of the aboveground facilities. The total new acreage required for operation of all Project facilities is approximately 2.1 acres, including 0.2 acre for the pipeline loops and 1.9 acres for the aboveground facilities. Most of the pipeline facilities would be installed using the horizontal directional drill (HDD) method and located within Northern's existing, multi-line, pipeline easements and offset 20 to 25 feet from Northern's existing pipelines, not requiring any new permanent easements. The operation of the new facilities would require acquisition of only a small portion of new permanent right-of-way associated with the existing Faribault Compressor Station and one isolated location along the St. Cloud Loop, as detailed in the following subsections.

A.6.1 Pipeline Facilities

The land disturbed by construction of the pipeline loops would include new and existing permanent right-of-way as well as temporary workspace (TWS) needed for typical pipeline construction procedures; extra temporary workspace (ETWS) for specialized construction procedures; construction staging areas; and access roads to work areas from nearby public roads.

Approximately two-thirds of the pipeline facilities are proposed to be installed using the HDD method. Northern would use a 75-foot-wide TWS along the Princeton Loop, including across wetlands that cannot be avoided by use of HDD. A 100-foot-wide TWS would be used for conventional (trench) construction in upland areas along the St. Cloud Loop where topsoil would be stripped and segregated across the full-right-of-way and where the TWS also would be used for HDD staging. Construction right-of-way cross-section drawings that depict Northern's proposed TWS limits relative to its existing pipeline and permanent easement are provided in appendix B.

[4] Descriptions of these facilities can be accessed via FERC's eLibrary at Accession no. 20160901-5200


Northern Lights 2017 Expansion
ALEXANDRIA COMPRESSOR
PIERZ COMPRESSOR
2.8 mile 12-inch St. Cloud Loop
NORTH BRANCH COMPRESSOR
2.0 mile 8-inch Princeton Loop
HUGO COMPRESSOR
Wisconsin
Minneapolis
St. Paul
FARMINGTON COMPRESSOR
FARIBAULT COMPRESSOR
OWATONNA COMPRESSOR
ALBERT LEA COMPRESSOR
Minnesota
Iowa
0 10 20 40 Miles
Proposed Facilities
Additional Compression
Pipeline
Existing Facilities
Compressor Station
Pipeline
Figure A.5-1
Project Overview

ETWS of varying widths would be required adjacent to the TWS in certain locations for specialized construction methods such as HDD, wetland, and waterbody crossing locations; at the beginning and end of each pipeline segment; pipeline crossovers; and for road crossings. In addition, six contractor yard/staging areas of various sizes would be used adjacent to the TWS and ETWS, two on the Princeton Loop and four on the St. Cloud Loop.

Temporary access roads would be needed to access the right-of-way as well as the off-right-of-way HDD drill paths for laying directional cables. The proposed access roads generally originate at existing public roads and generally consist of existing roads, driveways, and farm access points that range from 10 to 50 feet wide, centered over existing roads, where present. No permanent modifications are currently planned for use of the existing access roads; however, improvements (e.g., grading, adding gravel) may be conducted where necessary to facilitate ingress and egress of equipment and vehicles, and temporary widening up to 50 feet may be necessary to accommodate the turning radius of some trucks. Two permanent access roads would be constructed to access the new valve settings.

As depicted in the construction right-of-way cross section drawings provided in appendix B, no new operational land would be required for the Princeton Loop, which is offset approximately 20 feet from Northern's existing pipeline and offset 5 feet from the edge of Northern's existing easement boundary for its entire length. The St. Cloud Loop is generally offset approximately 25 feet from the existing pipeline alignment, and is located within existing easement for its entire length except for about 130 feet near the Rum River (at approximately milepost [MP] 2.2) where the new pipeline alignment diverges up to 52 feet from the existing pipeline alignment to accommodate the HDD angle. Therefore a small amount of new permanent right-of-way would be necessary at the Rum River crossing location.

Table A.6.1-1 summarizes the approximate land requirements for construction and operation of the pipeline facilities. The specific locations and dimensions of the TWS, ETWS, access roads, and staging areas for the loop extensions are shown on the maps and aerial photo-based alignment sheets provided in appendix A.

Although Northern has identified areas where extra workspace would be required, additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. Northern would be required to file information on each of those areas for our review and approval prior to use.

A.6.2 Aboveground Facilities

Approximately 19.4 acres, including the existing 6.0-acre fenced site, would be used as workspace for installation of the new unit at the existing Faribault Compressor Station. Following construction, the existing fenced station yard would be expanded by approximately 100 feet on the north side to encompass the new appurtenant facilities, and become a 7.9-acre fenced site. The existing fencing would be left in place, except where the new fence would be installed around the extended side of the site. Northern would install gravel around new buildings, impacting approximately 1.4 acres of the existing property that is currently vegetated. The remaining 0.5 acre of new property inside the fence would be vegetated, and the property

outside of the new fence line would continue to be used for agriculture by the adjacent landowner.

Operation of the upgraded compressor station would require the acquisition of 3.2 acres of land that primarily would abut the north end of the existing property boundary and the proposed new northern fence line. Approximately 0.1 acre would be within the new fenceline and the remaining land acquired would provide an approximately 100-foot-wide strip of property on the north side of the facility as a buffer from the adjoining property, and would extend to match the existing eastern and western property lines to provide a fully rectangular new property boundary that matches up to the existing property boundary limits, but which extends approximately 100 feet further on the north side.

Table A.6.1-1

Land Requirements for the Project – Pipeline Facilities

Facility	Amount	Construction (acres) [a]	New Operation (acres) [b]	Right of Way Cross-Section Drawing Number
Princeton Loop				
Looping Segment	2.0 miles (5 TWS segments)	13.1	0.0	ROW-1, ROW-2
ETWS [c]	19 sites	9.1	0.0	
Contractor Yard/Staging Areas	2 sites	13.9	0.0	
Access Roads	0.4 mile	1.4	<0.1	
Princeton Loop Subtotal		37.5	<0.1	
St. Cloud Loop				
Looping Segment	2.8 miles (4 TWS segments)	4.5	0.1	ROW-1 - 3
ETWS [c]	10 sites	11.8	0.0	
Contractor Yard/Staging Areas	4 sites	23.5	0.0	
Access Roads	2.4 miles	7.3	0.1	
St. Cloud Loop Subtotal		47.1	0.2	
Looping Segments Subtotal	4.8 miles (9 TWS segments)	17.6	0.1	
ETWS Subtotal	29 sites	20.9	0.0	
Contractor Yard/Staging Areas Subtotal	6 sites	37.4	0.0	
Access Roads Subtotal	2.8 miles	8.7	0.1	
	Project Total	84.6	0.2	

[a] Construction acreage includes the 100-foot-wide TWS required for construction of the St. Cloud Loop and the 75-foot-wide TWS required for the Princeton Loop, including the operation area.

[b] Based on GIS analysis, where the new pipeline alignment extends outside Northern's existing easement. No new operational right-of-way is required where the proposed pipeline would be within the existing right-of-way.

[c] ETWS, including extra work areas needed for HDD crossing, road crossing, pipeline crossover, wetland crossing, and waterbody crossing locations.

Note: Total numbers may not equal sum of addends due to rounding.

The other aboveground facilities associated with the pipelines would be located entirely within existing permanent maintained right-of-way for the pipelines; therefore, activities at these aboveground facilities would not increase the amount of construction or operational land requirements.

Table A.6.2-1 summarizes the land requirements for construction and operation of the compressor and other aboveground facilities. Drawings showing the limits of the existing Faribault Compressor Station, as well as the limits of temporary construction workspace and land required for facility operation, are provided on the maps in appendix A.

Table A.6.2-1

Land Requirements for the Project – Aboveground Facilities

Facility	Existing Property Size (acres)	Land Required for Construction (acres)	New Land Required for Operation (acres)	Description
Faribault Compressor Station	16.1 [a]	19.4 [b]	1.9 [c]	Additional 15,900-horsepower compressor unit
Other Aboveground Facilities	N/A	0.0 [d]	<0.1 [e]	Two valve settings at approximately 0.01 acre each
Total		19.4	1.9 [e]	

[a] Includes existing property.

[b] Approximately 3.2 acres abutting the north side of the existing property line would be acquired for the expansion; 0.1 acre of this would be within the new operational (fenced) footprint. See Appendix A for a site map.

[c] The existing operational footprint is approximately 6.0 acres, and the new footprint would be approximately 7.9 acres.

[d] Other aboveground facilities would be located entirely within the land needed for construction of the pipeline facilities (see table A.6.1-1), and therefore would not result in any additional acreage impacts.

[d] Each valve setting would occupy approximately <0.1 acre; however, because this acreage is within the land required for operation of the new pipeline facilities (see table A.6.1-1), it is not included in the total land required for operation.

N/A = Not applicable

A.7 CONSTRUCTION SCHEDULE

Northern proposes to begin construction by March 2017 in order to place the pipeline and compressor station in service by November 1, 2017. Revegetation and restoration measures would be employed as soon as possible following construction, and disturbed areas would be stabilized and reclaimed, weather permitting, by December 2017. Northern would monitor the success of revegetation for up to 3 years following construction, or until revegetation is successful.

Northern estimates the duration of construction for the Princeton Loop would be 75 days, the St. Cloud Loop would be 90 days, and the Faribault Compressor Station would be up to 210 days. Pipeline construction would generally take place Monday through Saturday during daylight hours; however, Northern states that certain activities may extend beyond daylight hours and into Sunday, as necessary, to maintain the project schedule. In particular, the HDD crossings may be conducted continuously (24 hours per day) at critical times, such as during pullback of the pipe into the drill hole on the longer drills and when pipe sections would need to be welded during pullback (see further discussion in section A.8.2.1, below.) If HDD activities

need to take place outside normal daytime working hours, noise mitigation measures would be implemented as described in section B.8.2.

A.8 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

The Project would be designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) *Minimum Federal Safety Standards* in 49 CFR 192. Northern would adopt our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures)[5] in their entirety for the Project, with modifications as described below. Project facilities would be marked and identified in accordance with applicable regulations. In accordance with 49 CFR 192, the pipeline would be inspected for leakage as part of scheduled operations and maintenance. Northern also would participate in the local One Call system. These standards are in accordance with the National Pipeline Safety Act of 1968, as amended.

Northern has not identified the need for any Project-specific modifications from the requirements in our Plan but has requested modifications to the requirements in our Procedures at nine locations. Specifically, Northern requests to modify Procedures section IV.A.1.d at three locations where Northern may need to park equipment overnight or refuel equipment within 100 feet from a wetland boundary in association with HDD operations at drill entry and exit points. In addition, Northern requests approval for a modification from sections V.B.2.a and VI.B.1.a where ETWS would have less than a 50-foot setback from waterbody and/or wetland boundaries, respectively, for stringing pipe used in HDD crossings. We have reviewed these requested modifications and find them acceptable due to site-specific conditions.

In order to minimize potential environmental impacts, Northern has developed the following Project-specific construction and reclamation plans,[6] which we have reviewed and find acceptable:

- General HDD Plan and Profile;
- Site-Specific HDD Plans;
- Plan for Inadvertent Release of Drilling Mud;
- Spill Prevention, Control, and Countermeasures Plan;

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[5] 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

[6] Copies of Northern's Project-specific construction and reclamation plans have been filed with the Commission and can be viewed on eLibrary at http://www.ferc.gov/docs-filing/elibrary.asp under this docket.

- Noxious Weed Plan; and
- Unanticipated Discovery Plan for Cultural Resources and Human Remains.

Northern would also develop a Project-specific Stormwater Pollution Prevention Plan (SWPPP) that would incorporate the requirements and best management practices from federal and state permits and our Plan and Procedures.

Northern would use one environmental inspector (EI) during construction and restoration. The EI would be on site during Project construction activities to ensure Northern's compliance with the measures outlined in our Plan and Procedures, the FERC Certificate, and all other environmental permit requirements from construction through restoration. The EI would have the authority to stop activities that are not in compliance with agency requirements until corrective action has been taken.

Northern would conduct environmental training sessions in advance of construction to ensure that all individuals working on the Project are familiar with the environmental mitigation measures appropriate to their jobs and the EI's authority. Northern has established an Environmental Complaint Resolution Procedure that provides landowners whose properties are crossed by the Project with directions for identifying and resolving their environmental mitigation problems or concerns.[7] Prior to construction, Northern would provide the resolution procedure to each landowner, including Northern's toll-free telephone number (888-367-6671), with instructions on lodging a complaint or questions.

A.8.1 Conventional Pipeline Construction Sequence

Northern would install the pipeline facilities below ground using conventional construction methods in certain areas. This typically consists of a sequential process of surveying, clearing, grading, excavating, pipe stringing and bending, welding, lowering-in and backfilling, hydrostatic testing, cleanup, and restoration. Crews working on each stage of construction generally proceed along the pipeline right-of-way in one continuous operation. The entire process would be coordinated to minimize the total time a tract of land would be disturbed and, therefore, exposed to erosion and temporarily precluded from normal use. The activities at any single point would last approximately 4 to 12 weeks.

[7] Northern's Environmental Complaint Resolution Procedure can be found in Resource Report 1, Appendix 1K, accessed via FERC's eLibrary at Accession no. 20160624-5196

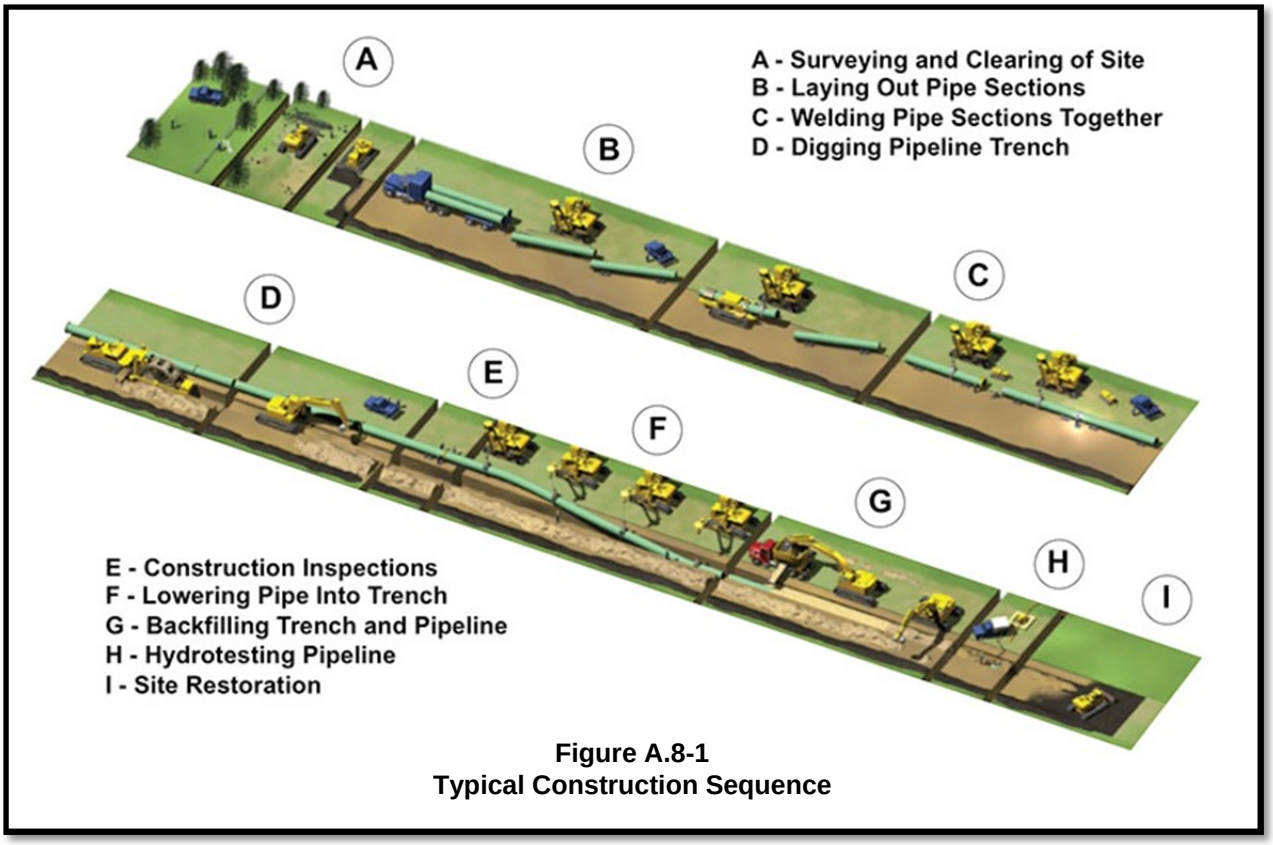


Figure A.8-1
Typical Construction Sequence

A.8.2 Special Pipeline Construction Procedures

In addition to the standard pipeline construction method discussed above, Northern would implement special construction procedures due to site-specific conditions and to reduce overall Project impacts.

A.8.2.1 Horizontal Directional Drill

The HDD method would be used at eight locations to minimize impacts on roads, residential areas, wetlands, and waterbodies by avoiding ground surface disturbance between the drill entry and exit points. Activity between the HDD entry and exit points would be limited to foot travel by construction personnel to deploy directional cables that guide the drilling head and to monitor for inadvertent release of drilling mud. However, one ETWS would be located between drill entry and exit points at approximately MP 0.5 to 0.6 on the St. Cloud Loop to be used for stringing and welding a pipe pullback section. Table A.8.2-1 lists the crossing locations, length, and specific features that would be avoided by each crossing. HDDs would not cross directly under any residences.

The HDD method is achieved by drilling a small-diameter pilot hole under the area to be crossed and enlarging the hole through successive reaming until it is large enough to accommodate a prefabricated segment of pipe. A slurry of drilling mud is circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and promote drillhole stability during drilling and/or the reaming process. Drilling mud primarily consists of bentonite, a non-toxic,

naturally occurring sedimentary clay mixed with water. The position of the drill head is electronically monitored, and directional corrections are made if needed to maintain the desired alignment. Pipe sections are generally staged and welded within a TWS area on the opposite side of the crossing and then pulled through the drilled hole.

Table A.8.2-1

Proposed HDD Locations for the Northern Lights 2017 Expansion Project

HDD Crossing Drawing Identification Numbers [a]	Reference MPs for Sections (approximate)		Approximate Crossing Distance in Feet	Approximate Duration of HDD in Hours	Features Avoided by HDD
	Begin MP	End MP			
Princeton Loop					
P4-1, SSP-001	0.4	0.6	1,140	10	Wetland
P4-2, SSP-002	1.0	1.1	440	10	289th Avenue
P4-3, SSP-003	1.2	1.4	790	10	Pond; Forested Area
P4-4, SSP-004	1.5	1.8	1,460	24	Wetland
St. Cloud Loop					
P4-1, SSP-001	0.0	0.4	2,020	24	6th Street NE; Wetland; Forested Areas
P4-2, SSP-002	0.5	0.6	710	10	Waterbody
P4-3, SSP-003	0.7	1.6	5,240	36	Various Wetlands; Forested Areas; 7 Driveways; Holly Street NW; Larch Drive NW
P4-4, SSP-004	1.6	2.8	5,710	24	345th Avenue NW; Xeon Street NW; Wetlands; Forested Areas; Rum River; Unnamed tributary to Rum River

[a] Plan and Profile Drawings (e.g., P4-1), and Site-Specific Plans (e.g., SSP-001), are provided in appendix 1G of Northern's Resource Report 1, which can be accessed via FERC's eLibrary at Accession no. 20160624-5196

During drilling, the pilot hole and other pre-ream efforts can be shut down at the end of each day; however, the pullback would likely be done in one continuous effort, which could extend after normal working hours. The pullback for some of the shorter crossings can likely be done in one daytime shift (e.g., 10 hours); however, for the longer crossings and those involving multiple pullback (welding) sections, the pullback would likely extend beyond a daytime shift into the nighttime. A majority of the time (e.g., 8-12 hours) for welding the pullback sections would be spent welding/inspecting/sleeving the next segment to be pulled, and during that time, non-essential equipment may be idled until pullback is reinitiated. This may reduce impacts on nearby noise sensitive areas (NSA) such as residences, when pullback efforts extend into the night. The potential noise impacts on NSAs and mitigation measures Northern would implement to reduce noise at NSAs during drilling are discussed in section B.8.2.

Site-specific characteristics including soil conditions not conducive to boring, caving of the borehole, loss of the drill string in the borehole, loss of drilling mud circulation, and pullback refusal may affect the success of an HDD. In order to assess the potential for successful HDD crossings and the risk of an inadvertent release of drilling fluid, Northern conducted a geotechnical HDD Feasibility Assessment for each HDD, which concluded that the HDD crossings on the Princeton and St. Cloud loops are feasible considering the geotechnical

conditions. Northern would manage and adjust the operation of the HDD equipment in problematic situations. In the event the adjustments do not correct the problem, the borehole may be moved to an adjacent location within an approved workspace.

In the event that an inadvertent release of drilling mud to the ground surface occurs, Northern would implement measures prescribed in its Plan for Inadvertent Release of Drilling Mud, which describes how Northern would monitor for and would respond to an inadvertent release of drilling mud. We have reviewed the content of this plan and find it acceptable to limit resource impacts. Temporary impacts from the HDD would primarily result from TWS at the entry and exit of each crossing and at workspace for the pull-back pipeline assembly and stringing.

A.8.2.2 Road Crossings

The Project would cross six public roads in Isanti and Sherburne Counties. The crossings would be completed in accordance with DOT requirements (49 CFR 192) and the requirements of any road crossing permits obtained for the Project. Northern would implement appropriate safety procedures, and traffic warning signs, detour signs, and other traffic control devices would be used, as applicable.

All six of the road crossings would be achieved by HDD (as identified in table A.8.2-1), thereby avoiding any impacts on the roadway surfaces. Highway crossings would be uncased, unless otherwise required by permits. The pipeline would be installed at least 48 inches below the roadside ditches, in accordance with permit requirements, and would be designed to withstand anticipated external loads.

A.8.2.3 Waterbody and Wetland Crossings

Northern's pipeline facilities would cross waterbodies and most wetlands using the HDD method as described above and in accordance with applicable permit conditions and the measures specified in our Procedures, U.S. Army Corps of Engineers (USACE) permit conditions, and Northern's construction plans. Two wetlands would require open-cut construction on the Princeton Loop.

In open cutting wetlands, the clearing of vegetation would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. Stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trenchline. During clearing, sediment barriers, such as silt fence and staked straw bales, would be installed and maintained adjacent to wetlands and within ETWS as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fence or straw bales installed across the working side of the right-of-way may be removed during the day when vehicle traffic is present and would be replaced each night. Sediment barriers would also be installed within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetland or other sensitive areas outside the construction work area. If trench dewatering is necessary in wetlands, the trench water would be discharged in stable, vegetated, upland areas and/or through

a filter bag or siltation barrier. No heavily silt-laden water would be allowed to flow into a wetland.

Construction equipment working in wetlands would be limited to that essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. In areas of saturated soils or standing water, low-ground-weight construction equipment and/or timber riprap, prefabricated equipment mats, or terra mats would be used to reduce rutting and the mixing of topsoil and subsoil. In unsaturated wetlands, the top layer of topsoil, up to 12 inches, would be stripped from the trenchline and stored separately from the subsoil. Topsoil segregation generally would not be possible in saturated soils.

Where wetland soils are saturated and/or inundated, the pipeline may be installed using the push-pull technique. The push-pull technique generally involves stringing and welding the pipeline outside of the wetland and excavating the trench through the wetland using a backhoe supported by equipment mats. The water that seeps into the trench can be used to "float" the pipeline into place together with a winch and flotation devices attached to the pipe. After the pipeline is floated into place, the floats are removed and the pipeline allowed to sink into place. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, a trackhoe working on equipment mats backfills the trench and completes cleanup.

Prior to backfilling, Northern would install trench breakers where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Equipment mats, terra mats, and timber riprap would be removed from wetlands following backfilling. Information regarding waterbody and wetlands impacts and mitigation procedures are provided in EA sections B.3.2 to B.3.3, respectively.

A.8.2.4 Residential Areas

Northern would implement several measures to minimize inconvenience to property owners where residences are located near the edge of the Project workspace. These measures include reducing the workspace as practicable, installing safety fencing and other safety-related measures, and performing clean-up thoroughly and promptly as soon as construction is complete. The specific steps to be taken to reduce potential impacts in residential areas include the measures described below:

- Where open-cut trenching occurs, safety fencing would be installed along the construction corridor in residential areas to discourage children, pets, and non-workers from entering the area. At a minimum, fencing would be installed adjacent to residences for a distance of 100 feet on either side of the residence on the residence side of the construction corridor.

- The trench would be secured with safety fencing each day as construction activities within residential areas come to a close.

- In areas where construction equipment could affect local traffic, flagmen or signage would be stationed on either side of road crossings to direct traffic during construction across

roadways. Northern proposes to drill under all roadways and no open cuts would be conducted.

- Generally, construction in residential areas would occur Monday through Saturday from 7 a.m. to 6 p.m, with the notable exception of HDD where nighttime construction is anticipated. HDD noise and potential impacts on nearby NSAs is described further in section B.8.2.1.

A residential area on the Princeton Loop includes two residences, one about 32 feet and another about 64 feet away, from Project workspace. Northern developed site-specific construction plans for these residences that are included in appendix C. With the issuance of this EA, we are requesting comments from the affected landowners on these site-specific plans.

A.8.2.5 Active Cropland

Construction in agricultural areas would be conducted in accordance with our Plan and Procedures. To conserve topsoil, full right-of-way topsoil removal would be conducted in cultivated and rotated cropland and managed pasture. A maximum of 12 inches of topsoil would be segregated. Where the existing topsoil is less than 12 inches, Northern would remove and segregate the actual depth of the topsoil to the extent practicable. Northern would not segregate topsoil in ETWS areas outside the TWS unless requested by a land management agency or landowner. The topsoil and subsoil would be stored in separate windrows on the construction right-of-way and would not be allowed to mix. Also, following construction, Northern would remove excess rock in cultivated cropland, pastures, and hayfields and would test topsoil and subsoil for compaction. Further information regarding soils and agricultural land is provided in EA sections B.2 and B.5.1.1.

Northern would consult with landowners in agricultural areas prior to construction in an effort to identify any known drain tile locations. Known drain tiles would be noted on the alignment sheets and marked with highly visible flagging at each right-of-way edge and the centerline of the pipe, where applicable. Previously undocumented drain tiles discovered during grading or trenching would also be flagged at each right-of-way edge and survey data would be collected at the location of any broken tiles. Northern commits, following construction, to repair damaged or broken drain tiles. Drain tile repairs would be made by a qualified drain tile specialist, the landowner, or a landowner's representative. The quality, size, and flow of replacement tile would equal or exceed that of the damaged tile.

Following construction, topsoil and subsoil would be tested for compaction in agricultural areas. The contractor would plow subsoil in accordance with the soil compaction mitigation procedures described in our Plan. Compaction testing would be conducted to verify compaction is relieved to a level equal to or better than adjacent undisturbed areas. Once plowing of the subsoil is complete, the segregated topsoil would be returned to the right-of-way. The restoration activity would be considered complete once the topsoil has been disked and raked to near pre-construction conditions. Northern would remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas at the landowner's request such that the size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction.

If construction requires the removal of private property features, such as gates or fences, they would be repaired following construction. Northern would implement its Project-specific Noxious Weed Plan to prevent, mitigate, and control the spread of noxious weeds during Project construction and operation.

A.8.3 Aboveground Facilities Construction and Operation Procedures

Construction of the additional compressor unit and valve setting facilities would take place at the same time as construction of the pipeline facilities. The construction of the compressor unit facilities would include general activities such as clearing and grading, foundation installation, erection of aboveground facilities, installation of piping equipment, testing of equipment, and timely clean-up and restoration of the Project area. Construction activity and storage of construction material would be limited to the ETWS areas, and waste materials would be disposed of in a manner consistent with state and local regulations.

Prior to ground-disturbing activities, erosion and sediment control devices would be installed in accordance with Northern's individual SWPPP. After the compressor site preparation is complete, excavation would be performed, as necessary, to accommodate the new concrete foundations. Forms would be set, rebar installed, and the concrete poured and cured in accordance with minimum strength requirements. Backfill would be compacted in-place, and excess soil would be evenly spread within the station yard or hauled off for proper disposal.

The aboveground compression unit facilities would be installed after foundations are completed. The buildings would be constructed and equipment and control systems installed in compliance with applicable local, state, and federal code requirements. Non-screwed piping would be welded using procedures in accordance with American Petroleum Institute standards (API 1999). Aboveground piping would be cleaned and painted according to Northern's specifications and in accordance with regulatory requirements.

