

Northern Natural Gas

West Leg 2024 Expansion

Attachment E

Environmental Resource Report



West Leg 2024 Expansion Project

**Martin County, Minnesota
Dodge County, Nebraska**

Environmental Report for Prior Notice Filing

Attachment E

FERC Docket No. CP24-____-000

March 2024

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
RESOURCE REPORT 1 – GENERAL PROJECT DESCRIPTION	
1. Provide a detailed description and location map of the project facilities.(§ 380.12(c)(1))	Section 1.2 and Figure 1-1
2. Describe any nonjurisdictional facilities that would be built in association with the project. (§ 380.12(c)(2))	Section 1.8
3. Provide current original U.S. Geological Survey (USGS) 7.5-minute-series topographic maps with mileposts showing the project facilities; (§ 380.12(c)(3))	Figure 1-2
4. Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the project facilities; (§ 380.12(c)(3))	Figures 1-4 and 1-5 (filed as P&C)
5. Provide plot/site plans of compressor stations showing the location of the nearest noise-sensitive areas (NSA) within 1 mile. (§ 380.12(c)(3,4))	The project has no proposed compression. Northern is providing aerial photographs showing the location of the noise sensitive areas at each horizontal directional drill (HDD) for the project pipeline facilities and at the Columbus branch line tie-over regulator station. See Figure 9-1.
6. Describe construction and restoration methods. (§ 380.12(c)(6))	Section 1.3
7. Identify the permits required for construction across surface waters (§ 380.12(c)(9))	Table 1.6-1
8. Provide the names and addresses of all landowners whose land would be crossed by the project facilities. Include the names and addresses of all residents adjacent to new or modified compressor stations. (§ 380.12(c)(10))	Appendix C (filed as P&C)
RESOURCE REPORT 2 – WATER USE AND QUALITY	
1. Identify all perennial surface waterbodies crossed by the proposed project and their water quality classification. (§ 380.12(d)(1))	Table 2.2-2
2. Identify all waterbody crossings that may have contaminated waters or sediments. (§ 380.12(d)(1))	Sections 2.1.4 and 2.2
3. Identify watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the proposed project. (§ 380.12(d)(1))	Section 2.1 and 2.2, and Table 2.2-1
4. Provide a table (based on NWI maps if delineations have not been done) identifying all wetlands, by milepost and length, crossed by the project (including abandoned pipeline), and the total acreage and acreage of each wetland type that would be affected by construction. (§ 380.12(d)(1) and (4))	Table 2.2-3
5. Discuss construction and restoration methods proposed for crossing wetlands, and compare them to staff’s Wetland and Waterbody Construction and Mitigation Procedures; (§ 380.12(d)(2))	Sections 2.2.1 and 1.3

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
6. Describe the proposed waterbody construction impact mitigation and restoration methods to be used to cross surface waters and compare to the staff's Wetland and Waterbody Construction and Mitigation Procedures (§ 380.12(d)(2))	Section 2.2.1
7. Provide original National Wetlands Inventory (NWI) maps or the appropriate state wetland maps, if NWI maps are not available, that show all proposed facilities and include milepost locations for proposed pipeline routes. (§ 380.12(d)(4))	Figure 2-1
8. Identify all U.S. Environmental Protection Agency (EPA)- or state-designated aquifers crossed. (§ 380.12(d)(9))	Section 2.1.1
RESOURCE REPORT 3 – VEGETATION AND WILDLIFE	
1. Classify the fishery type of each surface waterbody that would be crossed, including fisheries of special concern. (§ 380.12(e)(1))	Section 3.1
2. Describe terrestrial and wetland wildlife and habitats that would be affected by the project. (§ 380.12(e)(2))	Section 3.3
3. Describe the major vegetative cover types that would be crossed and provide the acreage of each vegetative cover type that would be affected by construction. (§ 380.12(e)(3))	Section 3.2 and Table 3.3-2
4. Describe the effects of construction and operation procedures on the fishery resources and proposed mitigation measures. (§ 380.12(e)(4))	Section 3.1
5. Evaluate the potential for short-term, long-term, and permanent impact on the wildlife resources and state-listed endangered or threatened species caused by construction and operation of the project and proposed mitigation measures. (§ 380.12(e)(4))	Sections 3.3 and 3.4
6. Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the project and discuss results of consultations with other agencies. (§ 380.12(e)(5))	Section 3.4 and Table 3.4-1
7. Identify all federally listed essential fish habitat that potentially occurs in the vicinity of the project and the results of abbreviated consultations with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, and any resulting essential fish habitat assessment – (§ 380.12(e)(6))	Section 3.1
8. Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact. (§ 380.12(e)(4) and (6))	Section 3

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
RESOURCE REPORT 4 – CULTURAL RESOURCES	
1. Initial cultural resources consultation and documentation, and documentation of consultation with Native Americans. (§ 380.12(f)(1)(ii) and (2))	Appendix H (SHPO consultation)
2. Overview/Survey Report(s). (§ 380.12(f)(1)(iii) and (2))	Appendix F (filed as P&C)
RESOURCE REPORT 5 - SOCIOECONOMICS	
1. For major aboveground facilities and major pipeline projects that require an EIS, describe existing socioeconomic conditions within the project area. (§ 380.12(g)(1))	Sections 5.2 and 5.3
2. For major aboveground facilities, quantify impact on employment, housing, local government services, local tax revenues, transportation, and other relevant factors within the project area. (§ 380.12(g)(2) through (6))	Section 5.1
RESOURCE REPORT 6 – GEOLOGICAL RESOURCES	
1. Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities. (§ 380.12(h)(1) and (2))	Section 6
2. Identify any geologic hazards to the proposed facilities. (§ 380.12(h)(2))	Section 6
3. Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities. (§ 380.12(h)(3))	Section 1.3.5
4. For LNG projects in seismic areas, the materials required by "Data Requirements for the Seismic Review of LNG Facilities," NBSIR84-2833. (§ 380.12(h)(5))	Not applicable
5. For underground storage facilities, how drilling activity by others within or adjacent to the facilities would be monitored, and how old wells would be located and monitored within the facility boundaries. (§ 380.12(h)(6))	Not applicable
RESOURCE REPORT 7 - SOILS	
1. Identify, describe, and group by milepost the soils affected by the proposed pipeline and aboveground facilities. (§ 380.12(i)(1))	Table 7.1-1
2. For aboveground facilities that would occupy sites over 5 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. (§ 380.12(i)(2))	Not applicable
3. Describe, by milepost, potential impacts on soils. (§ 380.12(i)(3) and (4))	Tables 7.1-1 and 7.2-1

