



**Office of
Energy Projects**

February 2021

Northern Natural Gas Company

Docket No. CP20-504-000

Lake City 1st Branch Line Abandonment and Capacity Replacement 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 3
Northern Natural Gas Company
Lake City 1st Branch Line Abandonment
and Capacity Replacement Project
Docket No. CP20-504-000

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Lake City 1st Branch Line Abandonment and Capacity Replacement Project proposed by Northern Natural Gas Company (Northern) in the above-referenced docket. Northern requests authorization to abandon, construct, modify, and operate natural gas pipeline facilities in Webster and Calhoun Counties, Iowa.

The EA assesses the potential environmental effects of the construction and operation of the Lake City 1st Branch Line Abandonment and Capacity Replacement Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The proposed Lake City 1st Branch Line Abandonment and Capacity Replacement Project includes the following facilities/activities:

- abandon in-place 34.2 miles of the Lake City 1st branch line (4-inch-diameter pipeline) from milepost (MP) 0.00 to MP 34.15;
- disconnect the abandoned segment of the Lake City 1st branch line pipeline from Northern's existing pipelines at five locations;
- uprate the maximum allowable operating pressure (MAOP) of 25.3 miles of the Lake City 2nd branch line (6-inch-diameter pipeline) and install a new take-off regulator setting to the Harcourt branch line pipeline;
- uprate the MAOP of the Callender branch line (2-inch-diameter pipeline);
- uprate the MAOP of the Manson 2nd branch line (4-inch-diameter pipeline) and install a new take-off regulator setting from the Manson 2nd branch line pipeline to the Manson 1st branch line pipeline and Rockwell City branch line pipeline; and

- construct 9.2 miles of new 6-inch-diameter pipeline extension of the Lake City 2nd branch line, relocate a receiver to the Lake City Town Border Station (TBS), and install a new take-off valve setting for the Lohrville TBS.

The Commission mailed a copy of the *Notice of Availability* to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the project area. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the natural gas environmental documents page (<https://www.ferc.gov/industries-data/natural-gas/environment/environmental-documents>). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (<https://elibrary.ferc.gov/eLibrary/search>), select "General Search" and enter the docket number in the "Docket Number" field (i.e. CP20-504). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

The EA is not a decision document. It presents Commission staff's independent analysis of the environmental issues for the Commission to consider when addressing the merits of all issues in this proceeding. Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **March 29, 2021**.

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

- (1) You can file your comments electronically using the [eComment](#) feature on the Commission's website (www.ferc.gov) under the link to [FERC Online](#). This is an easy method for submitting brief, text-only comments on a project;
- (2) You can also file your comments electronically using the [eFiling](#) feature on the Commission's website (www.ferc.gov) under the link to [FERC Online](#). With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "[eRegister](#)." You must select the type of

filing you are making. If you are filing a comment on a particular project, please select “Comment on a Filing”; or

- (3) You can file a paper copy of your comments by mailing them to the Commission. Be sure to reference the project docket number (CP20-504-000) on your letter. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852.

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

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

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

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TECHNICAL ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effects
ATWS	additional temporary workspace
BIA	Bureau of Indian Affairs
BCC	Birds of Conservation Concern
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Commission	Federal Energy Regulatory Commission
CRP	Conservation Reserve Program
dBA	decibels on the A-weighted scale
DOT-PHMSA	U.S. Department of Transportation – Pipeline and Hazardous Materials Safety Administration
EA	Environmental Assessment
ECB	Environmental clearance boundary
EI	Environmental inspector
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPPA	Farmland Protection Policy Act
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HDD	horizontal directional drilling
IDNR	Iowa Department of Natural Resources
IPaC	U.S. Fish and Wildlife Service’s Information for Planning and Conservation System
IR	inadvertent return of drilling fluids
ISO	International Organization for Standardization
L _{eq}	24-hour equivalent sound level
L _{dn}	day-night sound level

MAOP	Maximum Allowable Operating Pressure
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NNSR	Nonattainment New Source Review
NO ₂	nitrogen dioxide
NOI	<i>Notice of Intent to Prepare an Environmental Assessment for the Lake City 1st Branch Line Abandonment and Capacity Replacement Project and Request for Comments on Environmental Issues</i>
NO _x	nitrogen oxides
Northern	Northern Natural Gas Company
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
OEP	Office of Energy Projects
PEM	palustrine emergent wetland
Plan	<i>FERC's Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PCB	polychlorinated biphenyl
PGA	peak ground acceleration
PM _{2.5}	particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PM ₁₀	particulate matter less than or equal to 10 microns in aerodynamic diameter
ppm	parts per million
Procedures	<i>FERC's Wetland and Waterbody Construction and Mitigation Procedures</i>
Project	Lake City 1 st Branch Line Abandonment and Capacity Replacement Project
PSD	Prevention of Significant Deterioration
Psig	pounds per square inch gauge
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SPCC	<i>Northern's Spill Prevention, Control and Countermeasures Plan</i>
SWPPP	<i>Northern's Stormwater Pollution Prevention Plan</i>
TBS	Town Border Station
Tpy	tons per year
TWS	temporary workspace

UDP	Unanticipated Discovery Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S Department of Agriculture
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compounds

A. PROPOSED ACTION

1. Introduction

The staff of the Federal Energy Regulatory Commission (FERC or Commission) prepared this environmental assessment (EA) to address the environmental impacts of the abandonment, modification, construction, and operation of the proposed Lake City 1st Branch Line Abandonment and Capacity Replacement Project (Project). On July 31, 2020, Northern Natural Gas Company (Northern), filed an application with the Commission in Docket No. CP20-504-000 under Section 7(b) and 7(c) of the Natural Gas Act (NGA) and Subpart A of Part 157 of the Commission’s regulations. Northern seeks to obtain a Certificate of Public Convenience and Necessity (Certificate) and an Authorization from the Commission authorizing abandonment, construction, modification, and operation of certain natural gas pipeline facilities in Webster and Calhoun Counties, Iowa.

We¹ prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality’s (CEQ) regulations for implementing NEPA (Title 40 Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508])²; and the Commission’s regulations at 18 CFR 380.

The FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the National Gas Act (NGA), and the lead federal agency for preparation of this EA, in accordance with NEPA (40 CFR 1501) and the Energy Policy Act of 2005.

The EA is an integral part of the Commission’s decision-making process to determine whether to authorize Northern’s proposal. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and
- facilitate public involvement in the environmental review process.

Northern has requested a Certificate and Authorization by July 1, 2021, to begin Project activities in August 2021.

¹ “We,” “us,” and “our” refer to the environmental staff of the FERC’s Office of Energy Projects (OEP).

² On July 16, 2020, CEQ issued a final rule, Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act (Final Rule, 85 Fed. Reg. 43,304), which was effective as of September 14, 2020; however, the NEPA review of this project was in process at that time and was prepared pursuant to the 1978 regulations.

2. Project Purpose and Need

The purpose of this Project is to enhance the safety, security, and operational efficiency of Northern's pipeline system through the abandonment in-place of approximately 34 miles of the Lake City 1st branch line. The need for the abandonment was identified as part of Northern's ongoing modernization efforts and review of vintage and mechanically jointed or acetylene welded pipeline segments. The Lake City 1st branch line pipeline was placed in service in December 1931 and according to Northern, has substantially escalating maintenance demands. The system modifications and new pipeline construction that is proposed would replace the capacity lost from the abandonment of the Lake City 1st branch line pipeline.

Section 7(b) of the NGA specifies that no natural gas company shall abandon any portion of its facilities subject to the Commission's jurisdiction without the Commission first finding that the abandonment will not negatively affect the present or future public convenience and necessity.

Under section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on both economic issues, including need, and environmental impacts.

3. Scope of this Environmental Assessment

The resources and topics addressed in this EA include geology, soils, groundwater, surface waters, wetlands, fisheries, wildlife, vegetation, protected species, land use, visual impacts, cultural resources, air quality, noise, reliability and safety, cumulative impacts, and alternatives. This EA describes the affected environment as it currently exists and the anticipated environmental consequences of the Project and compares the Project's potential impact with that of reasonable alternatives. This EA also presents our recommended mitigation measures for the Commission to consider as conditions to any Certificate or authorization it may grant.

As the lead federal agency for the Project, FERC is required to comply with Section 7 of the Endangered Species Act, as amended (ESA) and Section 106 of the National Historic Preservation Act. These statutes have been considered in the preparation of this EA. In addition to FERC, other federal, state, and local agencies may use this EA in approving or issuing any permits necessary for all or part of the proposed Project. Permits, approvals, and consultations for the Project are discussed in section A.9 of this EA.

4. Public Review and Comment

On August 31, 2020, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Lake City 1st Branch Line Abandonment and Capacity Replacement Project and Request for Comments on Environmental Issues* (NOI). The NOI was sent to affected landowners; federal, state, and local government agencies; elected officials; environmental and public interest groups; Native American tribes; other interested parties; and local libraries and newspapers.

In response to the NOI, the Commission received comments from four landowners, the National Resources Conservation Service, and the Iowa State Historic Preservation Office (SHPO). The primary issues raised by the commentors concern federal/state permits, the Project's impacts on farmland, private property, cultural resources, and alternatives (abandonment by removal). The comments are addressed throughout the EA and specifically in sections A.9 (Federal and State Permits), B.5 (Land Use), B.6 (Cultural Resources), and C.3 (Alternatives).

In addition, we received comments on the NOI from a landowner concerning the potential loss of access to a "farm tap" and the subsequent impacts on his family farm's operations. In Northern's response to a staff environmental information request addressing the comments, it indicated that it would work with the landowner to retain his "farm tap" service by providing him access to another of Northern's adjacent natural gas transmission pipelines.

5. Proposed Facilities

The Project would consist of the abandonment of about 34.2 miles of pipeline and associated facilities and the construction and operation of new and modified existing pipeline facilities and additional appurtenances to replace the natural gas capacity of the abandoned facilities. Northern proposes the following activities to complete the Project:

- abandon in-place 34.2 miles of the Lake City 1st branch line (4-inch-diameter pipeline) from milepost (MP) 0.00 to MP 34.15;
- disconnect the abandoned segment of the Lake City 1st branch line pipeline from Northern's existing pipelines at five locations;
- uprate the maximum allowable operating pressure (MAOP) of 25.3 miles of the Lake City 2nd branch line (6-inch-diameter pipeline) and install a new take-off regulator setting to the Harcourt branch line pipeline;
- uprate the MAOP of the Callender branch line (2-inch-diameter pipeline);
- uprate the MAOP of the Manson 2nd branch line (4-inch-diameter pipeline) and install a new take-off regulator setting from the Manson 2nd branch line

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pipeline to the Manson 1st branch line pipeline and Rockwell City branch line pipeline; and

- construct 9.2 miles of new 6-inch-diameter pipeline extension of the Lake City 2nd branch line, relocate a receiver to the Lake City Town Border Station (TBS), and install a new take-off valve setting for the Lohrville TBS.

Northern proposes to complete these activities in two phases. The first phase would begin in late summer/early fall of 2021 and the second phase would begin in the late winter/spring of 2022. Phase 1 would consist of hydrostatic testing activities for the MAOP uprates. Phase 2 would consist of the Lake City 1st branch line abandonment activities (including all disconnections), all activities associated with the construction of the Lake City 2nd branch line extension, and the installation of new take-off regulator settings on the pipelines undergoing MAOP uprates.

Location and Description of Facilities and Proposed Activities

The tables below show the locations and MP of each facility. Table 1 shows the locations of pipeline facilities and table 2 shows the locations of the aboveground facilities. Additionally, figures 1.1-1 and 1.1-2 in appendix A show the locations of all facilities involved in the Project. Figure 1.1-1 shows Project components that would be completed in 2021, and Figure 1.1-2 shows Project components that would be completed in 2022 (appendix A).

Table 1 Project Pipeline Locations			
Project Component/Facility	Pipeline Diameter	MP(s)	County
Lake City 2nd branch line MAOP uprate	6-inch-diameter pipeline	0.00 – 25.3	Webster and Calhoun
Callender branch line MAOP uprate	2-inch-diameter pipeline	0.00 – 4.4	Webster
Manson 2nd branch line MAOP uprate	4-inch-diameter pipeline	0.00 – 7.8	Calhoun
Lake City 2nd branch line extension	6-inch-diameter pipeline	25.8 – 34.9	Calhoun
Lake City 1st branch line abandonment	4-inch-diameter pipeline	0.00 – 34.2	Webster and Calhoun

Lake City 2nd branch line MAOP uprate

Northern proposes to increase the MAOP of the Lake City 2nd branch line in Webster and Calhoun counties, Iowa. The operating pressure of the pipeline would increase from its current pressure of 500 pounds per square inch gauge (psig) to 800 psig. To complete the MAOP uprate, Northern would install temporary test headers at either

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end of each pipeline segment and hydrostatically test the pipeline in four segments to at least 150 percent of the proposed MAOP of 800 psig, or 1,200 psig.

Table 2 Project Above Grade Facility Locations			
Project Component/Facility	Facility Type	MP	County
Harcourt branch line take-off regulator setting	Regulator setting associated with Lake City 2nd branch line MAOP uprate	6.6	Webster
Manson 1st branch line and Rockwell City branch line take-off regulator setting	Regulator setting associated with Manson 2nd branch line MAOP uprate	7.8	Calhoun
Lohrville take-off setting	Take-off setting associated with Lake City 2nd branch line extension	26.7	Calhoun
Lake City 2nd branch line receiver relocate	Receiver associated with Lake City 2nd branch line extension	34.9	Calhoun

Callender branch line MAOP uprate

Northern proposes to increase the MAOP of the Callender branch line in Webster County, Iowa, from its current operating pressure of 500 psig to 800 psig. To complete the MAOP uprate, Northern would install temporary test headers at either end of the pipeline segment and hydrostatically test the pipeline to at least 150 percent of the proposed MAOP of 800 psig, or 1,200 psig.

Manson 2nd branch line MAOP uprate

Northern proposes to increase the MAOP of the Manson 2nd branch line in Calhoun County, Iowa, from its current operating pressure of 500 psig to 800 psig. To complete the MAOP uprate, Northern would install temporary test headers at either end of the pipeline segment and hydrostatically test the pipeline to at least 150 percent of the proposed MAOP of 800 psig, or 1,200 psig.

Regulator Settings

Northern is proposing to install two regulator settings in 2022 to assist in accommodating the increased MAOP resulting from the Lake City 2nd branch line and Manson 2nd branch line MAOP uprates. The regulator settings include a new take-off regulator setting near the Harcourt branch line take-off setting at MP 6.61 and a new take-off regulator setting at the Manson 1st branch line and Rockwell City branch line. The Harcourt branch line take-off regulator setting would protect the Harcourt branch line, with a MAOP of 500 psig, from the newly reclassified Lake City 2nd branch line, which would have a new MAOP of 800 psig. The Manson 1st branch line and Rockwell City branch line take-off regulator setting would protect the Manson 1st branch line and Rockwell City branch line, both of which have a MAOP of 500 psig, from the newly reclassified Manson 2nd branch line, which would have a new MAOP of 800 psig.

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Lake City 2nd branch line extension

Northern is proposing to construct and operate a 9.2-mile-long extension of the Lake City 2nd branch line in Calhoun County. The Lake City 2nd branch line extension would begin at MP 25.76 and extend west to the Lake City TBS. Two aboveground facilities would be constructed as part of the extension: a new take-off setting would be installed at MP 26.73 to feed the Lohrville branch pipeline and a receiver would be relocated to Northern's existing Lake City TBS.

Lake City 1st branch line abandonment

Northern is proposing to isolate and abandon in-place 34.2 miles of the Lake City 1st branch line from MP 0.00 to MP 34.2 in Webster and Calhoun counties, Iowa. To abandon the pipeline in place, Northern would disconnect, remove aboveground settings, and cap the Lake City 1st branch line at five locations where it interconnects with Northern's existing pipeline facilities and aboveground settings. To complete the disconnection, Northern would excavate and expose the pipe, and cut and cap the pipe segment. Table 3 identifies the disconnect sites that are part of the Project. Construction procedures for the disconnect sites are described below in section A.7.

County	MP	Facility Name Where the Disconnection Would Occur
Webster	0.00	M520A 20-inch-diameter pipeline take-off
Webster	6.61	Harcourt branch line take-off
Calhoun	18.61	Lake City 1st branch line block valve No. 3
Calhoun	25.08	Manson 1st and 2nd branch line take-offs
Calhoun	34.95	Lake City TBS

6. Land Requirements

Land required for construction of the Project includes temporary workspace (TWS) for excavations and new pipeline construction, staging areas, and access roads. Northern would use a 100-foot-wide construction right-of-way for the new pipeline. After construction, most of the TWS, and staging areas would be restored. Due to overlap with existing and active right-of-way, Northern would continue to maintain its permanent right-of-way of the abandoned pipeline, as well as maintain a 50-foot-wide right-of-way over the new Lake City 2nd branch line extension. Aboveground facilities would be maintained as graveled and fenced facilities. In total, the Project would affect about 149 acres. Northern has estimated that about 10 acres would be disturbed twice (in phase 1 and again in phase 2). These areas would undergo restoration after phase 1 activities but would be disturbed again in phase 2. A total of 36.7 acres would be required for new permanent right-of-way and operation of aboveground facilities. A more detailed

breakdown of acres affected by Project components by phase can be found in appendix B.

MAOP Uprates and Installation of Regulator Settings

Land required to complete work on the three MAOP uprate segments would include TWS needed for the installation of temporary headers at each end of the uprate segments, two new take-off regulator settings, and access roads to gain entry to work areas from nearby public roads. For all of the MAOP uprate segments, at least one or more of the TWS required to complete hydrostatic testing and install the new take-off regulator settings also would be used to complete other Project activities.

For the Lake City 2nd branch line MAOP uprate, Northern would install a new take-off regulator setting near the Harcourt branch line take-off. The new take-off regulator setting would also include the installation of a new 54-foot-long by 40-foot-wide permanent driveway, a 55-foot-wide by 65-foot-long permanent facility that would be fenced, and gravel would be installed as ground cover. In addition to installing the new take-off regulator setting, Northern would disconnect the Lake City 1st branch line within the same TWS. These two activities would both occur in 2022 in the same workspace.

For the Manson 2nd branch line MAOP uprate, Northern would install a new take-off regulator setting on the northern end of the uprate segment, to the Manson 1st branch line and Rockwell City branch line. The new take-off regulator setting would also include the installation of a new 47-foot-long by 40-foot-wide permanent driveway and a 100-foot-wide by 75-foot-long permanent facility that would be fenced with gravel ground cover.

Lake City 2nd Branch Line Extension

The land disturbed by construction of the new branch line extension would include TWS needed for typical pipeline construction procedures, additional temporary workspace (ATWS) for specialized construction procedures, construction staging areas, and access roads to work areas from nearby public roads.

Approximately 53 percent of the Lake City 2nd branch line extension would be constructed adjacent to, and offset 25 feet from, Northern's existing Lake City 1st branch line. Where the new branch line extension deviates from the existing pipeline, the offset was increased to avoid impacts on environmentally sensitive areas and allow for proper alignment of horizontal directional drilling (HDD) crossings. In order to safely install the pipeline, Northern proposes to use a 75-foot-wide TWS to construct the new branch line extension. Three staging areas would be used for storage of equipment, pipe sections, and construction material, as well as temporary field offices, parking, and pipe preparation and preassembly staging areas.

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As part of the new branch line extension, Northern would need to relocate a receiver to the existing Lake City TBS. Installation of the relocated receiver would use the same TWS and ATWS as the new branch line extension. When construction is complete, the receiver would occupy a 50-foot by 20-foot area within the already fenced and graveled TBS. The relocated receiver would also include the installation of a new 16-foot-long by 20-foot-wide permanent driveway. Additionally, a new take-off setting would be installed near MP 26.73 to feed Northern's Lohrville 1st branch line pipeline. Installation of the new take-off setting would occur within the TWS for the new Lake City 2nd branch line extension. The operational footprint of the new take-off setting would be 20 feet by 20 feet and would include a gravel pad surrounded by a guardrail. The take-off setting would be constructed entirely within the proposed permanent right-of-way for the new Lake City 2nd branch line extension.

Lake City 1st Branch Line Abandonment

Northern would use temporary workspaces to disconnect the pipeline from existing pipelines that would remain in service. At two disconnect sites (the Manson branch line take-off and the Lake City TBS disconnect sites), Northern would use TWS associated with the Lake City 2nd branch line extension. No additional TWS would be required for disconnection of the Lake City 1st branch line at these locations. For the remaining three disconnect sites, Northern would use temporary workspaces that do not overlap with any other Project components.

Access Roads

The Project would require 6 new temporary access roads and 3 new permanent driveways. Northern would use existing roads as well as ingress and egress rights to existing easements held by Northern to gain access to the work areas. Northern has stated that existing public roads can accommodate construction traffic without modification or improvement. Where access to the workspace is not available by public roads, Northern would construct new temporary access roads. Appendix C provides a table with details on new access roads required for the Project. Temporary access roads would be removed following construction and restored to the current land use, unless otherwise negotiated with the landowner. Permanent driveways (covering a total of about 0.1 acre) would be maintained throughout operation of the Project.

Staging Areas and Contractor Yards

Northern has identified three staging areas for construction of the pipeline for equipment, pipe sections, construction material and supply storage, as well as temporary field offices, parking, and pipe preparation and preassembly staging areas. The use of these staging areas would temporarily disturb approximately 13.7 acres of agricultural land and 0.8 acre of developed land. Following construction, the staging areas would be restored to the current land use.

7. Construction and Operation Procedures

During construction and restoration of the Project, Northern would adopt and implement the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) without modification and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures)³ with some modification. The Plan and Procedures are herein referred to as the FERC Plan and Northern's Procedures. Northern would also implement the following plans during construction, in addition to other federal, state, and local permit requirements:

- Plan for Inadvertent Release of Drilling Mud and Environmental Expectations for HDD Crossings (IR Plan);
- Stormwater Pollution Prevention Plan (SWPPP);
- HDD Feasibility Reports and Contingency Plan (HDD Plan);
- Spill Prevention, Control and Countermeasures Plan (SPCC Plan);
- Noxious Weed/Invasive Plant Control and Mitigation Plan;
- Unanticipated Discoveries Plan for Archaeological Resources and Human Remains in Iowa;
- Fugitive Dust Control Plan;
- Environmental Procedure 410.301 for PCB Disposal Requirements;
- Environmental Procedure 410.404 for Abandonment of Pipeline; and
- Environmental Procedure 410.405 for Sampling for PCBs During Pipeline Removal.