Prior to placing the Project facilities in service, all controls and safety equipment and systems, such as emergency shutdown systems, relief valves, gas and fire detection, and other protection equipment would be tested. Pressure testing would be conducted on piping, in accordance with the requirements of DOT pipeline safety regulations (49 CFR 192), Northern's testing specifications and applicable permits. Testing would follow all applicable federal, state, and local requirements. A waste minimization plan is not required at the Faribault Compressor Station because the station is not categorized as a generator of hazardous waste. However, Northern has company standards and procedures in place that would minimize the potential for uncontrolled releases of hazardous materials and oil.

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

A.9 NON-JURISDICTIONAL FACILITIES

As one of the customers for the Project, Al-Corn Clean Fuel (Al-Corn) is planning a $146 million expansion to its existing ethanol production plant in Claremont, Minnesota, from 50 million gallons/year to 120 million gallons/year. The plant is approximately 21 miles southeast of the Faribault Compressor Station. While the Al-Corn expansion does not fall under FERC jurisdiction, we consider the cumulative impacts of this expansion in our cumulative impacts assessment in section B.10.1 of this EA. We also disclose the environmental permitting requirements (as well as anticipated emissions changes) related to the Al-Corn production plant in section B.10.2.

The Faribault Compressor Station maintains its own existing utility electrical service, and Northern has not identified the need for additional electric supply infrastructure to support the proposed increased compression. No other non-jurisdictional facilities have been identified that would be needed for the Project.

A.10 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table A.10-1 lists the major federal, state, and local permits, approvals, and consultations for construction and operation of the Project and provides the current status. Northern would be responsible for obtaining and abiding by all permits and approvals required for construction and operation of the Project regardless of whether they appear in the table or not.

Table A.10-1

Permits, Approvals, and Consultations for Construction and Operation of the Project

Administering Agency	Permit or Approval	Status
Federal		
Federal Energy Regulatory Commission	Certificate for Public Convenience and Necessity	Approved for pre-filing process in October 2015. Section 7 application submitted June 24, 2016.
U.S. Army Corps of Engineers, St. Paul District	Section 404, Clean Water Act (CWA) – Dredge and Fill Section 10 Rivers and Harbors Act	Informal consultation initiated September 2015 and updated March 3, 2016; Pre-Application meeting occurred March 14, 2016. Pre-Construction Notification submitted May 31, 2016.
U.S. Fish and Wildlife Service (FWS), Region 3, Twin Cities Ecological Service Field Office	Section 7 Endangered Species Act, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and Easement crossings consultations	Informal consultation initiated September 2015 and updated January 26, 2016; follow-up contact February 17, 2016; northern long-eared bat streamlined consultation form submitted to the FWS April 22, 2016. Consultation complete.
U.S. Department of Agriculture • Natural Resource Conservation Service (NRCS) • Farm Service Agency	Conservation Easement Program and seeding recommendations; Conservation Reserve Program	Informal consultation initiated January 27, 2016; response received from Rice County NRCS and Farm Service Agency February 3, 2016. Other consultations pending.
Native American Tribes	National Historic Preservation Act (NHPA), Section 106 Consultation to determine impacts on Traditional Cultural Properties	Informal consultation with Native American Tribes initiated in September 2015; updated January 26, 2016 and March 8, 2016; Copies of archaeological survey report provided to interested tribes May 17, 2016.
State		
Minnesota Pollution Control Agency	Section 401 CWA Water Quality Certification	Authorization issued, dated February 12, 2013, assuming Project is authorized under USACE Section 404/Section 10 Regional General Permit No. 3.
	Clean Air Act, Prevention of Significant Deterioration Minor/Title V Major Air Construction Permit	Permit application submitted May 18, 2016; Anticipated approvals fall 2016
	NPDES Stormwater Permit	Application planned for summer/fall 2016; Anticipated receipt fall 2016
	NPDES Hydrostatic Test Water Discharge Permit	Application planned for summer/fall 2016 (if needed); Anticipated receipt fall 2016
	NPDES Trench Water Discharge Permit	Application planned for summer/fall 2016; Anticipated receipt fall 2016
Minnesota Department of Natural Resources	State Licenses to Cross Public Lands and Waters	Applications submitted May 31, 2016; Anticipated receipt fall 2016
	State Protected Species Consultations	Informal review of listed species in October 2015 and updated January 26, 2016. Response received February 23, 2016. Consultation complete.
	Water Appropriation Permit General Permit 1997-0005	Application planned for summer/fall 2016 (if needed); Anticipated receipt fall 2016
Minnesota State Historic Preservation Office	Section 106 Consultation, NHPA	Phase I Cultural Resource Report submitted for review and concurrence May 11, 2016; Concurrence and request for additional information received June 10, 2016; Response provided July 2016. State Historic Preservation Office (SHPO) concurrence received August 12, 2016; final revised version of report submitted to the SHPO August 25, 2016.

SECTION B – ENVIRONMENTAL ANALYSIS

In this section, we discuss the affected environment, general construction and operational impacts, and proposed mitigation to minimize or avoid impacts for each resource. Northern, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluate Northern's proposed mitigation measures to determine whether additional measures would be necessary to reduce impacts. Where we identify the need for additional mitigation, our additional recommended measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to any authorization that the Commission may issue to Northern. Conclusions in this EA are based on our analysis of the environmental impact and the following assumptions:

- Northern would comply with all applicable federal laws and regulations;
- the proposed facilities would be constructed as described in section A of this document; and
- Northern would implement the mitigation measures included in its application and supplemental filings to the FERC.

B.1 GEOLOGY

B.1.1 Physiographic Settings and Geologic Conditions

The proposed Project facilities are within the Western Lake Section of the Central Lowland Physiographic Province of the Interior Plains Region (U.S. Geological Survey [USGS] 2016a). The geologic terrane of this province is characterized by bedrock overlain by substantial deposits of glacial drift with relatively low surficial relief. Surficial geology at the Project facilities is characterized by unconsolidated deposits from Pleistocene Epoch continental glaciation ranging from 120 to 279 feet thick. The St. Cloud and Princeton loops are located within the Anoka Sand Plain (Landon and Delin 1995), a regional surficial outwash deposit that serves a sizeable aquifer that is vulnerable to contamination owing to its high permeability and shallow depth. The Faribault Compressor Station is within a nearly level to gently rolling glaciated till plain with moraines and glacial lake plains in some areas. There is little topographic relief along the pipeline loops or within the aboveground facility sites. The Princeton Loop has the greatest relief with a maximum difference in elevation of 78 feet.

The bedrock geology underlying the Project facilities can be characterized by a sequence of Paleozoic Era strata that were deposited within a basin known as the Hollandale Embayment (Delin and Woodward 1984) overlying older Pre-Cambrian basement rocks comprised primarily of igneous and metamorphic rocks. Moving roughly north to south, the bedrock units that underlie the unconsolidated materials become increasingly younger and higher stratigraphically. These, in turn, are underlain by successively older units moving downward to where the oldest strata unconformably overlie the Pre-Cambrian igneous and metamorphic terrane. The uppermost and, hence, youngest bedrock units underlying the Princeton Loop and St. Cloud Loop include the Eau Claire Formation of the Middle and Upper Cambrian Period and Mt. Simon Sandstone of the Middle Cambrian Period range. The bedrock formation underlying the Faribault Compressor Station is Middle Ordovician Period St. Peter Sandstone.

B.1.2 Mineral Resources and Paleontology

No mineral resources, including industrial, aggregate (e.g., sand, gravel, and crushed stone), or metallic (e.g., iron ore, copper, nickel, and titanium) minerals are located within 0.25 mile of the Project facilities in Minnesota. Additionally, no industrial or metallic mineral leases were found within 0.25 mile of the Project facilities (MNDNR 2016a).

Although the glacial deposits in Minnesota are capable of containing paleontological resources, such resources tend to be scarce where glacial ice was present because glacial deposition processes rarely preserve specimens intact. Therefore, the potential for impacting paleontological resources is considered minimal.

B.1.3 Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically are seismic-related including earthquakes, surface faulting, and soil liquefaction or landslides, flooding, and karst or ground subsidence.

Based on a review of the USGS Peak Ground Acceleration Map (USGS 2014), the risk for seismic ground motion (earthquakes) to cause damage to structures in the Project areas is low. Review of USGS fault mapping indicates that there are no recently active faults (less than 1.6 million years old) within the Project area, and the area has been tectonically stable for more than 500 million years (USGS 2016a). In addition, given the low potential for earthquakes to occur in the vicinity of the Project facilities, the potential for soil liquefaction to occur in the Project area is low. Therefore, no seismic-related geologic hazards are anticipated.

USGS landslide incidence and susceptibility mapping within the Project area indicates that the Project facilities are located in areas of low landslide incidence (Radbruch-Hall et al. 1982). Additionally, because of the relatively low topographic relief observed at each of the sites, the potential for a noteworthy landslide to occur in the Project area is considered unlikely.

Review of Federal Emergency Management Agency (2016) flood maps indicates that the St. Cloud Loop crosses an area with more than a minimal chance of flood hazard. The remaining facilities would not be in a flood hazard area. Although the likelihood of flooding in any given year is small, in the event that flooding should occur, it is not expected to have an effect on the pipeline. Potential effects associated with high rainfall events during construction would be mitigated by implementing measures in the Plan and Procedures. The pipeline would not cause additional flooding because it would be buried and the surface restored to pre-construction contours to the extent practicable. Construction or operational impacts due to flooding are not anticipated.

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst dissolution, sediment compaction, oil and gas extraction, underground mines, and groundwater pumping. Only the Faribault Compressor Station site has potential for karst development as indicated by the presence of carbonate rocks beneath the glacial drift (Weary and Doctor 2014). However, due to the depth of glacial drift that overlies the carbonate bedrock, surface expression of karst features are expected to be rare and would be substantially subdued, if present at all. Therefore, we do not anticipate that subsidence due to karst dissolution would affect Northern's proposed facilities.

We conclude that the Project impact potential from geological hazards is minimal and not significant.

B.1.4 Geotechnical Investigations

Northern conducted geotechnical borings within the Project area to characterize near-surface geology and to investigate the feasibility of successfully utilizing the HDD method as proposed for the Project (see section A.8.2.1). The geotechnical bores found that a variety of subsurface conditions are present along the HDD alignments ranging from medium dense sand to lean clay to gravel, with the majority of sites having sandy conditions. The results of the feasibility study determined that all of the HDD crossings in the Princeton and St. Cloud loops are considered feasible and that the bore profiles are expected to be drilled through formations that are suitable for HDDs. The hydro-fracture assessments indicate that some crossings have medium to high potential for inadvertent returns within the central length of the drill, and mitigation measures have been identified to address the risks of an inadvertent release of drilling fluids. Despite these risks, we agree that the HDD crossings are feasible. In the event of an inadvertent release, Northern would follow its Plan for an Inadvertent Release of Drilling Mud which outlines Northern's responsibilities, as well as clean-up protocols for such a release.

B.2 SOILS

B.2.1 Existing Characteristics

Soil characteristics in the Project area were identified and assessed using the Natural Resource Conservation Service (NRCS), Soil Survey Geographic Database (SSURGO, NRCS 2016), which is a digital version of the original county soil surveys developed by the NRCS for use with a geographic information system. Approximately 99 percent of the soils crossed by the Princeton Loop are characterized as sandy, with about half (45 percent) coarse sands and half (53 percent) fine sands. On the St. Cloud Loop, approximately 85 percent of the soils are fine sand, 13 percent are sandy loam, and the balance is hydric, alluvial, or poorly drained soils. The dominant soils impacted at the Faribault Compressor Station are predominantly flat loamy soils (55 percent) and silty clay loam (45 percent). Soils are also characterized as farmland, hydric, droughty, compactible, and erodible soils, and for their susceptibility to rutting and for the presence of known contamination. A description of these soil characteristics within the Project areas including impacts and mitigation measures are described below.

B.2.2 Farmland

The Project would affect two NRCS farmland classes, prime farmland and farmland of statewide importance. Prime farmland soils are classified as those best suited for production of food, feed, fiber, and oilseed crops. These soils generate the highest yields with the least amount of expenditure. Farmland of statewide importance generally include areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. During construction, approximately 19.3 acres of prime farmland and 22.3 acres of farmland of statewide importance would be temporarily affected.

Potential impacts on agricultural soils would be minimized and mitigated in accordance with the Plan and the special construction procedures described in section A.8.2.5. These include measures to conserve and segregate topsoil, alleviate soil compaction, protect and maintain existing drainage tile and irrigation systems, prevent the introduction of weeds, retain existing soil productivity, and replace fencing that is damaged. Implementation of proper topsoil segregation, soil decompaction, drainage, and weed controls would help ensure post-construction revegetation success and productivity, thereby minimizing the potential for long-term impacts on agricultural lands. Following construction, agricultural activities would be allowed to resume without restrictions except where aboveground facilities are present. None of the pipeline facilities would permanently impact prime farmland and no farmland of statewide importance would be permanently impacted by the Project facilities.

B.2.3 Droughty Soils

Droughty soils have a coarse surface texture and are somewhat excessively or excessively drained. They do not retain an adequate amount water necessary for germination and establishment of new vegetation. Coarse-textured soils have a lower water holding capacity following precipitation, which can result in moisture deficiencies in the root zone creating unfavorable conditions for many plants. A total of 31.4 acres (84 percent) of the Princeton Loop and 26.6 acres (56 percent) of the St. Cloud Loop construction footprints are droughty. None of the soils within the footprint of the Faribault Compressor Station are droughty.

Following construction, disturbed areas would be seeded, mulched, and permanent erosion controls would be installed, including permanent slope breakers, trench breakers, and diversion outlet structures. The effectiveness of revegetation and permanent erosion control devices would be inspected by FERC during construction and initial restoration, and then afterward as necessary. Effectiveness would also be monitored by Northern during the long-term operation and maintenance of the pipeline system. Erosion control devices would be maintained until the right-of-way is successfully revegetated. Following successful revegetation of construction areas, temporary erosion control devices would be removed.

B.2.4 Erosion

Soil erosion is a form of soil degradation when the soil nutrients and organic matter important for plant growth are lost, most commonly due to water (e.g., rainfall, runoff) and wind erosion. On-site impacts include decreases in agricultural productivity or density and vigor of vegetation cover because of loss of the nutrient-rich upper soil layers. Off-site effects include sedimentation of waterways and eutrophication of water bodies. The loss of soil from farmland may be reflected in reduced crop production potential, lower surface water quality, and damaged drainage networks. Approximately 37.3 acres (99 percent) of the Princeton Loop and 40.6 acres (86 percent) of the St. Cloud Loop construction footprints are susceptible to wind erosion. None of the soils within the footprint for the Faribault Compressor Station are highly wind erodible. A total of 6.6 acres (18 percent) of the Princeton Loop and 21.3 acres (51 percent) of the St. Cloud Loop construction footprints are considered water erodible. Approximately 0.4 acre (2 percent) of the construction footprint for the Faribault Compressor Station is water erodible; however, operation of this station would not permanently impact any water erodible soil.

To minimize any potential for soil erosion from wind and water, Northern would install temporary and permanent erosion control devices as specified in the Plan, the SWPPP, and applicable permits. Temporary erosion control measures, including interceptor diversions (e.g., slope breakers) and sediment filter devices (e.g., straw bales, silt fence, or sediment basins), would be installed immediately following initial ground disturbance. As required, temporary trench breakers would be installed immediately following ditch excavation to reduce runoff velocities in the trench during construction. Mulch or other wildlife-suitable erosion control matting may be used on slopes to prevent erosion during construction. Best management practices, such as spraying water as needed, would be implemented to limit wind erosion. The temporary erosion control devices would be inspected on a regular basis by Northern and after each rainfall event of 0.5 inch or greater to ensure controls function properly.

B.2.5 Compaction and Rutting

Compaction occurs when moist or wet soil particles are pressed together and the pore spaces between them are reduced. Restricted infiltration results in excessive runoff, erosion, nutrient loss, and potential water-quality problems. Compaction restricts penetration by plant roots and inhibits plant growth. The amounts of soil in the construction footprint that are compaction prone are 0.5 acre (1

percent) of the St. Cloud Loop, 8.1 acres (42 percent) of the Faribault Compressor Station site, and none of the Princeton Loop. Operation of the compressor station would permanently impact approximately 0.5 acre of compaction-prone soil.

During construction, temporary compaction of soils would be caused by grading and heavy equipment traffic over the soil surface. Grading and trenching have the potential to mix topsoil with subsoil, potentially resulting in reduced soil productivity and introduction of subsurface rocks to the soil surface. The Plan includes decompaction measures, topsoil stripping requirements, and restoration and revegetation measures. Northern would monitor revegetation after the first and second growing seasons unless revegetation was not progressing satisfactorily by the end of the second growing season; in that case, Northern would continue to monitor revegetation until the revegetation was progressing satisfactorily.

Rutting can occur when equipment is operated on soils that are moist or saturated. The amounts of soil in the construction footprint that have severe rutting potential are 0.5 acre (1 percent) of the St. Cloud Loop, 19 acres (100 percent) of the Faribault Compressor Station site, and none of the Princeton Loop. Operation of the expanded Faribault Compressor Station would permanently impact approximately 1.8 acres of soil with severe rutting potential.

In order to minimize rutting, Northern would stabilize access roads using gravel or timber equipment mats. If rutting of 6 inches or greater occurs during construction along ungraded portions of the Project area, Northern would immediately limit construction activities in that area or implement protective measures (e.g., install timber equipment mats) to prevent additional rutting. If rutting occurs along access roads, Northern would require its construction contractor(s) to provide maintenance equipment to repair the ruts to pre-construction conditions or better as soon as ground conditions permit. With implementation of these mitigation measures, we conclude that construction and operation of the Project would have negligible impacts on soils.

B.2.6 Soil Contamination

Soil contamination can exist and be encountered during construction if hazardous waste exists from prior residences, underground storage tanks, buried trash, unidentified oil or gas lines, etc. Based on a review of the Minnesota Pollution Control Agency's (MPCA) contaminated sites database, no soils that are currently known to be contaminated would be encountered during construction.

Project-related soil contamination resulting from spills or leaks of fuels, lubricants, and coolant from construction equipment would be minimized by Northern's adherence to its Spill Prevention Control and Countermeasures Plan (SPCC Plan), which specifies clean-up procedures in the event of spills or leaks of hazardous materials. Should a spill occur, Northern and its contractors would follow the SPCC Plan to contain the spill of any material that may contaminate soils and to ensure that the spill area is cleaned up and the materials are disposed of in an appropriate manner. Northern would also follow the procedures outlined in its SPCC Plan in the event contaminated soils are encountered during construction.

B.3 WATER RESOURCES AND WETLANDS

B.3.1 Groundwater

Aquifers underlying the Project area are present in glacial drift material over sedimentary bedrock strata. The Anoka Sand Plain is a regional surficial outwash deposit in the vicinity of the St. Cloud and Princeton loops and serves as an important aquifer that is vulnerable to contamination due to its high permeability and shallow depth. The bedrock aquifers underlying the Project area are composed of the

Hinckley Sandstone in the northern Project areas to Devonian Cedar (Valley Formation) toward the south. There are currently no EPA-designated Sole Source Aquifers crossed by the Project (EPA 2016a). Construction of pipelines and aboveground facilities is typically confined to a depth of no more than 10 feet below the ground surface, which is above the typical minimum depth of the bedrock aquifers underlying the Project area and is generally expected to be above the water table in surficial aquifers. However, the shallow surficial aquifers are typically composed of relatively permeable alluvial sands and gravels that respond rapidly to changes in water level elevations or groundwater flow.

If excavation occurs below the water table, the resulting changes in water levels and/or turbidity in these aquifers are expected to be localized and temporary because water levels would quickly re-establish equilibrium, and turbidity levels would rapidly subside. Northern would avoid or further minimize potential impacts by using construction techniques described in the Plan, such as using temporary and permanent trench plugs and interceptor dikes for pipelines, and by restoring ground contours and vegetation on the right-of-way to establish surface drainage and recharge conditions as closely as possible to those prior to construction. These measures would minimize impacts on surficial aquifers.

Based on review of the Minnesota County Well Index (Minnesota Geological Survey 2016), ten private water wells are within 150 feet of the construction workspace for the Project facilities (table B.3.1-1). No springs were identified by landowners or during field surveys within 150 feet of the Project workspaces. Eight of the wells are located near the Princeton Loop and two near the St. Cloud Loop. No wells are known to be present within the construction footprint for the loops, and no wells were identified within 150 feet of the Faribault Compressor Station.

The closest well to the construction workspace is 5 feet, and the remaining nine wells are between 61 and 146 feet from the construction workspace. The wells are not expected to incur impacts from construction. In order to ensure no impacts occur, Northern would consult with the landowners, and upon their approval, test the private wells within 150 feet of construction work areas for water quality, recharge, and depth to water prior to commencing with construction and again after final cleanup. The tests would be used to determine whether any construction-related impacts occurred. In the event that construction adversely affects a well, the damaged well would be restored to its former quality to the extent practicable, or replaced. Northern would provide water to the landowner if a well is adversely affected during construction.

Public and non-public community water supply source-water protection in Minnesota is administered by the Minnesota Department of Health (MDH) through the Wellhead Protection program. Wellhead Protection Areas for public and community water-supply wells are available through a database maintained by the MDH (2014). Review of this database indicates that the southeastern portion of the Faribault Compressor Station site overlaps a Wellhead Protection Area. Spill-related impacts from pipeline construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. Northern's SPCC Plan outlines measures that would be implemented to prevent accidental releases of fuels and other hazardous substances and describes response, containment, clean-up, and reporting procedures for spills that could affect public water supplies. Therefore, no Project-related impacts on public water supplies are anticipated.

Table B.3.1-1

Water Supply Wells and Springs within 150 feet of Construction Work Areas

Facility	County (Minnesota)	Approximate Milepost	Approximate Distance (feet) and Direction from Construction Work Area
Princeton Loop	Sherburne	0.0	145, South
		1.0	127, West
		1.0	5, East
		1.4	104, Northeast
		1.4	61, Southwest
		1.5	146, Southeast
		1.5	125, East
		1.8	120, South
St. Cloud Loop	Isanti	1.0	135, South
		1.7	120, South

Northern conducted a search using publicly available state and federal databases to identify the potential for and/or actual sources of groundwater contamination within 500 feet of the Project construction workspaces. No groundwater contamination issues are known that would be exacerbated by construction or operation of the facilities. In the unlikely event that undocumented sites with contaminated groundwater are encountered, containment measures outlined in Northern's SPCC Plan would be implemented to isolate and contain the suspected groundwater contamination and collect and test samples to identify the contaminants. Once the type, magnitude, and extent of the contamination is determined, a response plan would be developed for crossing or avoiding the site.

HDD methods planned for the Project would likely penetrate below the water table. However, because the drilling fluid is composed of water and non-toxic bentonite, the drilling would not affect groundwater quality, levels, or groundwater flow directions.

We conclude that the Project impact on groundwater is minimal and not significant.

B.3.2 Surface Waters

Surface water resources within the Project area are located within the Upper Mississippi River drainage basin. The Princeton and St. Cloud loops are located within the Rum River watershed, and the Faribault Compressor Station is within the Cannon River watershed. The Project would cross six waterbodies, including one ephemeral waterbody on the Princeton Loop and three perennial and two ephemeral waterbodies on the St. Cloud Loop. No waterbodies would be crossed by the Faribault Compressor Station expansion. Table B.3-2-1 lists the waterbodies crossed including county, approximate milepost, waterbody name, flow regime, crossing length, and proposed crossing method.

National wild and scenic rivers are protected by Section 7(a) of the Wild and Scenic Rivers Act. None of the waterbodies impacted by the proposed Project are included in the National Wild and Scenic Rivers System (National Wild and Scenic River System 2016).

Navigable waters are designated by the USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. According to the USACE, the Rum River is considered navigable throughout the length of the river, and therefore subject to USACE jurisdiction.

Table B.3.2-1

Waterbodies Crossed by the Project Route

Facility, County, Milepost	Waterbody Name	Flow Regime	Crossing Length (feet)[a]	Crossing Method [b]
Princeton Loop				
Sherburne County				
1.6	Unnamed Ditch to Blue Lake	Ephemeral	10.0	HDD
St. Cloud Loop				
Isanti County				
0.5	Unnamed Tributary to Rum River	Perennial	3.0	HDD/Equipment Bridging
1.7	Unnamed Tributary to Rum River	Ephemeral	3.0	HDD
2.0	Unnamed Tributary to Rum River	Perennial	13.0	HDD
2.6	Rum River	Perennial	150.0	HDD
2.8[c]	Unnamed Tributary to Rum River	Ephemeral	N/A	N/A; Equipment Bridging

[a] Crossing Length measured during field surveys as ordinary high water mark bank to bank. Crossing Length listed as N/A indicates that the referenced waterbody is located within the Project workspace, but is not crossed by the centerline. At this location, the nearest milepost is referenced.

[b] Vehicle and equipment crossings would be completed on bridges as specified in section V.B.5. of the Procedures.

[c] The St. Cloud Loop terminates at approximately MP 2.8; this location is about 0.3 mile west of MP 2.8 within a proposed ETWS proposed for an HDD pullback.

Based on review of Federal Emergency Management Agency flood hazard maps, the St. Cloud Loop would cross regulatory floodplains (i.e., the 100-year or base flood) associated with a wetland basin between approximately MP 0.1 and 0.3 and with the Rum River between approximately MP 1.6 and 2.7. The pipeline would be buried in those locations and not be exposed to flooding conditions during operations. The remaining Project facilities are located outside the regulatory floodplain. None of the work proposed by Northern would increase the potential for flooding.

The Rum River is the only designated Minnesota Public Water crossed by the Project. Crossing a Minnesota Public Water with a pipeline requires a Utility Crossing License from the MNDNR. The Rum River is also designated as an Outstanding Resource Value Water, and the crossing location is within a segment that is so designated due to its scenic and recreational attributes. The Rum River is also listed on the MPCA 2014 Inventory of Impaired Waters for mercury. However, Northern would cross the Rum River using the HDD method and, therefore, the crossing would not result in direct impacts on the bed or banks, or impact water quality.

Isanti County includes two special protection districts in its zoning ordinance that are waterbody-oriented and provide unique resource-based standards and permitting requirements (Isanti County 2014). These districts include the Shoreland District, which includes land within 1,000 feet of the Ordinary High Water Mark of a Minnesota Public Water and the Rum River Scenic District, which includes land within 300 feet of the determined water mark. Based on a review of the Isanti County Zoning Map, portions of the St. Cloud Loop would cross the Shoreland District between approximately MPs 1.6 and 2.8, and the Rum River Scenic District between approximately MPs 2.5 and 2.7. However, these crossings would primarily utilize the HDD method and subsequently avoid surface impacts within the zoning districts. The only portion impacted would be a small portion of the Shoreland District near MP 1.6, which is entirely actively cultivated cropland and where Northern would use ETWS and a staging area for the HDD entry point for the Rum River crossing. Therefore, we conclude no significant impacts on these zoning districts would occur. Additional discussion about these zoning districts is provided in section B.5.2.

No waterbodies within the Project area are classified by the State of Minnesota for domestic consumption. There are no potable surface water supplies within 3 miles downstream of any Project facilities or workspace. Therefore, the Project would not result in impacts on potable surface water supplies.

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

Destruction of streambank vegetation during construction can temporarily expose streambanks to erosion, cause sedimentation, increase turbidity, reduce riparian habitat, and result in increased water temperatures if there is a loss of shade vegetation. While some clearing of vegetation would be required for the Project to install equipment bridge crossings for the stringing of HDD pipe pullback sections, vegetation would be preserved to the greatest extent practicable at those locations, and clearing of streambank vegetation would be completely avoided by the use of the HDD method at other crossings. In addition, during operations, Northern does not anticipate maintaining vegetation along the HDD paths.

There are a variety of impacts that could occur to waterbodies due to erosion of disturbed soils and sedimentation in the waterbodies, including habitat loss, increased turbidity, decreased productivity, reduced streamflow capacity, and direct mortality to aquatic species. Upon installation of equipment bridges, Northern would install erosion and sediment control devices and maintain them to prevent streambank erosion throughout the duration of construction. Once the bridges are no longer needed and have been removed, Northern would reclaim and re-contour disturbed areas and maintain the erosion and sediment control devices until streambanks are revegetated and stabilized. As part of Northern's temporary erosion and sediment control measures, Northern would construct or install slope breakers, sediment barriers, stormwater diversions, trench breakers, and mulch, and seed to establish ground cover as necessary to protect waterbodies along the construction right-of-way, access roads, ETWS, spoil piles, and in other areas of land disturbance. Permanent erosion control would be executed by restoration of slopes and contours to pre-construction conditions and revegetation using approved seed mixes. Temporary and permanent erosion and sediment control measures would be installed as specified in the Procedures and Northern's NPDES Stormwater Permit. Based on these measures, we find that the potential for erosion and sedimentation to adversely affect waterbodies would be minimized to the extent practicable and impacts would not be significant.