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
4. Identify proposed mitigation to minimize impact on soils, and compare with the staff's Upland Erosion Control, Revegetation, and Maintenance Plan. (§ 380.12(i)(5))	Sections 7.3 and 7.3.1
RESOURCE REPORT 8 – LAND USE, RECREATION AND AESTHETICS	
1. Classify and quantify land use affected by: (§ 380.12(j)(1)) a. Pipeline construction and permanent rights-of-way (§ 380.12(j)(1)); b. Extra work/staging areas (§ 380.12(j)(1)); c. Access roads (§ 380.12(j)(1)); d. Pipe and contractor yards (§ 380.12(j)(1)); and e. Aboveground facilities (§ 380.12(j)(1)).	Table 8.1-2
2. Identify by milepost all locations where the pipeline right-of-way would at least partially coincide with existing right-of-way, where it would be adjacent to existing rights-of-way, and where it would be outside of existing right-of-way. (§ 380.12(j)(1))	Table 8.1-3
3. Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent right-of-way, and temporary construction right-of-way. (§ 380.12(j)(1))	Figure 1-7
4. Summarize the total acreage of land affected by construction and operation of the project. (§ 380.12(j)(1))	Table 8.1-2
5. Identify by milepost all planned residential or commercial/business development and the time frame for construction. (§ 380.12(j)(3))	Sections 8.2.3 and 8.2.4
6. Identify by milepost special land uses (e.g., sugar maple stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§ 380.12(j)(4))	Section 8.2.2
7. Identify by beginning milepost and length of crossing all land administered by Federal, state, or local agencies, or private conservation organizations. (§ 380.12(j)(4))	Section 8.2.2
8. Identify by milepost all natural, recreational, or scenic areas, and all registered natural landmarks crossed by the project. (§ 380.12(j)(4) and (6))	Section 8.2.2
9. Identify all facilities that would be within designated coastal zone management areas. (§ 380.12(j)(4))	Section 8.2.2
10. Identify by milepost all residences that would be within 50 feet of the construction right-of-way or extra work area. (§ 380.12(j)(5))	Section 8.2.4
11. Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project. (§ 380.12(j)(6))	Section 8.2.2

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
12. Describe any measures to visually screen aboveground facilities, such as compressor stations. (§ 380.12(j)(11))	Section 8.3, Northern is not proposing any compressor stations.
13. Demonstrate that applications for rights-of-way or other proposed land use have been or soon will be filed with Federal land-managing agencies with jurisdiction over land that would be affected by the project. (§ 380.12(j)(12))	Not applicable
RESOURCE REPORT 9 – AIR AND NOISE QUALITY	
1. Describe existing air quality in the vicinity of the project. (§ 380.12(k)(1))	Section 9.1.1
2. Quantify the existing noise levels (day-night sound level (Ldn) and other applicable noise parameters) at noise-sensitive areas and at other areas covered by relevant state and local noise ordinances. (§ 380.12(k)(2))	Sections 9.2.1 and 9.2.2 and Tables 9.2-2 and 9.2-3
3. Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NOx) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project. (§ 380.12(k)(3))	Section 9.1.2 and Table 9.1-2
4. Describe the existing and proposed compressor units at each station where new, additional, or modified compression units are proposed, including the manufacturer, model number, and horsepower of the compresso units. (§ 380.12(k)(4))	Not applicable
5. Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure. (§ 380.12(k)(4))	The project has no proposed compression. Northern has identified nearby noise sensitive areas by distance and direction for the proposed HDDs. See Table 9.2-3. Table 9.2-8 lists the NSAs for the Columbus branch line tie-over regulator station.
6. Identify any applicable state or local noise regulations. (§ 380.12(k)(4))	Table 9.2-1
7. Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment. (§ 380.12(k)(4))	The project has no proposed compression; Northern has provided noise impact information from the proposed HDDs; see Table 9.2-6. Operation noise at the Columbus branch line tie-over regulator station is provided in Table 9.2-9.
RESOURCE REPORT 10 - ALTERNATIVES	
1. Address the "no action" alternative. (§ 380.12(l)(1))	Section 10.1
2. For large projects, address the effect of energy conservation or energy alternatives to the project. (§ 380.12(l)(1))	Section 10.1.1 and 10.1.2
3. Identify system alternatives considered during the identification of the project and provide the rationale for rejecting each alternative. (§ 380.12(l)(1))	Section 10.2 and Table 10.2-1
4. Identify major and minor route alternatives considered to avoid impact on sensitive	Section 10.3

APPENDIX A TO PART 380 - MINIMUM FILING REQUIREMENTS	LOCATION IN ENVIRONMENTAL REPORT
environmental areas (e.g., wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route. (§ 380.12(l)(3))	
5. Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site. (§ 380.12(l)(3))	Section 10.3
RESOURCE REPORT 11 – RELIABILITY AND SAFETY	
1. Describe how the project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes. (§ 380.12(m))	Section 11
RESOURCE REPORT 12 – PCB CONTAMINATION	
1. For projects involving the replacement or abandonment of facilities determined to have PCBs, provide a statement that activities would comply with an approved EPA disposal permit or with the requirements of the TSCA. (§ 380.12(n)(1))	Section 12
2. For compressor station modifications on sites that have been determined to have soils contaminated with PCBs, describe the status of remediation efforts completed to date. (§ 380.12(n)(2))	Not applicable

Contents

- 1 RESOURCE REPORT 1 – GENERAL PROJECT DESCRIPTION..... 1**
 - 1.1 PURPOSE AND NEED 1
 - 1.2 PROPOSED FACILITIES, LOCATIONS, AND LAND REQUIREMENTS 1
 - 1.3 CONSTRUCTION PROCEDURES 5
 - 1.3.1 Testing 6
 - 1.3.2 Cleanup and Restoration 7
 - 1.3.3 Construction Schedule and Workforce 7
 - 1.3.4 Training, Inspection, and Environmental Compliance..... 8
 - 1.3.5 Special Construction Techniques..... 8
 - 1.4 OPERATION AND MAINTENANCE PROCEDURES 12
 - 1.5 FUTURE PLANS AND ABANDONMENT 13
 - 1.6 PERMITS AND APPROVALS 13
 - 1.7 AFFECTED LANDOWNERS..... 16
 - 1.8 NON-JURISDICTIONAL FACILITIES 16
 - 1.9 CUMULATIVE IMPACTS 16
- 2 RESOURCE REPORT 2 – WATER USE AND QUALITY 18**
 - 2.1 GROUNDWATER RESOURCES 18
 - 2.1.1 Sole Source Aquifers..... 18
 - 2.1.2 Wells and Springs..... 18
 - 2.1.3 Wellhead Protection Areas..... 19
 - 2.1.4 Potential Sources of Groundwater Contamination 20
 - 2.1.5 Groundwater Construction and Operation Impacts and Mitigation..... 20
 - 2.2 SURFACE WATER AND WETLAND RESOURCES 21
 - 2.2.1 Construction and Operation Impacts and Mitigation 25
- 3 RESOURCE REPORT 3 – FISHERIES, VEGETATION, AND WILDLIFE 26**
 - 3.1 FISHERIES 26
 - 3.2 VEGETATION 28
 - 3.3 WILDLIFE 30
 - 3.4 THREATENED AND ENDANGERED SPECIES 32
- 4 RESOURCE REPORT 4 – CULTURAL RESOURCES..... 38**
 - 4.1 CULTURAL RESOURCE SURVEY 39
 - 4.1.1 MNM80511 C-line extension 39
 - 4.1.2 Columbus Branch Line Tie-Over Regulator Station..... 40
 - 4.2 STATUS OF THE STATE HISTORIC PRESERVATION OFFICE CONSULTATIONS.. 40
- 5 RESOURCE REPORT 5 – SOCIOECONOMICS..... 41**
 - 5.1 LOCAL SETTING 41