Prior to initiating work, Northern would conduct environmental training for the construction contractor and environmental and craft inspectors to familiarize them with the specific conditions and issues associated with the Project. If sensitive environmental areas are identified that require specialized construction, avoidance, or monitoring, Northern would present these measures as part of the environmental training. Northern would conduct training throughout the duration of the Project for new personnel who join the team.

For purposes of quality assurance and compliance with mitigation measures, other applicable regulatory requirements and specifications, Northern would be represented on the construction spread by a chief inspector. The chief inspector would be assisted by a team of craft inspectors and at least one environmental inspector (EI). The EI's duties are consistent with those contained in Section II.B (Responsibilities of the EI) of the FERC Plan and would include ensuring compliance with environmental conditions attached to FERC certificate, Northern's environmental designs, and specifications and

³ The FERC Plan and Procedures are a set of baseline construction and mitigation measures developed to minimize the potential environmental impacts of construction on upland areas, wetlands, and waterbodies. They can be viewed on the FERC website at <http://www.ferc.gov/industries/gas/enviro/plan.pdf> and <https://www.ferc.gov/industries/gas/enviro/procedures.pdf>.

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environmental conditions attached to other permits or authorizations. FERC staff would maintain oversight of the Project's compliance with any conditions attached to any Certificate that FERC may issue.

The Project would be constructed, tested, operated, and maintained according to all applicable federal, state, and local laws, regulations, and requirements. These laws and regulations include the Natural Gas Pipeline Safety Act of 1968, as amended, the U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration's (PHMSA) *Transportation of Natural Gas or Other Gas by Pipeline, Minimum Federal Safety Standards* contained in 49 CFR 192, and the Commission's regulations at 18 CFR 380.15, *Siting and Maintenance Requirements*.

During all phases of this Project, the applicable requirements of the Occupational Safety and Health Administration would be followed. The requirements set forth in these regulations would be provided to Northern's employees engaged in the planning and execution of the Project and would be provided to Northern's construction contractors and third-party inspectors. These employees and contractors would be instructed to follow these requirements, as applicable, when abandoning, constructing, and modifying the proposed facilities.

Work would occur six days per week (Monday through Saturday) generally during daytime hours (7 a.m. to 7 p.m.). Some construction activities, including HDD activities, tie-ins, hydrostatic testing, and commissioning may extend beyond daylight hours and into Sunday, as necessary, to maintain the Project schedules.

7.1 Construction Procedures

MAOP Uprate Procedures

To complete the MAOP uprates, Northern's construction contractor would increase the pressures within the Lake City 2nd branch line, the Callender branch line and the Manson 2nd branch line to a minimum pressure of 1,200 psig. During testing, a high-pressure pump would be used to pressurize the pipeline section to the design test pressure. The test pressure would be maintained for a minimum of eight hours. No additives or chemicals would be added to the test water. During the hydrostatic test, the construction contractor would conduct leak surveys, as needed, which may include an employee traversing the pipeline centerline via pedestrian foot survey. At the completion of testing, the hydrostatic test water would be discharged through a dewatering structure into well vegetated upland areas or hauled off for disposal at an approved facility. The contractor may reuse or cascade test water from test section to test section to minimize water withdrawal, usage, and discharge volumes. Hydrostatic test water would be withdrawn from municipal supplies. 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. No chemicals would be added to the rinse water.

General Pipeline Construction Procedures

Constructing the proposed pipeline would involve conventional overland and trenchless construction techniques that generally follow a set of sequential operations, as described in the following sections. In the conventional overland pipeline construction scenario, the construction spread (crew) typically proceeds along the pipeline right-of-way in one continuous operation. As the spread moves along, construction at any single point along the branch line extension, from initial clearing to backfilling and final grading, would last approximately 6 to 12 weeks under the optimal construction scenario. However, ground conditions, weather, and access requirements may affect the construction sequencing and timing on individual properties.

Surveying and Staking

After notifying an affected landowner, a preconstruction survey crew would stake the outside limits of the approved work areas; the centerlines of the pipeline; highway crossings; sensitive environmental and/or cultural feature boundaries; access roads; and known underground utilities. Existing utility lines (e.g., cables, conduits, and pipelines) would be located and marked to prevent accidental damage during pipeline construction.

Clearing, Fencing and Grading

Following the installation of the staking and flagging, Northern's adjacent pipelines would be potholed with story poles installed to mark their location, as necessary.⁴ The approved work areas would be cleared of vegetation. Non-woody vegetation may be mowed and left in place to limit soil erosion.

A fence crew, typically operating in conjunction with the clearing crews, would cut and brace fences. Temporary gates may be installed in accordance with individual landowner requests. The fence crew also would fence off avoidance areas with temporary construction fence, as necessary to maintain public safety. Northern would work with landowners to ensure that livestock are separated from the construction footprint by fences or other appropriate barriers.

After the approved work areas have been cleared, grading (and rock removal) may be necessary to create a safe working area and allow the operation and travel of construction equipment. Minimal grading would be required in flat terrain. Natural drainages would be preserved to the extent possible. The full depth of topsoil, up to 12 inches, would be stripped and segregated in agricultural lands that are cultivated or have crops rotated in accordance with the FERC Plan (farmed lands are addressed further below).

⁴ The contractor would hydro-excavate a pothole to locate the existing pipeline and then install a PVC pipe (story pole) in the ground recording depth, mile post and other relevant information on the pipe. This process is part of Northern's damage prevention procedures.

Erosion and Sedimentation Control

Prior to ground-disturbing activities, erosion and sediment control devices would be installed along the TWS, ATWS, staging areas, and access roads in accordance with the Project's SWPPP. The SWPPP incorporates requirements from the FERC Plan and Northern's Procedures, as well as any site-specific erosion control information. The SWPPP describes general measures that would be implemented during Project activities to limit the potential for erosion during construction.

Trenching

Trench excavation is necessary to bury the pipeline. The trench would be excavated with a rotary trenching machine, track-mounted backhoe, or similar equipment. Northern does not anticipate that blasting would be required.

The bottom of the trench would be excavated as wide as required for the diameter of the pipe and safe construction practices. The sides of the trench may be sloped for safety, with the top of the trench wider at tie-in locations. A minimum separation of 25 feet would be maintained between Northern's existing and proposed pipelines to provide sufficient room for the use of standard overland pipeline construction methods and ready access for maintenance operations or in the event of an emergency.

The pipeline facilities would generally be installed at a depth of 48 inches in accordance with the requirements in 49 CFR § 192.327, which establishes a minimum 36 inches of cover for most pipelines in Class 1, 2, and 3 locations. Additional depth of cover requirements would be determined during the right-of-way negotiation process to address landowner concerns (e.g., in agricultural areas).

At certain crossing locations (e.g., roads and utilities), the pipeline would be installed in accordance with permit or easement conditions. In the unlikely event rock is encountered during construction, the pipeline would be installed with at least 24 inches of cover. During trenching, previously unidentified or unknown drain tile might be discovered. Northern would restore the functionality of the drain tile through the relocation, reconfiguration, or replacement of the existing tile. More details regarding drain tiles are provided below and in section B.5..

Trench dewatering may be necessary during the construction process. Trench dewatering would be conducted in accordance with the FERC Plan and Northern's Procedures and applicable permit conditions using appropriate best management practices (BMPs). The methods implemented to minimize erosion and sedimentation associated with dewatering activities are further detailed in the Project SWPPP.

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Pipe Stringing, Bending, Assembly, Welding, and Lowering

Individual pipeline joints in nominal 40-foot and/or 60-foot lengths or joints, protected with a fusion-bonded epoxy would be transported to and placed along the construction right-of-way by stringing trucks. Depending on natural grade changes and direction changes along the branch line extension routes, some bending of the pipe would be required. Selected joints would be bent in the field by hydraulic bending machines, as necessary, prior to pipe assembly and welding.

Following stringing and bending, the joints of pipe would be placed on temporary supports adjacent to the trench. The ends would be carefully aligned and welded together. Welds would be visually inspected and non-destructively tested in accordance with DOT standards and Northern's procedures, to ensure the assembled pipe would meet or exceed the design strength requirements. Welds displaying inclusions (void spaces) or other defects would be repaired or cut out as specified in Northern's welding procedures.

Following welding, the previously uncoated ends of the pipe would be coated at the joints. Prior to lowering the pipe into the trench, the coating would be inspected, and any damaged areas would be repaired.

The welded and coated sections of pipe would be lifted from the temporary supports and lowered into the trench by side-boom tractors or similar equipment. Before lowering the pipe, the trench would be inspected to see that it is free of rocks and other debris that could damage the pipe or the coating and that the pipe and trench configurations are compatible. Inspection would verify that minimum cover requirements are met.

Padding and Backfilling

After the pipe is lowered into the trench, the trench would be backfilled. Previously excavated materials would be pushed back into the trench using bladed equipment or backhoes. In areas where topsoil was segregated, subsoils would be backfilled first, followed by topsoil. Where the previously excavated material contains large rocks or other materials that could damage the pipe or coating, clean fill and/or protective coating (i.e., padding material) would be placed around the pipe prior to backfilling. Rock excavated from the pipeline trench may be used to backfill the trench only to the depth of the existing bedrock profile. Rock that is not returned to the trench may be provided to the landowner at their request and Northern's agreement for beneficial reuse, or disposed of offsite as construction waste. Northern would require its contractor to use proven compaction methods to minimize trench settling. Following backfilling, a small crown of material may be left over the trench to account for any potential soil settling.

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Hydrostatic Pressure Testing

Hydrostatic pressure testing of all newly constructed natural gas pipelines is required by 49 CFR Part 192. Due to the length of the branch line extension, one test section may be all that is required. If multiple test sections are used, Northern would reuse, or cascade, the test water from test section to test section in an effort to minimize water withdrawal, usage and discharge volumes. Hydrostatic pressure testing is described above under MAOP uprate procedures.

Cleanup and Restoration

After backfilling is complete, areas disturbed by Project construction would be restored and any remaining trash and debris would be properly disposed of. When construction is complete, the entire right-of-way would be protected by the use of BMPs and the installation of devices to control erosion and sedimentation, including site-specific contouring, permanent slope breakers, mulch, and reseeding or sodding to stabilize disturbed soils. Acceptable excess soil from the approved work areas would be used to restore contours. If sufficient soil is not available, it would be obtained from approved borrow pits. Erosion control measures would be installed in accordance with the Project's SWPPP and the FERC Plan and Northern's Procedures. Non-cropland would be revegetated in compliance with seed, fertilizer, and soil additive recommendations obtained from the local soil conservation authority or as requested by the landowner. Northern would work with landowners to determine if their property would need to be seeded with a native grass seed mix.

The Lake City branch lines are protected by an existing cathodic protection system; Northern would evaluate the need for additional cathodic protection test stations after a period of operation, and Northern would add additional cathodic protection stations to the Lake City 2nd branch line extension as necessary. Pipeline markers would be placed along the right-of-way and installed in accordance with 49 CFR Part 192. The markers would identify Northern as the operator and list telephone numbers for emergencies and inquiries. These facilities would be located at regular intervals and adjacent to road crossings but within the permanent right-of-way. Periodic inspections of the right-of-way would be conducted, and further restoration measures would be implemented, if necessary.

Aboveground Facilities and Regulator Settings

The sites of the two new take-off regulator settings, a valve take-off setting, and a relocated receiver would be cleared of existing vegetation, graded, and prepared for construction. Excess soil removed during construction activities would be stored on site for future restoration or disposed of in an approved manner.

The take-off regulator settings and take-off valve setting would be cleaned and restored in accordance with applicable state and federal permits and plans. Final grading

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would be completed, gravel surfaces added or refreshed (as needed), and grass or appropriate vegetation seeded per specifications. Compliance with the Project SWPPP and other permanent mitigation measures according to state and federal permits would be verified. Waste materials would be disposed of in a manner consistent with state and local regulations and disturbed areas would be restored in a timely manner in accordance with the FERC Plan.

Abandonment and Disconnect Procedures

About 9.2 acres of workspace are required to complete the disconnection and abandonment in-place of the Lake City 1st branch line. Northern would notify affected landowners of the upcoming activities. Once landowners have been notified, Northern would mobilize survey crews to stake the limits of the approved work areas. Northern would contact the Iowa One Call system to locate, identify, and flag existing underground utilities to prevent accidental damage during disconnection activities. Following survey, the construction crew would clear and grade the work area to remove vegetation and large rocks. Vegetation generally would be cut or scraped near flush with the surface of the ground, leaving rootstock in place where possible. Grading would be conducted where necessary to provide a safe and level work surface.

Crews would install temporary erosion controls along the edges of the approved work areas as defined in the SWPPP immediately after initial soil disturbance and would maintain the controls throughout construction. Temporary erosion control measures would remain in place until permanent erosion controls are installed, or restoration is completed.

At the sites where the abandoned pipeline needs to be disconnected from existing facilities, crews would dig trenches approximately 12 to 48 inches wide to a minimum of 6 feet below the surface to expose the pipe. Site conditions at some locations, such as areas with unstable soils or other underground utilities, may require excavating a larger or deeper trench to ensure safe working conditions. Excavated materials would be stockpiled within the approved work areas. As discussed above, where topsoil is stripped, subsoil would be stored separately from topsoil. Construction site dewatering may be necessary where water accumulates in the trench or work area. Where dewatering is necessary, the water would be discharged to adjacent well-vegetated upland areas and/or filtered through a filter bag or a hay bale structure.

After the pipe is exposed, above grade facilities would be cut from the pipe and removed, and steel caps would be welded onto both ends of the pipe remaining in place. Secondary containment would be placed below the pipe at each cut to catch unexpected liquids that may be present in the pipe. Liquids captured in secondary containment would be tested for polychlorinated biphenyl compounds (PCBs) and disposed of properly as further discussed in section B.9. After the pipe has been capped, the trench would be backfilled. In areas where topsoil was segregated, subsoils would be backfilled first, followed by topsoil. Portions of pipe and related appurtenances and structures that

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are below ground, would be abandoned in-place. To complete the abandonment process, segments of the abandoned pipeline would undergo venting to purge natural gas from the pipeline.

Disconnection activities at any given site are expected to take up to 10 days (longer if PCBs are encountered). Once disconnection of the Lake City 1st branch line is complete at each site, disturbed work areas would undergo final grading to restore contours and natural drainage patterns.

7.2 Specialized Construction Techniques

Construction across special features including roads, wetlands, waterbodies, and active cropland would involve special construction techniques as described below.

Access Roads

For all new access roads, Northern would employ standard pipeline construction practices to protect roadside ditches and maintain water flow, if present, including installation of culverts pursuant to state and county specifications. If necessary, the culverts would be covered with environmentally friendly geotextile fabric, rock, and dirt. Rock installed for temporary access roads would be underlain by a geotextile fabric. These materials would be removed following construction

Wetland and Waterbody Crossings

Northern would follow the wetland construction procedures in its Procedures to cross wetlands. Northern is requesting a modification to the FERC Procedures to locate permanent driveways across wetlands to access the proposed Harcourt branch line take-off regulator setting and the relocated Lake City 2nd branch line extension receiver. These modifications to the FERC Procedures are discussed further in section B.3.

Sediment barriers such as silt fence and staked straw bales would be installed and maintained adjacent to wetlands and waterbodies, and within ATWS as necessary to minimize the potential for sediment runoff. Silt fence or straw bales installed across the working side of the right-of-way would be removed during the day when vehicle traffic is present and would be replaced each night. Sediment barriers would also be installed near wetlands and waterbodies 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 areas and waterbodies outside the construction work areas. No heavily silt-laden water would be allowed to flow into a wetland or waterbody. Additional detail on the waterbody crossings, construction and restoration measures, and potential impacts and mitigation measures is discussed in section B.3.

Horizontal Directional Drill

Northern proposes to use the HDD method at two locations along the Lake City 2nd branch line extension (table 4). Northern proposes to conduct the HDD crossings in accordance with applicable permit conditions and the measures specified in Northern’s Procedures, HDD Plan, and IR Plan. This would include locating ATWS in upland areas at least 50 feet from the waterbody boundary, prohibiting refueling or fuel storage within 100 feet of waterbody boundaries, and limiting clearing of vegetation. Due to the planned use of the HDD method, equipment bridges are currently not expected to be necessary; however, if required, they would be installed, as specified in Northern’s Procedures, to maintain water flow and flow capacity at all times.

County	Approximate Milepost ^a		Approximate Length (feet)	Features Avoided
	Entry	Exit		
Calhoun	28.2	28.1	550	Purgatory Creek, wetlands
Calhoun	31.8	31.9	700	Norridge Avenue, wetlands
Note: Table values are rounded numbers. Due to rounding, subtotal or total numbers may not equal sum of addends.				

The HDD method considerably reduces impacts on sensitive resources by avoiding surface work and installing the pipeline at a substantial depth beneath the resources. HDD is a trenchless crossing method involving drilling a hole beneath the waterbody and installing a pre-fabricated pipe segment through the hole. The first step in an HDD is to directionally drill a small-diameter pilot hole from one side of the crossing to the other. The pilot hole is then enlarged by several reaming passes using successively larger reaming tools until the borehole is of sufficient diameter to allow for pullback of the pre-fabricated pipe.

ATWS would be required at the HDD entry to accommodate the drilling rig, drill pipe, drilling fluid systems, and other equipment. ATWS would also be needed at the HDD exit to accommodate equipment and for fabricating and stringing the segment of pipeline to be pulled back and installed in the HDD borehole. The prefabricated HDD pipeline segment would be inspected and hydrostatically tested in accordance with applicable PHMSA regulations.

During HDD operations, drilling fluid consisting primarily of water and bentonite clay is pumped under pressure through the inside of the drill pipe and flows back (returns) to the drill entry point along an annular space between the outside of the drill pipe and the drilled hole. The drilling fluid lubricates the drill bit, removes drill cuttings, and promotes hole stability. Based on drilling conditions, it may be necessary to amend the properties of the drilling fluid to enhance drilling efficiency and borehole stability.

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Only non-petrochemical based, non-hazardous drilling fluid additives that comply with permit requirements and environmental regulations and are NSF International/American National Standards Institute 60-certified would be used.

During normal HDD operations, circulation of the drilling fluid between the drill bit and the drilling rig is maintained. However, because the drilling fluid is pressurized, in certain conditions it can seep into the surrounding rocks and sediment. Formational drilling fluid losses typically occur when the drilling fluid flows through the pore spaces in the soil through which the HDD drilling profile passes or within fractures contained in the rock formation. Inadvertent returns of drilling fluid to the ground surface (IR) are more likely to occur in more permeable soils or via fractures or fissures in bedrock. Chances for an IR to occur are greatest near the drill entry and exit points where the drill path has the least amount of ground cover. The HDD Plan and IR Plan describe drilling methods that would be implemented to further reduce the potential for IRs to occur and to minimize the loss of drilling fluid should circulation be reduced or lost. Should an IR occur, Northern would implement measures to limit impacts on sensitive resources according to its IR Plan.

To ensure the success of the HDDs and reduce the potential for inadvertent returns, unforeseen conditions may require that construction activity associated with the HDD crossings occur outside the normal work period of 7 a.m. to 7 p.m., Monday through Saturday. Drilling of the pilot hole and other pre-ream efforts would be typically shut down at the end of each workday; however, the pullback would be conducted in one continuous effort, which could extend beyond normal working hours. Northern would start pullback activities at the start of the workday to reduce the potential for nighttime work. If Northern determines the need to extend work past 7 p.m. at an HDD, Northern would employ noise mitigation measures as described in section B.8.

Road Crossings

Northern would implement measures to minimize impacts on traffic and transportation facilities and public inconvenience at crossings to the extent practicable. Appropriate safety procedures would be implemented to protect workers and the public. Traffic warning signs, detour signs, and other traffic control devices would be used as required by federal, state, and local DOT, and other regulating bodies. In addition, crossings would be completed in accordance with the requirements of road crossing permits.

The Project would cross several existing public roads. Table 5 summarizes the crossing locations by approximate MP along with the surface type and anticipated construction crossing method.

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Table 5
Existing Public Roads Crossed by the Project

Road Name	Approx. MP	Surface Type	Planned Crossing Method
Langley Avenue/County Hwy N47	33.9	Paved	Conventional Bore
Marshall Avenue	32.8	Paved	Conventional Bore
Norridge Avenue	31.8	Paved	HDD
Ogden Avenue/County Hwy N57	30.8	Paved	Conventional Bore
Preston Avenue	29.8	Paved	Conventional Bore
350 th Street	29.4	Paved	Conventional Bore
Quinton Avenue	28.8	Paved	Conventional Bore
Red Oak Avenue	27.8	Paved	Conventional Bore
Sigourney Avenue	26.7	Paved	Conventional Bore

Construction of the pipeline across public roads would be accomplished by use of the conventional bore and HDD crossing methods. The HDD method is described above. Under the conventional bore method, the pipeline would be installed by boring a hole under the road using specialized boring equipment. This is done by digging a pit on each side of the roadway and augering a hole between the pits under the road. When completed, the bored hole is slightly larger than the outside diameter of the pipeline to be installed. Once the bore is completed, the pipeline section is welded to the boring pipe, pulled into place, and the boring pipe is removed. If required, any voids between the pipeline and the subsoil may be filled with grout (a sand-cement mix). The pipeline would be buried to a depth of at least four feet below the roadside ditches, in accordance with permit requirements and would be designed to withstand anticipated external loads.

Active Cropland

Construction in agricultural areas would be conducted in accordance with the FERC Plan and Northern's Procedures. To conserve topsoil, Northern would conduct full right-of-way topsoil removal in cultivated and rotated cropland and managed pasture. Topsoil and subsoil would be stored in separate windrows along the construction right-of-way and would be stabilized as necessary to minimize mixing, in accordance with the FERC Plan.

Northern consulted with landowners in agricultural areas to identify any known drain tile locations. Known drain tile would be noted on the alignment sheets provided to the contractors. Survey crews would mark the drain tile locations with highly visible flagging at each edge of the workspace and the centerline of the pipe, where applicable. Previously undocumented drain tile discovered during grading or trenching would also be flagged at each edge of the workspace. Survey data would be collected at the location of broken tile. If a damaged drain tile is flowing at the time of discovery, temporary repairs and screen installation would be completed prior to the end of the workday. If a damaged

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drain tile is not flowing at the time of discovery, the drain tile would be screened and temporarily repaired within 24 hours. Temporary repairs may be removed to accommodate pipe lowering and backfilling.