Waterbody crossings completed using the HDD method (see section A.8.2.1) would generally avoid and greatly minimize the potential for surface water impacts resulting from erosion, sedimentation, and/or excess turbidity by avoiding ground surface disturbance in and immediately adjacent to the waterbody. The execution of the HDD method requires the use of drilling mud under pressure, and the potential exists for an inadvertent release of drilling mud if the drill path encounters fractures or fissures that offer a pathway to the ground surface or the waterbody being crossed. Drilling mud released into a waterbody can result in temporary sedimentation of stream bottom habitats, increased turbidity levels, and cover stream bottom habitats and immobile benthic organisms. Northern would minimize the potential for an inadvertent release. However, because the potential for accidental releases of drilling mud exists, and potential impacts on waterbodies could occur, Northern has prepared a Plan for Inadvertent Release of Drilling Mud that outlines specific procedures and methods for addressing an inadvertent release of

drilling mud.[8] This plan includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, as well as making necessary agency notifications. We have reviewed this plan and find that impacts on waterbodies due to an inadvertent release would be minimized to the extent practicable.

Northern conducted a HDD Feasibility Analysis of its HDD crossings and identified locations where there could be a higher risk for inadvertent returns of drilling fluid due to subsurface conditions. While the potential for an inadvertent release exists for all crossings, higher potentials are identified for portions of four of the eight proposed crossings, including portions of crossings P4-1 on the Princeton Loop and P4-1, P4-3, and P4-4 on the St. Cloud Loop. In addition to the measures outlined in Northern's Plan for Inadvertent Release of Drilling Mud, Northern's HDD contractor would review Northern's HDD Feasibility Report and exercise heightened sensitivity to the mud circulation and drilling pressures when drilling along segments that have a higher risk of inadvertent releases. This may include use of additives during drilling to prevent inadvertent return events and/or in certain cases when drilling fluid circulation seems to be diminishing. Additives may include inert and environmentally benign materials such as wood fibers, seed husks, ground walnut shells, and other natural materials to attempt to seal conduits or to aid in reestablishment of drilling fluid returns to the entry and/or exit pits. Additional additive options may also include special polymers that swell when added to water which are non-hazardous and on an approved list maintained by the Minnesota Department of Health (MDH 2016).

A release of fuel or hazardous material into a waterbody can directly cause mortality to aquatic organisms and wildlife that use the waterbody. In order to prevent the introduction of fuels and/or hazardous materials into waterbodies, Northern has developed an SPCC Plan to prevent, contain, and clean up spills and address necessary precautions during material storage. As part of the SPCC Plan, fuel storage and refueling of equipment would not be allowed within 100 feet of waterbody boundaries, unless otherwise requested by Northern and approved by the FERC (see EA sections A.8 and B.3.5). Based on these measures, we find the potential for a release of fuel or hazardous material into a waterbody would be minimized to the extent practicable and impacts would not be significant.

Precipitation and/or the seepage of groundwater can necessitate the dewatering of trenches and other excavated areas. During dewatering, water would be pumped from the trench or excavated area, discharged into a well-vegetated upland area, and filtered through a geotextile sediment filter bag or straw bale dewatering structure, as outlined in the Procedures. Dewatering would be conducted in a manner designed to prevent the flow of silt-laden water directly into adjacent waterbodies and would be in accordance with applicable permitting requirements.

Northern would construct its facilities in accordance with the regulations and requirements of applicable permits such as USACE authorizations under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, the MNDNR Utility Crossing License, and NPDES stormwater discharge permit. Consultation with the USACE determined that the Project would likely qualify for Section 10/404 authorization under the USACE Regional General Permit No. 3. Northern submitted its Pre-Construction Notification for USACE Authorization, and its MNDNR Utility Crossing License applications on May 31, 2016.

Based on these measures we conclude impacts on waterbodies would be minimized to the extent practical and would not be significant.

[8] Northern's Plan for Inadvertent Release of Drilling Mud can be found in Resource Report 1, Appendix 1F, accessed via FERC's eLibrary at Accession no. 20160624-5196.

B.3.3 Wetlands

Four classes (Cowardin et al. 1979) of palustrine (freshwater) wetland systems are present in the Project area. These classes include palustrine emergent (PEM) wetlands -- characterized by erect, rooted, herbaceous vegetation; palustrine scrub-shrub (PSS) wetlands -- dominated by woody vegetation less than 20 feet in height; palustrine forested (PFO) wetlands -- characterized by woody vegetation that is approximately 20 feet tall or taller and normally includes an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer; and palustrine unconsolidated bottom (PUB) wetlands -- generally characterized as ponds with a vegetation cover less than 30 percent. Of these wetland types, only about 0.1 acre of PEM wetland and 0.5 acre of PSS wetland would be temporarily impacted by construction, and less than 0.1 acre of PSS wetland would be impacted by operations. No PFO or PUB wetlands would be impacted due to use of the HDD crossing method. Table B.3.3-1 lists the individual wetlands crossed by the Project, including their approximate milepost location, wetland type, crossing length, acreage impacted by construction and operations, and the proposed crossing method, as applicable.

The Princeton Loop would cross 1,182 feet of PEM wetlands; however, none would be affected during construction due to use of the HDD crossing method and none would be impacted by pipeline operation. The pipeline would also cross 787 feet of PSS wetlands, with 0.5 acre affected during construction as a result of the use of the open-cut method. Less than 0.1 acre of PSS wetland would be affected by routine maintenance of vegetation within a 10-foot-wide strip over the center of the pipeline during operations.

In accordance with the Procedures, Northern would limit impacts within the open-cut PSS wetlands to a 75-foot-wide construction corridor necessary to clear the vegetation, dig the trench, install the pipeline, and restore contours. During operation, Northern would not maintain vegetation along the HDD drill paths; therefore, no conversion or permanent impact on PEM or PSS wetlands crossed by HDD are anticipated. Following construction, the PSS wetlands that are open-cut would be allowed to return to their pre-construction state, and Northern may maintain vegetation, resulting in a permanent conversion of less than 0.1 acre of the wetland from PSS to PEM. No PFO or PUB wetlands are present on the Princeton Loop, and therefore no impacts on these two classes of wetlands would occur.

The St. Cloud Loop would cross all four classes of wetlands present in the Project area, PEM, PSS, PUB, and PFO, but none of the wetlands would be impacted from the pipeline crossing because of the planned use of the HDD crossing method. One PEM wetland (near the terminus of the loop [MP 2.8]) is within the proposed ETWS for the HDD pipeline pullback string. Approximately 0.1 acre of this PEM wetland would be temporarily impacted by stringing the pipeline across the wetland surface, with equipment operating on mats if needed to prevent rutting or ground disturbance. Existing temporary access roads that cross through wetlands are expected to be useable without improvements or modifications. During operation, Northern does not plan to maintain vegetation along the HDD drill paths; therefore, no conversion or permanent impacts on wetlands would occur. Following construction, the temporarily impacted PEM wetland is expected to return to its pre-construction state.

Two PEM wetlands are present within the proposed ETWS at the Faribault Compressor Station site. Wetlands within the ETWS would be avoided during both construction and operation of the Compressor Station addition and expansion of the site. Therefore, there would be no impacts from construction nor operations of the Project on either wetlands.

As noted above, Northern would largely avoid impacts on wetlands by using the HDD method (see section A.8.2.1) to install the pipeline facilities across most wetlands, except for the two PSS wetlands on the Princeton Loop, which would be crossed by the open-cut crossing method. In those

wetlands, Northern would limit the construction right-of-way width to 75 feet and use the Procedures and other measures to minimize wetland impacts as described in section A.8.2.3.

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

Compaction of wetland soils and rutting within wetlands due to equipment operation can affect wetland hydrology and revegetation. Compaction would be minimized by limiting equipment operation in wetlands and installing temporary equipment mats, as necessary. Soil characteristics also can be changed during construction because of inadvertent mixing of topsoil and subsoil during grubbing and trenching. To prevent such mixing in unsaturated wetlands, topsoil would be removed from directly over the trench and stockpiled for restoration as close as feasible to its original horizon. No topsoil segregation would be attempted in saturated wetlands.

Permanent changes in surface and subsurface hydrology through a wetland can have a long-term impact on the habitat type and quality. To minimize these impacts in areas where the pipeline trench might divert drainage or block the normal flow of water through a wetland, cross-drainage would be provided to maintain the hydrologic characteristics of the wetland. Trench plugs would be installed at the entrance and exit of the pipeline trench through the wetland to ensure that the wetland is not drained along the pipeline. Any confining layers that are breached during construction would be restored during backfilling. Restoration of each wetland would involve returning contours to pre-construction levels and removing temporary erosion control measures.

Wetland crossings completed using the HDD method would generally avoid and greatly minimize the potential for wetland impacts resulting from erosion, sedimentation, and/or excess turbidity by avoiding surface disturbance in and immediately adjacent to the wetlands. However, as described above, the potential for accidental releases of drilling mud exists, and potential impacts on wetlands could occur, but would be minimized by implementation of Northern's Plan for Inadvertent Release of Drilling Mud, which includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, as well as making necessary agency notifications.

Permanent erosion controls would be installed during restoration and may include slope breakers, interceptor diversion devices, and/or vegetation cover in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of surface water diversion devices to prevent erosion off the right-of-way into wetlands. Crossing of wetlands would be completed as described in section A.8.2.3, above, and in accordance with required permit conditions and our Procedures. In addition, Northern's SPCC Plan provides restrictions and mitigation measures to limit potential impacts associated with the release of fuels, lubricants, or other potentially toxic materials used during routine construction. Refueling and storage of hazardous materials would be prohibited within 100 feet of wetlands during construction, unless otherwise requested by Northern and approved by the FERC (see section B.3.5). Based on these measures, we find the potential for a release of fuel or hazardous material into a wetland would be minimized to the extent practicable.

Table B.3.3-1

Wetlands Impacted by the Project Facilities

Facility; County	Milepost	Wetland Type	Crossing Length (feet) [c]	Acreage Affected During Construction [d]	Acreage Affected During Operation [e]	Crossing Method [f]
Princeton Loop						
Sherburne	0.0	PSS	182	0.3	<0.1	Open-cut
Sherburne	0.1	PSS	48	0.2	<0.1	Open-cut
Sherburne	0.4	PEM	791	0.0	0.0	HDD
Sherburne	0.5	PSS	44	0.0	0.0	HDD
Sherburne	1.3	PEM	171	0.0	0.0	HDD
Sherburne	1.6	PEM	220	0.0	0.0	HDD
Sherburne	1.7	PSS	513	0.0	0.0	HDD
Subtotals Princeton			**1,969**	**0.5**	**<0.1**	**--**
St. Cloud Loop						
Isanti	0.0	PSS	163	0.0	0.0	HDD
Isanti	0.1	PEM	214	0.0	0.0	HDD
Isanti	0.7	PEM	45	0.0	0.0	HDD
Isanti	0.8	PEM	471	0.0	0.0	HDD
Isanti	1.0	PEM	111	0.0	0.0	HDD
Isanti	1.0	PEM	130	0.0	0.0	HDD
Isanti	1.1	PEM	158	0.0	0.0	HDD
Isanti	1.2	PEM	326	0.0	0.0	HDD
Isanti	1.4	PEM	62	0.0	0.0	HDD
Isanti	1.5	PEM	447	0.0	0.0	HDD
Isanti	1.6	PEM	139	0.0	0.0	HDD
Isanti	1.6	PUB	37	0.0	0.0	HDD
Isanti	1.6	PFO	18	0.0	0.0	HDD
Isanti	1.6	PSS	27	0.0	0.0	HDD
Isanti	1.8	PEM	206	0.0	0.0	HDD
Isanti	1.8	PFO	2,920	0.0	0.0	HDD
Isanti	2.2	PEM	725	0.0	0.0	HDD
Isanti	2.2	PEM	104*	0.0	0.0	N/A
Isanti	2.1	PFO	440*	0.0	0.0	N/A
Isanti	2.8 [g]	PEM	92	0.1	0.0	N/A
Subtotals St. Cloud			**6,835**	**0.1**	**0.0**	**--**
Faribault Compressor Station						
Rice	N/A	PEM	0.0	0.0	0.0	N/A
Rice	N/A	PEM	0.0	0.0	0.0	N/A
Subtotals Faribault			**--**	**0.0**	**0.0**	**--**
TOTAL PROJECT [h]			**8,804**	**0.6**	**<0.1**	**--**

[c] 0.0 = wetland is within workspace, but would be avoided by fencing. "*" denotes wetlands crossed by existing access roads, which would be used for construction without modification or improvement to the road.

[d] Temporary impacts include all workspace during construction activities (TWS and ETWS plus permanent right-of-way).

[e] Operational impacts (permanent) are based on the maintenance of a 10-foot-wide operational easement in the PSS wetlands that are open cut for pipe installation. There would be no pipeline operation impact on PEM wetlands, and no pipeline operation impact on PSS, PFO, and PUB wetlands crossed by HDD; as there would be no change in vegetation.

[f] Crossing Method listed as N/A indicates wetland would not be crossed by the pipeline but is within an ETWS. The two wetlands at the Faribault Compressor Station site would be fenced and avoided. Where access roads cross wetlands, the length of the crossing is provided; however, no impacts are anticipated because no modifications or improvements are anticipated for the intended uses (e.g., pick-up or ATV traffic).

[g] The St. Cloud Loop terminates at approximately MP 2.8; this location is about 0.3 mile west of MP 2.8 within an ETWS proposed for an HDD pullback.

[h] Totals may vary slightly due to rounding.

N/A = Not Applicable

After the completion of construction, wetland areas would be allowed to revegetate naturally. PEM wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation, and PSS wetlands, dominated by low woody vegetation, would revert to pre-existing conditions within one to three growing seasons following construction, resulting in no permanent impacts on these wetland types. In accordance with the Procedures, wetlands would be monitored for up to 3 years after the completion of construction, or until we conclude revegetation is successful.

The use of the HDD method would avoid impacts on PFO wetlands crossed by the pipeline, and Northern would not permanently maintain vegetation over the centerline of the pipelines where wetlands are crossed by the HDD method. However, Northern may maintain a 10-foot-wide herbaceous strip of vegetation over the centerline of the two PSS wetlands crossed by the open-cut method during pipeline operation. We conclude that the Project impact on wetlands is largely avoided and not significant.

B.3.4 Water Use

As required by 49 CFR 192, Northern would conduct pressure testing of the new pipeline loop extensions and Faribault Compression Station facilities prior to placing them into service. For the execution of pressure testing, Northern may use municipal supplies and/or surface water appropriations, and would require approximately 166,000 gallons of water to test the new pipeline loops and compressor station facilities. Total hydrostatic test water use may depend on water reuse after HDD pre-testing. It is expected that only one final pressure test would be required for the two pipeline loops. The water may be obtained from a combination of municipal supplies and/or surface water appropriations. If water is appropriated, Northern would obtain a Minnesota Water Appropriation Permit from the MNDNR.

Table B.3.4-1

Anticipated Hydrostatic Test Water Source and Discharge Locations and Volumes

Facility	Water Source	Withdrawal Location (Milepost)	Withdrawal Watershed	Approx. Volume (gallons)	Discharge Location (Milepost)	Discharge Rate (gallons per minute)
Princeton Loop	Municipal	N/A	Rum River	28,100	Haul Out (to Municipal Wastewater)	N/A
St. Cloud Loop	Municipal or Rum River	2.6	Rum River	87,900	2.8	2,000
Faribault Compressor Station	Municipal	N/A	Cannon River	50,000	Haul Out (to Municipal Wastewater)	N/A
Total				166,000		

N/A = Not Applicable

Prior to testing, a small volume of water may be pushed through the pipeline in a single event to rinse out dust, dirt, and debris that may have accumulated in the pipe during construction. No chemicals would be added to rinse water, and rinse water would be discharged to a dewatering structure located in an upland area to prevent runoff into wetlands or waterbodies. Table B.3.4-1 provides hydrostatic test details for the pipeline loops and compressor station facilities.

Water withdrawals from surface waterbodies would be conducted in a manner that does not reduce water flow to a point that would impair flow and impact fish and recreational uses. Intake hoses

would be suspended off the bottom of the waterbody to prevent sediment uptake, and intake screen devices would be fitted to prevent the entrainment of fingerlings and small fish during water withdrawal.

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

An estimated 676,620 gallons of water also would be required for use during HDD drilling to mix with bentonite and remove cuttings from the drill hole. Water would be obtained from municipal supplies and surface water appropriations. Table B.3.4-2 summarizes the HDD water use for each HDD crossing.

Table B.3.4-2

Anticipated HDD Water Sources and Volumes

Facility	HDD Crossing Drawing Identification Numbers [a]	Water Source	Withdrawal Watershed	Approximate Volume (gallons)
Princeton Loop	P4-1	Municipal	Rum River	17,010
	P4-2	Municipal	Rum River	9,450
	P4-3	Municipal	Rum River	17,010
	P4-4	Municipal	Rum River	29,610
Subtotal				73,080
St. Cloud Loop	P4-1	Municipal	Rum River	52,920
	P4-2	Municipal	Rum River	28,980
	P4-3	Municipal	Rum River	266,490
	P4-4	Municipal or Rum River	Rum River	255,150
Subtotal				603,540
Total				**676,620**

[a] Plan and Profile Drawings provided in appendix 1G of Northern's Resource Report 1, which can be accessed via FERC's eLibrary at Accession no. 20160624-5196

The discharge of test water would be directed to an energy-dissipating device such as a straw bale dewatering structure in well-vegetated upland areas at sufficient distances from surface waters. Discharge rates would be controlled to prevent erosion, scouring and sedimentation, flooding, or the introduction of foreign or toxic substances into adjacent waterbodies. Discharges would take place within the same watershed from which water was withdrawn. Northern would obtain a NPDES permit from the MPCA for the discharge of hydrostatic test water, and water quality sampling of discharges would be conducted in accordance with any permit conditions.

Water also may be withdrawn for the control and mitigation of fugitive dust in areas disturbed for construction such as access roads. Typically, dust control is provided by trucks that hold approximately 3,000 gallons of water per load, and water is obtained from permitted municipal or surface water sources. Northern estimates up to approximately 300,000 gallons of water may be used assuming 100 trucks are used over the course of construction for all Project facilities. Actual amounts required would vary based on climatic conditions at the time of construction.

B.3.5 Requested Modifications to our Procedures

Northern has adopted the May 2013 version of the FERC Procedures in its entirety for the Project, with some requested modifications. The requested modifications relate to Northern's proposed wetland and waterbody setback distances at nine locations for workspace, refueling, and/or equipment parking based on site-specific constraints. Table B.3.5-1 summarizes the locations where the requirements of the Procedures cannot be met due to site-specific conditions and Northern's reason for each modification. We have reviewed these and find them acceptable.

Table B.3.5-1

Requested Modifications to the FERC Procedures

Project Facility / Approximate Milepost	Feature	Activity Requiring Modification	Location in Procedures (Section No.)	Reason for Modification
Princeton Loop				
0.4	Wetland	Drill Entry/Exit Point within 100 feet of wetland boundary	IV.A.1.d	Final design of the HDD crossing results in a layout where the HDD equipment may need to be parked overnight and/or fueled within 100 feet from wetland boundary. Special secondary containment would be instituted to prevent any inadvertent spills, leaks, etc.
1.3	Wetland	Drill Entry/Exit Point within 100 feet of wetland boundary	IV.A.1.d	Final design of the HDD crossing results in a layout where the HDD equipment may need to be parked overnight and/or fueled within 100 feet from wetland boundary. Special secondary containment would be instituted to prevent any inadvertent spills, leaks, etc.
St. Cloud Loop				
0.0	Wetland	Drill Entry/Exit Point within 100 feet of wetland boundary	IV.A.1.d	Final design of the HDD crossing results in a layout where the HDD equipment may need to be parked overnight and/or fueled within 100 feet from wetland boundary. Special secondary containment would be instituted to prevent any inadvertent spills, leaks, etc.
0.3	Wetland	ETWS	VI.B.1.a	ETWS is needed for pipe stringing area and would be less than 50 feet from the wetland boundary.
0.5	Wetland	ETWS	VI.B.1.a	ETWS is needed for pipe stringing area and would be less than 50 feet from the wetland boundary.
0.5	Waterbody	ETWS	V.B.2.a	ETWS is needed for pipe stringing area and cannot be avoided crossing the waterbody.
2.8 [a]	Wetland	ETWS	VI.B.1.a	ETWS is needed for pipe stringing area and would be less than 50 feet from the wetland boundary.
2.8 [a]	Wetland and Waterbody	ETWS	VI.B.1.a	ETWS is needed for pipe stringing area and cannot avoid crossing the wetland and waterbody.
2.8 [a]	Waterbody	ETWS	V.B.2.a	ETWS is needed for pipe stringing area and cannot be avoided crossing the waterbody.
Faribault Compressor Station				
N/A	Wetland	ETWS	VI.B.1.a	ETWS is needed for construction of additional compression facilities and cannot maintain a 50-foot setback from wetland boundary.
N/A	Wetland	ETWS	VI.B.1.a	ETWS is needed for construction of additional compression facilities and cannot maintain a 50-foot setback from wetland boundary.

[a] The St. Cloud Loop terminates at approximately MP 2.8; these locations are about 0.1 to 0.3 mile west of MP 2.8 within a proposed ETWS proposed for an HDD pullback .

N/A = Not Applicable

B.4 FISHERIES, VEGETATION, AND WILDLIFE

B.4.1 Fisheries

Constructing the Project would require six waterbody crossings, three perennial and three ephemeral. Minnesota classifies waterbodies as either warm-water or cold-water fisheries under Minnesota Rules 7050.0430. The Rum River is the only warm-water fishery crossed. The others are unlisted waters, which are capable of supporting fish and other aquatic communities, and are defined by default in Minnesota Rule 7050.0430 as Class 2B. None of the waterbodies contain federally listed threatened, endangered, or special concern fisheries or designated critical habitat. No Essential Fish Habitat occurs within or near the Project area. Construction of aboveground facilities would not cause impacts on fisheries as no waterbodies would be directly affected.

Sedimentation and turbidity, alteration or removal of instream and stream bank cover, stream bank erosion, introduction of water pollutants, water depletions, and entrainment of small fishes during Project water withdrawals could increase stress, injury, and mortality of fish and other aquatic organisms. However, Northern would follow the Plan and Procedures to control erosion and sedimentation and to minimize impacts on waterbodies. Northern would also use the HDD method for installing the pipelines across waterbodies, therefore avoiding direct impacts on the waterbodies and associated fisheries and other aquatic resources.

An inadvertent release of drilling fluid or a spill of fuel or equipment related fluids could impact water quality and consequentially impact fisheries. To minimize the potential for an inadvertent release of drilling fluid to impact fisheries, Northern would implement its Plan for Inadvertent Release of Drilling Mud that includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, and would make all necessary agency notifications. Northern would adhere to its SPCC Plan which includes preventive measures to minimize potential impacts should a spill occur. These measures include personnel training, equipment inspection, and refueling procedures, as well as measures for containment and clean-up of a spill if it occurs.

Blasting is not anticipated to be required for the Project. In the event in-water blasting is required, Northern would develop and submit to us for our review and approval, a Blasting Plan that contains measures to reduce potential impacts on waterbodies and fisheries.

Northern may utilize surface waters and municipal water supplies for hydrostatic testing of the pipeline and/or dust control as described in section B.3.4, above. If surface water is appropriated, Northern would obtain a Minnesota Water Appropriation Permit from the MNDNR and would provide a copy of the permit to the FERC. Northern would minimize the potential for water withdrawals and discharges to affect fisheries by screening and positioning water intakes at the water surface to prevent the entrainment of fish and other biota; maintaining adequate flow rates to protect aquatic species; placing water pumps in secondary containment devices to minimize the potential for fuel spills or leaks; regulating discharge rates; and using energy dissipating devices and sediment barriers to prevent erosion, streambed scour, and sedimentation. Northern would also obtain and comply with state water withdrawal and discharge permits. Based on these measures, we conclude that fisheries would not be significantly affected.

B.4.2 Vegetation

Four dominant vegetation cover types would be affected by the Project facilities: agriculture (cropland), open land (herbaceous pastureland, grassland, and PEM wetlands), forests/woodlands (including PFO wetlands and PSS wetlands), and residential (mowed and maintained lawns and landscaping.) There are no known unique or sensitive vegetation types affected by the Project. Table B.4.2-1 lists the amount of each cover type that would be temporarily and permanently impacted by construction and operation of the Project.

Table B.4.2-1

Summary of Impacts on Vegetation Cover Types

Facility / Vegetation Cover Type	Temporary Impacts [a] (acres)	Operation Impacts [b] (acres)
Princeton Loop		
Agricultural	19.7	0
Open land (herbaceous)	12.8	<0.1 [c]
Forests/Woodlands	1.4	0
Residential	2.3	0
Princeton Loop Subtotal [d]	**36.2**	**<0.1**
St. Cloud Loop		
Agricultural	24.7	0
Open land (herbaceous)	14.4	0.1 [c]
Forests/Woodlands	0.4	0.1 [e]
Residential	0.0	0.0
St. Cloud Loop Subtotal [d]	**39.5**	**0.2**
Faribault Compressor Station		
Agricultural	12.4	1.9
Open land (herbaceous)	0.6	0
Forests/Woodlands	-	-
Residential	-	-
Faribault Compressor Station Subtotal [d]	**13.0**	**1.9**
Project Totals		
Agricultural	56.8	1.9
Open land (herbaceous)	27.8	0.1
Forests/Woodlands	1.8	0.1
Residential	2.3	0.0
Project Total [d]	**88.8**	**2.1**

[a] TWS needed for construction of the pipeline including permanent operation right-of-way, ETWS, and staging areas.

[b] Assumes no vegetation maintenance would be necessary in agricultural, open, or residential areas, or in forested areas that are crossed by HDD. Forested areas within TWS and ETWS would be allowed to return to preconstruction conditions and, therefore, would not be impacted by operation of the pipelines.

[c] New permanent access road and valve setting acreage.

[d] Acreage does not include non-vegetated areas designated as lands used for industrial/commercial/road purposes, or as open water areas.

[e] New permanent right-of-way to be acquired outside existing easement.

Northern identified the dominant vegetation of each cover type during field surveys. Agricultural land was found to consist of primarily corn and soybeans. Open emergent wetlands in the area are dominated by wool-fruited sedge, wool grass, lake sedge, and American manna grass . Disturbed emergent wetlands are dominated by reed canary grass and hybrid cattail. Disturbed grassland and pastures, which include the residential areas, are dominated by Kentucky bluegrass, smooth brome, and yellow foxtail. Residential areas also include numerous types of ornamental trees and shrubs. Forested

wetlands and floodplain wetlands are dominated by silver maple, hackberry, green ash, red maple and cottonwood. Upland woodlands are comprised of white pine, trembling aspen, paper birch, big-tooth aspen, and bur oak.

Primarily agricultural and open land vegetation would be affected by construction of the Princeton Loop followed by lesser amounts of forests/woodlands, and residential vegetation, respectively. Construction of the St. Cloud Loop would predominantly affect agricultural and open land vegetation. The Faribault Compressor Station construction would primarily affect agricultural vegetation and a small amount of open land vegetation.

Less than 0.1 acre of open land vegetation would be permanently impacted on both the St. Cloud and Princeton Loops due to the installation of new valve settings. In addition approximately 0.1 acre of open land would be affected due the installation of an access road on the St. Cloud Loop. New permanent right-of-way would also permanently affect 0.1 acre of forested land near MP 2.2 on the St. Cloud Loop.

The primary impact of the Project on vegetation would be the cutting, clearing, and/or removal of existing vegetation within the construction work area. The degree of impact would depend on the type and amount of vegetation affected, the rate at which the vegetation would regenerate after construction, and the frequency of vegetation maintenance during operation. Secondary effects associated with disturbances to vegetation could include the potential for increased soil erosion, loss of topsoil, increased potential for the introduction and establishment of invasive weedy species, potential increases in fugitive dust, potential visual resource impacts, and potential wildlife and agricultural productivity impacts.