5.2 SOCIOECONOMIC DATA..... 42

5.3 ENVIRONMENTAL JUSTICE COMMUNITIES..... 44

5.4 COMMUNITY ENGAGEMENT..... 45

6 RESOURCE REPORT 6 – GEOLOGICAL RESOURCES..... 45

7 RESOURCE REPORT 7 – SOILS..... 48

7.1 EXISTING SOIL RESOURCES 48

7.2 EXISTING SOIL LIMITATIONS..... 49

7.2.1 Prime Farmland..... 51

7.2.2 Water and Wind Erosion Hazard..... 51

7.2.3 Drainage Classification and Hydric Soils..... 51

7.2.4 Compaction and Rutting Potential..... 52

7.2.5 Corrosion Potential..... 52

7.2.6 Shallow Bedrock 52

7.2.7 Revegetation Concerns..... 53

7.3 GENERAL CONSTRUCTION/OPERATION IMPACT MITIGATION..... 53

7.3.1 Consistency with the FERC Upland Erosion Control, Revegetation, and Maintenance Plan 55

8 RESOURCE REPORT 8 – LAND USE, RECREATION, AND AESTHETICS 55

8.1 LAND REQUIREMENTS 55

8.2 LAND USE IMPACTS AND MITIGATION MEASURES..... 63

8.2.1 Land Use..... 64

8.2.2 Public Land, Recreation, and Other Designated Areas..... 65

8.2.3 Planned Residential and Commercial Areas 66

8.2.4 Existing Residences and Buildings..... 67

8.3 VISUAL RESOURCES IMPACTS AND MITIGATION MEASURES 67

9 RESOURCE REPORT 9 – AIR AND NOISE..... 67

9.1 AIR QUALITY 67

9.1.1 Existing Conditions 67

9.1.2 Anticipated Air Quality Impacts and Mitigation..... 69

9.1.3 Air Quality Mitigation Measures 73

9.1.4 Climate Change 74

9.2 NOISE 76

9.2.1 Applicable Noise Guidelines 76

9.2.2 Existing Noise Levels..... 77

9.2.3 Construction Noise Impacts 78

9.2.4 Operational Noise Impacts..... 84

9.2.5 Noise Mitigation Measures 86

9.3 CUMULATIVE IMPACTS 86

9.3.1 Cumulative Air Quality Impacts..... 86

9.3.2 Cumulative Noise Impacts 86

10 RESOURCE REPORT 10 – ALTERNATIVES 86

 10.1 NO-ACTION ALTERNATIVE 86

 10.1.1 Energy Conservation 87

 10.1.2 Energy Alternatives 87

 10.2 SYSTEM ALTERNATIVES 87

 10.3 ROUTE AND ABOVEGROUND FACILITY ALTERNATIVES 89

11 RESOURCE REPORT 11 – RELIABILITY AND SAFETY 89

 11.1 HAZARDS 89

 11.2 SAFETY STANDARDS 90

 11.2.1 Traffic Control 90

 11.2.2 Public Access 91

 11.2.3 Welding 91

 11.3 VALVE ISOLATION SAFETY 91

 11.4 PUBLIC EDUCATION PROGRAM 91

 11.5 SECURITY AND TERRORISM 91

12 RESOURCE REPORT 12 – PCB CONTAMINATION 92

13 REFERENCES 93

List of Tables

Table 1.1-3 Pipeline Facility 2

Table 1.2-1 Land Requirements for the Pipeline and Aboveground Facilities 4

Table 1.3-1 Road Approach Locations 9

Table 1.3-2 HDD Locations 10

Table 1.3-3 Public Road Crossings 11

Table 1.6-1 Permits, Approvals, and Consultations Required for Construction of the Project 14

Table 2.1-1 Water Supply Wells Surrounding the Project 19

Table 2.2-1 Watershed and River Basins Crossed by the Project 21

Table 2.2-2 Waterbodies Crossed by the Project 22

Table 2.2-3 Wetland Crossed by the Project 24

Table 3.3-2 Estimated Disturbance of Vegetation Cover Types 29

Table 3.4-1 Special Status Species that Potentially Occur in the Vicinity of the Project Area 35

Table 5.2-1 Minority Populations by Races and Ethnicity & Low-Income Populations in the Project Area 43

Table 5.2-2 Linguistically Isolated Population in the Project Area 44

Table 6.1-1 Steep Slopes Along the Project Centerline 46

Table 6.8-1 Geotechnical Testing Results 48

Table 7.1-1 Soil Associations Within the Project Area 48

Table 7.2-1 Soil Limitations Within the Project Area 50

Table 8.1-1 Land Crossed by the Project Pipeline 55

Table 8.1-2 Acreage Affected by Construction and Operation of the Project 56

Table 8.1-3 Existing Right of Way Paralleled by the Project 57

Table 8.1-4 Extra Temporary Workspace and Staging Areas 57

Table 8.1-5 Temporary and Permanent Access Roads 61

Table 8.1-6 Aboveground Facilities 63

Table 9.1-1 National Ambient Air Quality Standards..... 68
 Table 9.1-2 Emissions from Construction Equipment..... 72
 Table 9.1-3 Operational Emissions Summary..... 73
 Table 9.1-4 Potential GHG Emissions Impacts..... 75
 Table 9.2-1 MPCA State Noise Standards 77
 Table 9.2-2 Background Ambient Sound Pressure Levels for the Monitoring Locations..... 78
 Table 9.2-3 Summary of Identified HDD NSA Locations 79
 Table 9.2-4 Combined Equipment Sound Power at HDD Entry Pit 80
 Table 9.2-5 Combined Equipment Sound Power at HDD Exit Pit..... 80
 Table 9.2-6 HDD Noise Impact Summary Table..... 82
 Table 9.2-7 Summary of Identified Operational NSA Locations 84
 Table 9.2-8 Sound Power of Proposed Columbus Branch Line Tie-Over Regulator Station 84
 Table 9.2-9 Operational Noise Impact Summary Table 85
 Table 10.2-1 Comparison of System Alternatives 88