Northern would complete permanent drain tile repairs using a qualified drain tile specialist, the landowner, or a landowner's representative. In general, drain tiles would be scoped or snaked to determine if existing tile within the right-of-way is damaged. The existing drain tile would be inspected within the entire width of the workspace (i.e., to both edges of the workspace). Damaged, broken, or cracked drain tile would be replaced with new tile. The quality, size, and flow of replacement tile would equal or exceed that of the damaged tile. The drain tile would be permanently repaired so that its original gradient and alignment are restored. Replacement tile would be supported with a secondary method, such as perforated corrugated steel pipe. Repairs would be inspected prior to backfilling the trench area.

The contractor would plow subsoil in accordance with the soil compaction mitigation procedures described in the FERC 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, disked, and raked. Northern would remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, and hayfields, as well as other areas at the landowner's request. The size, density, and distribution of rock would be similar to adjacent areas not disturbed by construction. Additional discussion regarding impacts and mitigation for agricultural areas crossed by the Project are discussed in section B.5.1.

7.3 Operation and Maintenance

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

Operational activity on the pipelines would be limited primarily to maintenance of the right-of-way and inspection, repair, and cleaning of the pipelines. Periodic aerial and ground inspections by pipeline personnel would identify the following:

- soil erosion that may expose the pipe;
- dead vegetation that may indicate a leak in the line;

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- conditions of the vegetative cover and erosion control measures;
- unauthorized encroachment on the right-of-way, such as buildings and other substantial structures; and
- other conditions that could present a safety hazard or require preventative maintenance or repairs

The pipeline cathodic protection system also would be monitored and inspected periodically to verify proper and adequate corrosion protection, as applicable. Northern would use the pipeline corridor and public roads, as well as its proposed new permanent driveways, to gain access to the right-of-way and aboveground facilities. Additionally, Northern would work with landowners to obtain temporary access, if such access is required.

Vegetation maintenance is normally not required in agricultural cropland or grazing areas, residential areas, or in herbaceous wetlands. However, large brush and trees may be periodically removed in accordance with the FERC Plan and Northern's Procedures. The need for and frequency of any vegetation maintenance would depend upon the vegetation growth rate during operation of the pipeline facilities.

PHMSA requires pipeline operators to place pipeline markers at frequent intervals along the pipeline right-of-way, such as at intersections with a street, highway, railway, or waterway, and at other prominent points along the route. Pipeline markers would be placed along the upland portion of the pipeline and will have a pole-mounted design. Pipeline right-of-way markers can help prevent encroachment and excavation-related damage to pipelines. Since the pipeline right-of-way is wider than the pipeline itself, state laws require excavators to contact their state One Call center in advance of any excavation to locate the marked underground pipelines.

8. Construction Schedule and Workforce

Northern is proposing to commence construction activities associated with the MAOP uprates, specifically the hydrotesting of the pipelines, in August 2021. Northern is proposing to commence construction activities associated with the extension and disconnects, as well as the installation of two regulator settings, in April 2022. Northern has estimated completion of construction activities by November 2022.

Completion of the MAOP uprates is estimated to be conducted in one spread by one crew of between six and nine workers. Construction of the branch line extension is estimated to be conducted in one spread by one crew of 20 to 30 workers. Completion of the work to disconnect the pipeline is estimated to be conducted in one spread by one crew of between six and nine workers. All work at the aboveground facilities, including regulator setting and receiver installations, would be completed by one crew of between six and nine workers. Northern estimates that approximately 20 percent of the crews

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would be local workers. No new permanent staff, beyond those already working for Northern would be required to operate the new pipeline after completion of construction.

9. Permits

A list of federal and state environmental permits, approvals, and consultations for the Project, as well as the current status, is provided in table 6. Northern would also be responsible for any other local permits and approvals required to construct and operate the Project, regardless of whether or not they appear in the table below.

Table 6 Permits, Approvals, and Consultations Required for the Project		
Administering Agency	Permit or Approval	Status
Federal		
FERC	Order Authorizing Abandonment and issuing Certificate of Public Convenience and Necessity	Pending
U.S. Fish and Wildlife Service Rock Island Ecological Services Field Office	Section 7 Endangered Species Act	No Effect Consultation Complete
U.S. Department of Agriculture NRCS	Conservation Easement Program and seeding recommendations	Complete Submitted February 5, 2020 Receipt (Calhoun) March 9, 2020 Receipt (Webster) February 26, 2020
Farm Service Agency, Webster and Calhoun Counties	Conservation Reserve Program	Complete Submitted February 5, 2020 Follow-up (Calhoun) May 12, 2020 Receipt (Webster) February 26, 2020
State of Iowa		
Iowa Department of Natural Resources Water Quality Division – NPDES/Wastewaters	Section 402 Clean Water Act, National Pollution Discharge Elimination System Construction Stormwater GP 2	Draft SWPPP complete. Project is exempt from NPDES permit.
	NPDES and State Operation Permit GP8- Discharge from Hydrostatic testing, tank Ballasting and Water Lines	Discharge falls under non- reporting category of the permit
	NPDES and State Operation Permit GP9- Discharge from Dewatering and Residential Geothermal Systems	Discharge falls under non- reporting category of the permit
Iowa Department of Natural Resources Water Allocation and Use Program	Water Allocation and Use Program	Pending Anticipated Application Submittal January 2021 (for 2021 activities)

A. PROPOSED ACTION

Table 6 Permits, Approvals, and Consultations Required for the Project		
Administering Agency	Permit or Approval	Status
		Anticipated Application Submittal January 2022 (for 2022 activities)
Floodplain and Sovereign Lands Department	Floodplain Management Sovereign Lands and Rivers Iowa Environmental Review for Natural Resources	Pending Submitted Joint Application November 20, 2020 Pending Submitted February 5, 2020
Iowa State Historic Preservation Office	Section 106 National Historic Preservation Act Consultation	Complete Submitted June 17, 2020 SHPO responses July 3, 2020, and October 7, 2020
Local Agencies		
Webster County	Noxious Weed Plan Review	Pending Submitted October 1, 2020
Calhoun County	Noxious Weed Plan Review	Pending Submitted October 1, 2020
	Floodplain Development Permit	Pending Submitted November 1, 2020

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Project’s potential direct and indirect impacts on environmental resources. When considering the environmental consequences of the Project, the duration and significance of any potential impacts are described below according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to near pre-construction conditions almost immediately. Short-term impacts could continue for up to three years following construction. Long-term impacts would require more than three years to recover, but eventually would recover to near pre-construction conditions. Permanent impacts could occur because of activities that modify resources to the extent that they may not return to pre-construction conditions during the life of the Project, such as with the construction of an aboveground facility.

When determining the significance of an impact, we consider the duration of the impact as well as the geographic, biological, and/or social context in which the effects would occur, and the intensity (e.g., severity) of the impact. The context and intensity vary by resource and impact and are therefore described throughout the analysis. “Intensity” refers to the severity of the impact, in whatever context(s) it occurs. To determine intensity, we consider the severity of the impact using both the quantity of the resource affected as well as the duration of the impacts. Unless otherwise noted for a specific resource, the definitions above are used in the analysis. In the following sections, we address direct and indirect effects collectively by resource.

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

1. Geology

1.1 Physiographic Setting and Geologic Conditions

The Project would be located in the Dissected Till Plains section of the Central Lowlands physiographic province characterized by moderately dissected, flat to rolling plains. Iowa is further divided into ten landscapes of similar landforms and common geomorphology. The Project is in the Des Moines Lobe landscape, which is associated

with several glacial advances from southern Minnesota to Central Iowa that occurred 15,000 to 12,000 years before present day.

Surficial deposits in the Project area consist of unconsolidated glacial deposits of clay loam or loamy clay till, alluvium in stream bottoms, isolated occurrences of glacial outwash sand and loess, and colluvium derived from weathered sedimentary bedrock. Underlying bedrock is comprised of sandstone, mudstone, and shale from the Cretaceous age Dakota Formation and Pennsylvanian age Lower Cherokee Group. The depth to bedrock is predicted to be approximately 115 to 275 feet below the ground surface (Iowa Department of Natural Resources [IDNR], 2018). Elevations in the Project area range from 1,120 to 1,250 feet above mean sea level. Project workspaces are level or have low relief.

No active or historic oil or natural gas production wells are within 0.25 mile of the Project and no active or historic non-fuel mineral resource operations were identified within 0.25 mile of the Project.

1.2 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. Geologic hazards discussed below also include landslides, ground subsidence (including karst terrain), flood hazards, and the feasibility of utilizing the HDD method based on geologic conditions present in the Project area.

Seismic Hazards

The shaking during an earthquake can be expressed in terms of the acceleration as a percent of gravity (g), and seismic risk can be quantified by the motions experienced at the ground surface or by structures during a given earthquake expressed in terms of g. U.S Geological Survey (USGS) National Seismic Hazard Probability Mapping shows that for the Project area, within a 50-year period, there is a 2 percent probability of an earthquake with an effective peak ground acceleration (PGA) of 2 to 4 percent g; and a 10 percent probability of an earthquake with an effective PGA of 1 to 2 percent g being exceeded (USGS, 2018a). For reference, a PGA of 10 percent g (0.1g) is generally considered the minimum threshold for damage to older structures or structures not constructed to resist earthquakes.

Further, modern pipeline systems have not sustained damage during seismic events except due to permanent ground deformation or traveling ground-wave

propagation greater than or equal to a Modified Mercalli Intensity of VIII (similar to a Richter scale magnitude around 6.8 to 7.0) (O'Rourke and Palmer, 1996; USGS, 2018b). According to the USGS Quaternary Fault and Fold Database, no Quaternary-age faults would be crossed by the Project (USGS, 2020). As such, the risk of a significant earthquake damaging Project facilities is low and the risk of seismic ground faulting to occur is also low. Similarly, because the Project area has a low potential for strong prolonged ground shaking associated with seismic events, the soil liquefaction potential is negligible.

Flooding and Scour

Based on review of Federal Emergency Management Agency flood hazard maps, the following locations are within the 100-year floodplain (1 percent annual chance of inundation by flood): the Manson 1st branch line and Rockwell City branch line take-off regulator setting at MP 7.78; a portion of the Manson 2nd branch line MAOP uprate TWS; Lake City 2nd branch line extension at the banks of Purgatory Creek (MPs 28.1 and 28.2) and at an agricultural drainage that flows southeast to Purgatory Creek (MP 29.3). The only aboveground facility within a floodplain is the Manson 1st branch line and Rockwell City branch line take-off regulator setting, which is situated on flat, open agricultural land near the upper reaches of Purgatory Creek. Operation of this facility would impact 0.2 acre, the majority of which would consist of gravel surfacing, resulting in negligible impact on flood storage capacity. Specifically, approximately 107 cubic yards of flood storage capacity would be lost. Further, the proposed pipeline would cross one waterbody, Purgatory Creek. Purgatory Creek would be crossed using the HDD method, with pipe installation approximately 20 feet below the bed of the waterbody, minimizing the threat of exposure of the pipeline due to scour.

Ground Subsidence

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst dissolution, sediment compaction, oil and natural gas extraction, underground mines, and groundwater overpumping. As described above, there are no subsurface mines or oil and gas wells within 0.25 mile of the Project, and a search of publicly available information did not identify incidences of land subsidence from groundwater overpumping in the Project vicinity. The bedrock geology of the Project area consists of sandstones, mudstones, and shale overlain by glacial deposits. There is no known karst terrain nor any sinkholes near the Project. The closest carbonate rocks are approximately 5 miles west of the Lake City 2nd branch line MAOP uprate in Webster County (Weary and Doctor, 2014). Further, Northern did not identify any suspected karst features within 0.5 mile of the Project based on review of USGS topographic maps and aerial photography. Therefore, we conclude that impacts from

geologic hazards on the Project facilities during construction and/or operation would be minimal and the Project would not have significant impacts on geologic resources.

1.3 Geotechnical Investigations

Length of an HDD alignment, pipeline diameter, and subsurface material are factors in the technical feasibility of an HDD installation. Subsurface conditions that can affect the feasibility of an HDD include excessive rock strength and abrasiveness, unconsolidated gravel and boulder materials, poor bedrock quality, solution cavities and artesian conditions. It is also possible for HDD pipe installations to fail, primarily due to encountering unexpected geologic conditions such as transitioning from coarse unconsolidated materials into bedrock or if the pipe were to become lodged in the hole during pullback operations.

The Purgatory Creek HDD would be approximately 500 feet in length and the Norridge Avenue HDD would be approximately 700 feet in length. A total of three borings were used for design of Project HDDs: two along the proposed Purgatory Creek alignment, installed to a depth of 50 feet below grade (fbg) and one along the proposed Norridge Avenue HDD alignment, installed to a depth of 20 fbg.

The borings encountered layers of clay, clayey sand, and silty sand. Bedrock was not encountered. In the three geotechnical borings completed at the crossing locations, there were no indications of cobbles or boulders being encountered by the drilling equipment. These subsurface materials are generally favorable for HDD construction.

Hydrofracture risk assessments were also completed for each proposed HDD and determined that the required bore pressure to facilitate installation would be below the allowable bore pressure except in the vicinity of exit locations (the last 70 feet for the Purgatory Creek crossing and the last 250 feet for the Norridge Avenue crossing). This condition is common near the entry and exit points, but elevates the likelihood of an inadvertent return in these areas. For the Norridge Avenue crossing, wetland W40 is within the area of elevated risk.

Northern's geotechnical consultant recommended the use of a qualified drilling fluid technician through all phases of construction to help mitigate challenges including, but not limited to, difficult steering, loss of circulation, and maintaining hole stability. The use of a downhole annular pressure tool was also recommended. These measures have been incorporated into Northern's HDD Plan. Northern would additionally conduct visual inspections along the drill path, including monitoring wetlands, waterbodies, and other sensitive resources, for evidence of an IR. Northern would walk each HDD path

between the entry and exit points, where practicable, and visually inspect for IRs a minimum of twice daily.

Drilling operations would be stopped immediately at the first sign of an IR and Northern would implement response and clean-up efforts specific to the location of the release (e.g., upland, waterbodies or wetlands, sensitive resource areas). Further, drilling fluids would consist primarily of fresh water (municipal source) and a high yield bentonite clay. A list of any additional proposed additives (and their respective safety data sheets) would be supplied to FERC for review prior to construction.

If conducive upland areas are identified, Northern may dispose of excess drilling fluid via landfarming. Consistent with Section III.E of the Plan, disposal of the drilling fluid must not result in adverse environmental impact and is subject to compliance with all applicable survey, landowner or land management agency approval, and permit requirements. Prior to disposal, Northern would complete laboratory testing of excess drilling fluid for inorganic and organic environmental contaminants to ensure that disposal would not result in adverse environmental impact or otherwise conflict with landowner or land management agency approvals or permit requirements.

Based on the above analyses, we conclude that subsurface conditions would not render the HDDs infeasible.

2. Soils

Soil characteristics within the Project area were identified and assessed using the Natural Resource Conservation Service (NRCS), Soil Survey Geographic Database (NRCS, 2020). Project activities have the potential to adversely affect soil characteristics and reduce soil productivity. Other possible soil impacts include mixing of topsoil and subsoil layers, compaction, rutting, and alteration of drainage characteristics. Soils were also evaluated for characteristics that could affect construction or increase the potential magnitude of impacts. These characteristics include farmland designation, compaction potential, erodibility by wind, erodibility by water, the presence of shallow bedrock (bedrock within 60 inches of the ground surface), and revegetation potential. All Project area soils are classified as prime farmland or farmland of statewide importance. Project area soils are not classified as highly erodible by wind or water, are not underlain by shallow bedrock, and have high revegetation potential. Approximately 15.5 acres of compaction prone soils are within the 2021 Project workspaces and 107.3 acres of compaction prone soils are within the 2022 Project workspaces.

Additive impacts on soils can occur if projects are constructed concurrently or if previously restored areas are subsequently re-disturbed. As described previously, the

ATWS required to accommodate the MAOP uprates would also be used to support the pipeline extension and disconnects; therefore, certain ATWS areas would be disturbed twice as part of the Project. These workspaces, totaling approximately 10.6 acres of agricultural and developed land, would be stabilized using the appropriate sediment controls based on land use and as outlined in the FERC Plan, Northern's Procedures, and Northern's SWPPP. Stabilization measures may include temporary seeding, weed-free mulch, hydraulically applied soil stabilizer (e.g., hydromulch), and erosion control blankets. Sediment controls would be installed and maintained throughout construction and during the work stoppage between the 2021 and 2022 construction schedules.

2.1 Prime Farmland and Farmland of Statewide Importance

The U.S. Department of Agriculture defines prime farmland as land that has the best combination of physical and chemical characteristics for growing food, feed, forage, fiber, and oilseed crops. Unique farmland is land that is used for production of specific high-value food and fiber crops. In addition, soils may be considered of statewide or local importance if those soils are capable of producing a high yield of crops when managed according to accepted farming methods.

Following construction, Project areas would be returned, with the exception of aboveground facilities and permanent drives, to pre-construction use, and agricultural activities would be allowed to resume without restrictions. The Project would result in less than 1 acre of permanent impact, where prime farmland or farmland of statewide importance is converted to industrial use. This represents less than 0.01 percent of the total area of prime farmland and farmland of statewide importance within Calhoun and Webster Counties.⁵ Implementation of proper topsoil segregation, soil decompaction, drainage, and weed controls are expected to assist post-construction revegetation and productivity, thereby reducing the potential for long-term impacts on agricultural lands. Based on the above analysis, we conclude that the impacts on prime farmland and farmland of statewide importance would not be significant.

2.2 Soil Erosion and Revegetation Potential

Soil erosion is the wearing away of physical soil properties by wind and water and could result in a loss of soil structure, organic matter, and nutrients. Soil erosion potential is affected by numerous factors including soil texture, soil structure, organic matter content, and permeability and is influenced by slope and the intensity of the exposure to erosive forces.

⁵ Per the NRCS (2020), there are 361,320 acres in Calhoun County, Iowa and 418,670 acres in Webster County, Iowa that are classified as prime farmland or farmland of statewide importance.

Project area soils are not classified as highly erodible by wind or water; however, clearing, grading, and equipment movement can accelerate the erosion process and, without adequate protection, result in discharge of sediment to waterbodies and wetlands. Northern would install erosion and sediment control devices along construction workspaces in accordance with the FERC Plan and Northern's Procedures, and its SWPPP. The SWPPP incorporates requirements from the Plan and Procedures, as well as any site-specific erosion control information. Temporary erosion control measures would be installed immediately following initial ground disturbance. BMPs, such as routine wetting of the construction workspaces as necessary, would also be implemented to minimize wind erosion. Northern would inspect temporary erosion control devices on a regular basis and after each rainfall event of 0.5 inch or greater to ensure proper function. Temporary erosion control devices would be maintained until Project areas are successfully revegetated or permanently stabilized with gravel surfacing.

Construction and operation of the Project would not impact soils with characteristics prone to poor revegetation potential. Actively cultivated agricultural land would not be seeded. Open uplands would be seeded using seed mixes recommended by landowners or pursuant to NRCS seeding recommendations. Non-cropland would be revegetated in compliance with seed, fertilizer, and soil additive recommendations obtained from the local soil conservation authority or as requested by the landowner.

Given Northern's proposed mitigation measures and because disturbed areas would be restored, returned to pre-construction land use, or otherwise stabilized, permanent impacts due to soil erosion or poor revegetation are not anticipated.

2.3 Compaction Potential and Rutting

Soil compaction can occur by the repeated movement of heavy machinery across soils, particularly soils with high shrink-swell potential and poor drainage characteristics (i.e., soils with high clay content). Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils.

Northern would implement the measures in the FERC Plan to minimize compaction. These measures include restricting or delaying construction during wet weather or frozen soil conditions; and testing for and de-compacting soils in agricultural and residential areas. If rutting to a depth of 6 inches or greater occurs along ungraded portions of the Project areas during construction, Northern would immediately limit construction activities in that area or implement protective measures (e.g., install equipment mats) to prevent additional rutting. If rutting occurs along access roads,

Northern would repair the ruts as soon as ground conditions permit. Therefore, we conclude that soil compaction and rutting resulting from Project activities would be minimized and that resulting impacts would not be significant.

2.4 Existing Soil Contamination

Northern reviewed the U.S. Environmental Protection Agency's (EPA) Federal Registry Service database (EPA, 2020a) and the EPA's Cleanups in My Community database (EPA, 2020b) to identify facilities with potential and/or actual sources of contamination or cleanups within 0.25 mile of construction work areas associated with the Project. Based on this review, Northern identified three regulated facilities within 0.25 mile of the Project in Webster County and two regulated facilities within 0.25 mile of the Project in Calhoun County. Four of these five facilities are hazardous waste or disposal facilities but do not occur on databases of documented spills. At the remaining site, identified as Star Energy, approximately 30 gallons of diesel fuel were spilled onto a parking lot in July 2009. Information from the IDNR indicates that no drains or surface waters were impacted, and the spill received regulatory closure on June 11, 2015. The Star Energy facility is approximately 633 feet west of the Project workspace. Based on its distance, small volume, and closed regulatory status, the Project is not anticipated to intercept contamination associated with this spill.

Northern's environmental inspectors would monitor soils, groundwater, and drilling fluid returns for any signs of contamination. If suspected contamination is detected, all work would stop at that location. Northern would sample the suspected contamination and, pending laboratory results, the area would be fenced off with safety fencing. Depending on the media impacted, additional containment or plastic covers and underlayment may be implemented, and Northern would implement the disposal procedures outlined in its SPCC Plan. Northern would consult with the appropriate state and federal agencies, and additional investigation and/or cleanup would be determined in consultation with those agencies.

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 SPCC Plan, which specifies prevention and clean-up procedures for spills or leaks of petroleum products and hazardous materials. Should a spill occur, Northern and its contractors would follow the SPCC Plan to contain the spill and ensure that the spill area is cleaned up and the materials are disposed of in accordance with applicable federal, state, and local requirements. Therefore, we conclude the Project would not impact or spread areas of soil contamination.

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

3. Water Resources and Wetlands

3.1 Groundwater

Groundwater in Webster and Calhoun counties is found in unconfined, unconsolidated coarse-grained aquifers and deep bedrock aquifers. Unconfined aquifers are associated with exposures of alluvium in modern day stream valleys or sand and gravel deposits in buried Quaternary age stream valleys. Alluvium is known to exist at the locations where the Manson 2nd branch line MAOP uprate (north) and the Lake City 2nd branch line extension cross Purgatory Creek; however, there are no known wells serving public or private wells in these materials.