Following construction, Northern would seed and stabilize disturbed areas in accordance with the Plan and Northern's stormwater permit requirements. Actively cultivated agricultural land would not be seeded. Open uplands, including residential areas, would be seeded using seed mixes recommended by landowners or per NRCS seeding recommendations. PEM wetlands would be seeded with annual rye as specified in the Procedures. Forest/woodland impact areas would be temporarily seeded and allowed to regenerate naturally. Based on these measures, and because Northern would not maintain vegetation over the pipeline centerlines where the pipeline is installed by the HDD method, limited operational impact on vegetation is expected along the pipeline loops.

Under Executive Order 13112 (64 Federal Register 6,183), federal agencies shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species. Additionally, the agency must ensure all feasible and prudent measures to minimize risk of harm be taken in conjunction with the actions.

Federal and state lists of noxious and invasive weeds were reviewed to determine potential species that could occur in the Project area. These included the U.S. Department of Agriculture's Introduced, Invasive, and Noxious Plants database; the invasive species list maintained by the MNDNR; and the noxious weed lists maintained Minnesota Department of Agriculture. No county lists are maintained for Isanti, Sherburne, and Rice counties. In addition, based on Northern's field surveys conducted during fall 2015 and spring 2016, the species that are known to occur sporadically in the Project area include Canada thistle, bull thistle, garlic mustard, reed canary grass, common buckthorn, and glossy buckthorn.

Northern has developed a Project-specific Noxious Weed Plan to prevent, mitigate, and control the spread of noxious weeds during construction and operation of the proposed facilities. We have

reviewed this plan and find these measures, as well as Northern's adherence to the Plan, to adequately minimize the potential for weeds to be introduced or spread due to the Project.

We conclude that the Project impact on vegetation is largely temporary and not significant.

B.4.3 Wildlife and Migratory Birds

The Project would cross various vegetation communities including agricultural, open land, forest, and residential land which function as wildlife habitat. Game species such as white-tailed deer, wild turkey, mourning doves, and ring-necked pheasant occur within the Project area. Resident and migratory waterfowl species utilize the waterbodies and wetlands and surrounding cropland for breeding and migration. Non-game species such as rabbits, various rodents, raccoons, coyotes, red fox, and skunk utilize the cropland and riverine habitat as den and foraging locations within the Project area. Dense grass, shrubs, and small trees provide nesting habitat and seed production for a variety of songbirds such as warblers, finches, and sparrows. Raptors such as red-tail hawks, bald eagles, and northern harriers utilize upland grasslands for hunting songbirds and small mammals (e.g., rabbits, voles and shrews). Several species of snakes, frogs, turtles, and toads may also be found in the habitats adjacent to the waterbodies and wetlands.

Wildlife observed during Northern's field surveys conducted in September and November 2015 included ring-necked pheasant, yellow-rumped warbler, ruby-crowned kinglet, golden-crowned kinglet, black-capped chickadee, red-breasted nuthatch, dark-eyed junco, white-throated sparrow, blue jay, cooper's hawk, bald eagle, hairy woodpecker, cedar waxwing, eastern bluebird, common loon, blue-winged teal, tundra swan, sandhill crane, red squirrel, eastern gray squirrel, thirteen-lined ground squirrel, white-tailed deer, common garter snake, raccoon, american beaver, northern leopard frog, plains pocket gopher, and house wren.

No National Park Service Wilderness Areas, National Wild and Scenic Rivers, National Forests, or U.S. Fish and Wildlife Service (FWS) conservation easements or management areas are crossed by the Project. Managed wildlife habitats along the Project include forested tracts that are managed for game hunting which are typically maintained to encourage white-tailed deer and wild turkey hunting. Hunters often utilize pipeline rights-of-way for planting food plots and erecting hunting stands and blinds.

The St. Cloud Loop would cross the Becklin Homestead County Park/Wildlife Management Area (Becklin WMA) from MP 0.3 to 0.8 for an approximately 1,950-foot crossing length. This WMA is dedicated exclusively to physically challenged hunters (MNDNR 2016b). Northern would also be staging HDDs and stringing pullback pipe within the Becklin WMA, and drill entry and exit points would be located in open land within the WMA near MPs 0.4, 0.5, and 0.6 on land that is designated as prairie and has foot trails along the perimeter. Northern has requested an MNDNR license to cross the Becklin WMA and for workspace to install the pipeline within Northern's existing easement across the WMA. Northern would implement measures such as full right-of-way topsoil stripping and implementation of the Plan to minimize impacts on lands within the Becklin WMA, and restore disturbed areas to existing uses following construction. Northern would work with the MNDNR during permitting to identify any other measures that may be necessary to minimize impacts. Therefore, no long-term impact on the Becklin WMA is anticipated.

Construction activities, especially clearing of the work areas, would reduce feeding, nesting, and cover habitat components until vegetation has become re-established. Mobile species may be disturbed or displaced temporarily from portions of their habitats, and mortality of individuals of less mobile species, such as some small mammals, reptiles, or amphibians, may occur. Indirect wildlife impacts associated with construction noise and increased human activity could include abandoned reproductive efforts,

displacement, and avoidance of work areas. However, both direct and indirect impacts on wildlife along the construction corridor and other work areas generally would be of short duration and limited to the period of active construction.

Only temporary and minor impacts on wildlife species in the Project area are expected. No impacts on wildlife at a community or regional level are anticipated. Much of the Project would be constructed in previously disturbed areas and adjacent to existing rights-of-way. Additionally, as habitats affected by construction are relatively abundant in the areas adjacent to the rights-of-way, wildlife displaced during construction can temporarily relocate to suitable habitat nearby. Disruption of wildlife movement is expected to be minor because no permanent barriers to wildlife would be constructed.

EIs would inspect the trench daily prior to construction for wildlife or livestock. Additionally, in locations where wildlife activity is anticipated, Northern would install ramps in the trench at regular intervals to provide an exit for wildlife that may fall into the trench, and would provide gaps in spoil piles and pipe stringing to allow wildlife to exit the construction corridor. Fencing, ramps, and gaps would be assessed on a site-specific basis with the landowner, and would be applied based on the presence or absence of livestock and wildlife activity in a given area. Northern would implement the Plan and Procedures and would minimize the amount and time of open trench to minimize impacts on wildlife and livestock.

Following construction, TWS and ETWS outside the permanent right-of-way would be allowed to revert to pre-construction conditions in accordance with the Plan and Procedures. Effects on non-forested upland and wetland habitats disturbed by construction would be temporary, and are expected to return to pre-construction conditions within one or two growing seasons after construction is completed. Based on the collocation of the pipeline with existing rights-of-way, the presence of similar habitats adjacent to and in the vicinity of construction activities, and the implementation of the Plan and Procedures, we conclude that construction and operation of the Project would not significantly impact wildlife.

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (16 United States Code [USC] §§ 703-711), which prohibits the taking of any migratory bird, or a part, nest, or eggs of any such bird, except under the terms of a valid permit issued pursuant to federal regulations. Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 USC §§ 668-668d). Executive Order 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse effects on migratory birds through enhanced collaboration with the FWS. Executive Order 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors and that particular focus should be given to addressing population-level impacts. On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. In accordance with the executive order and the Memorandum of Understanding, Northern identified Birds of Conservation Concern and Important Bird Areas in the Project area (see table B.4.3-1) and consulted with the FWS concerning potential Project-related migratory bird impacts.

Table B.4.3-1

Birds of Conservation Concern that Potentially Occur in the Project Area

Facility	Bird Conservation Region	Listed Birds	
		Common Name [a]	Scientific Name
Princeton Loop and St. Cloud Loop	23 (Prairie Hardwood Transition)	Pied-billed Grebe	*Podilymbus podiceps*
		Horned Grebe (nb)	*Podiceps auritus*
		American Bittern	*Botaurus lentiginosus*
		Bald Eagle (b)	*Haliaeetus leucocephalus*
		Peregrine Falcon (b)	*Falco peregrinus*
		Yellow Rail	*Coturnicops noveboracensis*
		Solitary Sandpiper (nb)	*Tringa solitaria*
		Upland Sandpiper	*Bartramia longicauda*
		Whimbrel (nb)	*Numenius phaeopus*
		Hudsonian Godwit (nb)	*Limosa haemastica*
		Marbled Godwit (nb)	*Limosa fedoa*
		Red Knot (roselaari ssp.) (nb)	*Roselaari ssp.*
		Red Knot (rufa ssp.) (a) (nb)	*Rufa ssp.*
		Buff-breasted Sandpiper (nb)	*Tryngites subruficollis*
		Short-billed Dowitcher (nb)	*Limnodromus griseus*
		Black Tern	*Chlidonias niger*
		Common Tern	*Sterna hirundo*
		Black-billed Cuckoo	*Coccyzus erythropthalmus*
		Short-eared Owl (nb)	*Asio flammeus*
		Red-headed Woodpecker	*Melanerpes erythrocephalus*
		Willow Flycatcher (c)	*Empidonax traillii*
		Marsh Wren	*Cistothorus palustris*
		Brown Thrasher	*Toxostoma rufum*
		Blue-winged Warbler	*Vermivora pinus*
		Golden-winged Warbler	*Vermivora chrysoptera*
		Cerulean Warbler	*Dendroica cerulea*
		Henslow's Sparrow	*Ammodramus henslowii*
		Dickcissel	*Spiza Americana*
		Bobolink	*Dolichonyx oryzivorus*
		Rusty Blackbird (nb)	*Euphagus carolinus*
Faribault Compressor Station	22 (Eastern Tallgrass Prairie)	All Birds Listed in BCR 23 (except Yellow Rail, Willow Flycatcher, Marsh Wren, Brown Thrasher, Golden-winged warbler, and Bobolink), plus:	-
		Least Bittern	*Ixobrychus exilis*
		Black-crowned Night-Heron	*Nycticorax nycticorax*
		Black Rail	*Laterallus jamaicensis*
		Whip-poor-will	*Caprimulgus vociferous*
		Northern Flicker	*Colaptes auratus*
		Acadian Flycatcher	*Empidonax virescens*
		Loggerhead Shrike	*Lanius ludovicianus*
		Bell's Vireo (c)	*Vireo bellii*
		Bewick's Wren (*bewickii* ssp.)	*Thryomanes bewickii bewickii*
		Wood Thrush	*Hylocichla mustelina*
		Prothonotary Warbler	*Protonotaria citrea*
		Kentucky Warbler	*Oporornis formosus*
		Field Sparrow	*Spizella pusilla*
		Grasshopper Sparrow	*Ammodramus savannarum ammolegus*
		Smith's Longspur (nb)	*Calcarius pictus*

[a] Federal status indicated by the following identifiers: (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, and (nb) non-breeding in this BCR.

The nesting season for migratory birds in Minnesota is generally from April 15 to August 1. Pipeline construction during this timeframe could result in short-term disturbance of migratory bird habitat, causing birds present in the Project area to relocate temporarily during periods of active construction and human activity. The Project has the potential to alter or otherwise affect migratory bird foraging habitat temporarily; however, such impacts would be minimal, given the amount of similar habitats available outside of the construction right-of-way.

A variety of migratory bird species may be present seasonally along the Project route. The species most likely to be affected are those that are sensitive to forest fragmentation. However, forest fragmentation would be largely avoided or minimized by co-location of the Project facilities with Northern's existing right-of-way. In addition, Northern would not conduct incremental clearing of the permanent right-of-way in forested areas crossed by the HDD method, which would avoid permanent conversion of forested habitat to herbaceous or shrub habitat.

Some migratory bird species use open habitats for nesting and would be unable to nest within cleared workspaces during construction. The permanent right-of-way may also function as a travel corridor for some species and may provide food, cover, and breeding habitat for those species that use open and emergent habitats. In addition, maintained utility rights-of-way can provide important early successional habitats for several important game species and migratory birds.

Northern proposes to initiate construction in early spring, which would overlap the migratory bird nesting period. Accordingly, Northern has agreed to have a qualified biologist conduct avian surveys two days prior to construction activities. If any nests are observed, Northern has agreed to suspend construction activities within 50 feet of the nest while the MNDNR and FWS are contacted to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing ground-disturbing activities in the vicinity of an active nest. FERC staff consulted with the FWS (Twin Cities Field Office) on October 7, 2016, to verify the recommended buffer radius around any observed nests. The FWS stated that a 100-foot setback would be appropriate. We conclude that Northern's proposed measures are adequate to minimize impacts on migratory birds; however, to account for the FWS larger recommended buffer radius, **we recommend that:**

- **Northern should not proceed with construction within 100 feet of any active non-raptor migratory bird nest identified during preconstruction avian surveys while the MNDNR and FWS are contacted to determine any necessary avoidance or mitigation measures.**

Northern would not conduct routine vegetation maintenance of the right-of-way more frequently than once every 3 years, and routine vegetation maintenance would not occur between April 15 and August 1 of any year to minimize the potential for impacts on migratory bird species that may use the permanent right-of-way for nesting.

Raptors

Raptors represent a subcategory of migratory birds that often receive extra protection due to limited population numbers, limited available habitat, and/or extra nesting sensitivity to disturbance. To assess the potential for impact on raptors, Northern's field surveys for the Project in the fall 2015 and spring 2016 included 0.5-mile line-of-site raptor nest surveys. No raptor nests (including bald or golden eagles) were observed during these surveys. However, because raptors often establish new nests, follow-up surveys would be conducted immediately prior to construction as part of the migratory bird nest inspections described above. If active nests are observed, Northern has agreed to temporarily suspend construction activities within a 0.25-mile buffer of any raptor nests.

Based on the above, including our recommendation, we have determined that construction and operation of the Project would not result in population-level impacts or significant measureable negative impacts on birds of conservation concern or migratory birds.

B.4.4 Threatened, Endangered, and Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the Endangered Species Act of 1973, as amended (ESA), and those species that are state endangered or threatened. Section 7 of the ESA requires the lead federal agency (in this case, FERC) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. The agency is required to consult with the FWS to determine whether any federally listed endangered or threatened species or any of their designated critical habitat are located in the vicinity of a proposed project and to determine the proposed action's potential effects on those species or critical habitats.

Northern, acting as our non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, completed informal consultation with the FWS and the MNDNR regarding federal and state-listed species with the potential to be affected by the Project. Table B.4.4-1 lists the federally listed and state-listed threatened and endangered species and special concern species, as well as potential county of occurrence, habitat requirements, and the facilities where suitable habitat could be present.

Table B.4.4-1

Special Status Species Potentially Occurring in the Vicinity of the Project

Species Name	Status	County of Occurrence	Habitat Description	Potentially Suitable Habitat Present
Mammals				
Northern Long-Eared Bat *(Myotis septentrionalis)*	Federal Threatened	Sherburne, Isanti, and Rice	Hibernates in caves and mines; roosts and forages in upland forests.	St. Cloud and Princeton Loop Faribault Compressor Station
Gray Wolf *(Canis lupus)*	Federal Threatened	Isanti	Wide range of habitat, including forests, plains, prairies, agricultural areas, swamps, and barren lands.	St. Cloud
Birds				
Louisiana (Waterthrush *Parkesia motacilla)*	State Special Concern	Isanti	Steep-sided valleys with swiftly flowing streams that have rocky stream beds and riffles. Also may use silver maple floodplain forest.	St. Cloud Loop
Red-shouldered Hawk *(Buteo lineatus)*	State Special Concern	Isanti	Mature deciduous forest with scattered wetland openings.	St. Cloud Loop
Trumpeter swan (*Cygnus buccinator)*	State Special Concern	Sherburne	Small ponds and lakes or bays on larger waterbodies with extensive beds of cattails, bulrush, sedges, and/or horsetail. About 328 feet of open water for take-off. Stable levels of unpolluted, fresh water, emergent vegetation, low levels of human disturbance, and muskrat houses and American beaver lodges for nesting.	Princeton Loop
Mollusks				
Black Sandshell *(Ligumia recta)*	State Special Concern	Isanti	Riffle and run areas of medium to large rivers in areas dominated by sand or gravel.	St. Cloud Loop

Table B.4.4-1

Special Status Species Potentially Occurring in the Vicinity of the Project

Species Name	Status	County of Occurrence	Habitat Description	Potentially Suitable Habitat Present
Creek Heelsplitter *(Lasmigona compressa)*	State Special Concern	Isanti	Creeks, small rivers, and the upstream portions of large rivers. Preferred substrates are sand, fine gravel, and mud with swift currents and water depths ranging from 0.3-0.9 meter (1-3 feet) deep. Colonizes areas downstream of riffles in small pools.	St. Cloud Loop
Reptiles				
Blanding's Turtle *(Emydoidea blandingii*)	State Threatened	Isanti and Sherburne	Calm, shallow waters, including wetlands associated with rivers and streams with rich, aquatic vegetation. Nests in sandy uplands including agricultural fields. Overwinters in muddy bottoms of deep marshes, backwater pools, ponds, and streams.	St. Cloud Loop and Princeton Loop
Gopher snake *(Pituophis catenifer)*	State Special Concern	Sherburne	Well-drained, loose sandy and gravel soils. Dry sand prairies and bluff prairies are prime habitat. Also found in open/fragmented oak savanna and restored grassland/prairie, agricultural fields, and residential areas. Hibernation sites include rodent burrows and rock fissures in bluffs and outcrops. Females will nest in old mammal burrows or excavate a nest chamber in sandy soils.	Princeton Loop
Plants				
Prairie Bushclover *(Lespedeza leptostachya)*	Federal Threatened	Rice	Dry-mesic prairies on north or northwest-facing slopes of 10 to 15 degrees with well drained soils. Populations are primarily restricted to remnant prairies.	None present
Rattlesnake-master *(ryngium yuccifolium)*	State Special Concern	Rice	Remnant prairies.	None present

Northern conducted field surveys in fall 2015 and spring 2016 to identify potential habitat for sensitive species. The habitat assessments indicated that habitat for a majority of the federally listed and state-listed or sensitive species does not exist within the Project area, as the proposed loops follow Northern's existing operational right-of-way and most of the new pipeline is proposed to be installed via HDD. Species-specific discussions are provided in the following subsections.

B.4.1.1 Federally Listed Threatened and Endangered Species

Northern Long-eared Bat

The northern long-eared bat (NLEB) (*Myotis septentrionalis*) is a medium-sized bat of the Vespertilionidae family. Approximately 3.0 to 3.7 inches in length with a wingspan of 9 to 10 inches, the species derives its name from oversized ears relative to other members of the genus *Myotis*. The species overwinters in small crevices or cracks in hibernacula, such as caves and mines. In summer, the species roosts either singly or in colonies under loose bark or in crevices and hollows in both live trees and snags. A habitat generalist, roost tree selection appears also to be opportunistic; the species uses a variety of tree sizes and species. Migration to summer habitat occurs between mid-March and mid-May (FWS 2014a, 2014b). In Minnesota, the species is most likely to be found in forested wetlands and riparian areas. The

primary threats to the NLEB are white-nose syndrome, alteration/loss of habitat, and wind energy turbines.

Potential impacts on individual NLEBs may occur if clearing or construction takes place when the species is breeding, foraging, or raising pups in its summer habitat. Bats may be injured or killed if occupied trees are cleared during this active window, and the species may be disturbed during clearing or construction activities due to noise or human presence.

FWS rules restrict activity around NLEB roost trees and hibernacula. In Minnesota, the MNDNR and FWS maintain records of townships with known roost trees and hibernacula. If a project involving tree removal is not within a listed township, no further action is required. Review of the MNDNR and FWS records in June 2015 indicate that the proposed Project is not located within any township with known roost trees or hibernacula (MNDNR 2015a). Northern's Project-specific consultations with the FWS also determined the Project areas are not within 0.25 mile of any known hibernacula or 150 feet from any known occupied maternity roost tree for the NLEB. Because this Project is located outside of the buffer areas, the Project qualifies for a determination of "may affect, but take not prohibited" under the FWS final 4(d) rule and would be allowed to conduct tree clearing any time of the year after a 30-day review period has lapsed following submittal of the *Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form* (NLEB Form).

Northern submitted the NLEB Form to the FWS on April 22, 2016. No response or comments were received in response to Northern's submittal of the NLEB Form. Therefore, the FWS has accepted the determination that the Project *may affect, but take is not prohibited* for the NLEB. We agree with this determination.

Gray Wolf

The gray wolf (*Canis lupus*) is a large canine species that is federally listed as threatened in Minnesota due to habitat destruction, human interference, and overhunting. The gray wolf is identifiable by its canine body shape, long bushy tail with a black tip, and a mix of gray and brown coat colors. The average size of a gray wolf is 3 to 5 feet in length, weighing approximately 60 to 145 pounds (FWS 2015). This species prefers a wide range of habitats, including forests, plains, prairies, agricultural areas, swamps, and barren lands, but has been extirpated from most of its historic range. Dens are located near water and dug into well-drained soils on a south-facing slope, under boulders, among tree roots, or in cut banks, hollow logs, or other natural structures. Due to its wide-ranging nature, this species is rare to encounter.

Potentially suitable habitat occurs within the environmental clearance boundary for the St. Cloud Loop; however, according to a discussion we held with the Twin Cities FWS Field Office on May 26, 2016, the gray wolf is not anticipated to be present in the vicinity of the Project areas. As the Project is located outside of the wolf's current range, the Project would have *no effect* on the gray wolf.

Prairie Bushclover

Prairie bushclover (*Lespedeza leptostachya*) is a federally threatened prairie plant. It is a member of the pea family and only found within the tallgrass prairie region of the upper Mississippi River Valley in four states. Also known as slender-leaved bushclover, it has a clover-like leaf comprised of three leaflets about an inch long and a quarter-inch wide. Flowering plants are generally between 9 to 18 inches tall with the flowers loosely arranged on an open spike. The pale pink or cream colored flowers bloom in mid-July. The entire plant has a grayish-silver sheen (NatureServe 2015).

There are about 32 extant populations in the United States, of which nine are known to occur in Minnesota. Many of these known populations are small and comprised of fewer than 150 stems. In Minnesota, most populations occur on dry-mesic prairies on north or northwest-facing slopes of 10 to 15 degrees with well drained soils. Populations are primarily restricted to remnant prairies that have persisted despite widespread conversion to cropland. However, an extensive population at Red Rock Prairie occurs in an area that was plowed until the 1950s. Plants may have been introduced to this tract from neighboring pastures or may have persisted in areas that escaped cultivation because of rock outcrops. Some of the limited amount of remaining habitat is threatened by agricultural expansion, herbicides, urbanization, and the lack of natural disturbances, especially fire (NatureServe 2015).

The Faribault Compressor Station site is an existing compressor station surrounded by actively cultivated field. Based on field surveys, no remnant native prairie bushclover is present within the environmental clearance boundary for the Faribault Compressor Station site. Therefore, we conclude the Project would have *no effect* on prairie bushclover.

Due to our *no effect* determinations for the gray wolf and the prairie bushclover, and Northern's the use of the FWS' streamlined consultation process for the NLEB, the ESA Section 7 consultation for this Project is complete.

B.4.1.2 State-Listed Threatened and Endangered and Special Concern Species

Louisiana Waterthrush

The Louisiana waterthrush (*Parkesia motacilla*) is a bird species almost exclusively found in mature riparian forests. Typical habitat consists of steep-sided valleys with swiftly flowing streams that have rocky stream beds and riffles. Important microhabitat features such as small hollows or cavities within eroded stream banks, or exposed root masses immediately adjacent to streams, may be used as potential nest sites. Other crucial habitat components include adequate foraging sites of exposed/emergent rocks at the edge of water or within a stream; submerged leaf litter; and areas of water less than 1.2 to 2.0 inches deep. However, a substantial number of Louisiana waterthrushes occur in level, silver maple floodplain forest, particularly along the Kettle River, in Pine County. These floodplain areas are characterized by small channels with slow-moving water. Because the Louisiana waterthrush requires mature forest in riparian areas, it is sensitive to disturbance of forest cover and streambeds and associated microhabitat features, as well as water quality (MNDNR 2015b).

This species was last documented near the Rum River in the vicinity of the Project in 1990 as an individual response to playback to bird song. Where the pipeline would cross the Rum River, typical habitat consisting of steep-sided valleys with swiftly flowing streams that have rocky stream beds and riffles is not present. However, the area is floodplain with a small channel with slow-moving water. The Rum River crossing would be co-located with an existing pipeline, would be achieved by the HDD method, and would not alter the stream bed or bank.

Northern would inspect construction areas immediately prior to construction for the presence of any bird nests. If any nests are observed, Northern would stop all construction within a minimum of 100 feet of the nest (based on our recommendation in section in section B.4.3, above), and contact the FWS and MNDNR to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing construction in the vicinity of an active nest. Therefore, we conclude the Project would not significantly affect the Louisiana waterthrush.

Red-shouldered Hawk

The red-shouldered hawk (*Buteo lineatus*) occurs as a summer resident from the southeastern corner through north-central Minnesota. Red-shouldered hawks are most commonly found in large tracts of mature deciduous forest with scattered wetland openings. Suitable habitat typically occurs in uplands with diverse topography characterized by numerous small hills, ridges, and depressional wetlands or small lakes. Red-shouldered hawks also frequent mature floodplain forests. Researchers have found that nesting sites include high, thick canopies and trees with large diameters. Nest sites are often re-used year to year and are typically located halfway up tall trees, well below the canopy (MNDNR 2015b).

Red-shouldered hawks are sensitive to human disturbance. The MNDNR recommends that activity within 300 meters (984 feet) of nest sites be minimized during the breeding season from April 1 to June 30. Because red-shouldered hawks often nest in the same site year to year, retention of nest trees may facilitate subsequent nesting on a site. To assess the potential for impact on raptors, Northern conducted a field survey to evaluate the Project areas for raptor nests in September through November 2015 and would conduct follow-up surveys immediately prior to construction as part of their migratory bird nest inspections described above. If any nests or individuals are identified, Northern would contact the MNDNR and FWS for input on avoidance or mitigation measures, such as workspace buffering, prior to continuing construction in the vicinity of an active nest. In addition Northern would halt construction at a minimum distance of 0.25 mile from the nest (in accordance with Northern's proposed raptor avoidance measures) until this consultation is completed. Based on these measures, we conclude the Project would not significantly affect the red-shouldered hawk.

Trumpeter Swan

The trumpeter swan (*Cygnus buccinator*) is a large, white bird averaging 4.8 to 5.4 feet in length, with a wingspan of 6 to 8 feet. Adults are white, and juveniles are light to medium gray. Adults have black bills and feet and juveniles have pink bills and feet that gradually turn black during their first year. During the breeding season, trumpeter swans select small ponds and lakes or bays on larger waterbodies with extensive beds of cattails, bulrush, sedges, and/or horsetail. Ideal habitat includes about 100 meters (m) (328 feet) of open water for take-off; stable levels of unpolluted, fresh water; emergent vegetation; low levels of human disturbance; and the presence of muskrat houses and American beaver lodges for use as nesting platforms.

Trumpeter swans in Minnesota generally only migrate to central or southern Minnesota or nearby states to overwinter. Trumpeter swans return to the breeding grounds as the spring thaw begins, typically in late March and early April. Breeding pairs often protect a large number of territories (representing up to 100 acres or more) during the nesting period. They are intolerant of crowding and will drive out other intruding swans or predators. Their nests may be constructed on muskrat or beaver lodges, exposed hummocks, small islands, floating platforms, or on marsh vegetation built by the swans. The female lays an average of 4 to 6 eggs in late April, which she incubates for up to 5 weeks. The young cygnets stay in the nest for 1 to 2 days before venturing to aquatic feeding grounds. They are typically able to fly at about 100 days of age. In July, while the cygnets are flightless, adult trumpeter swans lose their primary wing feathers and often stay hidden in the marsh with their young. By August, adult swans grow new primary wing feathers and start to fly again. The cygnets remain with their parents through their first winter and the return trip to the breeding area.

Northern would inspect construction areas immediately prior to construction for the presence of any bird nests. If any nests are observed, Northern would contact the FWS and MNDNR to determine any necessary avoidance or mitigation measures, such as workspace buffering, prior to continuing construction in the vicinity of an active nest. In addition Northern would halt construction at a minimum

distance of 100 feet from the nest (based on our recommendation in section in section B.4.3, above), until this consultation is completed. Based on these measures, we conclude the Project would not significantly affect the trumpeter swan.