List of Figures

Figure 1-1 Project Overview Map
 Figure 1-2 Project Topographic Mapbook
 Figure 1-3 Sensitive Environmental Areas within 0.25 Mile of Proposed Project
 Figure 1-4 Alignment Sheets with Aerial Photograph – Public Version
 Figure 1-5 Alignment Sheets with Aerial Photograph (Filed as CUI//PRIV – Do Not Release)
 Figure 1-6 Facility Plot Plans (Filed as CUI//CEII – Do Not Release)
 Figure 1-7 Typical ROW Cross-Sectional Diagram
 Figure 1-8 Typical Crossings
 Figure 1-9 Cumulative Impacts
 Figure 2-1 Desktop and Field-Delineated Wetlands and Waterbodies
 Figure 5-1 US Demographic Locations
 Figure 6-1 Karst and Bedrock Geology
 Figure 6-2 FEMA Floodplains
 Figure 7-1 NRCS Soil Series Mapbook
 Figure 9-1 Approximate Locations with NSAs
 Figure 10-1 System Alternative

List of Appendices

Appendix A HDD Plan
 Appendix B Local Agency Correspondence
 Appendix C Landowner List – (Filed as CUI//PRIV – DO NOT RELEASE)
 Appendix D Noxious Weed Control Plan
 Appendix E Natural Resource Correspondence
 Appendix F Cultural Resources Report (Filed as CUI//PRIV – DO NOT RELEASE)
 Appendix G Unanticipated Discovery Plans
 Appendix H Cultural Resource Correspondence
 Appendix I Air Data
 Appendix J Northern’s PCB Disposal Requirements and Sampling For PCBs During Pipeline Removal
 Appendix K Environmental Complaint Resolution Procedure
 Appendix L Stormwater Pollution Prevention Plan
 Appendix M Winter Construction and Traffic Control Plans

Abbreviations and Acronyms

µg/m ³	Microgram
APE	Area of Potential Effect
AQCR	air quality control region
B-line	MNM80501 16-inch-diameter B-line
BCR	Bird Conservation Regions
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
C-line	MNM80511 16-inch-diameter C-line
CAA	Clean Air Act
CERT	Conservation and Environmental Review Tool
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
CP	cathodic protection
CWA	Clean Water Act
dB	Decibel
dBA	decibel in the A-weighted frequency scale
DOT	U.S. Department of Transportation
DWSMA	Drinking Water Supply Management Area
EI	Environmental Inspector
EPA	U.S. Environmental Protection Agency
ESB	environmental survey boundary
ETWS	extra temporary workspace
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gases
HAP	hazardous air pollutant
HDD	horizontal directional drill
HUC	Hydrologic Unit Code
Hz	Hertz
IPaC	Information for Planning and Consultation
L _d	daytime sound level
L _{dn}	day-night level
L _{eq}	equivalent sound level
L _n	nighttime sound level
LGU	Local government unit
LST	Leaking storage tank
MAOP	Maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MGS	Minnesota Geological Survey
MP	Milepost
MPCA	Minnesota Pollution Control Agency
MSI	Minnesota Spring Inventory
NAAQS	National Ambient Air Quality Standards

NABCI	North American Bird Conservation Initiative
NDEE	Nebraska Department of Environment and Energy
NDNR	Nebraska Department of Natural Resources
NHIS	Natural Heritage Information System
NHPA	National Historic Preservation Act
NLEB	northern long-eared bat
NGPC	Nebraska Game and Parks Commission
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
Northern	Northern Natural Gas
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRD	Natural Resource District
NRHP	National Register of Historic Places
NSA	noise sensitive area
NWI	National Wetlands Inventory
OCC	Operations Communication Center
ORVW	outstanding resource value water
OSHA	Occupational Safety and Health Administration
P&C	Privileged and Confidential
PCB	polychlorinated biphenyl
PIR	potential impact radius
Plan	FERC’s Upland Erosion Control, Revegetation, and Maintenance Plan
PM	particulate matter
PM _{2.5}	particulate matter with a diameter ≤ 2.5 microns
PM ₁₀	particulate matter with a diameter ≤ 10 microns
ppb	parts per billion by volume
ppm	parts per million by volume
Procedures	FERC’s Wetland and Waterbody Construction and Mitigation Procedures
Project	West Leg 2024 Expansion Project
psi	pounds per square inch
PSD	Prevention of Significant Deterioration
ROW	right of way
SHPO	State Historic Preservation Office
SLM	Sound level meter
SO ₂	sulfur dioxide
SPCC Plan	Spill Prevention, Control and Countermeasures Plan
SSURGO	Soil Survey Geographic Database
STAR	Science to Achieve Results
SWPA	Source Water Protection Areas
SWPPP	Stormwater Pollution Prevention Plan
TAR	temporary access road
TBS	town border station
T&E	threatened and endangered
tpy	tons per year
TWS	temporary workspace
UDP	Unanticipated Discovery Plan

USACE
USFWS
USGS
WHPA

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S. Geological Survey
Wellhead Protection Area

1 RESOURCE REPORT 1 – GENERAL PROJECT DESCRIPTION

Northern Natural Gas (Northern) owns and operates an interstate natural gas transmission pipeline system and associated aboveground facilities that extend from Texas to the Upper Peninsula of Michigan. Pursuant to the prior notice requirements set forth in 18 Code of Federal Regulations (CFR) § 157.208(c)(9), Northern is providing herewith an abbreviated analysis of potential environmental impacts associated with the West Leg 2024 Expansion Project (Project).¹ The Project will involve construction of approximately 4.53 miles of new pipeline to Northern’s natural gas transmission pipeline system in Martin County, Minnesota, and installation at an existing town border station (TBS) in Dodge County, Nebraska. A map depicting the Project location is provided as Figure 1-1.

1.1 PURPOSE AND NEED

The proposed facilities will serve markets for industrial, commercial and residential use that cannot be met by Northern’s existing infrastructure or by any alternatives, as discussed in Resource Report 10. Northern held an open season April 3, 2023, to April 21, 2023, to affirm and quantify market growth requirements, to solicit interest for firm transportation service, and to identify the need to construct facilities necessary to provide firm transportation service on Northern’s West Leg system. The open season also requested turnback capacity that could be used to meet the identified needs in lieu of constructing facilities. The open season resulted in nine customers requesting a total 12,960 dekatherms per day of peak winter volume with an in-service date of November 1, 2024. No capacity turnback request was received. This Project was designed to meet those requests for service.