Bedrock aquifers in Webster and Calhoun counties are associated with Paleozoic and Mesozoic sedimentary basins centered near Kansas and Oklahoma. The principle groundwater aquifers in the region are found in Cretaceous age Dakota Formation sandstones and Mississippian age limestone, with a slope and groundwater flow southwest towards the basin centers. Wells drilled into the Dakota aquifer average a yield of 100 to 500 gallons per minute; in the Project area water quality is good (less than 500 milligrams per liter of total dissolved solids) (Prior, 2003). Wells drilled into the Mississippian aquifer may yield up to 900 gallons per minute; however, water quality is fair (500 to 1,000 milligrams per liter of total dissolved solids) (Prior, 2003). Well data in the Project vicinity show that bedrock aquifers are approximately 115 to 275 feet below the ground surface (IDNR, 2019a and 2019b).

There are no EPA-designated sole source aquifers crossed by the Project. Wellhead protection areas are defined by a zone of capture area around a drinking water well where contaminants could enter and pollute the well. The IDNR administers Iowa's wellhead protection program. Upon review of the program database, no wellhead protection areas are crossed by the Project (IDNR, 2019b)

The IDNR also maintains records of private and public water wells in the state of Iowa (IDNR, 2019a). A review of the IDNR's retrieval database identified one well within 150 feet of Manson 2nd branch line MAOP uprate workspaces and two wells within 150 feet of the Lake City 2nd branch line extension workspaces (refer to table 7). No wells were identified within 150 feet of the other Project workspaces.

B. ENVIRONMENTAL ANALYSIS

Table 7 Private and Public Water Wells within 150 feet of the Project				
Project Component/Milepost	Ownership	Status	Distance from Component or Centerline	Direction from Component or Centerline
Manson 2nd branch line MAOP uprate (north)				
7.78	Private	Active	72 feet	South
Lake City 2nd branch line extension				
27.4	Private	Active	129 feet	South
32.1	Private	Active	120 feet	South
Source: Iowa Department of Natural Resources. 2019. All Registered Wells in the State of Iowa. Available online at https://geodata.iowa.gov/dataset/all-registered-wells-state-iowa . Accessed April and September 2020.				

One spring was also identified within 150 feet of the Project workspace. Specifically, the spring is located approximately 2,242 feet west of Quinton Avenue and 50 feet south of workspace at MP 29.2 on the Lake City 2nd branch line extension. The spring forms the headwaters of an ephemeral stream that flows to the southeast and does not cross the Project area. Northern has confirmed with the landowner that this spring is not in use as a water supply. Northern would implement BMPs as outlined in the FERC Plan and Northern’s Procedures, and its SWPPP to minimize erosion and sedimentation into this spring. Northern would continue to work with the landowners to identify any additional springs and water supply wells near the Project and file this information with FERC, as appropriate.

Northern would prohibit overnight parking of equipment and refueling of equipment within a 200-foot radius of private wells or a 400-foot radius of public wells. With landowner approval, Northern would conduct pre- and post-construction testing for water quality and yield for water supply wells and springs within 150 feet of Project workspaces. In the event that construction activities result in an adverse impact on a groundwater supply, Northern would provide a temporary source of potable water to the landowner and the damaged well would be restored, to the extent possible.

Surface drainage and groundwater recharge patterns can be temporarily altered by construction activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. Additionally, soil compaction caused by heavy equipment can reduce infiltration and increase surface runoff and ponding. These impacts would be minimized or avoided through implementation of the construction practices outlined in the FERC Plan and Northern’s Procedures.

Northern would not appropriate groundwater except to dewater the pipeline trench or other excavations during Project activities. Groundwater was encountered during Northern's geotechnical investigation at depths ranging from 4 to 16.5 feet below the ground surface; however, all Project disturbance would be well above the typical minimum depth of the bedrock aquifers underlying the Project area, anticipated to be 115 to 275 feet below the ground surface. In the event a surficial aquifer is encountered and the excavation would occur below the water table, the resulting changes in water levels and/or turbidity in these aquifers are expected to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside. Following disconnection activities, Northern would restore the ground surface to original contours as closely as practicable and restore vegetation according to the FERC Plan.

The Project would not cross known areas of groundwater contamination. An inadvertent spill or release of fuel or hazardous materials during construction could affect groundwater. To minimize the risk of potential fuel or hazardous materials spills, Northern would implement its SPCC Plan, which includes preventive measures such as personnel training for proper handling of fuel and hazardous materials, equipment inspection, and refueling procedures to reduce the likelihood of spills. The SPCC Plan also includes mitigation measures to reduce potential impacts should a spill occur.

We conclude that by implementing the measures discussed above, Northern's SPCC Plan, HDD Plan, IR Plan, and the FERC Plan and Northern's Procedures, construction activities would not result in significant impacts on groundwater resources.

3.2 Surface Water

The proposed facilities would all be located within the Des Moines River watershed. Constructing the Lake City 2nd branch line extension would require crossing Purgatory Creek which is a perennial waterbody located at approximately MP 28.2. Purgatory Creek has not been assigned any designated uses by the State of Iowa. This approximately 12-foot-wide waterbody would be crossed via HDD. No other waterbodies or surface water features including surface water intakes would be directly affected by ground-disturbance related to the proposed abandonment or construction activities, and Northern would install erosion control devices as appropriate per the FERC Plan and its Procedures to reduce the potential for eroded soils to enter any nearby waterbodies.

One workspace associated with the Manson 2nd branch line MAOP uprate would be 25 feet away from Purgatory Creek. Additionally, a workspace associated with the Callender branch line MAOP uprate would be about 62 feet from West Buttrick Creek,

which has been designated as a waterbody that contains critical habitat for federally listed species. Federally listed species are discussed in section B.4.4 of this EA. Northern would implement erosion and sediment control measures to minimize the amount of sediment leaving the Project workspaces during the short period of MAOP uprate activities. Any potential indirect impacts on the nearby waterbodies would be minor and temporary.

Using an HDD to cross Purgatory Creek would significantly reduce impacts on this waterbody as the water column and streambed would not be disturbed. However, use of an HDD could result in an IR of drilling fluids (commonly referred to as a “frac-out”) and/or the release of equipment-related fluids in or near the waterbody. Either release could affect water quality. To reduce the potential for an IR, and to minimize any impacts should one occur, Northern would implement measures described in its HDD Plan, IR Plan, and SPCC Plan. Based on the characteristics of Purgatory Creek and Northern’s use of an HDD to cross this waterbody, and the measures that Northern would implement to minimize indirect impacts on nearby waterbodies, we conclude that the Project would not significantly affect surface water resources.

3.3 Hydrostatic Test Water and Other Water Needs

Water necessary for the hydrostatic testing of new pipeline facilities would be obtained from municipal sources. Northern estimates that approximately 278,436 gallons of water would be needed. Upon completion of hydrostatic testing, water would be discharged into upland areas or hauled off for disposal. In addition to hydrostatic testing, Northern would require water for dust control and HDD activities. In total, Northern would require the use of approximately 560,731 gallons of water.

3.4 Wetlands

Northern identified 26 palustrine emergent (PEM) wetlands that would need to be crossed in order to construct and operate the Project. These PEM wetlands have been characterized as persistent, saturated or seasonally flooded/saturated, and excavated or farmed wetland. Most of the wetlands delineated are wet depressions in agricultural fields or roadside ditches. The dominant wetland species in these wet areas include tussock sedge, prairie cordgrass, cockspur grass, reed canary grass, and softstem bulrush.

Constructing the Project would temporarily impact about one acre of wetland. These temporary impacts include vegetation clearing and disruption of wetland soils. Additionally, the use of construction equipment through and near wetlands could result in an inadvertent release of equipment-related fluids. Such a release could adversely affect wetland vegetation and soils. To reduce the potential for an inadvertent release and to minimize any impacts should one occur, Northern would implement measures described

in SPCC Plan. Following construction, affected lands would be restored, and previous land uses could resume.

Northern proposes to install permanent driveways (rock fill and culverts) to access new aboveground facilities across two wetlands (roadside ditch wetlands); therefore, operating the Project would permanently impact (convert) about 0.1 acre of wetland. To install these driveways, Northern proposes to modify the FERC Procedures which prohibits the placement of permanent aboveground facilities in wetlands. Northern would ensure hydrological connectivity of these wetlands is maintained through the use of culverts. Given that there are no practical alternatives for the placement of these access driveways, , the nature of the wetlands affected, and the fact that hydrological connectivity would not be lost, we have determined that the resulting impacts would be minor and that this modification is acceptable.

Based on the characteristics of the PEM wetlands present in the project area and the amount of temporary and permanent wetlands affected, we conclude that the Project would not significantly affect wetlands.

Northern submitted a Jurisdictional Determination request to the USACE Rock Island District on June 29, 2020. The USACE determined that all of the affected wetlands are non-jurisdictional except for three wetlands that are adjacent to waterbodies, which are either crossed by HDD or avoided altogether, and will not be affected. As a result, no USACE permit is required for the Project.

4. Fisheries, Vegetation, and Wildlife

4.1 Fisheries

The Project would not likely affect fisheries or aquatic resources because all direct impacts on waterbodies would be avoided as discussed in section B.3.2. Also, as discussed in section B.3.2, any indirect impacts on nearby waterbodies would be minimized by Northern's use of erosion and sediment control measures.

There is the possibility of an IR of drilling fluids from the use of the HDD method that could affect aquatic species. These effects could include turbidity and sedimentation that could alter habitat and effect food sources. Drilling fluids would consist mainly of bentonite clay and other non-toxic substances, which would not present a direct harm to aquatic species. As outlined in Northern's IR Plan, if an IR occurs in a waterbody the construction contractor would immediately notify the EI to ensure that appropriate agencies are notified. Northern would use turbidity curtains to contain the mud and prevent it from spreading downstream. Following containment efforts, Northern would

clean up and remove the drilling mud for proper disposal in compliance with the applicable state and federal regulations.

4.2 Vegetation and Wildlife

Virtually all of the vegetation present within the Project area and potentially affected is classified as cropland agriculture (140 acres). The primary crops produced in the area are corn and soybeans. Less than one acre of the vegetated lands that would be affected is classified as open herbaceous land (further addressed in section B.5).

Ground disturbing activities would result in the temporary clearing and loss of cropland agricultural vegetation. Additionally, the use of construction equipment would increase the potential for the introduction and/or spread of noxious weeds and invasive plant species which are known to occur in the Project area. Northern conducted surveys to identify invasive species and noxious weeds and found that Canada thistle, common buckthorn, and Tatarian honeysuckle were present at three locations within the Lake City 1st branch line abandonment TWS and one location adjacent to the southern Callender branch line MAOP uprate site. To reduce the potential introduction and/or spread of undesirable plant species, Northern would implement measures in its project-specific Noxious Weed/Invasive Plant Control and Mitigation Plan which addresses numerous items including soil handling, equipment cleaning, and weed control. Following completion of the Project, agricultural use (planting, growing, and harvesting) of affected lands could resume and Northern would monitor and address noxious weeds and invasive plants. Impacts on agricultural lands are addressed in the section B.5 of this EA. Additionally, and as discussed previously, about one acre of wetlands and associated wetland vegetation would be affected by the Project.

Agricultural lands and vegetation as well as wetlands provide habitats for a variety of common wildlife (including migratory birds) that are habituated to persistent disturbance and human activity such as white tailed deer, pocket gopher, raccoon, opossum, gray fox, Canada goose, meadowlark, mourning dove, barn owl, garter snake, brown snake, American bullfrog, and tiger salamander. Although the temporary clearing of vegetation and the use of construction equipment would increase the rates of stress, injury, and mortality experienced by wildlife (particularly smaller less mobile species like frogs and salamanders) in the project area, this impact would be minor. Based on the level of impact on vegetation and wildlife and the scope of the Project, we conclude that the Project would not significantly affect these resources.

4.3 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from tropical regions of Mexico, Central and South

B. ENVIRONMENTAL ANALYSIS

America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act (16 U.S Code [U.S.C.] 703-711); bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Executive Order (EO) 13186 (66 FR 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the U.S. Fish and Wildlife Service (FWS).

On March 20, 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. This voluntary Memorandum of Understanding does not waive legal requirements under the Migratory Bird Treaty Act (MBTA), Endangered Species Act of 1973 (ESA), NGA, or any other statutes and does not authorize the take of migratory birds.

In accordance with EO 13186 and the MOU, Northern identified Birds of Conservation Concern in the Project area. The Project is within the Prairie Potholes Bird Conservation Region (BCR 11). Birds of Conservation Concern that could occur in the Project area are the black-billed cuckoo, red-headed woodpecker, bobolink, and Franklin's gull.

In general, a variety of migratory bird species may occur seasonally within the vicinity of the Project because these areas are located within the Central and Mississippi Flyways for waterfowl. Many species of migratory birds, including Sandhill and whooping cranes, use the flyways during spring and fall migration between the Gulf of Mexico and central Canada. The nesting season for migratory birds in Iowa is generally from April 1 to August 31.

Construction-related noise and human activity from Project activities during this timeframe could result in short-term disturbance, causing birds present in the Project area to relocate temporarily. Depending on the season, construction could also disrupt bird courting or nesting, including destruction of nests, eggs, and chicks within the construction work area. Some migratory bird species would be unable to nest in active Project areas during construction. The Project also has the potential to alter or otherwise affect migratory bird foraging habitat temporarily.

To avoid the potential for impacts on migratory birds, Northern proposes to commence construction activities associated with the MAOP upgrades in late summer/early fall 2021. Construction of the extension and disconnects, as well as the installation of two regulator settings are planned to commence in April 2022, and therefore would overlap with the migratory bird nesting season. However, due to the general disturbed

and cultivated areas that the Project would occur within and the fact that the Project construction would last only a short period of time, we conclude that the Project would not result in population-level impacts or significant measurable negative impacts on Birds of Conservation Concern or migratory birds, in general.

To further minimize impacts, Northern proposes to conduct preconstruction migratory bird and raptor surveys, where construction activities would occur during migratory bird and raptor nesting season. If active nests are discovered, Northern would set protective buffers around the nests in consultation with the FWS.

4.4 Protected Species

The Commission is required by Section 7 of the ESA to ensure that the Project would not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. Based on a review of the FWS's Information for Planning and Consultation tool performed by Northern representatives, four federally listed threatened and endangered species were identified as potentially occurring in the Project area. These species are the threatened Northern long-eared bat (*Myotis septentrionalis*), Western prairie fringed orchid (*Platanthera praeclara*), prairie bush clover (*Lespedeza leptostachya*), and the endangered Topeka shiner (*Notropis topeka*) and its designated critical habitat.

Northern submitted a Project Notification letter to the FWS Rock Island Ecological Services Field Office on February 5, 2020⁶, requesting confirmation of the threatened and endangered species identified within the Project area and comments on the species, their habitats, or designated critical habitat areas that may occur in the counties crossed by the Project. Northern indicated that it had not identified suitable habitat for Topeka shiners, prairie bush clover, or western prairie fringed orchid and therefore, concluded the Project would have no effect on these species. We agree. Because there are no known roost trees or hibernacula in Webster or Calhoun counties, virtually all of the affected vegetation present within the Project area is classified as cropland agriculture, and no tree clearing is proposed, we also agree that the Project would have no effect on the Northern long-eared bat. In general, the FWS does not provide concurrence with "no effect" determinations on listed species. We have fulfilled our responsibility required by Section 7 of the ESA.

Furthermore, based on our review of state listed threatened and endangered species as provided by Northern based on its review of the Iowa Natural Areas

⁶ Letter from Terry Plucker, Northern Natural Gas Company, to Kraig McPeck of the U.S Fish and Wildlife Service. Access at elibrary.ferc.gov. Accession number 20200731-5246, Resource Report 3, Appendix 3B.

Inventory's Natural Heritage Program website and the habitats affected by the Project, we conclude that the Project would not significantly affect state-listed species.

5. Land Use and Visual Resources

5.1 Land Use

The Project would affect agricultural, developed, and open space land uses. Agricultural use includes cultivated (and rotated) croplands, primarily corn and soybeans, as well as hayfields and pastures. Agricultural land use also includes lands enrolled in the National Resource Conservation Service's (NRCS) Conservation Reserve Program (CRP). Developed use generally includes industrial, commercial, and residential development including roads and utilities. No residential areas would be affected by the Project. Open space (also referred to as "open land") includes grasslands and undeveloped lands. No recreation facilities or contaminated sites would be affected by the Project; and therefore, are not addressed further in this analysis.

Ground disturbing activities, including the use of parking and storage spaces and access roads, would temporarily affect about 140 acres of agricultural land, 8.5 acres of developed land, and less than one acre of open space. Given the amount of open space affected and the nature of open space as a land use, this land use would not be significantly affected and is not addressed further in this analysis. Operating the Project would permanently convert about 35.7 acres of agricultural land to developed land.

Project-related activities which could occur over several months (but likely less than a year) would temporarily preclude the use of agricultural lands and could impact drain tiles and irrigation systems. Additionally, it is possible that saturated soil conditions could delay decompaction, topsoil replacement, and final grading until conditions allow for proper soil handling and restoration. During this time, affected lands would likely be encumbered, preventing or deterring agricultural-related grading, planting, soil enhancement, harvesting and other activities. Drain tiles and irrigation systems may be temporarily relocated and could be damaged. Additionally, and as described in previous sections of this EA, agricultural soils and vegetation would also be affected by the Project. Lastly, hydrostatic testing discharges on agricultural lands could saturate soils resulting in scouring, erosion, and other impacts. To reduce impacts on agricultural lands, Northern would conduct ground-disturbing activities in accordance with the FERC Plan and its Procedures and would maintain landowner access to fields and other agricultural facilities to the extent practicable. Following completion of the Project, affected lands would be restored. Northern states that impacts to drain tiles and irrigation systems would be addressed. Agricultural use of affect lands could resume. However, impacts on agricultural lands may persist, affecting agricultural use as

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described further below. Northern would not restrict agricultural activities across permanent easements/rights-of-way.

Although impacts on agricultural land use (preclusion and physical impacts to the land and drain tiles and irrigation systems) are generally temporary, occurring over only one growing season, several short-term impacts, generally observed following restoration of affected lands, could occur as a result of the Project. These impacts include soil disturbance, soil compaction, uneven grading and settling resulting in ponding, soil mixing (soil horizons and/or rock), unsuitable drainage, and the spread or introduction of non-native plant species. These short-term impacts which are also addressed in other sections of this EA could affect agricultural land use and crop production for multiple years. Additionally, occasionally observed long-term impacts on soils (changes to soil composition and chemistry) could also affect agricultural land use and crop production.

To prevent these short- and long-term impacts from occurring and to reduce their impact should they occur, Northern would conduct ground-disturbing activities in accordance with our Plan and its Procedures, Environmental Construction and Mitigation Plans, and Noxious Weed/Invasive Plant Control and Mitigation Plan. Additionally, Northern would photo document the condition of affected lands prior to ground disturbance. Northern would also: estimate topsoil depth based on visual observations, soil borings/samples, and soil surveys; segregate soils; test agricultural soils for compaction prior to and after ground disturbance; and remove non-native excess rock from the top 12 inches of soil. If necessary, Northern would regrade affected lands and plow subsoils in accordance with our Plan. Commission environmental staff would also monitor restoration efforts and require action if necessary. To address drain tile and irrigation system issues, Northern would communicate with landowners, assess drain tile systems, and monitor affected lands following completion of the Project.

Revegetation of agricultural areas would be considered successful when crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise. Resumption of agricultural operations following Project construction and/or planting of a cover crop would aid in the restoration of soil structure and productivity that could take several years to achieve success, depending on site-specific conditions and land use practices.

About 13.5 acres of agricultural land over four parcels are enrolled in the CRP. The CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The CRP provides assistance to farmers and ranchers in complying with federal and state environmental laws and encourages environmental enhancement. Impacts on agricultural land use were described

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above. Northern would work with landowners and the NRCS to mitigate any risks that would affect a landowner's participation in the CRP.

In response to our NOI, we received comments from the NRCS regarding the Farmland Protection Policy Act (FPPA). The FPPA does not apply to this Project because it is not being completed with assistance from a federal agency (assistance defined under the FPPA includes acquiring or disposing of land, providing financing or loans, managing property, or providing technical assistance).

In addition to impacts on cultivated croplands (addressed above), ground-disturbing activities could also impact livestock operations. Livestock use of pastures would be temporarily precluded, fences and gates could be removed and/or damaged, and livestock could experience higher rates of stress, injury, and mortality. To address these impacts, Northern would contact landowners prior to construction to ensure that livestock operations are not adversely affected by the Project and to develop a plan that would not impede livestock access to water sources.

Based on the agricultural lands present in the Project area, the potential impacts on them resulting from Project-related activities, and Northern's implementation of measures to prevent and reduce these impacts, we have determined that the Project would not significantly affect agricultural land use.

Project-related activities would temporarily affect developed lands including roads, utilities, other Northern pipelines (and associated rights-of-way). As described in section A, eight public paved roads would be crossed by conventional bore and one would be crossed by HDD. Construction equipment associated with the Project would also use public roads and private roads and driveways to access project workspaces. Ground-disturbing activities could increase traffic, disrupt utility service, and inconvenience nearby residents (noise and dust). Additionally, these activities could result in impacts on non-public access roads including rutting and the tracking of mud onto public roads or other areas. To reduce these impacts, Northern would adhere to local permit requirements, restrict activities to avoid peak road usage, and would expedite activities through these areas. Therefore, based on the rural character of the Project area and the number of roads and utilities affected, we have determined that the Project would not significantly affect developed land use.

We received a comment letter from a landowner (Ms. Linda Wetter) in response to the NOI inquiring if the pipeline could be abandoned by removal on her property, rather than abandoned in-place. In an environmental information request dated December 11, 2020, we asked Northern to respond to the comment letter. Northern responded saying a representative had a phone conversation with the landowner to answer questions. Northern explained to the landowner that the proposed pipeline would be installed

approximately 25 feet offset from the existing pipeline and, therefore, there would still be a pipeline on the property following the abandonment. Northern stated in its response that it still proposes to abandon the Lake City 1st branch line pipeline in-place on this landowner's property. In response to FERC staff's environmental information request dated February 9, 2021, Northern confirmed that Ms. Wetter and her tenant agreed that the pipeline would be abandoned in place. Visual Resources

The visual setting of the Project area can be characterized as open and rural with the primary land use being agricultural. The Project area consists of cultivated croplands, outbuildings supporting agricultural activities, and other commonly associated features. The use of heavy construction equipment and other related vehicles to conduct ground-disturbing activities and the placement of materials and soils on affected lands would temporarily impact the visual character of the Project area. Individuals may find this affect to be displeasing. However, this impact would be minor and temporary and as ground-disturbing activities are complete, the impact would shift with the equipment and activity. The erection of new minor aboveground piping facilities would result in a permanent impact on the visual character of the Project area. However, because these aboveground facilities are considered minor and are generally low to the ground, their impact would not significantly affect the visual character of the Project area.