Black Sandshell and Creek Heelsplitter

The black sandshell (*Ligumia recta*) is a mussel species with an elongate, moderately thick shell, reaching a size of up to 8 inches long. The outside of the shell is smooth, shiny, greenish or black, and often rayed. The black sandshell is usually found in the riffle and run areas of medium to large rivers in areas dominated by sand or gravel. They spend most of their lives buried in the bottom sediments of permanent waterbodies and often live in multi-species mussel bed communities. Declines in habitat conditions are associated with management of the Mississippi River as a navigational canal and with non-point source water pollution and sediment pollution. Dams, channelization, and dredging increase siltation, physically alter habitat conditions, and block the movement of fish hosts. The black sandshell is also being impacted by the infestation of non-native zebra mussels (*Dreissena polymorpha*) in the Mississippi River and its tributaries (MNDNR 2015b). One historical occurrence with a total of 16 live specimens was found in the Rum River within 1 mile of the St. Cloud Loop and was last observed in September 2004.

The creek heelsplitter (*Lasmigona compressa*) is a mussel species with a somewhat elongate or oblong shell, squared off at the posterior tip, moderately thin to stout, compressed, and up to 5 inches long. The outside of the shell is greenish or brown and usually has green rays. The creek heelsplitter typically occurs in creeks, small rivers, and the upstream portions of large rivers. Its preferred substrates are sand, fine gravel, and mud (MNDNR 2015b). Baker (1928) noted that the creek heelsplitter most often colonizes areas downstream of riffles in small pools and described the habitats used as characterized by swift currents and water depths ranging from 1 to 3 feet deep. Creation of dams and the ensuing siltation, dredging, and change in water flow are considered to be the most important threat leading to the extinction and extirpation of freshwater mussels, including the creek heelsplitter (MNDNR 2015b). According to historical records, two live specimens were found in the Rum River within 1 mile of the St. Cloud Loop and were last observed in September 2004.

The pipeline at the Rum River crossing would be co-located with an existing pipeline and would be installed by the HDD method, which would not alter the stream bed or bank. However, if a natural fracture or unconsolidated area in the ground is encountered, an inadvertent release of drilling fluid could occur, which could smother or otherwise impact individual mussels. Northern has developed a Plan for the Inadvertent Release of Drilling Mud, which provides procedures that would minimize the potential for release of drilling fluid into sensitive resource areas such as the Rum River, adjacent wetlands, or onto the adjacent surface soils. The plan also establishes operational procedures and responsibilities for the containment and clean-up of inadvertent releases associated with the HDD method.

Northern also would develop a SWPPP which would incorporate the requirements of the Plan and Procedures, as well as any site-specific erosion and sediment control information. Based on these measures, we conclude the Project would not significantly affect the black sandshell or creek heelsplitter.

Blanding's Turtle

The Blanding's turtle (*Emydoidea blandingii*) averages 5.9 to 9.8 inches in length and is identified by its domed upper shell (carapace) and its bright yellow chin and throat. The dark carapace typically has numerous, scattered yellow flecks. Wetland complexes with adjacent sandy uplands are required to support viable populations of Blanding's turtles. Calm, shallow waters, including wetlands

associated with rivers and streams, with rich, aquatic vegetation are especially preferred. In Minnesota, this species uses a wide variety of wetland types and riverine habitats.

In central Minnesota, shrub wetlands are utilized throughout the summer and also serve as overwintering sites. Female Blanding's turtles often nest in agricultural fields which may be hazardous to adult females and nests from the chemicals, disking, machinery usage, increased nest predation, and shade produced by growing crops.

Blanding's turtles typically overwinter in muddy bottoms of deep marshes, backwater pools, ponds, and streams. They emerge from overwintering sites in late March to early April. Small, temporary wetlands are frequently used by Blanding's turtles in spring and early summer, when these habitats provide basking sites and mating opportunities. Nesting occurs in sparsely vegetated uplands with well-drained, sandy soils. Blanding's turtles often initiate nesting at dusk, although nesting after dark is not uncommon. Females may travel up to 1 mile overland from their resident marsh to their nest site at which time they are vulnerable to predators and road mortality (Congdon et al. 1983, Piepgras et al. 2000). Hatchlings leave the nest from mid-August through early October. Because eggs are laid far from water, hatchlings are vulnerable to predators, automobiles, and desiccation while traveling from the nest to a wetland.

The Blanding's turtle is a late maturing, long-lived species unable to recover quickly from catastrophic events that reduce the population (Congdon et al. 1993). Their relatively low mobility, high juvenile mortality rate, and low reproductive potential are also limiting factors for population growth. Loss and degradation of upland and wetland habitats and mortality on roads are primary threats to the species.

The MNDNR recommended a number of measures to avoid and minimize impacts on Blanding’s turtles should they occur within the Project area. These recommendations include:

- turtles that are in imminent danger should be moved, by hand, out of the Project area;
- turtles that are not in imminent danger should be left undisturbed;
- no nests should be disturbed;
- silt fencing should be used to keep turtles out of construction areas, where necessary, and removed after the area has been revegetated;
- no dredging, deepening, or filling of wetlands should occur;
- wetlands will be protected from pollutants such as fuels and lubricants;
- erosion and sediment control devices should be used to prevent silt and sediment from reaching wetlands and waterbodies;
- erosion control mesh, if used, should be limited to wildlife-friendly materials;
- trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade;

- culverts under access roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 inches in diameter and flat-bottomed or elliptical; and

- construction areas should be returned to preconstruction conditions.

Northern has committed to implementing the MNDNR recommendations above, and would provide training to construction personnel regarding identification of the Blanding's turtle and the proper implementation of the MNDNR recommendations. Based on these measures, we conclude the Project would not significantly affect the Blanding's turtle.

Gopher snake

The gopher snake (*Pituophis catenifer*) is a large, heavy-bodied snake. Adults range from 37 to 72 inches long. The base color of this snake's back is usually a straw yellow, marked with a series of black to brown blotches that transition to a banded pattern on the tail. The head is yellow with irregular dark markings and a pointed nose. The chin and belly are pale yellow, and the belly has scattered black or brown mottled rectangles. The gopher snake is a permanent resident, emerging from hibernation in the spring. Breeding takes place in the spring with 3 to 24 eggs being laid in June or early July in a nest excavated by the female under a large rock or log. The eggs hatch in 56 to 100 days, and the young are 10 to 17 inches long and are precocial.

Gopher snakes prefer areas of well-drained, loose sandy, and gravel soils. Dry sand prairies and bluff prairies are prime habitat. Hibernation sites include rodent burrows and rock fissures in bluffs and outcrops. Females will nest in old mammal burrows or excavate a nest chamber in sandy soils. The primary threat to this species is habitat loss and degradation from agriculture, urban sprawl, and lack of fire (MNDNR 2015a).

Northern would use the HDD method and implement the Plan and Procedures to avoid and minimize habitat loss, alteration, or fragmentation due to vegetation removal, hydrologic changes, and soil compaction. Mortality from construction vehicles could occur should these snakes occur within the proposed Project work area. Northern would provide environmental training to its contractors to monitor for snakes within the construction area to avoid mortality from construction vehicles, to minimize time that trenches are open, and to inspect trenches prior to back filling. Based on these measures, we conclude the Project would not significantly affect the gopher snake.

Rattlesnake-master

The rattlesnake-master (*Eryngium yuccifolium*) is a plant that occurs primarily, if not exclusively, in prairies. Soils are usually glacial tills and range from dry to moist. In Minnesota, rattlesnake-masters are most commonly found on deep mesic loam but occasionally are found on well-drained, sand-gravel substrates. Identification of this species is relatively easy because of its large and distinctive leaves, which are present by mid-May and are fully developed from July through October. Flowers or fruits are not needed to make a positive identification.

The portion of the Project in Rice County is surrounded by cultivated cropland. Field surveys conducted for the Project confirmed that no native prairie remnants are present within the Project area in Rice County and no individuals were observed. Based on the absence of suitable habitat, we conclude the Project would not impact affect the rattlesnake-master.

B.4.1.3 Minnesota Biological Survey Site of Moderate Biodiversity Significance

The MNDNR identified a portion of the Project area on the St. Cloud Loop as a site of Moderate Biodiversity Significance. The MNDNR ranks Sites of Biodiversity Significance based on the relative significance of biodiversity of the site at a statewide level. This system ranks sites at four levels (outstanding, high, moderate, or below). Sites ranked as moderate contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery.

The designated site crossed by the St. Cloud Loop contains a large wetland complex that includes an approximately 2.5-mile-wide corridor along the Rum River that is important because of its size and habitat diversity. Northern has designed the St. Cloud Loop to use the HDD method to install the pipeline within this area. No ground-disturbing activity is expected to occur for installation of the pipe. However, two temporary access roads are needed to access the right-of-way during construction in this area on the east side of the Rum River. One is an existing private driveway approximately 0.5 mile in length near MP 2.2. The other is a new access road approximately 0.25 mile in length near MP 2.1.

Erosion and sediment control devices would be installed along the access roads in accordance with the individual SWPPP developed for the Project. The SWPPP would incorporate the requirements of the Plan and Procedures, as well as any site-specific erosion control information. Northern's application for construction stormwater permits would be submitted to the applicable regulatory agencies prior to the commencement of construction activities. Once construction is completed, the access road areas would be restored to preconstruction conditions.

Additionally, Northern has agreed to incorporate the MNDNR recommendations to minimize impacts on this area, including:

- as much as possible, operate within already-disturbed areas;
- minimize vehicular disturbance in the area (allow only vehicles/equipment necessary for pipeline removal and installation);
- do not park equipment or stockpile supplies in the area;
- do not place spoil within sites designated as Moderate Biodiversity Significance or other sensitive areas;
- inspect and clean equipment prior to bringing it to the site to prevent the introduction of invasive species;
- use effective erosion prevention and sediment control measures;
- revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible; and
- use only weed-free mulches, topsoils, and seed mixes. Of particular concern are birdsfoot trefoil (*Lotus corniculatus*) and crown vetch (*Coronilla varia*), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas, such as roadsides.

Northern has committed to satisfying the MNDNR recommendations, and based on these measures and the planned HDD, we conclude impacts on the site of moderate biodiversity along the Rum River would be minimized.

B.5 LAND USE, RECREATION, AND VISUAL RESOURCES

B.5.1 Land Use

Land use categories identified in the Project area consist of agriculture, open land, open water, forest/woodland, residential, and industrial/commercial/other lands. The total acreage to be disturbed for construction of all Project facilities is approximately 104.0 acres, including 84.6 acres for construction of the pipeline loops and 19.4 acres for construction of the aboveground facilities. The total acreage for operation of all Project facilities is approximately 2.1 acres, including 0.2 acre for the pipeline loops and 1.9 acres for the aboveground facilities. Most of the pipeline facilities, including valves, would be located within Northern's existing, multi-line pipeline easements, and the Faribault Compressor Station modifications would be located on land adjacent to the existing compressor site that would be purchased by Northern. A summary of the land use categories affected by construction and operation of the Project facilities is provided in table B.5.1-1.

B.5.1.1 Agricultural Land

Agricultural land is the predominant land use category that would be impacted by the Project. A total of approximately 56.8 acres of agricultural land would be temporarily impacted by construction activities, and 1.9 acres would be permanently impacted within the operational footprint for the expanded Faribault Compressor Station. Agricultural activities would be allowed to continue over the permanent pipeline right-of-way and on land outside of Northern's new fenceline for the Faribault Compressor Station following restoration. Discussion of impacts on prime farmland is provided in Section B.2.1.

Northern would maintain landowner access to fields, storage areas, structures, and other agricultural facilities during construction to the extent practicable. If irrigation systems or drain tiles are present, Northern would work with landowners to fully restore these systems. Crop production on some agricultural lands would be temporarily interrupted for one growing season while pipeline facilities are constructed. Northern has stated it would design the pipeline with a minimum 48 inches of cover in normal soils, which should not inhibit future tilling practices. Landowners would be compensated for any temporary or permanent crop loss resulting from construction and operation of the Project. Northern would employ the erosion and sediment control and restoration measures (e.g., soil stabilization, topsoil segregation, compaction avoidance) detailed in the Plan to minimize and mitigate impacts on agricultural lands. Additional description of the construction methods and mitigation measures Northern would implement on agricultural lands is provided in EA section A.8.3.2.5. Based on these measures, we conclude impacts on agricultural areas would be minimized to the extent practical.

Table B.5.1-1

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

Facility	Agricultural		Forest/ Woodland		Industrial / Commercial / Road		Open Land		Residential		Total [c]	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Princeton Loop												
TWS/ETWS	6.6	0.0	1.4	0	0	0	11.9	0	2.3	0	22.2	0.0
Access Road	0	0	0	0	0.5	0	0.9	<0.1	0	0	1.4	<0.1
Staging Area	13.1	0	0	0	0.8	0	<0.1	0	0	0	13.9	0
St. Cloud Loop												
TWS/ETWS	6.6	0	0.4	0.1	6.5	0	8.5	0	0	0	22.0	0.1
Access Road	0	0	0	0	0.5	0	1.0	0.1	0	0	1.5	0.1
Staging Area	18.1	0	0	0	0.6	0	4.9	0	0	0	23.6	0
Loop Totals [b]	**44.4**	**0.0**	**1.8**	**0. 1**	**8.9**	**0.0**	**27.2**	**0.1**	**2.3**	**0.0**	**84.6**	**0.2**
Faribault Compressor Station												
Faribault Compressor Station Totals [b]	12.4	1.9	0.0	0.0	6.3	0.0	0.6	0.0	0.0	0.0	19.4	1.9
Total Impacts [c]	**56.8**	**1.9**	**1.8**	**0.1**	**15.2**	**0.0**	**27.8**	**0.1**	**2.3**	**0.0**	**104.0**	**2.1**

[a] As a majority of the pipeline loops would be constructed using HDD; no ground disturbance would occur along the drill path. The construction acreage includes only areas where ground disturbing or surface activities are proposed, which includes TWS, ETWS, construction staging areas (contractor yards), and access roads. All "other aboveground facilities" (e.g., valve settings) would be installed entirely within the permanent right-of-way for the pipeline loops and therefore would not result in any additional land use impacts. No direct impacts on open water are anticipated due to use of HDD.

[b] Based on GIS analysis.

[c] Totals may vary slightly due to rounding.

B.5.1.2 Open Land

Construction of the pipeline loops would temporarily impact approximately 27.2 acres of open land, which would be restored and allowed to revert to previous use following construction, except that less than 0.1 acre of open land would be permanently converted to an industrial/commercial/road use by placement of the new pipeline valve settings and for access to the valve settings. Approximately 0.6 acre of open land is within the footprint for construction of the Faribault Compressor Station, consisting of roadside vegetation and PEM wetlands that would be avoided during construction.

B.5.1.3 Industrial/Commercial/Roads Land

The Project's direct impacts on industrial/commercial/roads land types include impacts within the property lines of existing Northern facilities and the use of existing access roads during Project construction. Construction would temporarily affect 6.3 acres of industrial land within the existing Faribault Compressor Station and approximately 8.9 acres of industrial/commercial/roads land types to construct the pipeline loops. Northern would minimize impacts on these areas by timing construction activities to avoid peak road use periods, maintaining access to any businesses at all times, and expediting construction on private lands. Potential temporary impacts associated with road crossings would be largely avoided by use of the HDD or conventional bore methods as described in section A.8.2.2. Therefore, we conclude that impacts on industrial/commercial/roads lands would not be significant.

B.5.1.4 Forest/Woodland

Approximately 1.8 acres of forest/woodland would be temporarily impacted by construction of the Project pipeline loops, and no forest/woodland would be affected by expansion of the Faribault Compressor Station. Construction of the Project would not permanently impact forest/woodland areas crossed using the HDD method, and Northern does not plan to maintain vegetation within sensitive areas crossed by HDD which includes the approximately 0.1 acre of forest/woodland that would be within new permanent right-of-way to be acquired near MP 2.2 on the St. Cloud Loop. Where trees would be cleared within the construction footprint to provide an adequate and safe work surface, the woody vegetation would be allowed to regrow following completion of construction. Based on these measures, we conclude that impacts on forest/woodland areas would be minimized to the extent practical, and would not be significant.

B.5.1.5 Residential Land

Approximately 2.3 acres of residential land would be temporarily impacted by construction near MP 1.1 on the Princeton Loop. Residential properties would also be crossed by the HDD method near MPs 0.8, 1.2, 1.3, and 1.4 on the St. Cloud Loop, but no ground disturbing activities would occur along the HDD path. No residential structures are directly over the proposed HDD path. Northern contacted the planning, zoning, and economic development departments for Sherburne, Isanti, and Rice counties and verified that no known new residential or commercial developments are in development or currently being planned within 2 miles of the Project.

The residential area crossed near MP 1.1 on the Princeton Loop includes two residences, one about 32 feet and another about 64 feet away from the proposed ETWS for the HDD crossing of 289th Avenue. The four residences near the HDD path on the St. Cloud Loop include one approximately 25 feet off the centerline, and the others between 35 to 55 feet off the centerline. A site-specific plan for the residences on the Princeton Loop is included in appendix C. Because no workspace is planned near the St. Cloud residences, surface impacts would be limited to laying of HDD directional cables (placed by foot) and monitoring for inadvertent releases along the drill path. No structure removal, tree and shrub clearing, or utility disruptions are anticipated for any residential properties crossed by the Project.

If unplanned ground disturbance is required, Northern would communicate with the landowners and would implement the special construction techniques described in section A.8.2.4 to limit impacts on property owners. As necessary, Northern would install a safety fence along the construction workspace, provide residents advanced notice of driveway crossings and closures, and limit typical construction activities to daylight hours, except when conditions necessitate working beyond these hours (such as during critical HDD operation). Based on these measures, we conclude impacts on residential areas would be minimized to the extent practical and not be significant.

B.5.1.6 Open Water

Open water along the pipeline alignments would be crossed via HDD; therefore, no permanent impacts on open water are anticipated. Discussion of potential impacts on waterbodies due to construction and operation of the Project, as well as impact minimization measures, are provided in sections A.8.2.3 and B.3.2, above. Based on these measures, no significant impacts on open water are anticipated.

B.5.2 Recreation and Special Use Areas

Based on a review of USGS topographic maps, aerial photographs, and agency websites, the Project would not cross any federal lands, nor would it cross or be within 0.25 mile of any state or national forests, national trails, parks, or golf courses. In addition, based on consultation with the FWS, no FWS easements or waterfowl production areas are crossed.

The St. Cloud Loop would cross the Becklin WMA, which is dedicated exclusively to physically challenged hunters (MNDNR 2016b), from MPs 0.3 to 0.7, for an approximately 1,950-foot crossing length. Northern would stage HDDs and string the pullback pipe within the Becklin WMA. The HDD entry and exit points would be sited in the Becklin WMA on open land near MPs 0.4, 0.5, and 0.6 in an area that is designated as prairie and has foot trails along the perimeter. Northern filed an application for a License to Cross Public Lands with the MNDNR for the Project on May 31, 2016, and would work with the MNDNR to minimize impacts on the Becklin WMA to the extent possible and restore disturbed areas to existing uses following construction. Therefore, no significant impact on the Becklin WMA is anticipated.

The St. Cloud Loop would also cross the Rum River State Water Trail, used primarily for water recreation, fishing, and camping (MNDNR 2016c), at approximately MP 2.6 for an approximately 150-foot-wide crossing length. Northern would cross the Rum River State Water Trail via HDD; therefore, construction of the Project is not expected to impact this feature. The St. Cloud Loop also is within 0.25 mile of the Dayton Watercraft Campsite (near MP 2.6) but would not cross this camping area (MNDNR 2016c). Potential for noise impacts on the Dayton Watercraft Campsite are discussed in EA section B.8.2.1. No other state lands or state trails are crossed by the Project.

Northern contacted the U.S. Department of Agriculture, NRCS, Farm Service Agency, and confirmed there are no NRCS easements, Wetland Reserve Program, or Conservation Reserve Program lands within the Project area.

B.5.3 Visual Resources

No special or unique features or viewsheds are present in or near the Project area other than the Rum River scenic district. Lands crossed by the Project are relatively flat areas with rural development and numerous roadways, and predominantly used for agricultural activities, with some forested and open areas. Except for where the St. Cloud Loop crosses the Becklin WMA, Rum River Scenic District, and Rum River State Water Trail, the Project would be on private lands where federal or state visual management standards do not apply. Northern continues to work with the MNDNR and Isanti County to address any applicable visual resource standards that may need to be followed in these areas.

Construction activities and equipment would cause temporary visual impacts, and the new valve settings would be permanently visible. Some isolated trees and shrubs would be removed from the TWS for construction. However, trees and woody vegetation would be allowed to regrow following construction, and the valves are small enough to not significantly alter the landscape. In addition, the majority of the pipeline, including the portions that cross the Rum River Scenic District and Rum River State Water Trail, would be installed by the HDD method, thereby avoiding permanent visual impacts. Therefore, visual impacts are expected to be temporary and minor.

The expansion of the Faribault Compressor Station would not create a substantial change in the long-term visible impact of the site, which is already a visible feature on the landscape. The additional buildings and associated infrastructure would be painted to match existing facilities and surrounded by a new fence that ties into the existing fence line. Some of the existing tree line at the site would be

removed by construction. Tree removal would be limited to the extent practicable, and trees would be replanted as necessary to provide adequate visual screening for the expanded facilities. Based on these measures, no significant impact on visual resources would occur due to construction and operation of the Faribault Compressor Station facilities.

B.6 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation an opportunity to comment. Northern, as a non-federal party, is assisting the FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR 800.

B.6.1 Survey Results

Northern completed a cultural resource survey for the Project and provided the resulting report to the FERC and Minnesota State Historic Preservation Office (SHPO). The survey included both archaeological and architectural resources and covered a total of 1,142 acres. A 280- to 1000-foot-wide corridor was surveyed for the pipeline loops, as well as ETWS, staging areas, access roads, and the work area for the Faribault Compressor Station modification. No archaeological resources were observed during the field investigation for the Faribault Compressor Station. An isolated flake was recovered from a shovel test unit on the Princeton Loop and recommended as not eligible for the NRHP. Six newly recorded sites (consisting of 3 pre-contact lithic scatters and 3 historic homesteads) and three isolated finds were identified within the St. Cloud Loop survey area. Five of the sites and all the isolated finds were recommended as not eligible for the NRHP. One site (21IA0106) was recommended for avoidance or evaluative testing. In addition, the locations of three previously recorded sites (21IA0065, 21MO0196, and 21MO0120) were revisited. Site 21IA0065 was recommended as not eligible for the NRHP, and the other two sites were not re-located and therefore considered unassessed. In a letter dated June 10, 2016, the SHPO agreed that five of the newly recorded sites, site 21IA0065, and the isolated finds were not eligible for the NRHP, but requested clarification that sites 21IA0106, 21MO0196, and 21MO0120 would be avoided. Northern provided this information and clarified that none of the sites or isolated finds identified by the survey were within the construction work area and all would be avoided. In a letter dated August 12, 2016, the SHPO agreed that all the sites would be avoided and no further archaeological survey was warranted. We agree with the SHPO.

No architectural resources have been identified for the Princeton Loop or the St. Cloud Loop. Seven architectural resources (six farmsteads and one utility plant) and one cemetery were identified within 1 mile of the Faribault Compressor Station. However, because none were located within the footprint of the proposed facility modification and the Project would involve a minor expansion of an existing facility, Northern recommended that no impact on the characteristics of these resources was anticipated. In its August 12, 2016 letter, the SHPO agreed that no further evaluation of these resources was required, and that they would not be affected by the Project. We agree with the SHPO.

B.6.2 Tribal Consultations

Northern contacted 30 federally recognized Indian tribes, providing a Project description and mapping, and requesting any information or concerns regarding places of traditional or cultural significance. Tribes contacted included: the Bad River Band of the Lake Superior Tribe of Chippewa Indians; Bois Fort Band of the Minnesota Chippewa Tribe; Flandreau Santee Sioux Tribe; Fond du Lac Band of the Minnesota Chippewa Tribe; Grand Portage Band of the Minnesota Chippewa Tribe; Iowa Tribe of Kansas and Nebraska; Iowa Tribe of Oklahoma; Keweenaw Bay Indian Community; Lac Courte

Oreilles Band of Lake Superior Chippewa Indians; Lac Vieux Desert Band of Lake Superior Chippewa Indians; Leech Lake Band of the Minnesota Chippewa Tribe; Lower Sioux Indian Community; Mille Lacs Band of the Minnesota Chippewa Tribe; Minnesota Chippewa Tribe; Omaha Tribe of Nebraska; Otoe-Missouri Tribe of Indiana; Prairie Island Indian Community; Red Cliff Band of Lake Superior Chippewa Indians; Red Lake Band of Chippewa Indians; Sac and Fox Nation of Missouri in Kansas and Nebraska; Sac and Fox Nation of Oklahoma; Sac and Fox Tribe of the Mississippi in Iowa; St. Croix Chippewa Indians; Santee Sioux Nation; Sisseton-Wahpeton Oyate of the Lake Traverse Reservation; Sokaogon Chippewa Community; Spirit Lake Tribe; Turtle Mountain Band of Chippewa Indians of North Dakota; Upper Sioux Community; and White Earth Band of Minnesota Chippewa Tribe.

The Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan and Prairie Island Indian Community in the State of Minnesota both responded with requests for more information and an opportunity to review the cultural resources reports, which Northern has provided. The Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan responded that the Project would have no adverse effect on historic properties. The Santee Sioux Nation expressed concerns about the potential to affect traditional cultural resources and requested an opportunity to monitor during archaeological surveys. Northern coordinated with this tribe during field surveys and no additional requests have been received. The Mille Lacs Band of the Minnesota Chippewa Tribe, Minnesota, responded that it does not have any concerns with the Project and indicated there are no known cultural or traditional properties that would be affected. The Upper Sioux Community inquired about the Becklin Homestead Park; expressed concerns about safety where the pipeline would be installed under roads or has bends, or would impact previously undisturbed lands; and requested detailed construction alignment sheets and environmental survey reports for review and comment which Northern provided. In addition, the Upper Sioux Community indicated it may want to request tribal monitors be present during construction. Northern indicated the presence of tribal monitors could be arranged. Northern will continue to clarify monitoring needs with the Upper Sioux Community as the Project plans are finalized.

We sent our NOI to these same 30 tribes. No comments from tribes have been received in response to our NOI.

B.6.3 Unanticipated Discoveries Plan

Northern provided a plan to address the unanticipated discovery of cultural resources and human remains during construction. The plan describes the process of notifying interested parties, including federally recognized Indian tribes who request notification, in the event of any discovery. The plan was submitted to the SHPO for review and comment. In a letter dated March 22, 2016, the SHPO found the procedures in the plan appropriate. We requested revisions to the plan, and Northern provided a revised plan which we find acceptable.

B.7 SOCIOECONOMICS

The socioeconomic impact associated with construction of the Project would be short-term and localized primarily because of the relatively short construction period (up to 9 months, and only 4 to 6 weeks in any location) for installation of the facilities. Population (worker) influx as a result of construction would occur over the entire Project area, which would limit the local impact on housing, public services, and infrastructure (fire, medical, education, police, transportation). Some beneficial economic impact would be realized through local and non-local construction payroll expenditures, purchases of construction goods and materials, and increased tax revenues in the various counties.

B.7.1 Population, Housing, and Employment

Northern estimates it would need up to 50 personnel for construction of each pipeline loop and 80 personnel for construction of the compressor facility over the estimated 9-month construction period. Northern does not anticipate hiring any new permanent staff beyond those already employed with the company for operation of the new facilities. The impacts on the populations near the Project areas are expected to be temporary and relatively minor. Non-local workers may bring family members with them to the Project area; however, due to the short duration of construction, the abundant supply of housing, and the relatively small increase in population that would be experienced due to the influx of non-local construction personnel, we do not anticipate any significant impacts on the local population.

B.7.2 Public Services, Infrastructure, and Traffic

The non-local workforce would be relatively small compared to the current local populations in the Project area and would not result in major impacts on the availability of local community facilities, commodities, and services. There are multiple local fire departments and at least one police department and one medical facility near each Project site that could handle emergencies should they arise. Due to the relatively small number of workers required for the Project, coupled with the smaller subset of workers that may bring families with children to the area, we do not anticipate a substantial impact on local schools. Construction vehicles would generally use county and township roads to access the Project right-of-way, which may temporarily affect local traffic, but would not result in significant impacts.

B.7.3 Environmental Justice and Sensitive Receptors

The EPA asked that we consider the Project impacts on environmental justice communities (i.e., low-income and minority communities) and sensitive receptors such as children and people with asthma. However, no environmental justice issues are expected to result from the Project as no low-income nor minority communities would be crossed by the Project (U.S. Dept. of Commerce 2016). Project construction and operation would be expected to have positive socioeconomic effects on the general local population by generating new jobs for construction, promoting economic activity, and providing tax revenue. Therefore, we conclude the Project would not disproportionately affect racial, ethnic, or low-income population groups. Further, as detailed in section B.8.1, below, we conclude air emissions generated during construction and operation of the Project facilities would not have significant impacts on local or regional air quality; therefore, no significant impacts on sensitive receptors are expected.