1.2 PROPOSED FACILITIES, LOCATIONS, AND LAND REQUIREMENTS

Pipeline

MNM80511 C-line extension

Northern proposes to install and operate an approximately 4.53-mile extension of its 16-inch-diameter MNM80511 C-line (C-line) in Martin County, Minnesota, and associated aboveground appurtenant facilities. The upstream tie-in for the proposed C-line will occur within Northern’s existing Welcome south receiver and maximum allowable operating pressure (MAOP) regulator facility located west of 100th Ave. The Welcome south receiver and MAOP regulator facility will be relocated as part of this Project and is more fully described below. Northern is renaming this facility the MNB87501 Sherburn TBS #2 take off as the regulator and receiver are being relocated; the only thing that will remain at this location at completion of construction is the MNB87501 Sherburn TBS #2 from MNM80501 take off valve.

Northern will install a line stop on the east side of 100th Avenue to minimize greenhouse gas emissions during tie-in activities. The line stop is in Section 22, T102N, R32W, Martin County, Minnesota. Northern also will complete a hot tap on the south side of 60th Street, at the Project terminus, to further reduce greenhouse gas emissions.

The proposed upstream tie-in to Northern’s MNM80511 16-inch-diameter C-line will be below ground in Section 21, T102N, R32W, Martin County, Minnesota. The proposed downstream tie-in

¹ The proposed facilities will be constructed in accordance with 18 CFR §§ 157.208, 157.210 and 157.216.

will occur on the south side of 60th Street within Northern’s proposed and relocated Welcome south receiver and MAOP regulator facility, which is more fully described below. The downstream tie-in to Northern’s MNM80501 16-inch-diameter B-line (B-line) will be below ground in Section 12, T101N, R33W, Martin County, Minnesota.

With the exception of a small segment of pipeline to be installed by horizontal directional drill (HDD) P4-3, the proposed C-line extension will be installed parallel (with a 25-foot offset) to the B-line. From MP 10.16 to MP 10.36, the maximum offset between the B-line and proposed C-line will be 67 feet; Northern deviated as the existing B-line contains a point of inflection in the middle of HDD P4-3. The pipeline will be installed in a 90-foot-wide nominal construction corridor, also referred to as temporary workspace (TWS). In addition to the construction corridor, Northern will utilize extra temporary workspace (ETWS), existing and proposed permanent driveways and facilities, temporary access roads (TARs) and existing farm roads, and staging areas during construction. Northern also will use existing roads, as well as its ingress and egress rights to existing easements to gain access to the work area. Existing public roads can accommodate construction traffic without modification or improvement. Northern will construct the proposed pipeline within existing easements.

General

A description of the pipeline including diameter, MAOP, and length of the pipeline, along with location information is detailed in Table 1.1-3. Figure 1-2 is a map of the Project components, including MPs, on topographic quadrangles at a 1:24,000 scale. Northern also has included Figure 1-3, which is a project map showing the location of the Project components in relation to sensitive environmental areas within 0.25 mile of project-related construction activities. The public and privileged and confidential (P&C) versions of the alignment sheets and facility aerial, Figures 1-4 and 1-5, respectively, use recent aerial photographs at a 1:2,400 scale. MPs for the Project also are detailed on the alignment sheets. The remaining figures are as follows.

- Figure 1-6 Facility Plot Plans (Filed as CUI//CEII – Do Not Release)
- Figure 1-7 Typical Right of Way (ROW) Cross-Section Diagram
- Figure 1-8 Typical Crossings (foreign pipelines, public roads and private driveway)
- Figure 1-9 Cumulative Impacts

Table 1.1-3 Pipeline Facility

Facility	Pipeline Diameter and Type	MAOP (psig)	Approximate Length (miles)	MP	County	State
MNM80511 C-line	16-inch-diameter mainline	1,440	4.53	5.89 to 10.42	Martin	MN

Aboveground Facilities

MNB87501 Sherburn TBS #2 Take Off

The upstream tie-in for the proposed C-line will occur on the west side of 100th Avenue within Northern’s existing Welcome south receiver and MAOP regulator facility, which will be relocated as part of this Project. The current lot, which measures 250 feet by 175 feet, will be removed and the equipment including the existing building, MAOP regulators, receiver, and tie-in valves are being relocated to the south end of the Project. The fence, gravel lot which measures 226 feet by 151

feet, approximately 130 feet of piping, and one permanent driveway will be removed. Approximately 0.93 acre of the existing facility will be returned to the landowner with the exception of a 23-foot by 12-foot lot (approximately 0.01 acre) and one existing permanent driveway that is 23 feet by 20 feet will remain for the existing MNB87501 Sherburn TBS #2 branch line take-off valve. Northern will rename this facility the MNB87501 Sherburn TBS #2 take-off facility and install a guardrail around the existing take-off valve. This facility is located in Section 21, T102N, R32W, Martin County, Minnesota.

MNB87401 Sherburn TBS #1 Take Off

On the south side of 85th Street at approximate MP 7.07, Northern will install a tie-over valve and associated piping to its existing MNB87401 take-off valve setting. The tie-over is located in Section 28, T102N, R32W, Martin County, Minnesota. Approximately 25 feet of belowground piping will be installed from the proposed C-line to the existing MNB87401 take-off valve facility. The new tie-over pipe will tie into an existing aboveground valve setting. A new blow-down valve will be installed within the existing MNB87401 take-off valve setting facility guardrail. The existing guardrail will be removed to install the new pipe and be reinstalled in the same location resulting in no lot size modifications.

Welcome south receiver and MAOP regulator

Northern proposes to relocate and operate the Welcome south receiver and MAOP regulator to the south side of 60th Street in Section 12, T101N, R33W, Martin County, Minnesota. The Welcome south receiver and MAOP regulator is currently located at the terminus of the existing C-line. The receiver, MAOP regulators and associated electrical equipment, control valves, an overpressure protection valve, tie-in valves, associated piping, and a building with approximate dimensions of 15 feet by 17 feet with a maximum height of 12 feet will be located at the terminus point of the proposed C-line.