Based on existing land use and the visual character of the Project area, the mostly temporary Project-related impacts on these resources, and the measures Northern would implement to reduce these impacts, we conclude that the Project would not significantly impact land use and visual resources.

6. Cultural Resources

The National Historic Preservation Act (NHPA) is the cornerstone of the federal government's historic preservation program. Section 101(d)(6) of the NHPA states that properties of traditional religious and cultural importance to Indian tribes⁷ may be determined eligible for the National Register of Historic Places (NRHP). In carrying out our responsibilities under Section 106 of the NHPA, the FERC conducted government-to-government consultations with Indian tribes that may attach religious and cultural importance to properties in the area of potential effect (APE), in accordance with the implementing regulations at Title 36 Code of Federal Regulations (CFR) Part 800.2(c)(2)(ii). Consultations with Indian tribes are detailed below.

⁷ Indian tribes are defined in Title 36 Code of Federal Regulations (CFR) Part 800.16(m) as: "an Indian tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation, or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their special status as Indians."

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Section 106 of the NHPA requires that the FERC take into account the effect of its undertakings⁸ (including authorizations under Sections 3 and 7 of the Natural Gas Act [NGA]) on historic properties,⁹ and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Northern, as a non-federal applicant, is assisting FERC staff in meeting our obligations under Section 106 by providing data, analyses, and recommendations in accordance with 36 CFR 800.2(a)(3) and FERC's regulations at 18 CFR 380.12(f). Cultural resources¹⁰ information was gathered for Northern by its consultants, Commonwealth Heritage Group (Commonwealth) and Merjent, Inc. (Merjent). FERC remains responsible for all final determinations under the NHPA. Below, we summarize the status of compliance with Section 106 for this Project.

The regulations for implementing Section 106 of the NHPA, at 36 CFR Part 800.9, encourages the integration of the 106 compliance process with the NEPA process; and we have done that in this section of the EA below. This section is broken into several subsections that mirrors the Section 106 compliance process. The process includes consultations; identification of historic properties; assessment of effects; and resolution of adverse effects, if necessary. Then we discuss the Unanticipated Discovery Plan (UDP) produced by Northern for this Project, and its review by consulting parties. Lastly, we reach conclusions about the status of our compliance with the NHPA.

6.1 Consultations

In accordance with the implementing regulations for complying with Section 106, at 36 CFR Part 800, the FERC consulted with the State Historic Preservation Office (SHPO) of Iowa,¹¹ and interested Indian tribes, prior to making our determinations of

⁸ "Undertaking means a project activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency," as defined in 36 CFR 800.16(y).

⁹ Historic properties include prehistoric or historic sites, districts, buildings, structures, objects, landscapes, or properties of traditional religious or cultural importance listed on or eligible for listing on the NRHP, as defined in 36 CFR 800.16(l).

¹⁰ Cultural resources are locations of human activity, occupation, or use. According to FERC's Office of Energy Projects "Guidelines for Reporting on Cultural Resources Investigations for National Gas Projects," cultural resources include any prehistoric or historic archaeological site, district, object, cultural feature, building or structure, cultural landscape, or traditional cultural property. Although cultural resources are not defined in 36 CFR 800, it is a term-of-art in the field of historic preservation and archaeological research. Indian tribes believe that cultural resources could include natural resources, such as plants and animals of traditional importance to tribes, topographic features that may be sacred, and viewsheds.

¹¹ The Iowa SHPO is housed within the State Historical Society of Iowa.

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NRHP eligibility and Project effects for all cultural resources identified in the APE. Those consultations are summarized below.

FERC sent copies of our August 31, 2020 NOI for the Project to a wide range of stakeholders, including other federal agencies, such as the ACHP, U.S. Department of the Army Corps of Engineers (USACE), EPA, U.S. Department of the Interior Bureau of Indian Affairs (BIA) and National Park Service (NPS); state and local government agencies, such as the SHPO for Iowa; affected landowners; and Indian tribes that may have an interest in the Project area. The NOI contained a paragraph about Section 106 of the NHPA, which stated that we use the notice to initiate consultations with the SHPO as well as to solicit their views and those of other government agencies, interested Indian tribes, and the public on the Project's potential effects on historic properties.

Consultations with the SHPO

FERC Staff Consultations

In a letter to FERC dated September 16, 2020 (filed November 2, 2020), the Iowa SHPO acknowledged receipt of our August 31, 2020 NOI for this Project, and requested a copy this EA.

Communications Between the Applicant and the SHPO

On June 17, 2020, Northern provided the SHPO with a copy of its Phase I cultural resources survey report covering Project elements produced by Commonwealth Heritage Group (Commonwealth, Jones and Edwards, June 2020), and a copy of Northern's UDP for the Project. In a July 13, 2020 reply, the Iowa SHPO wrote: "Upon completion of our technical assistance review, we find that Commonwealth's survey and reporting are consistent with best practices advocated by the Association of Iowa Archaeologists in their *Guidelines for Archaeological Investigations in Iowa* (2019) and that the results could be used to support an agency's determination of effect."

FERC staff's September 21, 2020 environmental information request to Northern pointed out that the SHPO appeared to be under the misconception that the Project is being conducted under the Commission's Blanket procedures and is not considered an undertaking. We requested that Northern re-communicate with the SHPO to explain that the Project is being reviewed by FERC under Section 7 of the NGA, and is in fact an undertaking, and request the SHPO's opinions on whether or not they agree with the findings and recommendations in the Commonwealth survey report.

In its October 13, 2020 response to FERC staff's environmental information request, Northern documented that it sent another letter to the Iowa SHPO, dated October

2, 2020, re-submitting the survey report, UDP, and its Overview report, and again requesting review comments. On October 7, 2020, the SHPO replied to Northern with a form letter, acknowledging receipt of the reports, and stating that it intended to provide review comments within 30 days, which would expire on November 6, 2020. Because the SHPO did not respond by that date, FERC staff takes that to mean that the SHPO did not object to the report's findings and recommendations.

Consultations with Indian Tribes

FERC Staff Consultations

The unique and distinctive political relationship between the U.S. government and Indian tribes is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiates tribes from other entities that deal with, or are affected by, the federal government. This relationship has given rise to a special federal trust responsibility, involving the legal obligations of the U.S. government toward Indian tribes, and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights.

FERC acknowledges that it has trust responsibilities to Indian tribes, and so, on July 23, 2003, it issued a "Policy Statement on Consultations with Indian Tribes in Commission Proceedings" in Order 635. That policy statement included the following key objectives:

- The Commission will endeavor to work with Indian tribes on a government-to-government basis, and will seek to address the effects of proposed projects on tribal rights and resources through consultations; and
- The Commission will ensure that tribal resources and interests are considered whenever the Commission's actions or decisions have the potential to adversely affect Indian tribes or Indian trust resources.

On October 17, 2019, the Commission revised its policy statement. The revision included two new items. In one, the Commission stated that it will set forth in its environmental documents and orders how tribal input resulting from consultations was considered in agency decisions for infrastructure projects. In the other, the Commission stated that it will consider the effect of its actions on treaty rights in its NEPA and decision documents.

FERC contacted Indian tribes that may attach religious or cultural significance to sites in the region or may be interested in potential Project impacts on cultural resources. We identified Indian tribes that historically used or occupied the Project area through

basic ethno-historical sources such as the *Handbook of North American Indians*, communications with the SHPO, information provided by the applicant and its cultural resources consultants, and scoping responses to our NOI.

We sent our August 31, 2020 NOI for this Project to 36 federally-recognized Indian tribes. These consultations are listed on appendix E. No tribes responded to our NOI.

Communications Between the Applicant and Indian Tribes

On February 4, 2020, Northern contacted the Iowa SHPO to request comments on the proposed list of Native American tribes that might have an interest in the Project. No comments were received from the Iowa SHPO in response to that letter.

Northern contacted 23 Indian tribes via letters on February 5, 2020, to introduce the proposed Project and request comments. Two tribes responded to Northern's letters (see appendix E). On February 13, 2020, the Winnebago Tribe of Nebraska sent Northern an email stating that the Tribe has no known historic or cultural sites near the Project and thus has no concerns. In a March 4, 2020 letter to Northern, the Otoe-Missouria Tribe of Indians requested copies of the cultural resources survey reports. Northern provided the tribe with a copy of the survey report on June 18, 2020.

On March 23, 2020, Northern's consultant, Merjent, followed up with telephone calls to all the tribes that had not previously responded to letters to verify receipt of the original letters and to request comments. The Ho-Chunk Nation of Wisconsin and the Prairie Band Potawatomi Nation requested that a copy of the notification letter be sent to them via email. In response, Northern emailed the appropriate letter to each tribe on March 23, 2020. The Osage Nation stated it has no concerns because it does not have ancestral lands or cultural properties in the Project area. The Miami Tribe of Oklahoma noted that the Project would have no effect on areas of tribal interest.

Northern again sent letters to Indian tribes on June 18, 2020. No responses to those letters have been filed in this docket to date.

6.2 Identification of Historic Properties

Area of Potential Effect

As stated in our NOI, we define the direct APE as all areas subject to ground disturbance, including the construction right-of-way, additional temporary extra workspaces, contractor/pipe storage yards, staging areas, disposal areas, aboveground facilities, and new or to-be-improved access roads. Northern defined the APE as the

environmental clearance boundary (ECB), temporary workspaces, aboveground facilities, and access roads needed at Project elements. As discussed in section A, the Project would affect about 149 acres.

Overview Results

Commonwealth conducted a desktop literature review and site file search for the 34.5-mile-long Lake City 1st branch line that Northern proposes to abandon in-place. The review examined an area within 1.0 mile of the pipeline. Within that area, Commonwealth found that 11 previous archaeological investigations have been conducted. There are four previously recorded archaeological sites in this area. Three sites were previously un-evaluated (13WB88, WB221, and WB222). One previously recorded site (13WB501) was evaluated as not eligible. Sites 13WB221 and 222 were originally recorded in 1976 and are respectively located about 1,408 feet and 2,300 feet from the pipeline. Un-evaluated site 13WB88, a prehistoric camp originally recorded in 1961, is located on the pipeline. However, since there are no construction or removal activities associated with the abandonment of this portion of pipeline, no impacts on the site should occur (Jones, 2020).

In advance of field surveys of Project components where there would be construction or removal activities, a literature and records review was conducted by Commonwealth covering the ten ECB locations.

No previously reported archaeological sites were identified within or immediately adjacent to the ECBs. Three archaeological sites are reported within 1.0 mile of the Project: 13CH61, 13WB501, and 13WB585. All three sites are of post-contact affiliation and are located at least 0.25 mile away from the ECBs (Jones and Edwards, 2020).

There are 51 historic buildings or structures reported within 1.0 mile of the Project, including the Callender Cemetery, located 3,063 feet from an ECB. The Purgatory Creek Bridge (#090380), originally constructed in 1933, and previously determined not eligible for the NRHP, was once located 475 feet from ECB 7; but between 2004-2005, the bridge was demolished and replaced by a concrete culvert. Previously recorded historic House Site 94-546 is located 53 feet from ECB 5. ECB 5 is an existing Town Border Station with above-ground buildings and piping. Northern proposes to install temporary test headers at this ECB; which would be removed. These actions would not change the historic landscape or character of the setting at house 94-546.

The Chicago, Milwaukee, St. Paul and Pacific Railroad, constructed in the 1880s, is illustrated on the 7.5-minute USGS topographic quadrangle map as the Union Pacific

Railroad crossing through ECB 9 between Traer and Sigourney Avenues. However, this railroad was abandoned in the 1980s. Archaeological surveys of this area failed to find any remnants.

The Lake City 1st branch line itself is an historic property, part of the A-Line found eligible for the NRHP in 1998. The A-Line was built in 1930. The Lake City 1st branch line was placed into service in December 1931. In 2002, the ACHP published its “Exemption Regarding Historic Preservation Review Process for Projects Involving Historic Natural Gas Pipelines” (5 April 2002, *Federal Register*, vol. 67, no. 66:16364–16365). Under that exemption, once proper documentation of a section of a pipeline’s history has been completed, for subsequent abandonments additional documentation of that section would not be required. Impacts on the pipeline were mitigated, in accordance with the ACHP exemption, through the 2002 publication of *Natural Gas Comes to Iowa: What it Meant When the A-Line Arrived*, by Christopher Castaneda (Castaneda, 2002).

Inventory Results

Phase I archaeological surveys of the ten ECBs was conducted by Commonwealth on December 10, 2019, and between March 24 and April 30, 2020. In total, the inventories covered about 399.1 acres. Therefore, the ECBs were larger in size than the proposed construction areas totaling about 149 acres. No cultural resources were identified at any of the ECBs by Northern’s contractor (Jones and Edwards, 2020). In a July 13, 2020 letter to Northern, the Iowa SHPO stated that the negative results of the Commonwealth surveys of Project elements could be used to support FERC’s determinations. We agree that no historic properties, outside of the A-Line itself, would be affected at the ECBs.

6.3 Unanticipated Discovery Plan

Northern prepared a Project-specific UDP that outlined protocols to be implemented if unanticipated cultural resources or human remains are discovered during construction. A copy of the UDP was provided in appendix 4D of RR4 in the ER attached to Northern’s application to the FERC. The UDP was submitted to the Iowa SHPO twice by Northern: once on June 17, 2020; and a second time on October 2, 2020. No comments have been received to date from the SHPO regarding the UDP. While the SHPO has not reviewed the UDP, FERC staff found it acceptable.

6.4 Compliance with the NHPA

No traditional cultural properties or properties of religious or cultural importance to Indian tribes were identified in the APE by Northern or its consultants, the SHPO of

Iowa, the BIA, the NPS, or Indian tribes contacted. Therefore, we have complied with the intent of Section 101(d)(6) of the NHPA.

Based on the overviews and survey reports filed by Northern, we conclude that that abandonment and removal activities associated with this Project should have no effects on historic properties, outside of the A-Line pipeline itself, for which effects have already been mitigated in accordance with the ACHP Exemption. No additional investigations are required at the ECBs. We have completed the process of complying with Section 106 of the NHPA, in accordance with 36 CFR Part 800, for this Project.

7. Air Quality

The term air quality refers to relative concentrations of pollutants in the ambient air. Air quality in the Project area would be affected by construction and operation of the Project, however the Project would not result in new stationary source emissions or modifications to the existing air quality permits of Northern's existing system.

The Project area has an average daily temperature of 19.4 degrees Fahrenheit (°F) in January and 75.4 °F in July, with an average annual precipitation of about 33 inches (Climate Data, 2020).

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The EPA oversees the implementation of the CAA and establishes National Ambient Air Quality Standards (NAAQS) to protect human health and welfare.¹² NAAQS have been developed for seven "criteria air pollutants," including nitrogen dioxide (NO₂), carbon monoxide (CO), ozone, sulfur dioxide (SO₂), particulate matter less than or equal to 2.5 microns in aerodynamic diameter (PM_{2.5}), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM₁₀), and lead, and include levels for short-term (acute) and long-term (chronic) exposures. The NAAQS include two standards, primary and secondary. Primary standards establish limits that are considered to be protective of human health and welfare, including sensitive populations such as children, the elderly, and asthmatics. Secondary standards set limits to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings.

The EPA, and state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. The data are then averaged over a specific time period within specific areas and are

¹² The current NAAQS are listed on USEPA's website at <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

used by regulatory agencies to determine compliance with the NAAQS and to determine if an area is in attainment (criteria pollutant concentrations are below the NAAQS), nonattainment (criteria pollutant concentrations exceed the NAAQS), or maintenance (area was formerly nonattainment and is currently in attainment). Webster and Calhoun Counties, Iowa are in attainment with the NAAQS criteria pollutants (EPA, 2020c).

Greenhouse gases (GHG) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. Carbon dioxide (CO₂) is the primary GHG emitted during fossil-fuel combustion, while smaller amounts of methane and nitrous oxide are GHGs that are also emitted. GHGs are non-toxic and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHG under the CAA. The primary GHGs that would be emitted by the Project are CO₂, methane, and nitrous oxide. During construction of the Project, the primary GHG emitted would be CO₂ due to combustion emissions from the majority of construction equipment; during Project operation, the primary GHG emitted would be methane due to fugitive leaks that would occur from the pipeline and aboveground appurtenant equipment. Throughout the life of the Project, fugitive leaks would result in a greater volume of GHG emissions during Project operation than construction due to the temporary nature of construction.

Emissions of GHGs are typically quantified and regulated in units of carbon dioxide equivalents (CO₂e). The CO₂e weighs the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO₂. Thus, CO₂ has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.¹³

There are no air quality regulatory requirements applicable to the Project due to its location within attainment areas, because there are no new stationary source emissions associated with the Project, and because the Project would not result in modifications to Northern's existing air quality permits along its existing system.

7.1 Construction Emissions Impacts and Mitigation

Project construction would result in temporary, localized emissions that would last the duration of construction activities. Heavy equipment and trucks, delivery vehicles,

¹³ These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

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and construction workers commuting to and from work areas would generate exhaust emissions through the use of diesel or gasoline engines. Northern would not conduct open burning during construction to dispose of cleared vegetation.

Construction activities, such as land clearing and grading, ground excavation and soil disturbance, and driving on unpaved roads, would also result in the temporary generation of fugitive dust. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic and types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Northern estimated construction emissions based on the fuel type and anticipated frequency, duration, capacity, and levels of use of various types of construction equipment. Construction emissions were estimated using 40 CFR Part 98, Subpart W, the EPA's MOVES model, and AP-42 guidance. Table 8 below provides the total Project construction emissions, including exhaust emissions and fugitive dust from on-road and off-road construction equipment and vehicles, exhaust emissions from construction worker vehicles for commuting, vehicles used to deliver equipment/materials to the site, and venting emissions due to pipeline venting during abandonment of the existing pipeline.

Table 8 Construction Emissions for the Project (tons per construction duration)								
Activity	NOx	CO	VOC	PM10	PM2.5	SO2	HAPS	CO2e
Non-Road Engine Emissions	172.12	39.95	13.81	7.12	6.91	0.08	0.31	8,163.51
Unpaved Roads	--	--	--	12.23	1.22	--	--	--
Pipeline Venting	--	--	4.9	--	--	--	--	478.3
Earthmoving Fugitives	--	--	--	14.93	1.58	--	--	--
Total Project Emissions	172.12	39.95	18.71	34.28	9.71	0.08	0.31	8,641.81

Construction emissions shown in table 8 are not expected to result in a violation or degradation of ambient air quality standards. To minimize fugitive dust emissions, Northern would implement the following measures contained within its Fugitive Dust Control Plan:

- apply water to exposed soils during construction operations on unpaved areas;
- maintain equipment properly; and
- operate equipment only on an as-needed basis to minimize combustion emissions.

Construction emissions would occur over the duration of construction activity. Construction emissions would be relatively minor and would result in short-term, localized impacts in the immediate vicinity of construction work areas. With Northern's proposed mitigation measures and given the temporary nature of construction activities, we conclude air quality impacts from construction would be limited and would not result in significant impacts on the local or regional air quality.

7.2 Operational Emissions Impacts and Mitigation

The Project would not result in new stationary source emissions, but would result in minor fugitive emissions during Project operation. Fugitive emissions are minor leaks that would occur at valves, seals, and other piping components at the aboveground facilities and along the pipeline. Northern conservatively estimates that Project operation would result in 25.6 tons per year of volatile organic compounds (VOCs) and 3,693.5 tons per year of CO₂e respectively, of fugitive emissions from the related aboveground facilities, while 3.1 tons per year of VOCs and 201.6 tons per year of CO₂e would be emitted during operation of the new pipeline. The Project would not result in changes or modifications to the current air quality permits at the existing compressor stations along Northern's existing pipeline system.

Based on the minimal quantity of operational emissions and the lack of stationary source emissions, we conclude that operation of the Project would not cause or significantly contribute to a degradation of ambient air quality.

8. Noise

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are

perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 pm. and 7:00 am). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear; and 10 dBA is perceived as a doubling of noise (Bies and Hansen, 1988).

8.1 Federal Noise Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA, 1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSAs). NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10 dBA nighttime penalty added prior to the logarithmic calculation of the L_{dn} , for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA. FERC also uses the 55 dBA L_{dn} (or 48.6 dBA L_{eq}) metric to evaluate construction activities that may occur during nighttime hours.

We identified no state or local noise regulations applicable to the Project.

8.2 Construction Noise Impacts and Mitigation

Noise would be generated during construction of the Project. Phase 1 activities would last only a few weeks to months, while Phase 2 activities could last several months. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Northern would also inform nearby residents of the Project and construction schedule and would respond to and investigate all concerns.

Additionally, Northern would conduct the majority of construction activities between the hours of 7:00 am to 7:00 pm, Monday to Saturday. Limited activities, including HDD pullback, hydrostatic testing, tie-ins, and commissioning may extend into

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nighttime or Sunday hours, however, these activities would be of short duration and would not result in significant noise impacts. Northern may require continuous 24-hour HDD construction if unforeseen circumstances arise during drilling. In the event of nighttime drilling, Northern conducted a noise analysis to estimate the noise levels due to 24-hour drilling, as well as the existing ambient sound levels, which were measured in March 2020. The result of the noise analysis is shown below in table 9. Noise from HDD construction would be generated at the drill entry and exit points throughout the duration of drilling activities, with noise from the entry site being the more significant source. Northern estimates that drilling at each HDD site could last about 2 weeks¹⁴.

In order to ensure that noise levels due to HDD construction would not result in significant impacts to nearby NSAs, Northern would monitor noise levels during the pilot and ream process to verify the assumptions and numbers utilized in the noise analysis presented in table 9.