B.8 AIR QUALITY AND NOISE

B.8.1 Air Quality

Construction and operation of the Project would affect local and regional air quality. Federal and state air quality standards are designed to protect human health and the environment from airborne pollutants. The EPA has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants such as nitrogen oxides (NO_x) and carbon monoxide (CO), ozone, 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 microns, and PM_{10} includes particles with an aerodynamic diameter less than or equal to 10 microns. The Clean Air Act (CAA) identifies two class types of NAAQS: primary standards and secondary standards. Primary standards are limits set to protect the public health of the most sensitive populations, such as asthmatics, children, and the elderly. Secondary standards are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife, and structures.

Greenhouse gases (GHG), the most common of which are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, hydrofluorocarbons, and perfluorocarbons, are naturally occurring pollutants in the atmosphere and products of human activities, including burning fossil fuels. Fossil fuel combustion emits CO_2, CH_4, and N_2O. GHG emissions are generally calculated in terms of carbon dioxide equivalents (CO_{2e}) where the heating potential of each gas is expressed as a multiple of the heating potential of CO_{2e}.

B.8.1.1 Existing Air Quality

The EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed "attainment areas." Areas that do not meet the NAAQS are termed "nonattainment areas." Areas for which insufficient data are available to determine attainment status are termed "unclassifiable areas." Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed "maintenance areas." All Project facilities would be located in attainment areas.

B.8.1.2 Permitting/Regulatory Requirements

The CAA of 1970, 42 U.S. Code §§ 7401 et seq., amended in 1977 and 1990, is the basic federal statute governing air quality. In addition to the NAAQS, air emissions and equipment would be subject to various other federal and state air quality regulations. The federal air quality requirements are contained in 40 CFR Parts 50 through 99 including:

- New Source Review;
- State and Title V Operating Permit Programs;
- New Source Performance Standards; and
- National Emission Standards for Hazardous Air Pollutants

Preconstruction air permitting programs that regulate the construction of new stationary sources of air pollution and the modification of existing stationary sources are commonly referred to as New Source Review (NSR). Major NSR requirements are established on a federal level but may be implemented by state or local permitting authorities under either a delegation agreement with the EPA or as a State Implementation Plan program approved by the EPA. Major NSR has two components: the Prevention of Significant Deterioration (PSD) permitting program and the nonattainment area NSR (NNSR) permitting program. PSD requirements include the use of Best Available Control Technology, air quality impact analyses, and additional impact analyses. NNSR requirements for nonattainment pollutants include Lowest Achievable Emission Rate, emission offsets, and an alternatives analysis.

Rice County, where the additional compression facilities would be constructed, is currently designated as in attainment/unclassifiable for all NAAQS. Therefore, the less restrictive air quality thresholds apply to the Project. The Faribault Compressor Station is an existing minor source with respect to PSD. Emissions of all criteria pollutants from the Faribault Compressor Station, after the proposed modification, would not exceed the major source permitting thresholds; therefore, PSD permitting requirements do not apply to the Project.

The Title V permit program in 40 CFR 70 requires major sources of air pollutants to obtain operating permits. The major source thresholds under the Title V program are 100 tons per year (tpy) of any air pollutant, 10 tpy of any single hazardous air pollutant (HAP), or 25 tpy of any combination of

HAPs. Stationary sources are not required to obtain a Title V permit on the sole basis of GHG emissions levels (i.e., exceeding the Title V major source threshold for GHG only).

The authority to issue Title V operating permits in Minnesota has been delegated to the MPCA. The MPCA administers the Title V operating permit program through MAR Section 7007.0200. The Title V thresholds are the same as the federal standards, with the exception of PM_{10} (25 tpy), SO_2 (50 tpy), and lead (0.5 tpy). The Faribault Compressor Station is a Title V facility, currently authorized under MPCA Title V Permit Number 13100058-003, based on existing CO emissions. After the Project is constructed, the Faribault Compressor Station would remain a Title V source. Northern submitted its permit modification application to the MPCA May 18, 2016, to account for the generator replacement and new turbine at the Faribault Compressor Station.

New Source Performance Standards (NSPS) in 40 CFR 60 regulate certain emissions from specific source categories. Subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines) would apply to the emergency generator at the compressor station. The emissions standards in Subpart KKKK (Standards of Performance for Stationary Combustion Turbines) would apply to the new turbine at the Faribault Compressor Station. Northern would comply with these subparts.

The National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, subpart ZZZZ, would apply to the new emergency generator. New stationary reciprocating internal combustion engines located at area sources of HAPs must meet the requirements of subpart ZZZZ by meeting the NSPS standards at 40 CFR 60, Subpart JJJJ. Northern would comply with the requirements of subpart JJJJ.

B.8.1.3 Construction Emissions

Construction of the Project would result in temporary increases in emissions of some pollutants due to the use of equipment powered by diesel fuel or gasoline engines, fugitive dust due to disturbance of the ground surface, and other indirect emissions attributable to construction workers commuting to and from work sites. However, these construction activities would be temporary and localized and are not expected to independently cause or significantly contribute to an emission level that results a violation of the NAAQS. Large earth-moving equipment and other mobile sources are sources of combustion-related emissions, including criteria pollutants (i.e., NO_X, CO, volatile organic compounds, SO_2, and PM_{10}) and small amounts of HAPs. Air pollutants from the construction equipment would be limited to the immediate vicinity of the construction area and would be temporary.

The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity. Northern would employ construction-related practices to control fugitive dust, such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic, reducing the speed of vehicular traffic on unpaved roads, and covering open-bodied haul trucks in accordance with the Project Fugitive Dust Plan. Table B.8.1-1 provides estimates of fugitive dust emissions associated with construction activities.

Table B.8.1-1

Fugitive Dust Emissions from Earthmoving Activity

Construction Activity	Daily Material Handling (ton/day)	Construction Rate Days	Average Exposed Area (acres)	Emission Factors (lb/ton) PM_{10}	Emission Factors (lb/ton) $PM_{2.5}$	Emissions (tpy) PM_{10}	Emissions (tpy) $PM_{2.5}$
Topsoil removed by scraper	205	144	-	0.058	0.0061	0.85	0.09
Trench excavation and loading to storage piles	220	144	-	0.037	0.0039	0.59	0.06
Backfilling trench	220	144	-	0.012	0.0013	0.19	0.02
Topsoil replacement	205	144	-	0.012	0.0013	0.18	0.02
Wind erosion of exposed areas	-	-	41.1	0.38	0.03999	6.21	0.65
Total						**8.02**	**0.84**

Table B.8.1-2 summarizes the estimated emissions of criteria pollutants, total HAPs and GHGs from construction equipment and material deliveries. The GHG emissions associated with Project construction are principally from CO_2.

Table B.8.1-2

Emissions from Construction Equipment

	Emissions (tpy)								
	Criteria Pollutants								
Description	NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2e	Formaldehyde	Total HAPs
Engine emissions	59.23	14.30	4.60	0.03	2.41	2.34	2,764	0.77	1.28
Unpaved Roads	-	-	-	-	12.98	1.40	-	-	-
Total	**59.23**	**14.30**	**4.60**	**0.03**	**15.39**	**3.74**	**2,764**	**0.77**	**1.28**

Note: VOC = volatile organic compounds

Construction-related emission estimates are based on typical diesel-fueled construction equipment, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each pipeline loop and for work planned at aboveground facilities. Based on conservative estimates in the number and type of equipment that would be used for the Project, we conclude that engine emissions, combined with fugitive dust and other construction related emissions would not result in a violation of NAAQS.

B.8.1.4 Operational Emissions

The Project includes the installation of a second compressor unit at the Faribault Compressor Station, representing a new primary stationary point source of air pollutants. Long-term operating emissions of the Project facilities would result from combustion of natural gas in the Solar Mars turbine as well as fugitive emissions along the pipeline or blowdowns at the station.[9] Emission estimates of criteria pollutants and formaldehyde (the highest emitted HAP) for the Faribault Compressor Station, per year of operation, are presented below in table B.8.1-3. Total annual HAPs emissions for the Faribault Compressor, in aggregate, would be about 1.1 tpy, well below the 25 tpy permitting threshold.

[9] A blowdown is the venting of natural gas from the facility.

Table B.8.1-3

Proposed Faribault Compressor Station Emissions Summary (tpy)

	NO_X	CO	VOC	SO_2	PM	CO_2e	Formaldehyde
Existing Potential-to-Emit Emissions							
Unit 1	49.8	62.4	18.2	1.6	7.0	54,686	0.33
Fugitive Sources	-	-	1.1	-	-	-	-
Proposed Potential-to-Emit Emissions							
Unit 2	29.0	32.3	15.6	1.36	6.0	46,678	0.28
Emergency Generator (replacement)	1.2	1.1	0.1	0.002	0.02	302	0.23
Total [a]	**80.0**	**95.8**	**35.0**	**3.0**	**13.0**	**101,666**	**0.84**

[a] The total PTE emissions may be slightly different than those in the air permit application due to rounding.

Note: VOC = volatile organic compounds

In addition to standard operations, blowdowns, which release methane into the atmosphere, would occur at the compressor station. Blowdown methane emissions are estimated to involve:

- 2 million standard cubic feet (MMscf) for initial for tie-in operations;
- 1 MMscf for station emergency shutdown testing;
- 1 MMscf for individual unit and building emergency shutdown testing; and
- approximately 1 MMscf for commissioning of each unit (5 start/stops for each unit at 0.1 MMscf each).

These estimates result in emissions of approximately 100-125 tons of methane annually. During operation, Northern estimates approximately 30 starts/stops per year, resulting in 3 MMscf released annually from the new unit.

Operational emissions from pipelines include fugitive methane leaks from equipment such as valves and regulators. The estimated annual GHG emissions from the Princeton and St. Cloud loops and the Lake Mills tie over regulator would be 162.6 tpy of CO_{2e}. Emissions factors for natural gas facilities are from 40 CFR 98, subpart W, table W-3. The EPA's interactive unit converter was used to calculate methane emissions to CO_{2e}.[10]

Northern completed ambient air quality analyses to demonstrate compliance with ambient air quality standards for criteria pollutants at the Faribault Compressor Station. The air quality modeling was completed using AERMOD, using both the existing and the proposed new air emissions sources; the

[10] The EPA's Interactive Units Converter (used to convert cubic feet of methane to CO_{2e}) can be found on the EPA website at https://www3.epa.gov/cmop/resources/converter.html#two.

results are presented in table B.8.1-4. Based on the AERMOD results below, the modified Faribault Compressor Station would not exceed, or contribute to a violation of, the NAAQS.

Table B.8.1-4

AERMOD Modeling Results for the Modified Faribault Compressor Station

Pollutant	Averaging Period	Maximum Modeled (µg/m^3)	NAAQS Standards (µg/m^3) [a]
SO_2	1-hour	11.80	188
PM_{10}	24-hour	17.82	150
	Annual	0.34	12
$PM_{2.5}$	24-hour	17.82	35
	Annual	0.34	12
CO	1-hour	102.00	10,000
	8-hour	78.42	40,000
NO_x	1-hour	47.84	188
	Annual	0.65	100

µg/m^3 = microgram per cubic meter

[a] These values are the minimum standards with varying levels allowed. The NAAQS can be viewed at https://www.epa.gov/criteria-air-pollutants/naaqs-table

The EPA provided comments requesting an analysis of impacts on children's health and safety. Conservative modeling, presented above, shows the anticipated air quality impacts to be well below the NAAQS which are set to be protective of human health, including sensitive subpopulations.

Air quality impacts from operation of the Faribault Compressor Station would be minimized by the use of equipment, emissions controls, and operating practices that meet or exceed best management practices. Measures proposed to minimize air quality impacts include the use of clean burning natural gas as the fuel for all combustion devices. The turbine would also be equipped with SoLoNO$_x$ emissions control technology. This technology incorporates low NO$_x$ combustors to limit emissions of NO$_x$ and CO. As discussed previously, the Faribault Compressor Station is not subject to PSD or NNSR permitting requirements. Compliance with federal and state air regulations and state permit requirements would ensure that air quality impacts would be minimized during installation and operation of the additional compressor unit at the Faribault Compressor Station. We conclude that emissions generated during operation would not have significant impacts on local or regional air quality.

B.8.2 Noise

We require that noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade, or update of an existing station must not exceed an equivalent sound level (L_{eq}) of 55 decibels (dB) in the A-weighted frequency scale (dBA) at any pre-existing noise sensitive area (NSA). In addition, our guidelines require that the operation of a new compressor station or modifications to an existing compressor station should not result in a perceptible increase in vibration at any nearby NSA. The sound level of 55 dBA L_{dn} also can be used as a "benchmark sound criterion/guideline" for assessing the noise impact of temporary or intermittent noise such as site construction noise at a compressor station and a natural gas blowdown event of a compressor unit. In addition to federal standards, the State of Minnesota established noise rules at MAR Section 7030.0040. There are no known local noise ordinances that apply to the Project.

B.8.2.1 Construction Noise

Pipeline and aboveground valve setting construction noise impacts are expected to be short-term and transient at any given location and, therefore, have minimal impact. Construction noise, while varying according to equipment in use, would be mitigated by the attenuating effect of distance and the intermittent and short-lived character of the noise. Further, the nature of pipeline construction results in construction activity and associated noise levels moving along the corridor so that no single NSA is exposed to significant noise levels for an extended period.

Noise mitigation measures to be employed during construction of the proposed Project include ensuring that sound muffling devices that are provided as standard equipment by the construction equipment manufacturer are kept in good working order. In addition, construction would generally be limited to daytime hours unless nighttime construction is required for certain critical activities (such as during HDD pullback or to ensure bore hole integrity).

Noise associated with the installation of the additional unit at the Faribault Compressor Station should have a minimal and temporary impact on the nearby NSAs, in part because the construction would be primarily limited to daytime hours. Construction activities would be performed with standard heavy equipment such as a track-excavator, backhoe, as well as use of a bulldozer, dump trucks, and concrete trucks. Most construction equipment would operate intermittently. We do not anticipate that construction noise at the compressor station site would have significant impacts on the surrounding environment.

Noise from Horizontal Directional Drilling

Typical HDD operations generate a noise level of approximately 85 dBA at 50 feet. The sound level at any specific NSA would be a function of that location's distance from the HDD site and any intervening topography. Northern would attempt to keep daytime HDD noise levels at or below 55 dBA; however, some HDD crossings may be conducted continuously (24 hours per day). In these instances, Northern would conduct ambient noise level surveys at NSAs prior to construction and estimate the noise level attributable to the proposed drills with no mitigation measures employed. If the anticipated noise levels would exceed 55dBA L_{dn}, Northern would work directly with the impacted residents or other applicable personnel to come to an agreeable mitigation option.

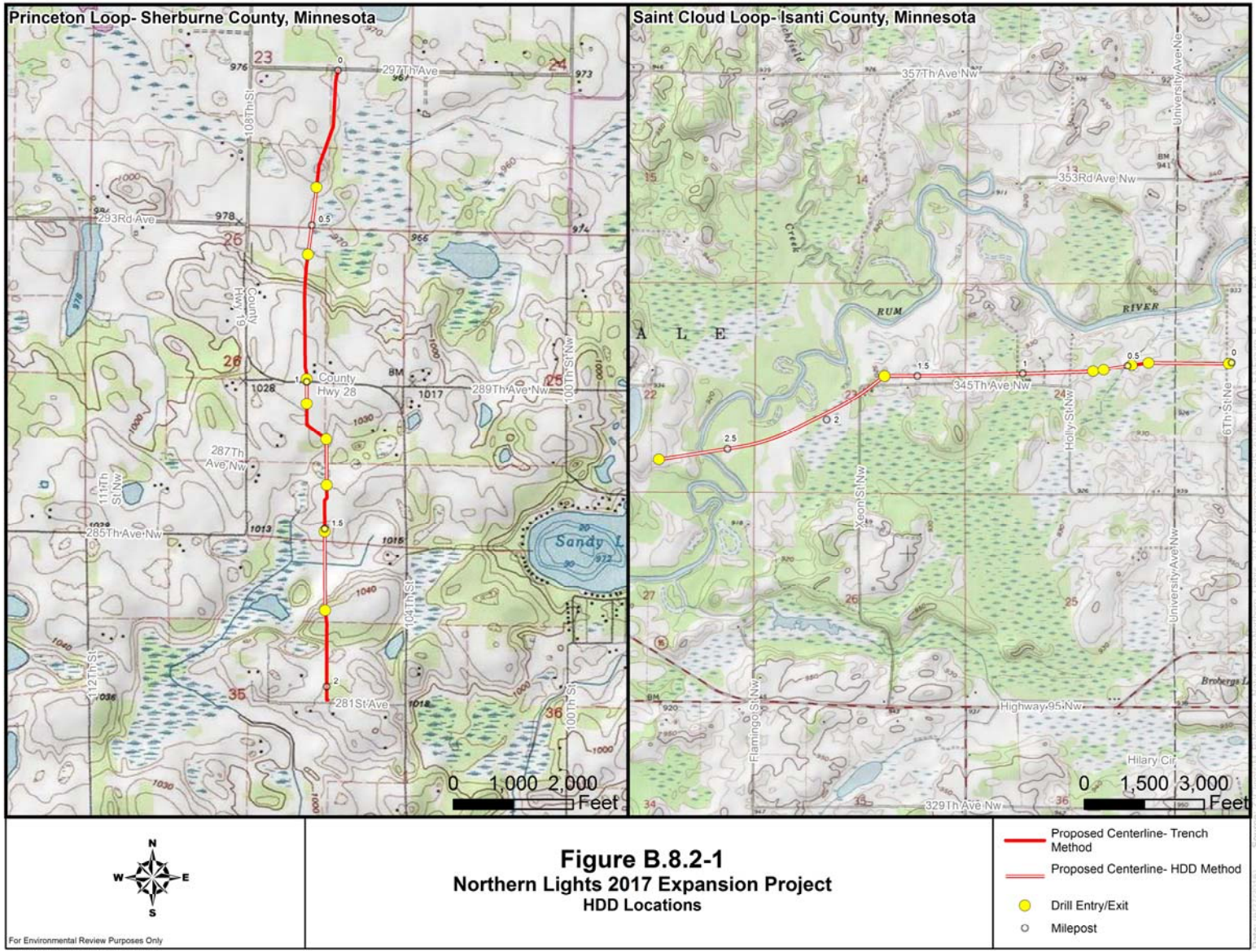
Northern would use the HDD method at four locations on both the Princeton and St. Cloud loops, for a total of eight HDDs (see figure B.8.2-1). There are several residences, and one campground, within 0.5 mile of the proposed HDD sites. Table B.8.2-1 provides the unmitigated noise level at the nearest NSAs for each of the drill entry/exit points. HDD operations, including drilling and pullback, would typically occur during daytime hours, but may extend into nighttime hours if necessary to ensure the success of the drill (e.g., during critical times such as pipe pullback). Two of the St. Cloud HDDs (P4-3 and P4-4) could potentially occur on a 24-hour, continuous basis; however, the noise analysis conservatively assumes 24 hour operation at all HDD sites.

Table B.8.2-1

Estimated Noise Levels at NSAs for HDDs without Mitigation

HDD Crossing Drawing Identification Number	Entry/Exit Site	Distance & Direction to NSA	Ambient ($L_{dn,}$ dBA)	HDD Noise Level (dBA)	HDD + Ambient ($L_{dn,}$ dBA)	Increase Above Ambient (dBA)	Duration (days)[a]
Princeton Loop							
P4-1	Entry	950 ft. (SW)	45.0	50.8	51.8	6.8	2.3
	Exit	600 ft. (NW)	45.0	52.6	53.3	8.3	
P4-2	Entry	200 ft. (NE)	45.0	**69.1**	69.1	24.1	1.5
	Exit	200 ft. (NE)	45.0	**64.2**	64.3	19.3	
P4-3	Entry	450 ft. (SE)	45.0	**60.0**	60.2	15.2	1.9
	Exit	725 ft. (N)	45.0	48.9	50.4	5.4	
P4-4	Entry	250 ft. (ENE)	45.0	**67.0**	67.0	22.0	3.0
	Exit	1,000 ft. (WSW)	45.0	44.4	47.7	2.7	
St. Cloud Loop							
P4-1	Entry	1,750 ft. (ESE)	50.0	45.3	51.3	1.3	3.8
	Exit	350 ft. (SW)	50.0	54.8	56.0	6.0	
P4-2	Entry	900 ft. (W)	45.0	53.3	53.9	8.9	1.9
	Exit	1,600 ft. (W)	45.0	42.7	47.0	2.0	
P4-3	Entry	425 ft. (SSW)	45.0	**60.6**	60.7	15.7	8.3
	Exit	630 ft. (W)	45.0	52.1	52.9	7.9	
P4-4	Entry	425 ft. (SSW)	45.0	**60.6**	60.7	15.7	8.5
	Exit	600 ft. (W)	45.0	51.4	52.3	7.3	

[a] Assumes 24-hour operations for all drills and includes drilling operations from initial pilot hole drilling through final pullback, but does not include time needed for staging of equipment and equipment removal after installation. Most drilling operations would be limited to normal working hours, and only critical (e.g., pullback operations) may need to occur past normal working hours.



As shown in table B.8.2-1, the unmitigated HDD noise levels could exceed 55 dBa L_{dn} at some NSA locations, which are all residences. In those locations, Northern would mitigate noise, which may include, but is not limited to the following:

- installing plywood noise barriers between noise-generating equipment and the NSA(s);
- using residential-grade exhaust silencers on engines (e.g., generators, pumps, and hydraulic power units);
- using low-noise generators;
- installing a partial enclosure around the mud mixing/cleaning system;
- installing a partial barrier around engine jacket-water coolers; or
- providing temporary relocation for landowners to a nearby hotel for several days.

Assuming the appropriate noise-reducing and buffering measures listed above are implemented, table B.8.2-2 shows what the estimated, mitigated noise levels would be at those locations where unmitigated HDD noise would exceed 55dBA L_{dn}. Based on these measures, the HDD noise levels could be below 55 dBA L_{dn}.

Table B.8.2-2

Estimated HDD Noise Levels at NSAs after Noise Mitigation

HDD Crossing Drawing Identification Number	Entry or Exit Site	Distance & Direction to Residential NSA	Ambient (dBA, L_{dn})	Sound Level of HDD (dBA, L_{dn})	HDD + Ambient (dBA, L_{dn})	Increase Above Ambient (dBA)
Princeton Loop						
P4-2	Entry	200 ft. (NE)	45.0	53.7	54.2	9.2
P4-2	Exit	200 ft. (NE)	45.0	53.5	54.1	9.1
P4-3	Entry	450 ft. (SE)	45.0	50.0	51.2	6.2
P4-4	Entry	250 ft. (ENE)	45.0	53.9	54.4	9.4
St. Cloud Loop						
P4-3	Entry	425 ft. (SSW)	45.0	51.2	52.1	7.1
P4-4	Entry	425 ft. (SSW)	45.0	51.2	52.1	7.1

However Northern has not yet committed to specific noise mitigation measures during construction; therefore, **we recommend that:**

- **<u>Prior to construction of the HDDs P4-2, P4-3, P4-4 on the Princeton Loop and HDDs P4-3 and P4-4 on the St. Cloud Loop,</u> Northern should file with the Secretary, for the review and written approval by the Director of OEP, an HDD noise mitigation plan to reduce the projected noise level attributable to the proposed drilling operations at nearby NSAs. During drilling operations, Northern should implement the approved plan, monitor noise levels, and make all reasonable efforts**

to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.

Based on Northern's proposed mitigation measures and our recommendation, we conclude that construction-related noise would be minimized and mitigated to the extent practical.

B.8.2.2 Operational Noise

An acoustical analysis was conducted for Northern by an independent noise consulting firm for the Faribault Compressor Station with the additional unit. Table B.8.2-3 summarizes the estimated noise impacts at the nearest NSAs during operations.

Table B.8.2-3

Estimated Noise Impacts for the Modified Faribault Compressor Station

Nearest NSA and Type of NSA	Distance & Direction to NSA from the Existing Station (feet)	Distance & Direction to NSA from the New Unit #2 (feet)	Current Sound Level (L_{dn}) of the Station[a]	Sound Level (L_{dn}) of the Station with Mitigation[b]*	Est'd Sound Level (L_{dn}) of new Unit #2	Total Sound Level (L_{dn}) – Station plus new Unit #2	Increase or Decrease from the Existing Sound Level
NSA #1 (Residence)	1,080 (NW)	980 (NW)	53.2 dBA	50.4 dBA	47.6 dBA	50.4 dBA	-1.0 dB
NSA #2 (Residences)	720 (SSW)	850 (SSW)	53.8 dBA	52.1 dBA	47.7 dBA	53.4 dBA	-0.4 dB

[a] Because the ambient noise level was higher than the "actual" station noise, the L_{dn} was calculated using the measured L_{dn} from the 2015 survey and the actual station noise level from a previous (1998) survey at the Faribault Compressor Station.

[b] Sound level of the existing station assumes noise mitigation for the existing station compressor unit would be installed to ensure station sound level meets applicable sound level requirements after the installation of the new Unit #2.

The results of the acoustical analysis indicate that, if the anticipated and recommended noise control measures for the new equipment are successfully implemented, the noise attributable to the Faribault Compressor Station would be lower than 55 dBA L_{dn}, and the overall noise at the nearby NSAs is expected to decrease. In addition, because noise sources that could cause perceptible vibration (e.g., turbine exhaust noise) would be adequately mitigated as described below, there should not be any Project-related perceptible increase in vibration at any NSA during compressor station operation. Based on the noise analysis, the noise associated with a natural gas blowdown event would be lower than 55 dBA L_{dn} at the nearest NSAs.

The following are the mitigation measures that would be implemented for the station:

- apply noise control measures to the compressor building enclosing the new turbine and compressor, including the use of appropriate building materials;
- install mufflers for the turbine exhaust system;
- install acoustical pipe insulation for outdoor aboveground gas piping, as necessary;
- install an air intake system silencer; and
- use low-noise gas and lube oil coolers with the compressor unit.

Northern would employ these noise mitigation measures (as described above and in the acoustical analysis report) or equal noise mitigation measures, as necessary, to meet the FERC 55 dBA L_{dn} noise standard. Blowdowns would occur at the Faribault Compressor Station; however, they are not part of normal daily operations. Most blowdowns occur at commissioning or decommissioning of a station, during maintenance, or for emergencies. After commissioning, it is anticipated that blowdowns would occur infrequently (less than 1-2 times per month), lasting 1 to 5 minutes. Noise associated with a unit blowdown event would occur via a blowdown silencer designed to meet an A-weighted sound level of 60 dBA at a distance of 300 feet, which would result in a noise level of 52 to 53 dBA L_{dn} at the nearest NSA (NSA 2).

In order to confirm Northern meets our noise requirements, **we recommend that**:

- **Northern should file a noise survey with the Secretary no later than 60 days after placing the authorized unit at the Faribault Compressor Station in service. If a full load condition noise survey is not possible, Northern 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 the station at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Northern should install additional noise controls to meet that level within 1 year of the in-service date. Northern shall confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

In its comments, the EPA requested information about the potential increase in noise at other compressor stations along the Northern system to accommodate the increase in capacity proposed under this Project. Compressor units and engines are the principal source of noise at compressor stations. No additional compression at any other station is proposed nor would additional compression be required to move the requested additional volumes through the Northern system. Since each compressor station is individually authorized for a specific horsepower of compression, and the noise impacts from the peak use compression are evaluated, no increase in peak noise is expected at any other station along Northern's system.

Based on the noise analysis above and our recommendation, we conclude that operation-related noise would not result in significant noise impacts.

B.9 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

The pipeline and aboveground facilities associated with the project must be designed, constructed, operated, and maintained in accordance with the DOT 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 DOT pipeline standards are published in 49 CFR 190-199. For example, Part 192 specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency

shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

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.

The facilities associated with Northern's Project must be designed, constructed, operated, and maintained in accordance with DOT standards, including the provisions for written emergency plans and emergency shutdowns. Northern would provide the appropriate training to local emergency service personnel before the facilities are placed in service.

Based on compliance with DOT standards, we conclude that Northern's pipeline loop and compressor station expansion construction and operation would represent an insignificant increase in risk to the public.