The relocated receiver and MAOP regulator lot will measure 210 feet by 155 feet; this includes an approximate 12-foot buffer on all sides of the receiver lot with the exception of the north side by the permanent driveways. The buffer will include native grasses and the seeds of butterfly-friendly foliage and bollards for protection from mowing. The graveled and fenced receiver lot will measure 186 feet by 131 feet. Northern will install a new six-foot-high chain-link fence topped with barbed wire. Two new permanent driveways, measuring 36 feet by 20 feet, will be installed to provide access off 60th Street. Two permanent access roads are required for pull-through parking, which will eliminate backing of equipment onto 60th Street. The receiver and MAOP regulator lot, permanent driveways and buffer zone will create a new aboveground facility footprint of approximately 0.76 acre. The total gravel footprint for the facility including the permanent access roads is 0.58 acre. Northern is in the process of obtaining a facility easement for the receiver and MAOP regulator facility.

Columbus Branch Line Tie-Over Regulator Station

Northern proposes to install the Columbus branch line tie-over regulator station within the existing North Bend NE #1 TBS², located on the east side of Highway 79 in Section 6, T17N, R6E, Dodge County, Nebraska. The existing TBS measures approximately 100 feet by 125 feet. Northern will utilize a 200 foot by 200 foot ETWS and two TARs for a total workspace of 0.93 acre, which

² Installation of the regulator station will not impact the existing operations of the North Bend NE #1 TBS.

includes the existing TBS lot. Northern will install new equipment inside the existing TBS lot as follows. The MAOP regulators will include control valves and associated electrical equipment, a relief valve and a building to protect the control valves from weather. The building will measure approximately 8 feet by 13 feet with a maximum height of approximately 11 feet. Approximately 40 feet of station piping will be removed for the tie-ins.

The existing facility footprint with the existing permanent driveway is 0.26 acre and will not be expanded or modified. Northern will utilize the existing facility driveway for operational access off of Highway 79. Northern will temporarily remove portions of the existing fence to access the facility. Following construction, Northern will replace any sections of fence that were temporarily removed or damaged with a new six-foot-high chain-link fence topped with barbed wire.

Construction and Operational Acreages

The total acreage for temporary construction activities of Project components is approximately 84.45 acres. Total permanent operational acreage of the Project components is 26.66 acres. Approximately 78.2% (66.04 acres) of the construction footprint for the Project will require new temporary workspace permits while approximately 21.8% (18.41 acres) of the construction footprint will overlap with existing pipeline ROW or existing Northern facilities. Approximately 51.1% (13.62 acres) of the operational footprint for the Project will occur outside of existing permanent ROW while 48.9% (13.04 acres) will overlap with existing operational footprints of other Northern facilities.

Table 1.2-1 Land Requirements for the Pipeline and Aboveground Facilities

Facility		Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities			
C-line extension, Martin County, MN			
Pipeline ROW (TWS)		46.46	25.64
ETWS		12.97	0.00
Temporary access road		1.99	0.00
Staging areas		21.34	0.00
Subtotal		82.76	25.64
Aboveground Facilities			
MNB87501 Sherburn TBS #2 Take Off, Martin County, MN ⁴	Relocate equipment and reduce lot, retain one existing valve setting and permanent driveway	0.00 ^{1,2}	0.00 ^{1,2}
MNB87401 Sherburn TBS #1 Take Off	No modification to existing lot	0.00 ^{1,3}	0.00 ^{1,3}
Welcome south receiver and MAOP regulator, Martin County, MN	New facility and two permanent access roads	0.76	0.76
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE	Existing lot with permanent driveway	0.26	0.26
	ETWS	0.63	0.00

Facility		Land Affected During Construction (acres)	Land Affected During Operation (acres)
	TAR	0.04	0.00
Aboveground Facility Subtotal		1.69	1.02
Project Total		84.45	26.66

¹ No new operational footprint required, existing facility with permanent driveway(s).

² Facility included in workspace ETWS02.

³ Facility included in ETWS10 and temporary workspace.

⁴ Location of the original Welcome south receiver and MAOP regulator site.

1.3 CONSTRUCTION PROCEDURES

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

Northern is adopting the 2013 Federal Energy Regulatory Commission (FERC) Upland Erosion Control and Revegetation Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) in their entirety for the Project; these are incorporated herein by reference. Northern has not identified any need for requesting modifications to the FERC Plan or Procedures.

Typical construction activities associated with the Project are summarized below. Construction activities and storage of construction material will be limited to the Project workspaces. Waste materials will be disposed of in a manner consistent with state and local regulations. Northern will use a licensed asbestos abatement contractor to perform an evaluation of all pipeline coatings at the tie-in locations. Disturbed areas will be restored in a timely manner. The construction spreads will generally proceed along the pipeline ROW in one continuous operation. As each spread moves along, construction at any single point along the pipeline, from initial surveying and clearing to backfilling and final grading, will last approximately 6 to 20 weeks. The construction process will be coordinated to minimize the total time a tract of land is disturbed and subsequently exposed to potential erosion and temporarily taken out of normal use. For the C-line extension, Northern will adhere to the Minnesota Pollution Control Agency’s Clean Water Act (CWA) Section 401 Water Quality Certification for the Minnesota Utility Regional General Permit. The Minnesota Pollution Control Agency (MPCA) limits the amount of open trench at any one time to less than 5,280 feet to limit the potential for unforeseen weather events to cause erosion and discharges to Waters of the United States. The state of Nebraska does not have a regulation limiting the amount of open trench. Northern will not clear trees as part of the Project.

Construction of the pipeline will include general activities such as surveying and staking, clearing and grading, installing erosion and sediment control measures, trenching, stringing/bending/welding, coating and inspection, pipe lowering, tie-ins, backfilling, pressure testing, and final cleanup and restoration.

Construction activities associated with the aboveground pipeline facilities will include general activities such as clearing and grading, permanent access road installation, foundation installation, erection of aboveground facilities, installation of piping equipment, testing of equipment, and clean up and restoration. These activities, which are described below, are typical and actual construction may vary.

During construction, the workspaces initially will be surveyed and staked to mark the limits of construction and then cleared of existing vegetation, graded, and prepared for installation of the proposed pipeline or assembly of the new or expanded aboveground facilities. Northern will prevent the mixing of topsoil and subsoil during construction. Excess soil removed during construction activities will be stored onsite for future restoration or disposed of in an approved manner.

After site preparation is complete, trenching will be conducted to install the proposed pipeline and excavation will be conducted to complete the tie-ins and accommodate the new foundations for various aboveground facilities and buildings at the Welcome South receiver and MAOP regulator and the Columbus branch line tie-over regulator station. Forms will be set, rebar installed, and the concrete poured and cured in accordance with minimum strength requirements. The trench will be backfilled over the pipeline along with the tie-in locations. Backfill will be compacted in-place, and excess soil will be evenly spread within the TWS and facility yards or hauled off for proper disposal. Northern will install a crown of topsoil over the trench to account for settling, typically three to six inches thick.