Table 9 Noise Analysis for 24-Hour Construction at the HDD Sites						
HDD Crossing	NSA	Distance and Direction from Entry/Exit	Calculated Sound Attributable to HDD (dBA L _{dn})	Measured Ambient Sound (dBA L _{dn})	Calculated Total Sound Level (dBA L _{dn})	Calculated Increase Over Existing Sound Level (dBA)
Purgatory Creek	NSA 1	2,320 feet SE (entry); 2,721 feet SE (exit)	48.8	49.3	52.1	2.8
	NSA 2	5,550 feet SSW (entry) and 5,452 feet SSW (exit)	42	65.2	65.2	0
	NSA 3	4,365 feet S (entry) and 1,588 feet S (exit)	43.5	46.8	48.5	1.7
Norridge Avenue	NSA 4	1,665 S (entry) and 1,588 feet S (exit)	52.6	50.6	54.7	4.1
	NSA 5	2,885 feet N (entry) and 3,107 feet N (exit)	47.3	46.4	49.9	3.5

Table 9 above indicates that 24-hour drilling activities would not result in noise levels greater than 55 dBA L_{dn} at nearby NSAs. HDD construction would result in an increase in noise levels at nearby NSAs ranging from 0 to 4.1 dBA and therefore would not likely result in significant noise impacts at NSAs.

¹⁴ The actual duration could increase to some extent by weather delays or slow drilling rates due to unexpectedly hard rock or changing geological makeup that may necessitate equipment change-outs.

Noise may also be generated during pipeline venting (i.e., blowdowns) that are necessary to evacuate gas from the pipelines prior to abandonment. Pipeline venting is typically of short duration (less than 20 minutes) and would occur during daytime hours only. Based on the temporary nature of construction activities, the predicted sound levels due to HDD construction, and Northern's mitigation measures, we conclude that construction noise would not result in significant noise impacts on residents and the surrounding communities. The Project would not result in noise impacts during Project operation.

9. Reliability and Safety

The transportation of natural gas by pipeline and pressurization of natural gas at aboveground facilities involves some incremental risk to the public due to the potential for an accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture. The overall purpose of the Project is to improve the safety and reliability of Northern's existing aging pipeline system.

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. Methane has an auto-ignition temperature of 1,000 degrees F and is flammable at concentrations between 5.0 and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

9.1 Safety Standards

The DOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49, U.S. Code Chapter 601. The DOT's PHMSA administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA's safety mission is to ensure that people and the environment are protected from

the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 specifically addresses natural gas pipeline safety requirements to be implemented by the pipeline operator.

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

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

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 specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

9.2 Pipeline Class Locations

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

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centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

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

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

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

9.3 Emergencies

The DOT prescribes the minimum standards for operating and maintaining pipeline and aboveground natural gas facilities, including the requirement to establish a written plan governing these activities. Each operator is required to establish an emergency plan that includes procedures to minimize the hazards of a natural gas emergency.

The DOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of

each organization that may respond to a natural gas pipeline or facility emergency, and to coordinate mutual assistance. Northern must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas emergency and report it to the appropriate public officials.

With continued compliance with DOT safety standards, operation, and maintenance requirements, we conclude the Project would be constructed and operated safely.

9.4 PCB Contamination

The Project does not involve the addition of, or modification of compressor stations and the new pipeline would not contain any liquids that would contain PCBs. Northern has sampled multiple farm taps along the pipelines to be abandoned or updated, and all results have indicated non-detectable levels of PCBs. Northern's PCB disposal procedures meet the requirements outlined in the Toxic Substances Control Act as established under EPA regulations.

The Project would include pipe removal at five disconnect sites along the Lake City 1st branch line, where the pipe would be cut and capped. Secondary containment would be installed below all pipe segments to be cut prior to initiation of the cutting activity. Prior to fully cutting the pipe, a hole would be cut in the top of the pipe and the pipe would be inspected for free liquids. In the event liquids are present, they would be removed by a vacuum truck prior to cutting the pipe segment. Any liquids captured in secondary containment would be containerized and tested for PCB contamination. Should the liquids contain PCB levels of 50 parts per million (ppm) or higher, the liquids would be transported to an approved PCB disposal site by a licensed contractor. Any non-hazardous liquids would be disposed of through a petroleum recycler. Any piping which tests above 10 microgram/100 square centimeters (50 ppm) in a wipe test would be grouted per the Toxic Substances Control Act regulations.

10. Cumulative Impacts

In accordance with NEPA and with FERC policy, we identified other actions in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by the CEQ, a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of the agency or party undertaking such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over time. The CEQ guidance states that

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an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions (CEQ, 1997). In this analysis, we consider the impacts of past projects within defined areas of influence as part of the affected environment (environmental baseline) which were described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered. Table 10 summarizes the resource-specific geographic scopes that were considered in this analysis.

An action must first meet the following three criteria to be included in the cumulative analysis:

- affects a resource also potentially affected by the Project;
- causes this impact within all, or part of, the Project area defined by the resource-specific geographic scope; and
- causes this impact within all, or part of, the time span of the proposed Project's estimated impacts.

As described in our analysis above within section B of this EA, constructing and operating the Project would temporarily and permanently affect the environment. The Project would generally have minor to negligible effects on geology, soils, vegetation, wildlife, agricultural land, air quality, and noise.

No NRHP-eligible cultural resources were identified in the areas affected by the Project; therefore, the Project would have no impact on cultural resources, and would therefore not contribute to cumulative impacts on these resources. In addition, as described in section B.1, the Project activities would not impact or be affected by mineral or geological resources or hazards. Therefore, the Project would not contribute to cumulative impacts on geological resources. These resources are not considered further for purposes of evaluating cumulative impacts.

Table 10 below summarizes the resource-specific geographic boundaries that were considered in this analysis. Actions outside of these boundaries are generally not evaluated because their potential to contribute to cumulative impacts diminishes with increasing distance from the Project.

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Table 10 Cumulative Impact Resource-Specific Geographic Scopes	
Resource	Cumulative Impact Geographic Scope
Soils	The boundaries of construction workspaces.
Surface water, Fisheries, Wetlands, Vegetation, Wildlife	The watershed level provides a natural boundary and a geographic proxy to accommodate general wildlife habitat and ecology characteristics in the Project area; therefore, impacts of other actions on surface water, wetlands, vegetation and wildlife are evaluated in combination with the Project within each defined hydrologic unit code (HUC) - 12 watershed boundary.
Land Use and Visual Resources	Impacts of other actions in combination with the Project are evaluated within 1 mile of Project work areas.
Air Quality	Construction impacts include other actions within 0.25 mile from Project workspaces. (Note: The Project would not have air impacts during operation with the exception of fugitive emissions)
Noise	Construction impacts include other actions within 0.25 mile from the proposed Project's earth-disturbing equipment work and 0.5 mile from HDD activity. (Note: The Project would not have noise impacts during operation)

10.1 Other Actions identified within the Geographic Scope

Table 1 in appendix D summarizes recent past, current, and reasonably foreseeable actions and affected resources occurring within one or more geographic scopes identified in table 10. Northern obtained the information about present and future planned actions summarized in appendix D by consulting federal, state, and local agency and municipality websites. Northern also reviewed past and reasonably foreseeable projects that have been or would be completed under its existing blanket certificates and that fall within the geographic scope for this Project. Based on the geographic scopes outlined in table 10, we identified 12 actions whose impacts when combined with the impacts of the Project could result in a cumulative impact. Details on these actions are provided in appendix D.

10.2 Potential Cumulative Impacts of the Proposed Project

The actions considered in our cumulative impact analysis, identified in appendix D, may vary from the proposed Project in nature, magnitude, and duration. These actions are included based on the likelihood of their impacts coinciding with the Project's impacts, which means that these other actions have current or ongoing impacts or are "reasonably foreseeable." The actions we considered are those that could affect similar resources within the same geographic scope defined in table 10, and during the same timeframe as the Project. The anticipated cumulative impacts of the Project and these other actions are discussed below. Table 2 in appendix D shows the footprint of each of the identified actions within the resource-specific geographic scopes.

In our analysis, the footprint of a project is often an acceptable metric for evaluating the significance of an impact on a number of resources. In appendix D, table 3, we provide the footprint (acres) of and the percentage of the HUC-12 watershed affected by each of the projects. Based on available data, other actions in the geographic scope of the Project, mainly Northern's actions that would occur under its Blanket Certificate, would affect about 15 acres of land total. The Project would affect about 149 acres of land total. These impacts are spread out over 9 different HUC-12 watersheds (figure 1.12-1 in appendix D) that range in size from about 10,130 acres to 38,737 acres. The Project's largest footprint in one single HUC-12 watershed (Purgatory Creek) is 72 acres, which encompasses 0.2 percent of that watershed (27,657 acres). Based on available data, there are no other actions identified that would occur in the Purgatory Creek Watershed during the timeframe of the Project. The largest estimated cumulative impact in one watershed, based on available data of other actions in the area, would be in the Tank Pond Watershed. The Project combined with other known actions in that watershed would affect 0.1 percent of the watershed.

Soils

Impacts on soils resulting from the proposed Project, when combined with other existing and reasonably foreseeable projects in the area, may result in compaction and erosion when soils are exposed prior to restoration if not mitigated. Some of Northern's current and proposed blanket certificate projects listed in appendix D overlap or partially overlap with Project workspaces. Most projects in the impact area are FERC jurisdictional and would be required to adhere to the FERC Plan, which includes measures to conduct topsoil segregation, install erosion controls, and conduct decompaction. With implementation of topsoil segregation and the use of erosion controls, as well as the minimal overlap among projects and minimum duration of exposed excavations during construction of the Project, the cumulative impacts on soils

from the Project when combined with agricultural practices and other project activities in the impact area would be minor, and generally temporary.

Water Resources and Wetlands

Cumulative impacts on water resources and wetlands, from past, present, and reasonably foreseeable actions in the Project area would depend on the type of project/activity and its proximity and temporal connection with the Project. Cumulative impacts on water resources and wetlands from actions in the Project area could occur from overlapping or temporally sequential construction activities that include ground disturbing activities in/near waterbodies, wetlands, or water supply sources; direct in-water work; or water withdrawals. The Project would not directly affect any waterbodies or groundwater wells and would affect about 1 acre of wetlands. Other actions in the geographic scope could cause temporary impacts on surface waters and result in cumulative impacts within the subject HUC-12 watershed.

Based on the existing environment of the Project due to ongoing agricultural practices, our analysis of potential actions/projects in the Project's geographic scope that could contribute to water resources and wetlands impacts, and the fact that the Project's impacts on water resources and wetlands would be minor, we conclude that any cumulative impacts would not be significant.

Vegetation and Wildlife

Cumulative impacts on vegetation and wildlife, from past, present, and reasonably foreseeable actions in the Project area would depend on the type of project/activity, amount and type of habitat affected, and the rate at which the vegetation would regenerate. Cumulative impacts on vegetation and wildlife from actions in the Project area could occur from activities that include vegetation clearing (habitat loss) and large moving and noise emitting equipment (wildlife mortality and disturbance). In general, ongoing agricultural practices in the Project area have the greatest impact on vegetative and wildlife communities. Vegetation and wildlife habitat disturbed by construction of the Project would consist of primarily agricultural land that would be allowed to return to pre-construction use following the completion of construction activities. In general, the vegetation and wildlife communities are defined by anthropogenic utilization of the Project area and the plants and animals that occupy this area are acclimated to human perturbation. For these reasons we conclude that cumulative impacts on vegetation and wildlife would not be significant.

Land Use and Visual Resources

In general, pipeline projects impact a relatively small area in relation to the total landscape, as these impacts are typically temporary in nature and vegetation is allowed to be reestablished over the easement with the exception of permanent aboveground facilities. The same would apply to other projects and actions in the area that do not involve construction of permanent aboveground facilities. The Project would result in less than one acre of permanent aboveground facilities. The other known actions in the area are some of Northern's proposed upgrades to its existing pipeline system similar to the Project and two fiber optic lines, which would involve either minor aboveground facilities or none at all.

Generally, construction of the Project and other actions in the Project area would temporarily impact the main land use, agriculture, until the areas are restored to preconstruction use at the completion of Project activities. Within the geographic scope for land use (2-mile linear buffer for the new pipeline and a 1-mile radius for aboveground facilities/facility modification areas), the Project would affect up to 1 percent. Northern's other actions would affect less than 1 percent of land within the geographic scope. Data is limited for the fiber optic line projects, but we estimate that impacts acreages would be similar. To be conservative, the projects combined could impact up to 3 percent of land use in the defined geographic scope. In general, because the landscape crossed is mainly agricultural land and most actions in the areas would return the majority of land to its original use and aesthetic, there would not likely be any significant long term cumulative impacts on land use or visual resources as a result of the Project.

Air Quality

The proposed Project would result in short-term impacts on air quality as a result of construction in the vicinity of the Project, as discussed in section B.8.1. Specifically, use of heavy equipment would generate emissions of air pollutants and fugitive dust, which would result in short-term emissions that would be highly localized, temporary, and intermittent.

Construction of the projects listed in table 1 in appendix D that are within 0.25 mile of the Project and would have overlapping construction schedules could contribute to cumulative impacts on local air quality. Similar to the proposed Project, construction of projects that would involve the use of heavy equipment that would generate short-term emissions would be highly localized, temporary, and intermittent. Each project identified in appendix D would be required to meet applicable federal and state air quality standards to avoid significant impacts on air quality (including standards for fugitive dust and exhaust emissions standards). Most of the projects listed in appendix D would be

Northern projects; similar to the proposed Project, the other Northern projects would employ similar mitigation measures as the proposed Project, including minimizing equipment idling time, and use of dust suppression. Based on the temporary nature of construction, and the mitigation measures proposed for the Project and the other projects, we conclude that the proposed Project would not result in significant cumulative impacts on air quality.

Noise

Noise impacts would occur during construction of the proposed Project. Sound level impacts during construction would be highly localized and attenuate quickly as the distance from the sound source increases. Construction activities associated with some of the projects listed in appendix D may overlap with the construction schedule for the proposed Project and could result in cumulative noise impacts on nearby residents. However, based on the short-term and temporary nature of construction-related activities, and Northern's commitment to construct primarily during the daytime hours, with the exception of the few activities noted in section B.8.2., impacts from the Project are not expected to significantly contribute to cumulative impacts on noise levels during construction.

Climate Change

Climate change is the variation in climate (including temperature, precipitation, humidity, wind, and other meteorological variables) over time, whether due to natural variability, human activities, or a combination of both, and cannot be characterized by an individual event or anomalous weather pattern. For example, a severe drought or abnormally hot summer in a particular region is not a certain indication of climate change. However, a series of severe droughts or hot summers that statistically alter the trend in average precipitation or temperature over decades may indicate climate change. Recent research has begun to attribute certain extreme weather events to climate change (U.S. Global Change Research Program [USGCRP], 2018).

The leading U.S. scientific body on climate change is the USGCRP, composed of representatives from 13 federal departments and agencies.¹⁵ The Global Change Research Act of 1990 requires the USGCRP to submit a report to the President and Congress no less than every four years that “1) integrates, evaluates, and interprets the findings of the USGCRP; 2) analyzes the effects of global change on the natural

¹⁵ The USGCRP member agencies are: Department of Agriculture, Department of Commerce, Department of Defense, Department of Energy, Department of Health and Human Services, Department of the Interior, Department of State, Department of Transportation, Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and U.S. Agency for International Development.

environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years.” These reports describe the state of the science relating to climate change and the effects of climate change on different regions of the United States and on various societal and environmental sectors, such as water resources, agriculture, energy use, and human health.

In 2017 and 2018, the USGCRP issued its *Climate Science Special Report: Fourth National Climate Assessment*, Volumes I and II (Fourth Assessment Report) (USGCRP, 2017; and USGCRP, 2018, respectively). The Fourth Assessment Report states that climate change has resulted in a wide range of impacts across every region of the country. Those impacts extend beyond atmospheric climate change alone and include changes to water resources, transportation, agriculture, ecosystems, and human health. The U.S. and the world are warming; global sea level is rising and acidifying; and certain weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHG in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture, clearing of forests, and other natural sources. These impacts have accelerated throughout the end of the 20th and into the 21st century (USGCRP, 2018).

GHGs were identified by the EPA as pollutants in the context of climate change. GHG emissions do not result in proportional local impacts; it is the combined concentration in the atmosphere that affects the global climate. These are fundamentally global impacts that feedback to local and regional climate change impacts. Thus, the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional. For example, a project 1 mile away emitting 1 ton of GHGs would contribute to climate change in a similar manner as a project 2,000 miles distant also emitting 1 ton of GHGs.

Climate change is a global phenomenon; however, for this analysis, we will focus on the existing and potential cumulative climate change impacts in the Project area. The USGCRP’s Fourth Assessment Report notes the following observations of environmental impacts are attributed to climate change in the Midwest region (USGCRP, 2017; USGCRP, 2018):

- the Midwest region has experienced an increase in annual average temperatures of 1.25 °F; since the first half of the 20th century, with a greater warming of average daily minimum temperature;

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- the Midwest has seen increasing rainfall over the past 50 years, with a large increase in heavy rainfall events;
- heavy rainfall events are leading to more flooding, erosion, and runoff into waterways;
- rainfall and humidity have been increasing during spring and early summer;
- an average of 9 additional frost-free growing season days; and
- a shift of range of about 30 miles of many understory species to the northwest, following the direction of climate shift.

The USGCRP’s Fourth Assessment Report notes the following projections of climate change impacts in the Project region (Northeast United States) with a high or very high level of confidence¹⁶ (USGCRP, 2018):

- annual average temperatures in the Midwest are projected to increase by 4.2°–5.3°F by the mid-21st century and by 5.6°–9.5°F by the late 21st century, compared to the average for 1976–2005;
- while days in Midwestern cities over 100°F are rare, they could become increasingly more common by late century;
- winter and spring precipitation are important to flood risk in the Midwest and are projected to increase by up to 30% by the end of this century; and
- unless offset by additional reductions of ozone precursor emissions, climate change will increase ozone levels over most of the Midwest, particularly over already polluted areas.

It should be noted that while the impacts described above taken individually may be manageable for certain communities, the impacts of compound extreme events (such as simultaneous heat and drought, wildfires associated with hot and dry conditions, or

¹⁶ The report authors assessed current scientific understanding of climate change based on available scientific literature. Each “Key Finding” listed in the report is accompanied by a confidence statement indicating the consistency of evidence or the consistency of model projections. A high level of confidence results from “moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.), medium consensus.” A *very* high level of confidence results from “strong evidence (established theory, multiple sources, consistent results, well documented and accepted methods, etc.), high consensus.”
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flooding associated with high precipitation on top of saturated soils) can be greater than the sum of the parts (USGCRP, 2018).

The GHG emissions associated with construction and operation of the Project were identified and quantified in section B.7 of the EA. Construction and operation of the Project would increase the atmospheric concentration of GHGs in combination with past, current, and future emissions from all other sources globally and contribute incrementally to future climate change impacts. In order to assess impacts on climate change associated with the Project, Commission staff considered whether it could identify discrete physical impacts resulting from the Project's GHG emissions or compare the Project's GHG emissions to established targets designed to combat climate change.

To date, Commission staff has not identified a methodology to attribute discrete, quantifiable, physical effects on the environment resulting from the Project's incremental contribution to GHGs. We have looked at atmospheric modeling used by the EPA, National Aeronautics and Space Administration, the Intergovernmental Panel on Climate Change, and others, and we found that these models are not reasonable for project-level analysis for a number of reasons. For example, these global models are not suited to determine the incremental impact of individual projects, due to both scale and overwhelming complexity. We also reviewed simpler models and mathematical techniques to determine global physical effects caused by GHG emissions, such as increases in global atmospheric CO₂ concentrations, atmospheric forcing, or ocean CO₂ absorption. We could not identify a reliable, less complex model for this task and thus staff could not determine specific localized or regional physical impacts from GHG emissions from the Project. Without the ability to determine discrete resource impacts, Commission staff are unable to assess the Project's contribution to climate change through any objective analysis of physical impact.

Additionally, we have not been able to find any GHG emission reduction goals established at the state¹⁷ or federal level that we can use as comparative criteria for project level emissions.¹⁸ We note that there have been a series of recent administrative changes and we continue to evaluate their impact on our review process. For example, on January 20, 2021, President Biden issued the *Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (EO

¹⁷ We reviewed the U.S. State Greenhouse Emission Targets site for individual state requirements at: <https://www.c2es.org/document/greenhouse-gas-emissions-targets/>

¹⁸ The national emissions reduction targets expressed in the EPA's Clean Power Plan were repealed, *Greenhouse Gas Emissions From Existing Electric Utility Generating Units; Revisions to Emissions Guidelines Implementing Regulations*, 84 Fed. Reg. 32,250, 32,522-32, 532 (July 8, 2019), and the targets in the Paris Climate Accord were withdrawn (November 2020).

B. ENVIRONMENTAL ANALYSIS

13990) and on January 27, 2021, the *Executive Order on Tackling the Climate Crisis at Home and Abroad* (EO 14008). Amongst other objectives, the Executive Orders call for a net-zero emission economy and a carbon-free electricity sector. In addition, on January 20, 2021, President Biden announced that the U.S. will rejoin the Paris Climate Agreement (Agreement), enabling the U.S. to be a party to the Agreement on February 19, 2021. The Agreement is a binding international agreement to reduce GHG emissions and impacts on climate change that was signed by 196 parties on December 12, 2015 and entered into force on November 4, 2016. The Agreement aims to limit global warming to well below 2 degrees Celsius, and preferably to 1.5 degrees Celsius, compared to pre-industrial levels.¹⁹ Prior to the U.S. withdrawal from the Agreement in November 2020, the U.S. initially proposed a 26 to 28 percent domestic reduction in GHG by 2025 compared to 2005.²⁰ It is not yet clear if the U.S. would retain or modify these goals upon rejoining the Agreement.

¹⁹ Additional information is available at <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

²⁰<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20States%20of%20America%20First/U.S.A.%20First%20NDC%20Submission.pdf>

C. ALTERNATIVES

In accordance with NEPA and Commission policy, we consider and evaluate alternatives to the proposed action, including the no-action alternative, system alternatives, aboveground facility location alternatives, and abandonment alternatives. As the proposed action involves construction and abandonment of pipelines within an existing pipeline corridor, alternative pipeline routes were not considered. Additionally, as the proposed action involves only aboveground facilities necessary to connect the proposed Lake City 2nd branch line extension to the existing pipeline and to facilitate safe operation of the pipeline extension and other system modifications, no aboveground facility alternative locations were considered.