B.10 CUMULATIVE IMPACTS AND CLIMATE CHANGE

B.10.1 Cumulative Impacts

Cumulative impacts may result when the environmental effects associated with a project are superimposed on, or added to, either temporary (construction-related) or permanent (operation-related) impacts associated with past, present, or reasonably foreseeable projects or activities. Although the individual impacts of each project might not be significant, the cumulative impacts of multiple projects could be significant. In accordance with NEPA, the cumulative impacts of Northern's proposed Project along with other projects were considered.

Cumulative impacts represent the incremental effects of the proposed action when added to other past, present, or reasonably foreseeable actions. Inclusion of other actions is based on identifying commonalities of impacts from other actions along with those of the proposed Project. An action must meet the following criteria:

- impact a resource potentially affected by the proposed action;
- cause the impact within all, or part of, the Project vicinity; and
- cause the impact within all, or part of, the time span of the Project.

Existing or reasonably foreseeable actions that would affect similar resources during similar periods as the Project were considered. Northern reviewed publicly available data and consulted with each county planning agency to identify other projects that are near the Project and would occur during the approximate 2017 to 2019 timeframe. Actions located outside the Project's geographic scope, as defined below, and timeframe were generally not evaluated because their potential to contribute to a cumulative impact would diminish with increasing distance and time from the Project.

- Impacts on geology, soils, wetlands, vegetation, cultural resources, and wildlife resources would be largely contained within or directly adjacent to proposed Project workspaces.
- Impacts on ground and surface water resources, and fishery resources (primarily increased turbidity or contamination by spills) may extend outside of the workspaces, but

would also be contained to a relatively small area. Therefore, we evaluate other projects' impacts on water resources and fishery resources within the same Hydrologic Unit Code 12 sub-watersheds crossed by each Project facility.

- Impacts on land use and visual resources may extend outside of the Project footprint to include land uses immediately adjacent to the Project facilities and to the same viewshed affected by the Project facilities, respectfully. Impacts on land use near the Faribault Compressor Station were assumed to extend up to 5 miles, and impacts on recreational resources would include the same recreational resource (e.g., park, trail system).

- Temporary impacts on air quality, including fugitive dust, would be largely limited to areas immediately around active construction. It is assumed that long-term impacts on air quality would be constrained within about a 50-kilometer (31-mile) radius and is thus adopted as the maximum extent for a cumulative impact analyses. Therefore, other projects/actions that overlap in time and location with construction activities and those with potentially significant long-term stationary emission sources within a 50-kilometer radius of the Project were evaluated.

- Long-term impacts on NSAs include other stationary source projects with the potential to result in noise impacts on the same NSAs within 0.5 mile of the Faribault Compressor Station. We also consider areas where the temporary noise from construction of the Project would overlap with noise from other construction projects.

- Communities that could be affected by the increased workforce are considered in our analysis. In more rural locations, these communities could be located numerous miles from Project workspace.

The projects considered in the cumulative impacts analysis are listed in table B.10-1, and the potential cumulative impacts associated with each resource are discussed below.

None of the past, present, or reasonably foreseeable projects identified in the Project's geographic scope would affect the same geology, soils, wetlands, vegetation, or wildlife resources as the Project; therefore, no cumulative impacts on those resources would occur. As concluded in section B.6, no impacts on cultural resources are expected to occur within or adjacent to proposed Project workspaces, and none of the other projects listed in table B.10-1 overlap the Project workspace; therefore, no cumulative impacts on cultural features are anticipated.

The potential for Project impacts on groundwater and surface water resources and fisheries (primarily due to increased turbidity or contamination due to spills), could extend outside of the Project workspaces, but would be contained to a relatively small area due to the proposed Project stormwater runoff controls, SPCC Plan, and other mitigation measures described above in sections B.3.1 and B.3.2. In addition, we presume the road construction projects listed in table B.10-1 would be required to implement similar mitigation measures, and that the other projects would either not likely pose a significant risk or are sufficiently far from the Project; therefore, no significant cumulative impacts on these resources would occur.

The projects listed in table B.10-1 would not affect the same land uses or recreational resources (e.g., Becklin WMA), and the Project would not affect any visual resources; therefore, no cumulative impact on land use, recreational, or visual resources would occur.

Table B.10-1

Present and Reasonably Foreseeable Projects Considered for Cumulative Impacts within the Geographic Scope of the Project

Project Type / Project Name	Associated Project Component(s)	Location [a]	Project Description	Project Status
Projects Contained Within or Adjacent to Proposed Project Workspaces: None				
Projects Within the Same Hydrologic Unit Code 12 Sub-Watersheds				
Private Residential Construction	All	Isanti, Sherburne, Rice counties	Various private projects (new fireplaces, re-roofing, re-siding, etc.)	Various (permitted, under construction, under zoning review)
Sherburne County Road Construction SP 71-604-034	Princeton Loop	About 4 miles southwest in Sherburne County	County Road 4 recondition/ overlay project.	Unknown (not started)
Isanti County Road Construction	St. Cloud Loop	About 2.8 miles southeast in Isanti County	Spring River Drive South/ Jackson Rd NE seal and coat work.	Unknown (not started)
Projects Within the Same Viewshed Affected by the Project facilities, or 5 miles of the Faribault Compressor Station				
Private Residential Construction	All	Isanti, Sherburne, Rice counties	Various private projects (new fireplaces, re-roofing, re-siding, etc.)	Various (permitted, under construction, under zoning review)
Projects Within a 50-kilometer (31-mile) Radius				
Al-Corn Clean Fuel (Al-Corn) Plant Expansion	Faribault Compressor Station	About 21 miles southeast	Expansion of its existing ethanol production plant in Claremont, Minnesota, from 50 million gallons/year to 120 million gallons/year	Under Minnesota Pollution Control Agency air quality permit review
Projects Occurring Within the Same Timeframe and Regions of Influence				
Private Residential Construction	All	Isanti, Sherburne, Rice counties	Various private projects (new fireplaces, re-roofing, re-siding, etc.)	Various (permitted, under construction, under zoning review)
Sherburne County Road Construction SP 71-604-034	Princeton Loop	About 4 miles southwest in Sherburne County	County Road 4 recondition/ overlay project.	Unknown (not started)
Isanti County Road Construction	St. Cloud Loop	About 2.8 miles southeast in Isanti County	Spring River Drive South/ Jackson Rd NE seal and coat work.	Unknown (not started)
Al-Corn Clean Fuel (Al-Corn) Plant Expansion	Faribault Compressor Station	About 21 miles southeast	Expansion of its existing ethanol production plant in Claremont, Minnesota, from 50 million gallons/year to 120 million gallons/year	Under Minnesota Pollution Control Agency air quality permit review

[a] Approximate distance and direction from nearest Project component. Where location information is known for a given project, the shortest perpendicular distance between the project and the Project component was measured.

None of the projects listed in table B.10-1 are located in the immediate areas that the Project construction activities would occur; therefore, cumulative impacts associated with construction air and noise emissions would not occur. While the Al-Corn project would generate long-term air quality emissions and is located within 30 miles of the Project facilities, air modeling for the facility shows no significant air quality impacts at its own fenceline, over 20 miles from the Faribault Compressor Station (MPCA 2016). None of the other projects listed in table B.10-1 could be cumulative to the Project's operational emissions, and none would generate noise that would impact the same NSA's as the Project; therefore, no cumulative impacts with regard to air quality or noise would occur.

As described in section B.7, the socioeconomic impact associated with construction of the Project would be short-term and localized, primarily because of the relatively short construction period (9

months) for installation of the facilities. Northern anticipates that the total construction workforce would consist of about 180 total construction workers spread out between each Project facility, and no new permanent jobs would be created by the Project. Therefore, the temporary population influx would be spread and have limited localized impacts on housing, public services, and infrastructure (fire, medical, education, police and transportation). The other energy projects listed in table B.10-1 could occur at the same time as the Project, but are sufficiently distant from the Project facilities and located near large population centers that have substantial housing, public services, and infrastructure; therefore, the cumulative socioeconomic impacts are not likely to be noticeable.

B.10.2 Related Facilities

As noted in EA section A.9, the Project would facilitate the expansion of Al-Corn's existing ethanol production plant in Claremont, Minnesota, from 50 million gallons/year to 120 million gallons/year. The plant is approximately 21 miles southeast of the Faribault Compressor Station. Al-Corn is planning to install a new natural gas combustion turbine with a duct burner for combined heat and power, replace and relocate grain storage and handling equipment, expand rail loading/unloading capabilities, add equipment for additional fermentation, distillation, and product storage, and add one new natural gas fired boiler and new dryer.

In August 2015, the MPCA published an "Environmental Assessment Worksheet" describing the expected environmental impacts of the Al-Corn expansion project (MPCA 2016). Al-Corn also filed an application with the MPCA for modifications to its existing Title V air emission permit based on the change in emissions listed below in table B.10-2 and anticipates receiving approval before the end of 2016. Construction of the expansion is planned to commence after receipt of MPCA permit approval and take 14 to 16 months, and would likely be completed in late 2017.

Table B.10-2

Proposed Change in Al-Corn Emissions

	NO_X	CO	VOC	SO_2	PM	CO_2e	Total HAPs
Existing Potential-to-Emit Emissions	60.4	95.0	93.6	42.9	81.8	281,263	24.0
Proposed Change in Emissions	132.6	132.0	84.7	25.7	37.3	485,614	0
Total Potential-to-Emit Emissions After Al-Corn Expansion	193.0	227.0	178.3	68.6	119.1	767,297	24.0

Note: VOC = volatile organic compounds

B.10.3 Climate Change

Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer are not indications of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change.

The Intergovernmental Panel on Climate Change (IPCC) is the leading international, multi-governmental scientific body for the assessment of climate change. The United States is a member of the IPCC and participates in the IPCC working groups to develop reports. The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP). Thirteen federal

departments and agencies[11] participate in the USGCRP, which began as a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990.

The IPCC and USGCRP have recognized that:

- globally, GHGs have been accumulating in the atmosphere since the beginning of the industrial era (circa 1750);
- combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture and clearing of forests is primarily responsible for this accumulation of GHG;
- these anthropogenic GHG emissions are the primary contributing factor to climate change; and
- impacts extend beyond atmospheric climate change alone, and include changes to water resources, transportation, agriculture, ecosystems, and human health.

In May 2014, the USGCRP issued a report, *Climate Change Impacts in the United States*, summarizing the impacts that climate change has already had on the United States and what projected impacts climate change may have in the future (USGCRP 2014). The report includes a breakdown of overall impacts by resource and impacts described for various regions of the United States. Although climate change is a global concern, for this cumulative analysis, we will focus on the potential cumulative impacts of climate change in the Project area.

The USGCRP's report notes the following observations of environmental impacts with a high or very high level of confidence that may be attributed to climate change in the Midwest region:

- average temperatures have risen about 1.5 °F between 1900 and 2010 and are projected to increase another 4 to 5 °F over the next several decades;
- an increase in health risks due to projected additional heat stress and poor air quality;
- the agricultural crop growing season has lengthened since 1950 and is projected to continue lengthening due to the earlier occurrence of the last spring freeze, potentially increasing crop production in the short-term;
- increased temperature stress, wetter springs, and the continued occurrence of springtime cold air outbreaks are projected may reduce crop yields overall in the long-term (particularly corn and soybeans);
- a change in range and/or elevation is projected for many tree species with potential declines in paper birch, quaking aspen, balsam fir, and black spruce and increases in oaks and pines;

[11] The following departments comprise the USGCRP: EPA, Department of Energy, U.S. Department of Commerce, U.S. Department of Defense, U.S. Department of Agriculture, U.S. Department of the Interior, U.S. Department of State, PHMSA, Department of Health and Human Services, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and Agency for International Development.

- tree species in flat terrain may have difficultly migrating the long distances needed to reach temperatures suitable for the species, resulting in some potential decline in forests;

- increased insect outbreaks, forest fire, and drought may result in increased tree mortality and the reduction in beneficial carbon sinks;

- annual precipitation has increased by about 20 percent over the past century, particularly from increased high intensity rainfall events, and this trend is projected to continue;

- surface water temperatures in the Great Lakes have increased several degrees between 1968 and 2002, and are projected to increase by about 7 to 12 degrees by the end of the century; and

- increased surface water temperatures, increased precipitation, and longer growing seasons are projected to result in an increase in blue-green and toxic algae in the Great Lakes, harming fish and reducing water quality.

Emissions of GHGs from the proposed Project and other regional projects would not have any direct impacts on the environment in the Project area. Currently, there is no standard methodology to determine how a project's relatively small incremental contribution to GHGs would translate into physical effects on the global environment.

However, the USGCRP report states that in the Midwest region "per capita GHG emissions are 22 percent higher than the national average due, in part, to the reliance on fossil fuels, particularly coal for electricity generation." Natural gas emits less CO_2 compared to other fuel sources (e.g., fuel oil or coal). Therefore, the USGCRP report also notes that increased use of natural gas in the Midwest may reduce emissions of GHGs. We find that the Project, along with other planned natural gas projects in the Midwest region, may result in the displacement of some coal use or encourage the use of lower carbon fuel for new growth areas, thereby regionally offsetting some GHG emissions.

SECTION C – ALTERNATIVES

In preparing this EA, we considered several alternatives to the proposed action to determine whether they would be environmentally preferable over the Project. These alternatives include the no-action alternative and system alternatives. Aboveground facility (compressor station) site alternatives were not assessed because the Faribault Compressor Station is an existing site owned by Northern that would be expanded primarily within the existing Northern-owned parcel, thus minimizing environmental impacts and impacts on new landowners. Further, alternative sites were not identified during scoping that would lead us to assess sites to construct a new compressor station. Similarly, Northern's proposed looping is entirely co-located with Northern's existing pipeline facilities and primarily in locations where multi-line easement rights exist. Alternative routes would result in new right-of-way and would impact other landowners that are not affected by the proposed Project or may not be currently crossed by any pipeline facilities. Alternative routes would also be longer, may reduce the amount of habitat that could be avoided by use of HDD, and likely result in greater impacts on environmental resources than the proposed Project. Further, we did not receive any comments suggesting specific alternate routes for us to consider. Therefore, we did not evaluate any route alternatives for the proposed Project.

The following evaluation criteria were used to determine whether an alternative would be environmentally preferable:

- technical feasibility and practicality;
- significant environmental advantage over the proposed action; and
- ability to meet the Project's stated objective (i.e., providing 76,000 dekatherms per day of natural gas on Northern's system).

C.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the environmental impacts analyzed in this EA would not occur. However, Northern's objective of providing natural gas to meet near-term demand of 76,000 dekatherms per day to be used for industrial, commercial, and residential use would not be met. The customers, however, would still require additional natural gas transportation capacity to meet residential, commercial, and industrial growth demands. This includes the delivery of natural gas to heat homes and businesses, supplying natural gas for appliance and machinery operation, and supplying gas to industrial plant operations. Alternatively, Northern's customers could investigate the potential to use other sources of energy to meet the power demands that would be meet by the proposed Project; however, their willingness and ability to do so is speculative and outside the scope of our analysis here. Therefore, this alternative would not satisfy the third criterion above that considers the alternative's ability to meet the purpose and need for the Project.

A Commission decision to deny the proposed action (i.e., adopting the no-action alternative) would avoid the environmental impacts addressed in this EA; however, other natural gas transmission companies would most likely be required to increase their capacity and to construct new facilities to meet the demand for additional capacity. This action would result in greater environmental impacts in other areas and would not eliminate the cumulative impacts in the long term. Therefore, the no-action alternative would not satisfy the purpose and need for the Project; as such, we do not recommend it.

C.2 SYSTEM ALTERNATIVES

System alternatives may include new pipeline along existing right-of-way, alternative pipe diameters or compression scenarios, or alternative placement of pipeline loop. Multiple system alternatives were evaluated that could conceivably meet the objectives of the Project. These alternatives include utilizing a different existing natural gas pipeline system or different configuration of Northern's pipeline facilities, including one "no compression" option, and the use of electric-driven rather than natural-gas-driven compressors.

C.2.1 Other Pipeline Systems

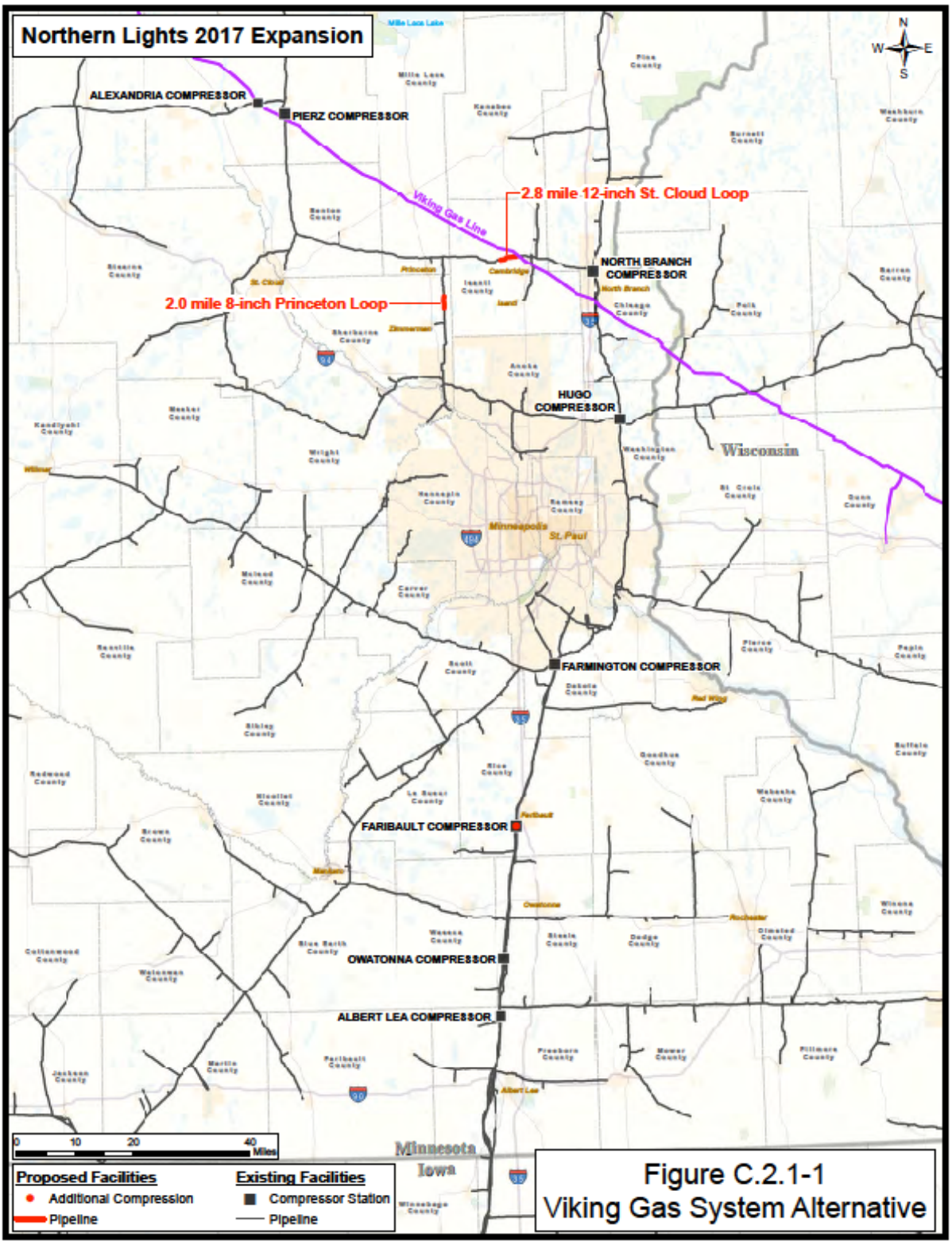
There is one other natural gas pipeline operating within a reasonable distance of the Project area, that being a pipeline system operated by Viking Gas Transmission Company (Viking), which was considered as a possible alternative to the Project (see figure C.2.1-1). The Viking system passes within a few miles of the St. Cloud Loop; however, we are not aware of any facilities Viking is planning to construct that could serve Northern's customers. Further, to construct new facilities to replace the proposed Project with service from the Viking system is estimated to require the installation of more than 100 miles of new pipe, new delivery stations and, possibly, additional compression. This provides no obvious environmental advantage over the proposed action, thus we do not recommend this alternative.

C.2.2 No-Compression Alternative

An alternative was considered that would not include any compression in the form of a new compressor station or expansion of an existing station. In this scenario, operational impacts on air quality and prime farmland would be avoided; however, approximately 63 miles of new pipeline loop, substantially more than the proposed Project, would be needed along Northern's existing system. Even though a majority of land disturbance could occur within or adjacent to Northern's existing right-of-way, installing 63 miles of mainline loop would impact more landowners, more land, and environmental resources. In addition to the environmental costs, Northern states that it would be economically prohibitive compared to the expansion of the Faribault Compressor Station associated with the proposed Project. Due to the length of pipeline that would be required and the increased landowner and environmental impacts and costs, we do not recommend this alternative.

C.2.3 Electric-Driven Compression Alternative

Northern's proposal would allow for natural gas service from natural gas-fired compressors on a continuous and uninterrupted basis. According to Northern, the uninterruptible delivery requirement is the primary reason for use of gas-fired units in its application. Use of electric-driven compressors would reduce the local emission of criteria air pollutants from the combustion of natural gas at the compressor station; however, Northern states that the use of electric-driven compression units would result in loss of service in the event of a commercial power outage. Such an electrical power outage has a high likelihood of occurring at the same time as peak natural gas demand. Nevertheless, we assessed the requirements to provide electric service to the station and identified that approximately 12 Megawatts of power would be required to drive a 15,000-hp compressor at full power. The closest transmission line capable of providing that level of power supply to the Faribault Compressor Station is 25 miles away, and would subsequently require construction of 25 miles of electric transmission line in addition to the offsite generation of additional electricity. We conclude that this does not provide an operation or an environmental advantage over the proposed action, and therefore we do not recommend this alternative.


Northern Lights 2017 Expansion
ALEXANDRIA COMPRESSOR
PIERZ COMPRESSOR
Viking Gas Line
2.8 mile 12-inch St. Cloud Loop
NORTH BRANCH COMPRESSOR
2.0 mile 8-inch Princeton Loop
HUGO COMPRESSOR
Wisconsin
Minneapolis
St. Paul
FARMINGTON COMPRESSOR
FARIBAULT COMPRESSOR
OWATONNA COMPRESSOR
ALBERT LEA COMPRESSOR
Minnesota
Iowa
N
W
E
S
0 10 20 40 Miles
Proposed Facilities
Additional Compression
Pipeline
Existing Facilities
Compressor Station
Pipeline
Figure C.2.1-1
Viking Gas System Alternative

SECTION D – STAFF'S CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if Northern 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.

We recommend 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. Northern 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. Northern 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 OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the project and activities associated with the abandonment portion of the project. This authority shall allow:

    a. the modification of conditions of the Order; and

    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.

3. **Prior to any construction**, Northern shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, environmental inspectors, and contractor personnel will be informed of the environmental inspectors' 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**, Northern 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 the facility 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.

    Northern'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. Northern's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Northern 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 **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by Northern's site-specific Plan described in this document and/or minor field realignments per landowner needs and requirements that 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**, Northern shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Northern must file revisions to the plan as schedules change. The plan shall identify:

   a. how Northern 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 Northern 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 onsite construction and inspection personnel;

   c. the number of environmental inspectors assigned, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;

   d. company personnel, including environmental inspectors and contractors, who will receive copies of the appropriate material;

e. the location and dates of the environmental compliance training and instructions Northern 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 Northern's organization having responsibility for compliance;

g. the procedures (including use of contract penalties) Northern 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. Northern shall employ at least one environmental inspector per construction spread. The environmental inspector(s) 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. 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

e. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Northern shall file updated status reports with the Secretary on a **biweekly** 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 Northern's efforts to obtain the necessary federal authorizations;

b. the construction status of the project, work planned for the following reporting period, and any schedule changes for dry-wash crossings or work in other environmentally sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the environmental inspector(s) 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, and their cost;

e. the effectiveness of all corrective actions implemented;

f. a description of any landowner/resident complaints that 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 Northern from other federal, state, or local permitting agencies concerning instances of noncompliance, and Northern's response.

9. **Prior to receiving written authorization from the Director of OEP to commence construction of any project facilities**, Northern shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Northern must receive written authorization from the Director of OEP **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.

11. **Within 30 days of placing the authorized facilities in service**, Northern shall file an affirmative statement with the Secretary, certified by a senior company official:

a. that the respective facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or

b. identifying which of the conditions in the Order Northern 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.

12. Northern shall not proceed with construction within 100 feet of any active non-raptor migratory bird nest identified during preconstruction avian surveys while the MNDNR and FWS are contacted to determine any necessary avoidance or mitigation measures.

13. **Prior to construction of HDDs P4-2, P4-3, and P4-4 on the Princeton Loop, and HDDs P4-3 and P4-4 on the St. Cloud Loop**, Northern shall file with the Secretary, for the review and written approval by the Director of OEP, an HDD noise mitigation plan to reduce the projected noise level attributable to the proposed drilling operations at nearby NSAs. During drilling operations, Northern shall implement the approved plan, monitor noise levels, and make all

reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.