Aboveground facilities will be installed after foundations are completed. The proposed aboveground facilities include a receiver, MAOP regulators, tie-over valve settings, and associated piping and valves. All non-screwed piping associated with the receiver and MAOP regulators will be welded or flanged. All welders will be qualified and welding activities will be conducted in accordance with American Petroleum Institute standards and Northern engineering standards. Equipment and structures will be installed in compliance with applicable local, state and federal code requirements. Aboveground piping will be cleaned and painted according to Northern's specifications and in accordance with regulatory requirements.

1.3.1 Testing

Pressure testing will be conducted on piping in accordance with the requirements of DOT pipeline safety regulations (49 CFR Part 192), Northern's testing specifications and applicable permits. Testing will follow all applicable federal, state and local requirements.

The pipeline will be capped with manifolds, filled with water or air, pressurized, and held for one or eight hours. Any significant loss of pressure will indicate that a leak may have occurred and warrant further inspection and, where necessary, repair. If water is used, the volume required to pressure test the C-line extension is 247,070 gallons and the pipeline can be tested in one section. If water is used for the aboveground facilities, the volume required to pressure test the aboveground facilities would be:

- 20 gallons for the MNB87401 Sherburn TBS #1 Take Off
- 2,220 gallons for the Welcome South receiver and MAOP regulator
- 350 gallons for the Columbus branch line tie-over regulator station

The test water is expected to contact only new pipe, and no additives or chemicals will be added to the test water. The hydrostatic test water will be obtained from local public water supplies. The hydrostatic test water will be hauled off for disposal at an approved facility.

The volume of water required to hydrostatically pressure test the HDD pipe is 22,500 gallons. The volume of water required for HDD drilling mud is 143,000 gallons. This water also will be acquired from local public water supplies. The total volume of water required for Project construction is 415,160 gallons.

1.3.2 Cleanup and Restoration

After each pipeline has been installed and backfilled, the areas disturbed by construction will be graded to original land contours, as near as practicable, to conform to adjacent areas. Non-cultivated land will be reseeded in accordance with individual landowner requirements and land management agency requirements or respective DOT seed mixes. As 95.1 % of the construction footprint is either actively farmed agricultural land or industrial/commercial land, only 3.73 acres of open land will require seeding during restoration; therefore, individual consultations with local Natural Resources Conservation Service (NRCS) offices were not completed. Rather, Northern will implement the respective state DOT-defined seed mixes along with seed mixes provided by NRCS offices on previous projects.

Heavy equipment traffic may compact the subsoil on agricultural land. Topsoil and subsoil will be tested for compaction following construction in agricultural areas. Northern will decompact subsoil in accordance with the soil compaction mitigation procedures described in the Plan. Once decompaction of the subsoil is complete, the segregated topsoil will be returned to the ROW. Decompaction will be completed on the restored topsoil using shallow-ripping tools. Northern will remove excess rock from the upper 12 inches of soil in all cultivated cropland, pastures and hayfields. The final surface will be examined to verify that native rock visible on the surface is similar in size, density and distribution to that in undisturbed areas adjacent to the ROW.

Cleanup will include restoring the slope, contour, grade, and drainage of the ROW as near as practicable to preconstruction conditions. Each trench may be crowned to allow for anticipated settlement of the backfill. Final erosion and sediment control measures also will be installed in accordance with the Plan and Procedures, state permits and the Stormwater Pollution Prevention Plan (SWPPP), including site-specific contouring, permanent slope breakers, mulch, and reseeded or sodding to stabilize the disturbed soils. The total workspace for the Columbus branch line tie-over regulator station is under one acre; therefore, a SWPPP is not required.

1.3.3 Construction Schedule and Workforce

Northern is requesting approval to begin construction of the Project in May 2024 to meet the customers' contracted in-service date of November 1, 2024. If post-construction restoration extends past November 1, 2024, Northern will follow the Winter Construction Plan found in Appendix M. The temporary workspaces will be restored to pre-construction contours and revegetated with approved seed mixes during fall 2024 or spring 2025. Northern expects to achieve 80% cover of pre-existing vegetation by August 1, 2025. Areas being returned to agricultural production will be available for such use spring 2025. Tree clearing is not required for the Project and therefore will not impact the construction schedule.

Northern estimates the duration of construction for the Project will last up to 180 days. Pipeline construction will generally take place Monday through Saturday during daytime hours (7 a.m. to 7 p.m.). Northern will not work on Sundays, or past 7 p.m. on Mondays through Saturdays except for the following activities: tie-ins, pressure testing, testing and commissioning, electrical work, inspections, and erosion control installation and repairs. These time sensitive activities listed above may extend into nighttime hours past 7 p.m. and may include Sunday.

Northern assumes that HDDs will not require nighttime work due to their short length and only one pull section.

Northern anticipates that one spread with up to 100 construction workers, including Northern inspection staff, will be required for the C-line extension and associated facilities. A second spread of 15 to 25 construction workers and inspection staff will be required for the Columbus branch line tie-over regulator station. No new permanent staff will be required to operate the pipeline and aboveground facilities after completion of Project construction.

1.3.4 Training, Inspection, and Environmental Compliance

Northern will require that designated environmental requirements are incorporated in construction drawings and specifications. Northern will conduct training for its field construction personnel and contractors' personnel before and during installation of the proposed facilities. Northern's training will focus on Project permit requirements, the Project SWPPP implementations, the Plan and Procedures, the HDD Plan, standard environmental conditions for blanket projects, as well as the procedures discussed in the Resource Reports. Northern will employ at least one Environmental Inspector (EI) per spread. The EI position is a full-time position with stop-work authority and will report directly to Northern's environmental department. The EI's duties are consistent with those contained in section II.B (Responsibilities of the EI) of the Plan and will include ensuring compliance with environmental conditions for blanket projects, Northern's environmental designs and specifications, and environmental conditions attached to other permits or authorizations. The EI(s) will complete routine monitoring during construction, clean up and restoration.

1.3.5 Special Construction Techniques

Access road improvements and road approaches

Prior to construction activities, temporary road approaches for all public and private roads will be constructed in accordance with MPCA guidance for vehicle-tracking Best Management Practices (BMPs). Existing roads or drives will be expanded to a minimum width of 20 feet with approximately 6 inches of 3-inch-diameter or greater aggregate spread across the width of the expanded road. The rock will be underlain by a geotextile fabric. The temporary road approaches will be a minimum of 50 feet in length. Northern will install culverts per state or local specifications to allow any water flow that may be present at the time of the crossing to continue to flow.

Subject to local jurisdictional review, temporary road approaches to access construction workspaces that are adjacent to public roads will be installed as listed in Table 1.3-1. The road approaches will be installed through the road ROWs and within the proposed Project workspaces, starting at the edges of each roads' driving surface. Road approaches will comply with the MPCA Sediment Control Practices – Vehicle Tracking BMPs (MPCA, 2022a).