Alternatives were evaluated using a specific set of criteria. The evaluation criteria applied to each alternative include a determination of whether the alternative:

- meets the objective of the proposed Project;
- is technically and economically feasible and practical; and
- offers a significant environmental advantage over the proposed Project.

Through environmental comparison and application of our professional judgment, each alternative is considered (in the sequence identified above) to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. An alternative that cannot achieve the purpose for the Project cannot be considered as an acceptable replacement for the Project.

Not all conceivable alternatives are technically and economically feasible and practical. Technically feasible alternatives, with exceptions, would generally involve the use of common pipeline construction methods. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. An alternative that would involve the use of a new, unique, or experimental construction method(s) may be technically feasible, but not economically practical. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render the project economically impractical.

To determine if an alternative is practicable and would provide a significant environmental advantage over the proposed action, we compare the impacts of the alternative and the proposed action (e.g., number of wetlands/waterbodies affected by the alternative and number of wetlands/waterbodies affected by the proposed action). To ensure consistent environmental comparisons and to normalize the comparison of

resources, we generally use “desktop” sources of information (e.g., publicly available data, aerial imagery) and assume the same construction and operation right-of-way widths and general workspace requirements. We evaluate data collected in the field if surveys were completed for both the proposed action and the corresponding alternative. Our environmental comparison uses common factors such as (but not limited to) total amount of land affected, length/distance of the pipeline route, and acres affected of a resource. Furthermore, this analysis considers impacts on both the natural and human environments.

Our determinations attempt to balance the overall impacts (and other relevant considerations) of the alternative(s) and the proposed action. Recognizing the often competing interests driving alternatives and the differing nature of impacts resulting from an alternative (i.e., impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative or discount or eliminate factors that are not relevant or may have less weight or significance. Ultimately, an alternative that is environmentally comparable or results in minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

One of the goals of an alternatives analysis is to identify alternatives that would result in less environmental impact. In this EA, we evaluated each environmental resource potentially affected by the Project and concluded that constructing and operating the Project would not significantly impact these resources. Consistent with our conclusions, the value gained by further reducing the (not significant) impacts of the Project when considered against the cost of relocating the activities to a new set of landowners was also factored into our evaluation.

1. No-Action Alternative

The No-Action Alternative could be achieved by the Commission deciding to not authorize the proposal. The impacts disclosed in this EA would not occur, at the cost of not meeting the purpose, need, and goals of the Project. Though it would result in less impacts on landowners and the environment (increasing maintenance and repairs and associated ground disturbance are still expected to occur), the No-Action alternative would not allow Northern to enhance the safety and operational efficiency of its existing interstate natural gas transmission pipeline system. Therefore, we conclude that the no-action alternative would not meet the objectives of the Project.

2. System Alternatives

System alternatives are those that would make use of other existing, modified, or

proposed pipeline systems to meet the Project objectives. To be considered viable, such alternatives must have the ability to provide an equivalent amount of transportation capacity to the customers in the area. Use of a system alternative would make it unnecessary to construct all or part of the proposed Project, though some modifications or additions to the existing or planned systems may be required. Such modifications or additions would likely result in environmental impacts; however, these impacts could be less than, similar to or even greater than those associated with the proposed Project.

In addition to the Lake City 1st branch line, which Northern proposes to abandon, Northern operates the Lake City 2nd branch line and the Lake City 3rd branch line. As it exists, the Lake City 2nd branch line is incapable without modification of providing the necessary replacement natural gas transmission capacity. Northern's proposed extension of the Lake City 2nd branch line makes use of this existing pipeline system to reduce impacts on the environment. As it exists, the Lake City 3rd branch line is incapable without modification of providing the necessary replacement natural gas transmission capacity. To provide the necessary replacement natural gas transmission capacity, the existing Lake City 3rd branch line would need to be extended by 22 miles which would result in greater impacts on the environment than that of the 9-mile extension of the Lake City 2nd branch line. Therefore, we conclude that system alternatives would not offer a significant environmental advantage over the proposed Project.

3. Abandonment by Removal

As proposed and evaluated in the preceding analysis, Northern would abandon 34.15 miles of the Lake City 1st branch line in-place. As an alternative to abandoning this pipeline in-place, we considered abandonment-by-removal. However, when compared to abandonment in-place, disturbing approximately 34.15 miles of land to remove the Lake City 1st branch line would result in considerably greater impacts on the environment. Additionally, land affected for abandonment-by-removal would further increase as additional temporary workspaces and contractor yards would be required to complete the project. The impacts on the environment including impacts on soils, water resources, vegetation and wildlife, cultural resources, land use and air and noise would be similar to those described for construction of the Lake City 2nd branch line extension in the preceding analysis. Therefore, based on the considerably greater amount of land that would be affected by abandonment-by-removal and the likely subsequent impacts on the environment, we conclude this alternative would not provide a significant environmental advantage over the proposed action.

4. Conclusion

No system alternatives were identified that would meet our evaluation criteria for recommendation. We also found that the alternative of abandoning the pipeline by removal does not provide a significant environmental advantage over the proposed Project. Therefore, we conclude that the proposed Project is the preferred alternative to meet the Project's objectives.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Northern abandons, constructs, and operates the proposed facilities in accordance with its application and supplements, and the staff's recommended mitigation measures below, approval of the Project would not constitute a major action significantly affecting the quality of the human environment. We recommend that the Commission Order contain a finding of no significant impact and include the measures listed below as conditions in any authorization the Commission may issue to Northern.

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, or the Director's designee, **before using that modification.**

2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Project, and abandonment activities. This authority shall allow:
 - a. the modification of conditions of the Order;
 - b. stop-work authority; and
 - c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from Project construction, operation, and abandonment activities.

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 (EIs), and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming

D. CONCLUSIONS AND RECOMMENDATIONS

involved with construction and restoration activities.

4. The authorized abandonment and construction activities and 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 all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

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 pipeline 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, or the Director's designee, **before construction in or near that area**.

This requirement does not apply to extra workspace allowed by the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan* and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

D. CONCLUSIONS AND RECOMMENDATIONS

- 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 Order and before construction or abandonment activities begin**, Northern shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP, or the Director's designee. 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 EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
 - d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
 - e. the location and dates of the environmental compliance training and instructions 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:
 - (1) the completion of all required surveys and reports;
 - (2) the environmental compliance training of onsite personnel;
 - (3) the start of construction; and
 - (4) the start and completion of restoration.

D. CONCLUSIONS AND RECOMMENDATIONS

7. Northern shall employ at least one EI per construction spread. The EI(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. a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Northern shall file updated status reports with the Secretary on a **monthly** basis until all construction and restoration activities are complete, except during construction of the Lake City 2nd branch line extension when status reports shall be filed on a **biweekly** basis. 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 stream crossings or work in other environmentally-sensitive areas;
 - c. a listing of all problems encountered and each instance of noncompliance observed by the EI(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;
 - e. the effectiveness of all corrective actions implemented;
 - f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
 - g. copies of any correspondence received by Northern from other federal,

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state, or local permitting agencies concerning instances of noncompliance, and Northern's response.

9. Northern shall develop and implement an environmental complaint resolution procedure, and file such procedure with the Secretary, for review and approval by the Director of OEP, or the Director's designee. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, Northern shall mail the complaint procedures to each landowner whose property will be crossed by the Project.
 - a. In its letter to affected landowners, Northern shall:
 - (1) provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;
 - (2) instruct the landowners that if they are not satisfied with the response, they should call Northern's Hotline; the letter should indicate how soon to expect a response; and
 - (3) instruct the landowners that if they are still not satisfied with the response from Northern's Hotline, they should contact the Commission's Landowner Helpline at 877-337-2237 or at LandownerHelp@ferc.gov.
 - b. In addition, Northern shall include in its **monthly/biweekly** status report a copy of a table that contains the following information for each problem/concern:
 - (1) the identity of the caller and date of the call;
 - (2) the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;
 - (3) a description of the problem/concern; and
 - (4) an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.
10. Northern must receive written authorization from the Director of OEP, or the Director's designee, **before commencing construction or abandonment by removal of any Project facilities**. To obtain such authorization, Northern must file with the Secretary documentation that it

D. CONCLUSIONS AND RECOMMENDATIONS

has received all applicable authorizations required under federal law (or evidence of waiver thereof).

11. Northern must receive written authorization from the Director of OEP, or the Director's designee, **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.
12. **Within 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 facilities have been constructed and abandoned 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.

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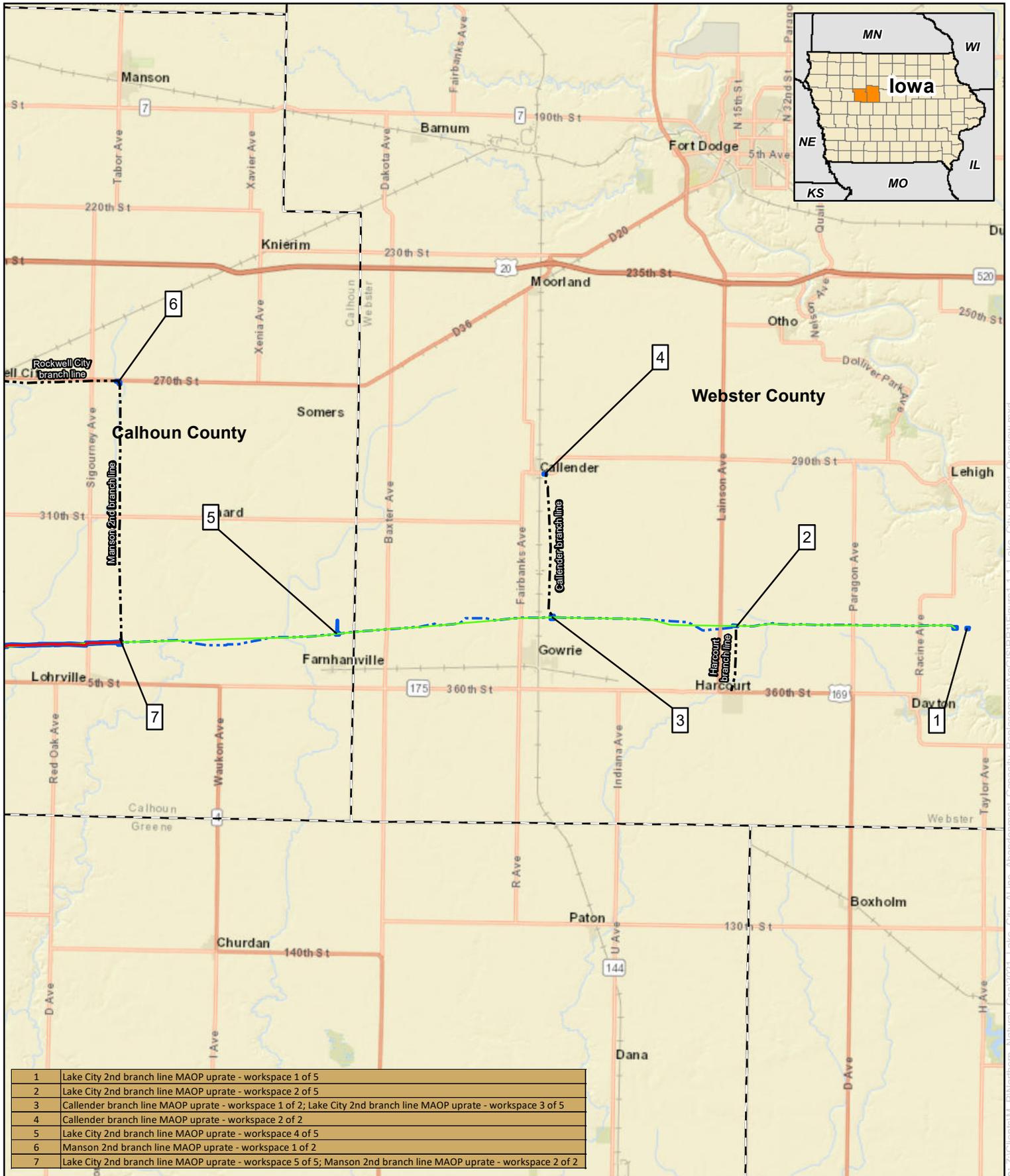
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Appendix A



1	Lake City 2nd branch line MAOP uprate - workspace 1 of 5
2	Lake City 2nd branch line MAOP uprate - workspace 2 of 5
3	Callender branch line MAOP uprate - workspace 1 of 2; Lake City 2nd branch line MAOP uprate - workspace 3 of 5
4	Callender branch line MAOP uprate - workspace 2 of 2
5	Lake City 2nd branch line MAOP uprate - workspace 4 of 5
6	Manson 2nd branch line MAOP uprate - workspace 1 of 2
7	Lake City 2nd branch line MAOP uprate - workspace 5 of 5; Manson 2nd branch line MAOP uprate - workspace 2 of 2

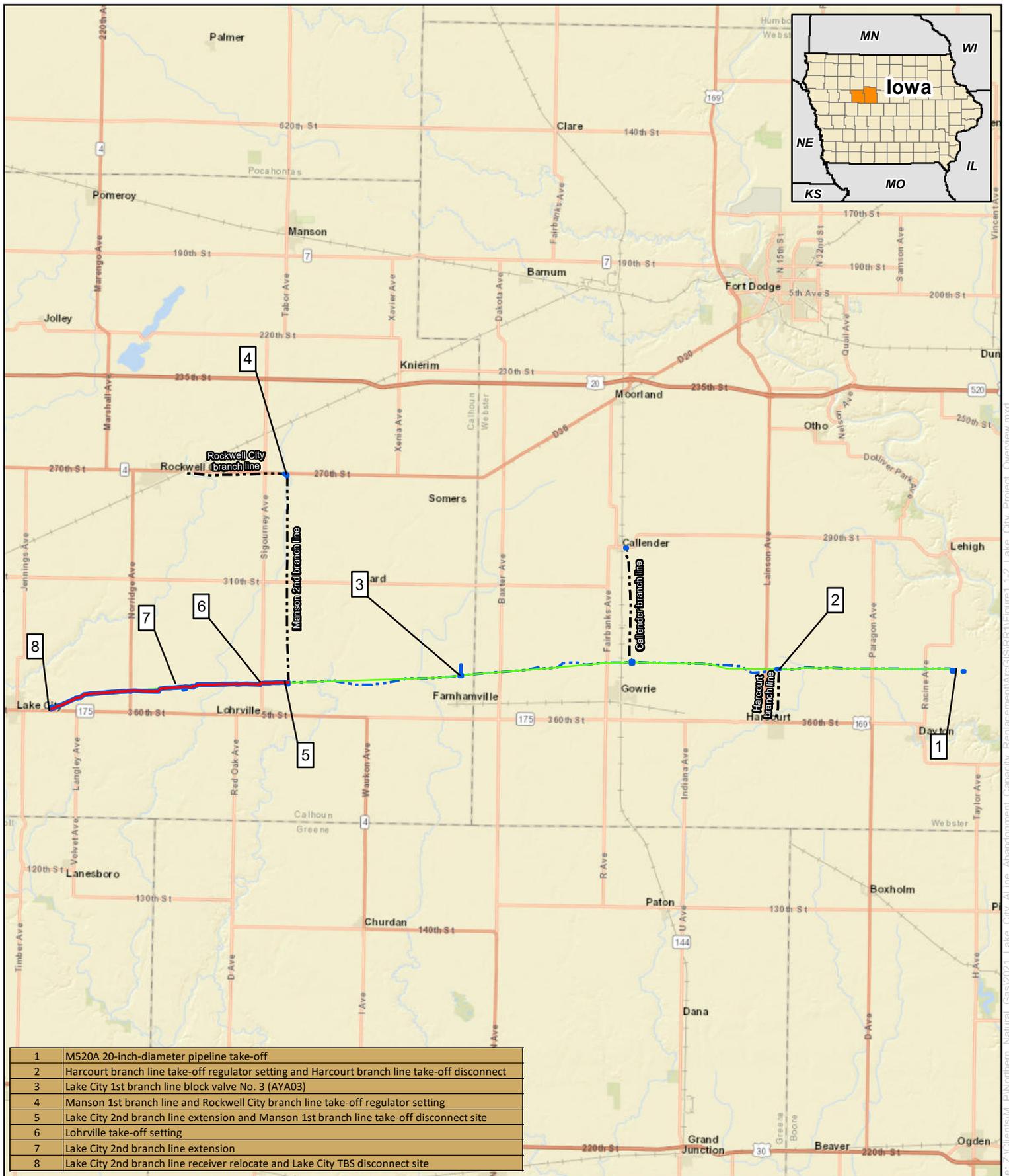


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Figure 1.1-1
Northern Natural Gas
Lake City 1st Branch Line Abandonment
and Capacity Replacement Project
Overview Map – 2021 Project Activities
Webster and Calhoun Counties, Iowa

- Proposed Lake City 2nd branch line Extension
- Existing Lake City 1st branch line
- - - Existing Lake City 2nd branch line
- - - Existing branch line
- Environmental Clearance Boundary

Source: Z:\Clients\W_P\Northern_Natural_Gas\2021_Lake_City_Line_Abandonment_Capacity_Replacement\ArcGIS\RTI\Figure1.1-1_Lake_City_Project_Overview.mxd Date: 12/16/2020



1	M520A 20-inch-diameter pipeline take-off
2	Harcourt branch line take-off regulator setting and Harcourt branch line take-off disconnect
3	Lake City 1st branch line block valve No. 3 (AYA03)
4	Manson 1st branch line and Rockwell City branch line take-off regulator setting
5	Lake City 2nd branch line extension and Manson 1st branch line take-off disconnect site
6	Lohrville take-off setting
7	Lake City 2nd branch line extension
8	Lake City 2nd branch line receiver relocate and Lake City TBS disconnect site

0 12,500 25,000 Feet

1 inch = 25,000 feet

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Figure 1.1-2
Northern Natural Gas
Lake City 1st Branch Line Abandonment
and Capacity Replacement Project
Overview Map – 2022 Project Activities
Webster and Calhoun Counties, Iowa

Proposed Lake City 2nd branch line Extension	Existing Lake City 1st branch line
Environmental Clearance Boundary	Existing Lake City 2nd branch line
	Existing branch line

Appendix B

Appendix B

Appendix B, Table 1 Land Required for Construction and Operation of Project in 2021			
Project Component/Facility/Workspace Type	County	Construction (acres)	Operation(acres)
MAOP uprates			
Lake City 2nd branch line MAOP uprate	Webster and Calhoun		
TWS		10.5	0.0
ATWS		1.2	0.0
Temporary Access Road		2.3	0.0
Callender branch line MAOP uprate ^a	Webster		
TWS		1.4	0.0
Manson 2nd branch line MAOP uprate ^b	Calhoun		
TWS		3.2	0.0
Temporary Access Road		0.5	0.0
Project Total (2021)		19.0	0.0
^a	For the Callender branch line MAOP uprate, one of the two TWS required to complete hydrostatic testing would be shared with workspace 3 of 5 associated with the Lake City 2nd branch line MAOP uprate. To avoid duplicating impacts, construction acreages are assigned to the Lake City 2nd branch line MAOP uprate.		
^b	For the Manson 2nd branch line MAOP uprate, one of the two TWS required to complete hydrostatic testing would be shared with workspace 5 of 5 associated with the Lake City 2nd branch line MAOP uprate. To avoid duplicating impacts, construction acreages are assigned to the Lake City 2nd branch line MAOP uprate.		
Note: Table values are rounded numbers. Due to rounding, subtotal or total numbers may not equal sum of addends.			