14. Northern shall file noise surveys with the Secretary **no later than 60 days** after placing the authorized unit at the Faribault Compressor Station in service. If a full load condition noise survey is not possible, Northern 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 the station at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Northern shall install additional noise controls to meet that level **within 1 year** of the in-service date. Northern shall confirm compliance with the L_{dn} of 55 dBA requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

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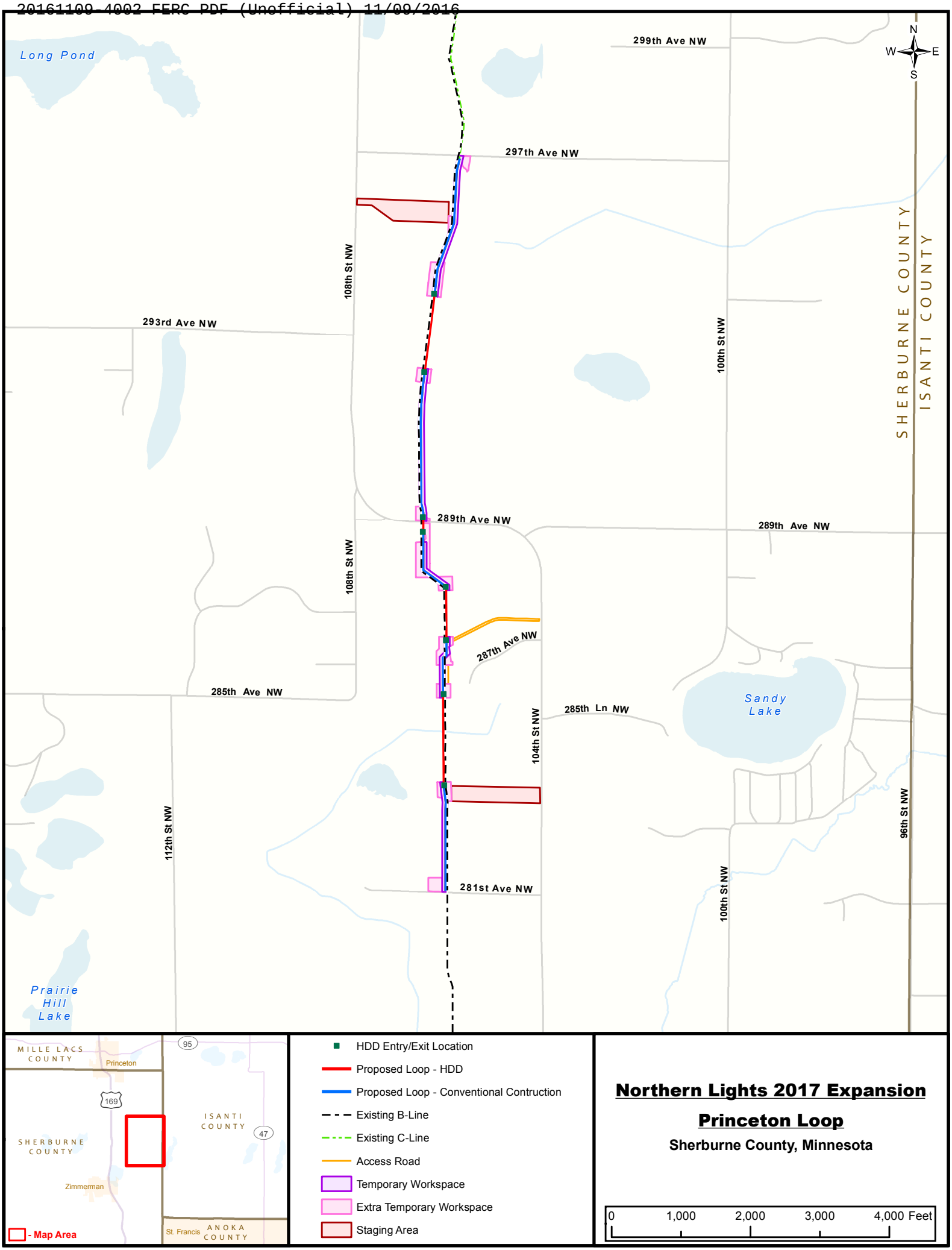
APPENDIX A

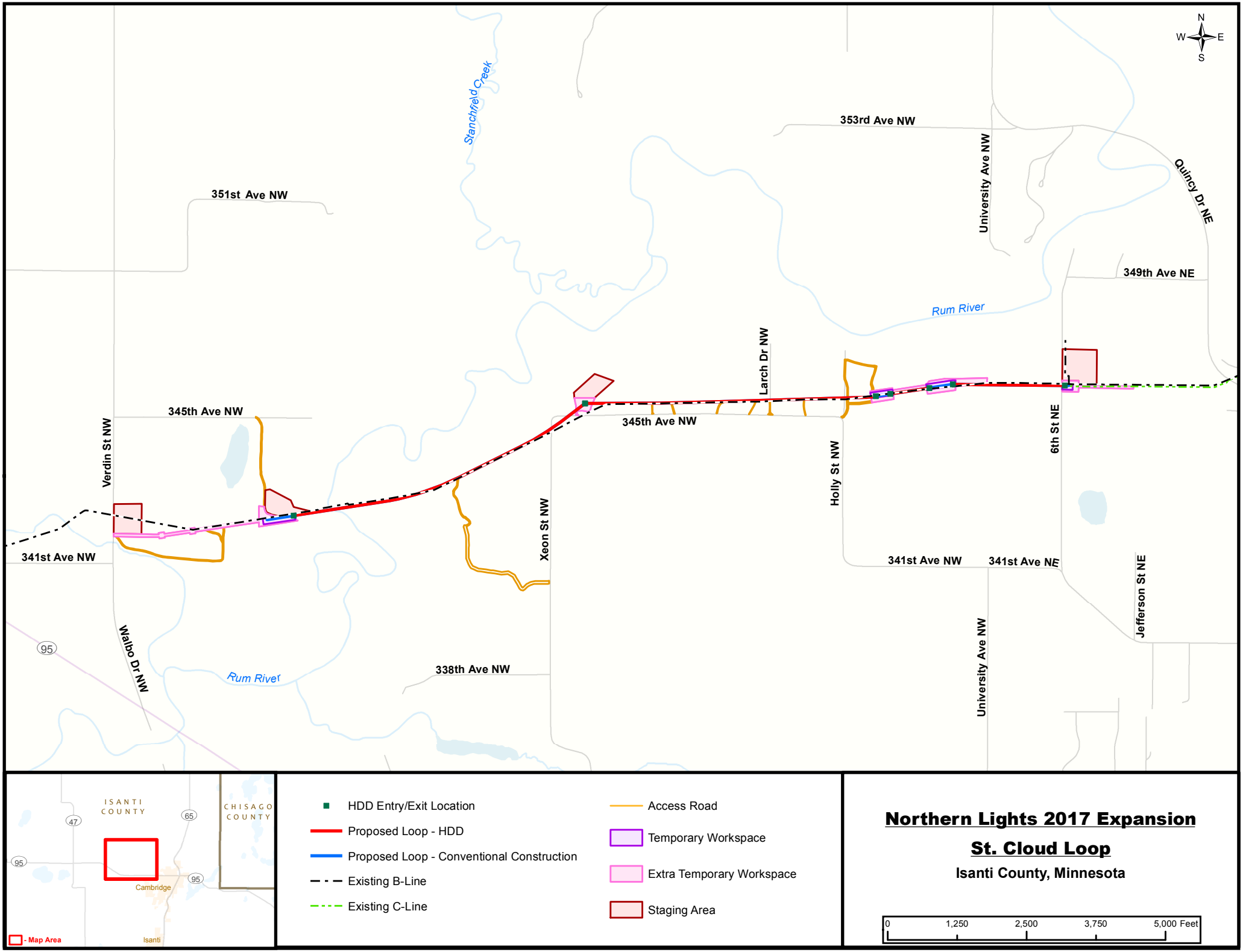
Pipeline Route and Site Location Maps

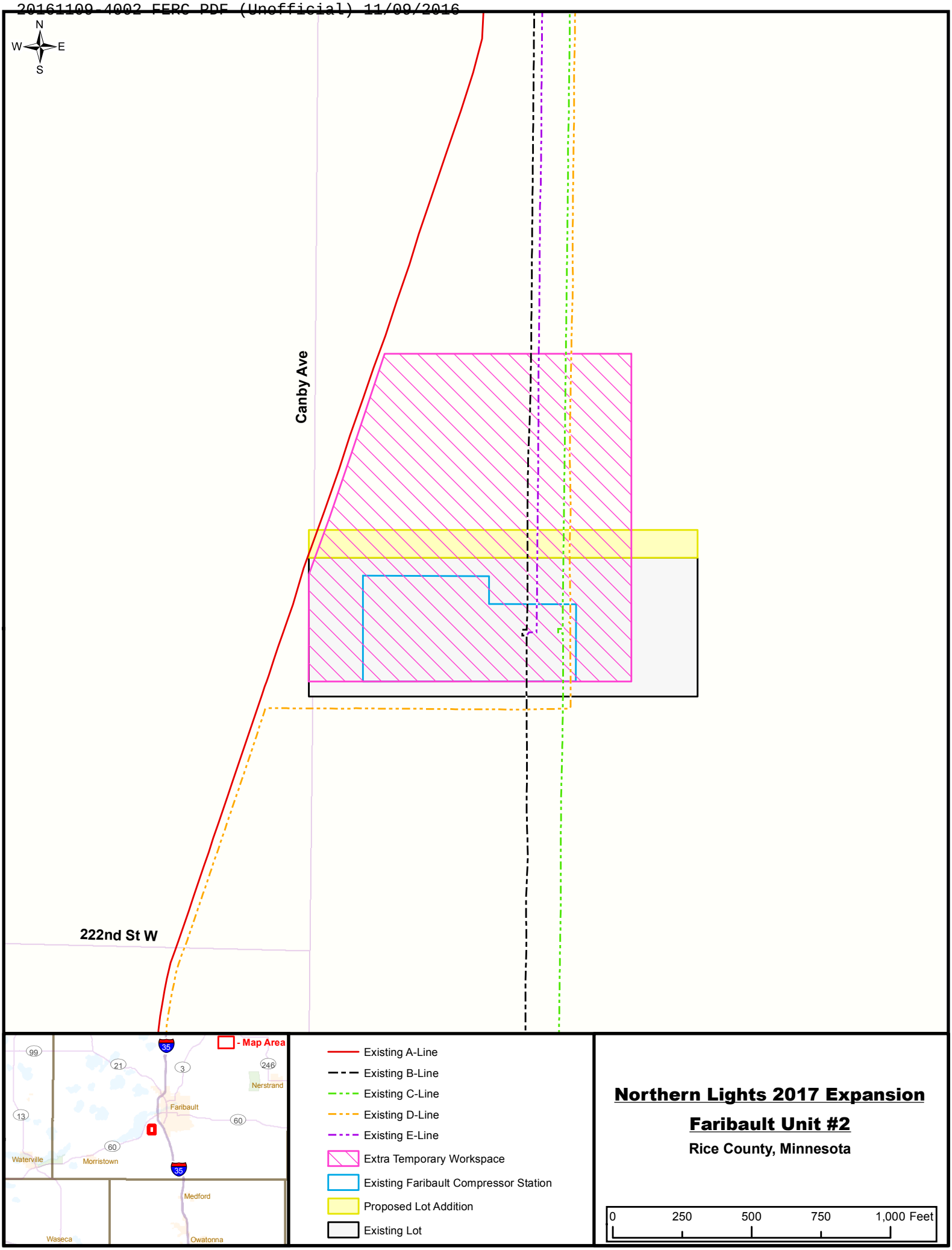


Northern Lights 2017 Expansion

Princeton Loop

Sherburne County, Minnesota


N
W
E
S
Stanchfield Creek
353rd Ave NW
University Ave NW
Quincy Dr NE
351st Ave NW
349th Ave NE
Rum River
Larch Dr NW
345th Ave NW
345th Ave NW
Verdin St NW
Holly St NW
6th St NE
Xeon St NW
341st Ave NW
341st Ave NW
341st Ave NE
Jefferson St NE
University Ave NW
95
Walbo Dr NW
Rum River
338th Ave NW
ISANTI COUNTY
CHISAGO COUNTY
47
65
95
95
Cambridge
- Map Area
Isanti
HDD Entry/Exit Location
Proposed Loop - HDD
Proposed Loop - Conventional Construction
Existing B-Line
Existing C-Line
Access Road
Temporary Workspace
Extra Temporary Workspace
Staging Area
Northern Lights 2017 Expansion
St. Cloud Loop
Isanti County, Minnesota
0
1,250
2,500
3,750
5,000 Feet



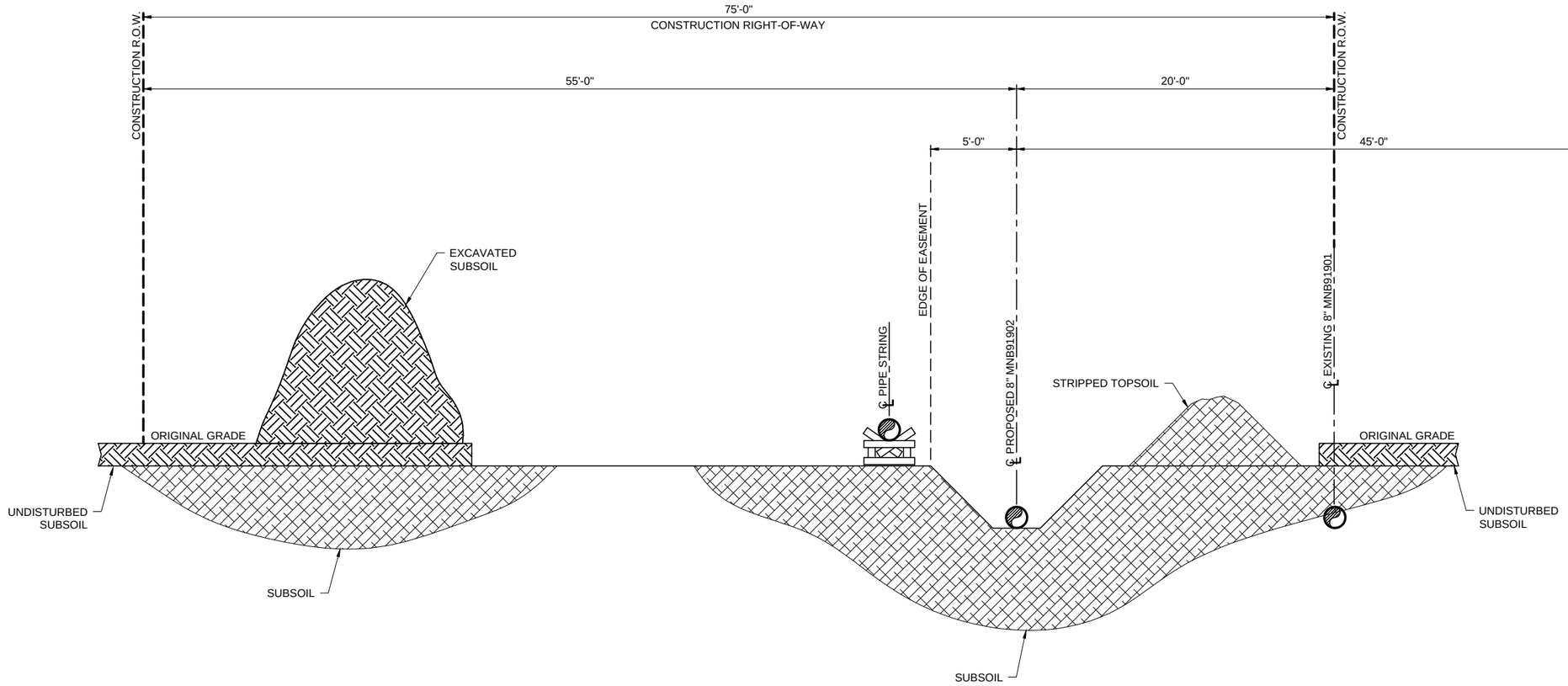
Northern Lights 2017 Expansion

Faribault Unit #2

Rice County, Minnesota

APPENDIX B

Construction Right-of-Way Cross Section Drawings



CONSTRUCTION RIGHT-OF-WAY MP 0.00 - 0.38, 0.60 - 1.00, 1.07 - 1.21, 1.36 - 1.40

REF. DWG. P3-1 - P3-4,

LEGEND

TOPSOIL

SUBSOIL

48" 24" 0 4'-0" 8'-0"

SCALE: 1/4" = 1'-0"

APPENDIX B

SCALE DISCLAIMER:
NOTED SCALE APPLIES TO 22"x34" PAPER SIZE ONLY

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

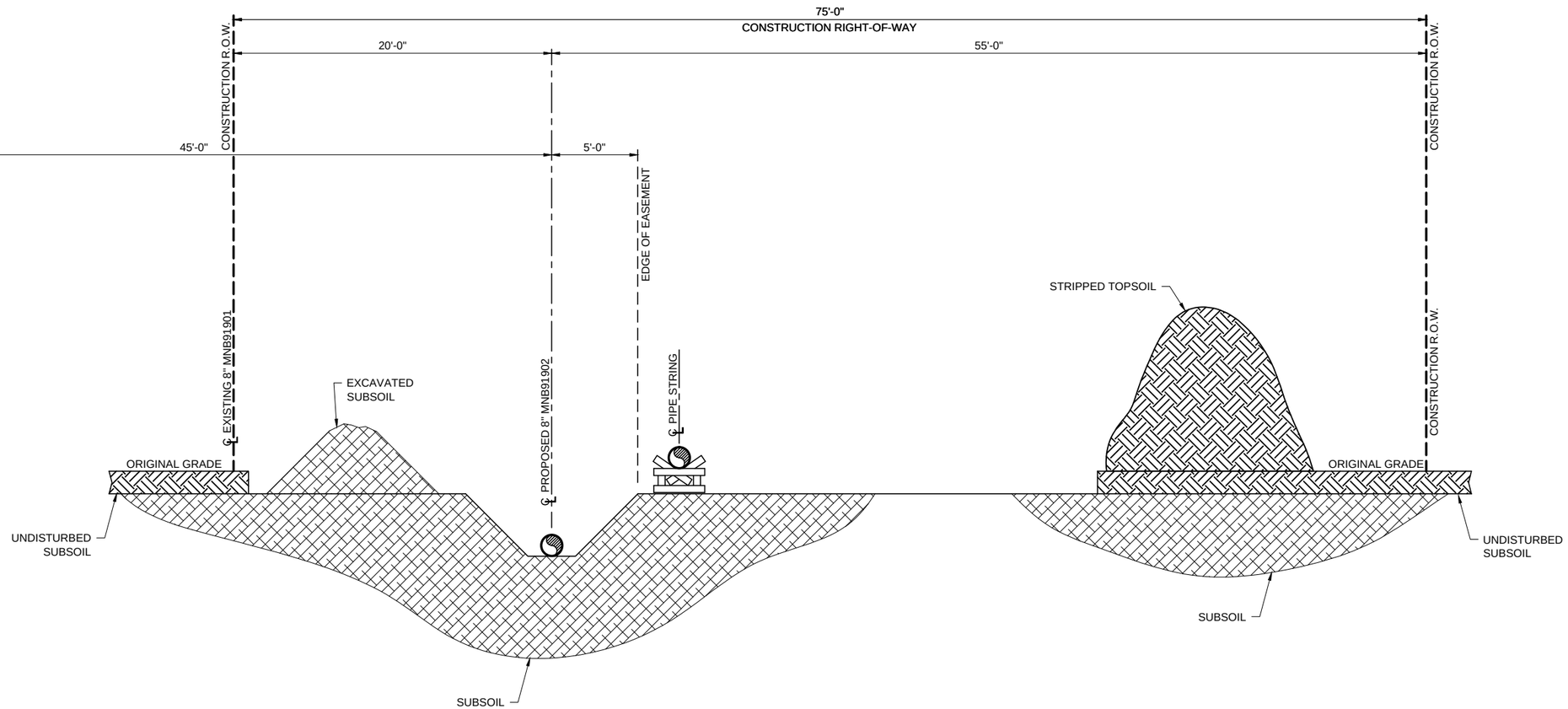
STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				

FAC. CODE:		REL. W.O.
PL#		CONST. YR
STA#		
	BY	DATE
DESIGN		
DRAWN		
ASBUILT		
FILE NO.:		
SCALE:		

Northern Lights 2017
Expansion Project Princeton Loop

PROJECT NO.

DWG. NO.



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REF. DWG. P3-4 - P3-6

LEGEND

TOPSOIL

SUBSOIL

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SCALE: 1/4" = 1'-0"

APPENDIX B

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SCALE:		

Northern Lights 2017
Expansion Project Princeton Loop

PROJECT NO.

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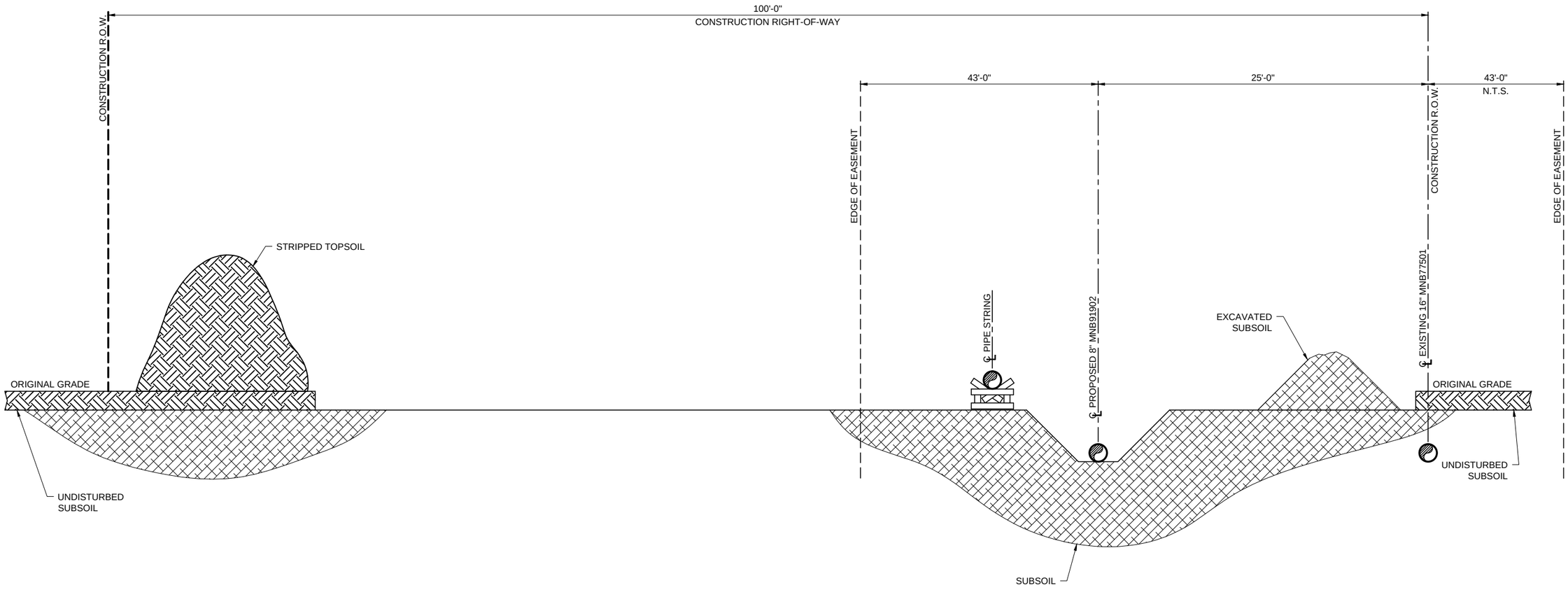

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REF. DWG. P3-7

LEGEND

TOPSOIL

SUBSOIL

48" 24" 0 4'-0" 8'-0"

SCALE: 1/4" = 1'-0"

APPENDIX B

SCALE DISCLAIMER:
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NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				

FAC. CODE:		REL. W.O.
PL#		CONST. YR
STA#		
	BY	DATE
DESIGN		
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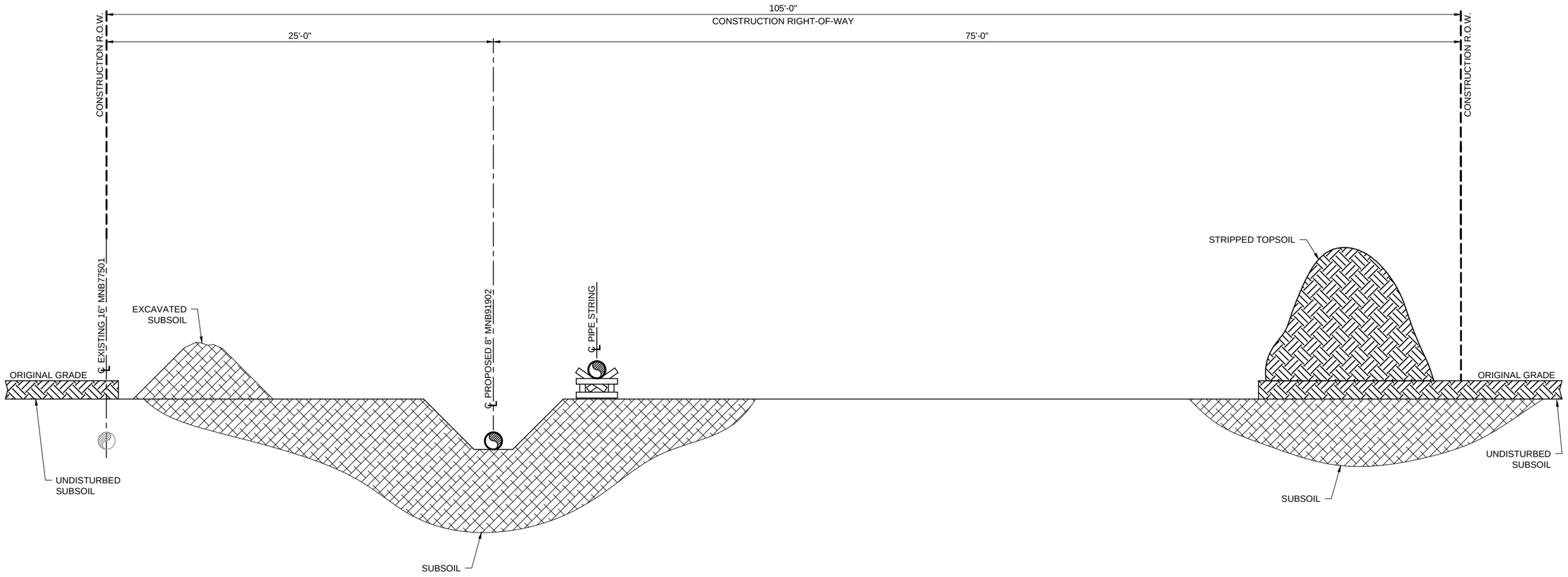
FILE NO.:		
SCALE:		

Northern Lights 2017
Expansion Project St Cloud Loop

PROJECT NO.

DWG. NO.



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REF. DWG. P3-2

LEGEND

TOPSOIL

SUBSOIL

48" 24" 0 4'-0" 8'-0"

SCALE: 1/4" = 1'-0"

APPENDIX B

SCALE DISCLAIMER:
NOTED SCALE APPLIES TO 22"x34" PAPER SIZE ONLY

NO.	REVISION - DESCRIPTION	BY	DATE	CHK'D	APP'D

STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				

FAC. CODE:		REL. W.O.
PL#		CONST. YR
STA#		
	BY	DATE
DESIGN		
DRAWN		
ASBUILT		
FILE NO.:		
SCALE:		

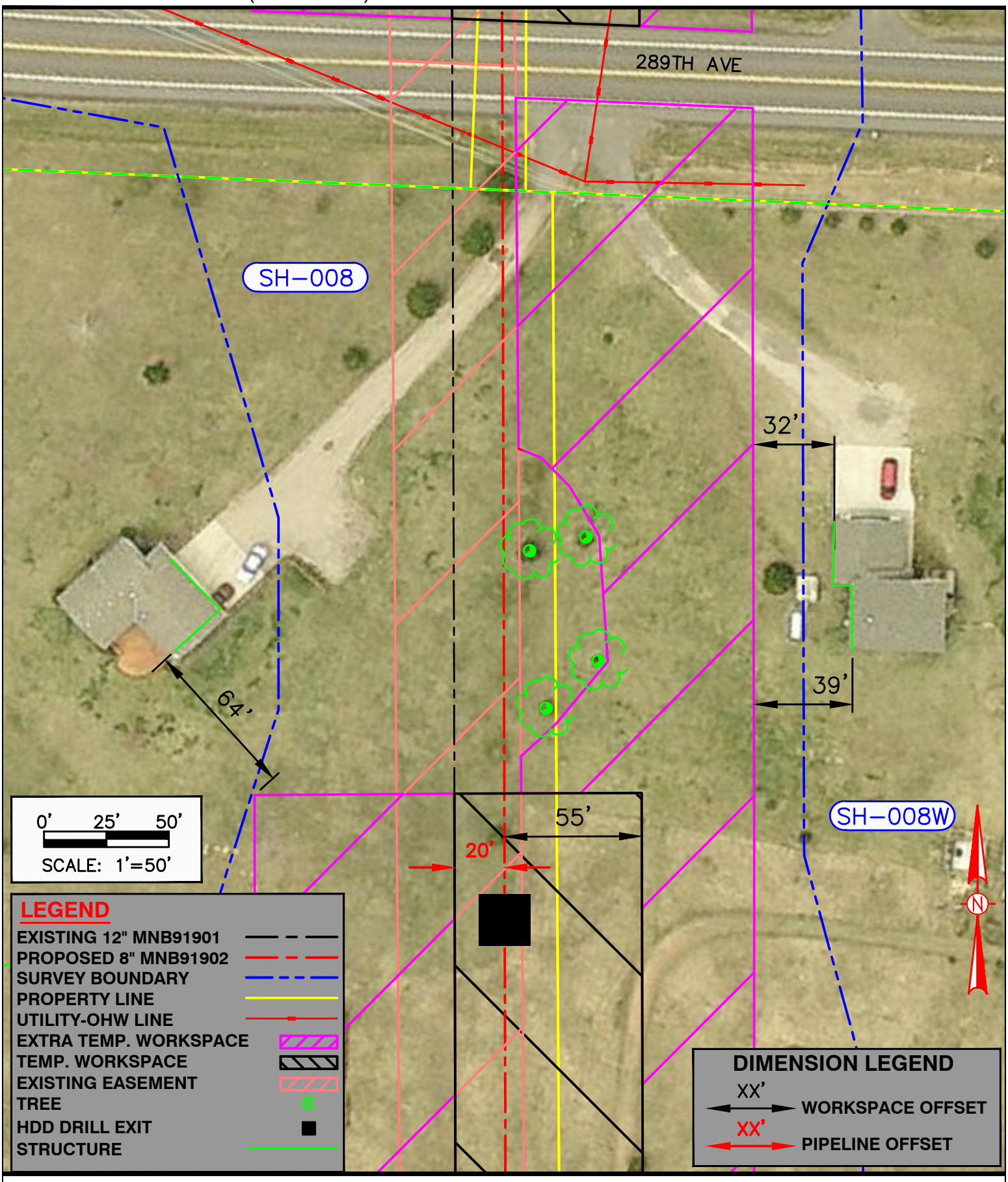
Northern Lights 2017
Expansion Project St Cloud Loop

PROJECT NO.

DWG. NO.

APPENDIX C

Residential Site-Specific Plan



Princeton 8" MNB91902
Residence Site Specific Plan of
Tract SH-008, SH-008W
SEC 26, T35N. R26W
Sherburne County, Minnesota

RSSP-001
Issued to FERC
Date: 5/5/16
Scale: 1'=50'

J:\PROJECTS\NNG\2017\0110XXXX 2017 EXPANSION\5-FERC FILING\PRINCETON \0111XXXX PRINCETON_UPDATED_QUAD_MAPS.DWG

Document Content(s)