Appendix B

Appendix B, Table 2 Land Required for Construction and Operation of the Project in 2022			
Project Component/Facility/Workspace Type	County	Construction (acres)	Operation (acres)
Regulator Settings			
Harcourt branch line take-off regulator setting	Webster	-- a	0.1
New Permanent Driveway		--	0.1
Manson 1st branch line and Rockwell City branch line take-off regulator setting	Calhoun	3.2	0.2
New Permanent Driveway		-- b	< 0.1
Temporary Access Road		0.5	0.0
Subtotal Regulator Settings		3.7	0.4
Lake City 2nd branch line extension	Calhoun		
TWS		82.2	36.3 c
ATWS		17.3	0.0
Staging Areas		14.5	0.0
Temporary Access Roads		0.5	0.0
Lohrville take-off setting		-- d	< 0.1
Lake City 2nd branch line extension receiver relocate		-- d	< 0.1
New Permanent Driveway		-- d	< 0.1
Subtotal Lake City 2nd branch line extension		114.5	36.3
Lake City 1st branch line abandonment (disconnect sites)	Webster and Calhoun		
M520A 20-inch-diameter pipeline take-off	Webster	6.1	0.0
Harcourt branch line take-off	Webster	1.3	0.0
Lake City 1st branch line block valve No. 3 (AYA03)	Calhoun	1.8	0.0
Temporary Access Road		2.3	0.0
Manson 1 st and 2 nd branch line take-offs	Calhoun	-- e	0.0
Lake City TBS	Calhoun	-- e	0.0
Subtotal disconnect sites		11.5	0.0
Project Total (2022)		129.7	36.7

Appendix B

Appendix B, Table 2 Land Required for Construction and Operation of the Project in 2022			
Project Component/Facility/Workspace Type	County	Construction (acres)	Operation (acres)
a			
<p>Northern would use the same TWS to complete the Harcourt branch line take-off disconnect and construct the Harcourt branch line take-off regulator setting. To avoid duplicating impacts, construction acreages are assigned to the Harcourt branch line take-off disconnect site. No additional TWS or ATWS would be required for these Project activities.</p>			
b			
<p>The permanent driveway at the Manson 1st branch line and Rockwell City branch line take-off regulator setting would be constructed within the TWS for the regulator facility. To avoid duplicating impacts, construction acreages are assigned to the regulator setting. No additional TWS would be required to construct the permanent driveway.</p>			
c			
<p>Includes acres of new permanent right-of-way only. Portions of the new permanent right-of-way for the proposed Lake City 2nd branch line extension overlap the existing 50-foot-wide permanent right-of-way of Northern's existing pipelines. Acres of Northern's existing right-of-way in these areas are not included.</p>			
d			
<p>Northern would use TWS and ATWS associated with the Lake City 2nd branch line extension to relocate the receiver to the Lake City TBS and access (permanent driveway). In addition, the Lohrville take-off setting would be installed within the TWS and permanent right-of-way for the Lake City 2nd branch line extension. To avoid duplicating impacts, construction acreages for both facilities are assigned to the Lake City 2nd branch line extension. No additional workspace is needed for construction of these Project facilities.</p>			
e			
<p>Northern would use the same TWS and ATWS to construct the Lake City 2nd branch line extension and disconnect the Lake City 1st branch line at the Mason 1st and 2nd branch line take-off and Lake City TBS disconnect sites. To avoid duplicating impacts, construction acreages are assigned to the Lake City 2nd branch line extension. No additional TWS or ATWS would be required for these Project activities.</p>			
<p>Note: Table values are rounded numbers. Due to rounding, subtotal or total numbers may not equal sum of addends.</p>			

Appendix C

Appendix C

Temporary Access Road and Permanent Driveway Impacts								
Project Component	Approx. MP	Length (feet)	Planned Width (feet)	Road Type	Planned Use	Planned Modification	Area Affected (acres)	Existing Land Uses
MAOP uprates (2021)								
Lake City 2nd branch line MAOP uprate Temporary Access Road	N/A	1,996	50	New	Temporary	Remove Topsoil or Matting, Culvert	2.3	Agricultural, Developed
Manson 2nd branch line MAOP uprate Temporary Access Road	N/A	524	55	New	Temporary	Remove Topsoil or Matting, Culvert	0.5	Agricultural, Developed
Subtotal MAOP uprates		2,520					2.8	
Regulator Settings (2022)								
Harcourt branch line take-off regulator setting New Permanent Driveway	6.6	52	40	New	Permanent	Add Gravel, Culvert	0.1	Agricultural, Open Land
Manson 1st branch line and Rockwell City branch line take-off regulator setting New Permanent Driveway	7.8	45	40	New	Permanent	Add Gravel, Culvert	<0.1	Open Land
Temporary Access Road		524	55	New	Temporary	Remove Topsoil or Matting, Culvert	0.5	Agricultural, Developed
Subtotal Regulator Settings		621					0.6	
Lake City 2nd branch line extension (2022)								
Temporary Access Road	29.6	35	50	New	Temporary	Remove Topsoil or Matting, Culvert	<0.1	Open Land
Temporary Access Road	31.9	445	50	New	Temporary	Remove Topsoil or Matting, Culvert	0.4	Agricultural, Open Land
Lake City 2nd branch line extension receiver relocate New Permanent Driveway	34.2	22	20	New	Permanent	Remove Topsoil or Matting, Culvert	<0.1	Open Land
Subtotal extension		502					0.5	
Lake City 1st branch line abandonment (disconnect sites) (2022)								
Lake City 1st branch line block valve No. 3 (AYA03) Temporary Access Road	18.6	1,996	50	New	Temporary	Remove Topsoil or Matting, Culvert	2.3	Agricultural, Open Land
Subtotal disconnect sites		1,996					2.3	
Project Total		5,639					6.2	

Appendix D

Appendix D

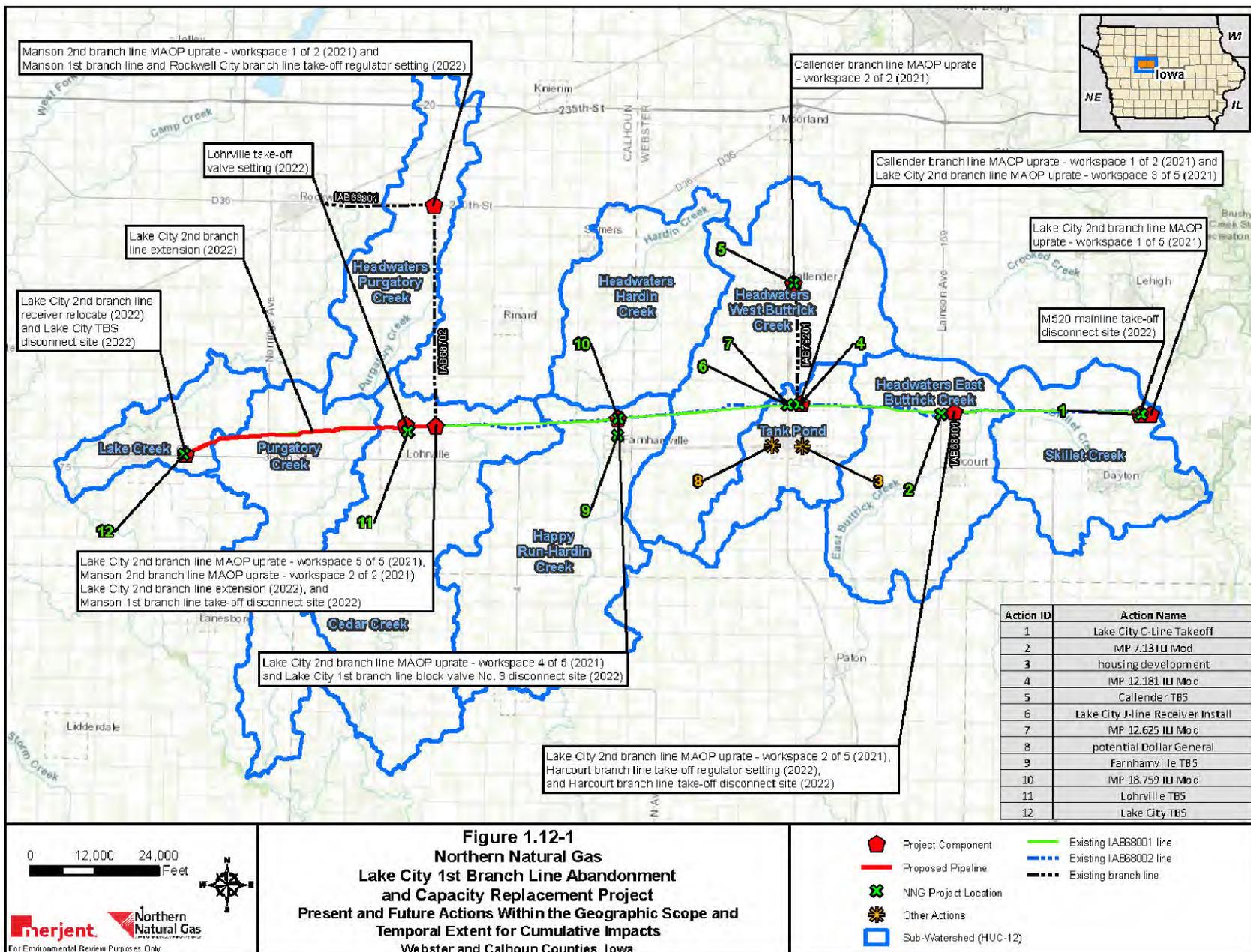
Appendix D, Table 1						
Past, Present, and Reasonably Foreseeable Activities and Projects Considered in the Cumulative Impact Analysis for the Project						
Activity/Project	Nearest Project Component	Approx. Distance from Project (miles) ^a	Description	Past, Present or Reasonably Foreseeable	Status or Timeframe	Within Geographic Scope for:
PIPELINE SYSTEM PROJECTS						
Lake City C-line Take-off	Lake City 2nd branch line MAOP uprate	0.0	Take-off location of the Lake City 2nd branch line from the M520C mainline. This will allow a redundant gas feed to the Lake City 2nd and 3rd branch lines.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
MP 7.13 ILI Mod	Lake City 2nd branch line MAOP uprate	0.0	Replace 2-inch saddle on 6-inch line with a 6-inch by 2-inch reducing tee with pig-guide bars.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
MP 12.181 ILI Mod (Callender branch line take-off)	Lake City 2nd branch line MAOP uprate	0.0	Replace 2-inch saddle on 6-inch line with a 6-inch by 2-inch reducing tee with pig-guide bars.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
Callender TBS	Callender branch line MAOP uprate	0.0	Upgrade TBS.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
MP 12.625 ILI Mod (JYJ02 Modification)	Lake City 2nd branch line MAOP uprate	0.0	Replace existing block valve setting. This will include replacing the valve with a full-port ball valve, and placing valve setting below grade.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
MP 18.759 ILI Mod (JYJ03 Removal)	Lake City 2nd branch line MAOP uprate	0.0	Remove existing block valve setting and replace with spool of pipe.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
Farnhamville TBS	Lake City 2nd branch line MAOP uprate	0.8	Upgrade TBS and build new take-off and branch line.	Reasonably foreseeable	Spring 2021	Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual
Lake City J-line Receiver Install	Lake City 2nd branch line MAOP uprate /Lake City 2nd branch line extension	0.0	Add a temporary receiver at the end of the existing 2nd branch line.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise

Appendix D

Appendix D, Table 1						
Past, Present, and Reasonably Foreseeable Activities and Projects Considered in the Cumulative Impact Analysis for the Project						
Activity/Project	Nearest Project Component	Approx. Distance from Project (miles) ^a	Description	Past, Present or Reasonably Foreseeable	Status or Timeframe	Within Geographic Scope for:
Lohrville TBS	Lake City 2nd branch line extension	0.0	Upgrade TBS and build new take-off and branch line.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
Lake City TBS	Lake City 2nd branch line extension	0.0	Upgrade TBS.	Reasonably foreseeable	Spring 2021	Soils, Groundwater, Surface Waters, Wetlands, Vegetation, Wildlife, Land Use, Visual, Recreation, Air Quality, Noise
INDUSTRIAL AND COMMERCIAL DEVELOPMENTS						
Lake City Fiber Optic Line	Lake City 2nd branch line extension	Unknown	Webster-Calhoun Cooperative Telephone Association to install a new fiber optic line to service residents of Lake City.	Reasonably foreseeable	Summer 2020	NA-Webster-Calhoun Cooperative Telephone Association was unable to provide project location.
Lohrville Fiber Optic Line	Lake City 2nd branch line extension	Unknown	Webster-Calhoun Cooperative Telephone Association to install a new fiber optic line to service residents of Lohrville.	Reasonably foreseeable	Summer 2020	NA-Webster-Calhoun Cooperative Telephone Association was unable to provide project location.
^a Approximate distance listed represents the feature or facility closest to the Project.						

Appendix D

Appendix D, Table 2									
Impacts on Resources from Past, Present, and Reasonably Foreseeable Activities and Projects Considered in the Cumulative Impact Analysis for the Project									
Activity/Project	Includes Air Pollutant Emitting Facilities?	Temporal Overlap?	Acres of Impact within Geographic Scope by Resource						
			Soils Construction Workspace	Groundwater, Vegetation, Wildlife HUC 12 Watershed	Land Use 1-mile Radius	Air Quality (construction) 0.25-mile Radius	Noise (construction) 0.25-mile Radius	Prime Farmland ^a	Erodible Soils ^b
PIPELINE SYSTEM PROJECTS									
Lake City C-line Take-off	No	Yes	0.6	1.1	1.1	1.1	1.1	1.1	0
MP 7.13 ILI Mod	No	Yes	0	1.4	1.4	0.0	0.0	1.4	0
MP 12.181 ILI Mod (Callender branch line take-off)	No	Yes	5.5	5.5	5.5	5.5	5.5	5.5	0
Callender TBS	No	Yes	0.1	0.1	0.1	0.1	0.1	0.1	0
MP 12.625 ILI Mod (JYJ02 Modification)	No	Yes	0	2.8	2.8	0	0	2.8	0
MP 18.759 ILI Mod (JYJ03 Removal)	No	Yes	1.8	1.8	1.8	1.8	1.8	1.7	0
Farnhamville TBS	No	Yes	0	>0.1	>0.1	0	0	>0.1	0
Lake City J-line Receiver Install	No	Yes	0	0	0	0	0	0	0
Lohrville TBS	No	Yes	0	>0.1	>0.1	>0.1	>0.1	>0.1	0
Lake City TBS	No	Yes	>0.1	>0.1	>0.1	>0.1	>0.1	>0.1	0
INDUSTRIAL AND COMMERCIAL DEVELOPMENTS									
Lake City Fiber Optic Line ^c	No	Yes	0	0	0	0	0	0	0
Lohrville Fiber Optic Line ^c	No	Yes	0	0	0	0	0	0	0
^a	Includes all categories of prime farmland, including prime farmland if drained. Source: Soil Survey Staff, NRCS, USDA. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ . Accessed May 2020.								
^b	Includes all soils in the SSURGO database that are classified as wind or water erodible soils. Wind erodible soils are characterized as having a WEG rating of 1 or 2, or which are highly wind erodible, and water erodible soils are characterized as map units with a slope greater than 15 percent or soils with a K value of greater than 0.35 and slopes greater than 5 percent. Source: Soil Survey Staff, NRCS, USDA. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ . Accessed May 2020.								
^c	Webster-Calhoun Cooperative Telephone Association was unable to provide the exact location of the fiber optic line location for either project.								



Appendix D

Appendix D, Table 3																			
Area and Percent of Watershed Affected by the Project and Projects in the Cumulative Impacts Area																			
Activity/Project	Watershed																		
	Skillet Creek (20,977 acres)		Headwaters East Buttrick Creek (26,185 acres)		Tank Pond (12,476 acres)		Headers West Buttrick Creek (34,737 acres)		Happy Run- Hardin Creek (35,295 acres)		Cedar Creek (38,737 acres)		Purgatory Creek (27,657 acres)		Headwaters Purgatory Creek (18,495 acres)		Lake Creek (10,130 acres)		
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	
Lake City 1st Branch Line Abandonment and Capacity Replacement Project	8.0	0.03%	1.3	0.005%	5.5	0.04%	1.4	0.004%	4.1	0.01%	26.9	0.07%	72.0	0.2%	3.7	0.02%	16.9	0.2%	
Pipeline System Projects (see Table 1.12-2)	1.1	0.005%	1.4	0.005%	8.3	0.07%	1.4	0.004%	1.9	0.005%	0.9	0.002%	0.0	0.0%	0.0	0.0%	0.0	0.0%	
Industrial and Commercial Developments (see Table 1.12- 2) ^a	0.0	0.0%	0.0	0.0%	0.0	0.0%	20.0	0.06%	20.0	0.06%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	
Total	9.1	0.04%	2.7	0.01%	13.8	0.1%	2.8	0.07%	6.0	0.07%	27.8	0.07%	72.0	0.2%	3.7	0.02%	16.9	0.2%	

^a The locations and size of these projects is currently unknown. Northern has conservatively estimated their impacts to be 10 acres per county per project, and their location to be similar to the proposed Project where Webster and Calhoun Counties meet.

Appendix E

Appendix E

Indian Tribes Contacted		
Tribes Sent FERC's 8/31/20 NOI	Tribes Sent 2/5/20 & 6/18/20 Letters from Northern	Responses
Apache Tribe of Oklahoma c/o Durrell Cooper and Bob Komardley, Chair	Apache Tribe of Oklahoma c/o Bob Komardley, Chair	None filed to date
Cheyenne and Arapaho Tribes, Oklahoma c/o Reggie Wassana, Governor, and Max Bear, THPO a/	Cheyenne and Arapaho Tribes of Oklahoma c/o Reggie Wassana, Governor, and Max Bear, THPO	None filed to date
Citizen Potawatomi Nation of Oklahoma c/o John Barrett, and Kelli Mosteller, THPO		None filed to date
Flandreau Santee Sioux Tribe in South Dakota c/o Anthony Reider, Chair, and Garrie Kills a Hundred, THPO	Flandreau Santee Sioux Tribe in South Dakota c/o Anthony Reider, Chair and Garrie Kills a Hundred, THPO	None filed to date
Forest County Potawatomi Community of Wisconsin c/o Ned Daniels, and Michael LaRonge, THPO		None filed to date
Ho-Chunk Nation of Wisconsin c/o Marlon White Eagle, President, and William Quackenbush, THPO	Ho-Chunk Nation of Wisconsin c/o Marlon White Eagle, President, and William Quackenbush, THPO	3/23/20 - Requested copy of the letter be emailed
Iowa Tribe of Kansas and Nebraska c/o Tim Rhodd, Chair, and Lance Foster, THPO	Iowa Tribe of Kansas and Nebraska c/o Tim Rhodd, Chair, and Lance Foster, THPO	None filed to date
Iowa Tribe of Oklahoma c/o Edgar Kent, Chair, and Amy Scott, THPO	Iowa Tribe of Oklahoma c/o Edgar Canton, Chair, and Amy Scott, THPO	None filed to date
Kaw Nation of Oklahoma c/o Lynn Williams		None filed to date
Kickapoo Traditional Tribe of Texas c/o Juan Garza		None filed to date
Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas c/o Lester Randall		None filed to date
Kickapoo Tribe of Oklahoma c/o David Pacheco		None filed to date
Kiowa Indian Tribe of Oklahoma c/o Matthew Komalty		None filed to date
Little Traverse Bay Bands of Odawa Indians in Michigan c/o Regina Gasco-Bentley, Chair, and Wesley Andrews, THPO	Little Traverse Bay Bands of Odawa Indians in Michigan c/o Regina Gasco-Bentley, Chair, and Wesley Andrews, THPO	None filed to date
Lower Sioux Indian Community in Minnesota c/o Robert Larsen, Brian Pendleton, President, and Cheyanne St. John, THPO	Lower Sioux Indian Community in Minnesota c/o Brian Pendleton, President, and Cheyanne St. John, THPO	None filed to date
Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians of Michigan c/o Bob Peters		None filed to date
Menominee Indian Tribe of Wisconsin c/o Joan Delabreau, Douglas Cox, Chair, and David Grignon, THPO	Menominee Indian Tribe of Wisconsin c/o Douglas Cox Sr., Chair, and David Grignon, THPO	None filed to date
Miami Tribe of Oklahoma c/o Douglas Lankford, Chair, George Strack, and Diane Hunter, THPO	Miami Tribe of Oklahoma c/o Douglas Lankford, Chief, and Diane Hunter, THPO	None filed to date
Nottawaseppi Huron Band of the Potawatomi in Michigan c/o Jamie Stuck		None filed to date

Appendix E

Indian Tribes Contacted		
Tribes Sent FERC's 8/31/20 NOI	Tribes Sent 2/5/20 & 6/18/20 Letters from Northern	Responses
Omaha Tribe of Nebraska c/o Isaac Sherman, Chair, and Thomas Parker, THPO	Omaha Tribe of Nebraska c/o Isaac Sherman, Jr., Chair, and Thomas Parker, THPO	None filed to date
Osage Nation of Oklahoma c/o Geoffrey Standing Bear, Chief, Dr. Andrea Hunter, THPO, and James Munkres, Archaeologist	Osage Nation of Oklahoma c/o Geoffrey Standing Bear, Principal Chief, and Dr. Andrea Hunter, THPO	None filed to date
Otoe-Missouria Tribe of Indians in Oklahoma c/o John Shotton, Chair, and Elsie Whitehorn, THPO	Otoe-Missouria Tribe of Indians in Oklahoma c/o John Shotton, Chair, and Elsie Whitehorn, THPO	3/4/20 – Requested copies of cultural resources reports
Pawnee Nation of Oklahoma c/o Walter Echo-Hawk, President, and Kellie Poolaw, THPO		None filed to date
Peoria Tribe of Indians of Oklahoma c/o Craig Harper, and Logan Pappenfort, Cultural Preservation Director		None filed to date
Pokagon Band of Potawatomi Indians in Michigan and Indiana c/o Matthew Wesaw, and Mike Zimmerman, THPO		None filed to date
Ponca Tribe of Nebraska c/o Oliver Little Cook, Larry Wright, President, and Nick Mauro, THPO	Ponca Tribe of Nebraska c/o Larry Wright, Jr., President, and Nick Mauro, THPO	None filed to date
Prairie Band of Potawatomi Nation in Kansas c/o Joseph Rupnick, Liana Onnen, Chair, and Hattie Mitchell, NAGPRA Representative	Prairie Band of Potawatomi Nation in Kansas c/o Liana Onnen, Chair, and Raphael Wahwassuck, NAGPRA Representative	3/23/20 - Requested email conveying letter about Project
Prairie Island Indian Community in Minnesota c/o Shelley Buck, President, and Franky Jackson, THPO	Prairie Island Indian Community in Minnesota c/o Shelley Buck, President, and Franky Jackson, THPO	None filed to date
Sac and Fox Nation of Missouri in Kansas and Nebraska c/o Tiauna Carnes, Chair	Sac and Fox Nation of Missouri in Kansas and Nebraska c/o Tiauna Carnes, Chair	None filed to date
Sac and Fox Nation of Oklahoma c/o Justin Wood, Kay Rhoads, Chief, and Anthony Duboise, THPO	Sac and Fox Nation of Oklahoma c/o Kay Rhoads, Principal Chief, and Anthony Duboise, THPO	None filed to date
Sac and Fox Nation of the Mississippi in Iowa c/o Judith Bender, Anthony Waseskuk, Chair, and Jonathan Buffalo, THPO	Sac and Fox Nation of the Mississippi in Iowa c/o Anthony Waseskuk, Chair, and Johnathan Buffalo, Historic Preservation Director	None filed to date
Santee Sioux Tribe of Nebraska c/o Rodger Trudell, and Duane Whipple, THPO		None filed to date
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation in South Dakota c/o Verlyn Beaudreau, Dave Flute, Chair, and Diane Desrosiers, THPO	Sisseton-Wahpeton Oyate in South Dakota c/o Dave Flute, Chair, and Diane Desrosiers, THPO	None filed to date
Spirit Lake Tribe of Fort Totten in North Dakota c/o Douglas Yankton, Myra Pearson, Chair, and Dr. Eric Longie, THPO	Spirit Lake Tribe of Fort Totten in North Dakota c/o Myra Pearson, Chair, and Dr. Erich Longie, THPO	None filed to date

Appendix E

Indian Tribes Contacted		
Tribes Sent FERC's 8/31/20 NOI	Tribes Sent 2/5/20 & 6/18/20 Letters from Northern	Responses
Three Affiliated Tribes of the Fort Berthold Reservation in North Dakota c/o Mark Fox and Jeff Desjarlais, THPO		None filed to date
Upper Sioux Community in Minnesota c/o Kevin Jensvold, Chair, and Samantha Odegard, THPO	Upper Sioux Community in Minnesota c/o Kevin Jensvold, Chair, and Samantha Odegard, THPO	None filed to date
Winnebago Tribe of Nebraska c/o Coly Brown, Frank White, Chair, Randy Teboe, Emily Deleon	Winnebago Tribe of Nebraska c/o Frank White, Chair, and Randy Teboe, THPO	2/13/20 – No concerns
Wyandotte Nation c/o Billy Friend, and Sherri Clemons, THPO		None filed to date
Yankton Sioux Tribe in South Dakota c/o Robert Flying Hawk, Chair, and Kip Spotted Eagle, THPO		None filed to date

a/ THPO = Tribal Historic Preservation Officer