Table 1.3-1 Road Approach Locations³

Road Name	MP	Number of Road Approaches
C-line extension, Martin County, MN		
100th Avenue	5.89	3
85th Street	7.05	2
County Road 119	7.30	2
80th Avenue	8.79	2
70th Street	9.05	2
70th Avenue	10.32	2
60th Street	10.35	3
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE		
No road approaches		

During restoration, Northern will remove the temporary road approaches, including the rock, culverts and geotextile fabric and restore the road ROWs to preconstruction condition.

Wetland crossing

Wetland field surveys are complete for the Project. One emergent meadow wetland was identified within the proposed workspace on the C-line extension in Martin County, Minnesota. One emergent wetland was identified in the proposed workspace on the Columbus branch line tie-over regulator station in Dodge County, Nebraska. Northern will cross the wetland in Minnesota via HDD; therefore, the only impact on the wetland will be the six-foot-wide foot-traffic travel lane or two parallel three-foot-wide travel lanes used to accommodate HDD activities. Impacts from the travel lanes will be limited to foot traffic and hand clearing of select branches or stalks of vegetation, with no motorized equipment allowed on the travel lanes. There will be no open-cut trenching or grading in any wetland. Following construction, the travel lanes will be allowed to revegetate naturally.

One emergent wetland confined to a roadside ditch was identified within the Project environmental survey boundary (ESB) in Nebraska. The wetland in Nebraska will be temporarily impacted by ETWS and installation of two TARs. Northern will minimize wetland impacts by installing a temporary bridge over the wetland within the TARs; thereby limiting filling and grading activities within the wetland ditch. Construction in the wetland area will be conducted in accordance with the Plan and Procedures.

Waterbody crossings

Waterbody field surveys are complete for the Project. Two perennial waterbodies were identified within the proposed workspace on the C-line extension in Martin County, Minnesota. These waterbodies will be crossed via HDD; therefore, there are no planned direct impacts on the waterbodies. There are no waterbodies in the workspace in Dodge County, Nebraska. Construction at the waterbody crossings will be conducted in accordance with the Plan and Procedures.

HDD/Road/Railroad crossings

HDD is a method to install pipelines beneath obstacles or sensitive areas. Use of the HDD method is designed to minimize planned disturbance to the ground surface between the entry and exit points of the crossing. Specifically, HDD allows for trenchless construction across a waterbody, wetland or other feature and is used to minimize impacts from construction activities on the resource or

³ Northern assumed two road approaches for each staging area and one road approach for each TWS/ETWS. Northern did not include the location of the road approaches on the alignment sheets; the road approaches will be field-determined based on site conditions at the time of construction.

feature being crossed. Northern will drill a small-diameter pilot hole and enlarge the pilot hole through successive reaming passes until the hole is large enough to accommodate the pipeline. The only HDDs on the Project are planned on the C-line extension in Martin County, Minnesota; therefore, Northern will restrict the use of drilling additives to those on the ANSI/NSF Standard 60-2003e, in accordance with Minnesota Rules, Chapter 4725. The drilling additives will be listed in the weekly reports filed with FERC.

Pipe sections will be staged and welded within ETWS on the opposite side of the crossing and then pulled through the drilled hole. Northern plans to complete three HDDs for the Project; none of them will require nighttime work.

Northern’s contractor will assign personnel to continuously monitor the HDD activities. This will include walking the HDD travel lane(s) between the entry and exit points, where practicable, and visually inspecting for inadvertent releases. At the road crossings, the contractor will ensure monitoring is conducted in accordance with all applicable safety requirements. At the waterbody crossings, visual inspections will be conducted from the waterbody banks. At the wetland crossing, the contractor will likely be able to traverse the full extent of the wetland within the travel lanes. If a boat is required for the open water feature, the contractor will have a boat available onsite. The contractor is responsible for determining a safe monitoring method. Northern’s EI also will monitor the drill path periodically, at least twice per day, for an inadvertent release of drilling mud and document the overall drilling progress, including rate of return and drill pressure.

Table 1.3-2 summarizes the HDD locations.

Table 1.3-2 HDD Locations

Crossing Drawing Number	Features Avoided by HDD	Begin MP	End MP	Length (feet)	Approximate Duration (days)	Secondary Crossing Method
C-line extension, Martin County, MN						
P4-1	Waterbody S02	6.70	6.85	842	7	HDD
P4-2	85th Street & private driveway	7.03	7.09	317	4	HDD
P4-3	Waterbody S01, Wetland W01, & 70th Avenue	10.16	10.35	1,040	10	HDD

Based on site-specific conditions, Northern may elect to reverse the entry and exit points for an HDD. Northern’s EIs will monitor noise at NSAs during HDD activities and include the noise reports with the EIs’ weekly reports filed with FERC.

Northern does not plan to conduct HDDs past 7 p.m.

In the event of an inadvertent release of drilling mud, Northern will implement measures to limit impacts on sensitive resources according to its HDD Plan. Further discussion about the HDD Feasibility Assessment is included in the HDD Plan. Northern will obtain water for drilling mud from municipal sources.

Northern’s contractor will be responsible for the disposal of the drilling mud. Disposal sites will be limited to upland areas including permitted mine reclamation sites, landfills and landspreading in upland agricultural areas with landowner approval. Northern will collect samples of drilling

mud for each HDD and test the samples for environmental contaminants including Resource Conservation and Recovery Act metals, pesticides and total petroleum hydrocarbons. Northern will review the laboratory results to confirm the drilling mud and cuttings do not contain hazardous materials above state and federal action levels. Northern’s contractor will obtain consent from disposal site landowners prior to disposal of drilling mud.

The Project will require crossings of six public roads and no railroads. Five of the roads are graveled roads; four of these will be crossed via conventional bore methods, which is further described below. Two of the roads will be crossed via HDD. Northern’s construction contractor will provide traffic warning signs along the public road crossings as recommended by the Minnesota Manual on Uniform Traffic Control Devices (Minnesota DOT, 2019) and as required by local and/or state road encroachment permits. Northern also will cross one private driveway via HDD and one private driveway via the open cut method. As shown on alignment sheet P3-4, the private driveway that will be crossed via HDD also will be utilized for construction access to complete tie-in activities at the MNB87401 Sherburn TBS #1 take off and the HDD.

Potential traffic interruptions at the public road crossings are not expected due to installation of the pipeline via the HDD or conventional bore but could occur when delivering materials and equipment to the construction site. Flaggers will be utilized to stop traffic, as necessary, during these short delays. Northern will coordinate with local officials to avoid traffic interruptions and ensure the safety of pedestrians, motorists and emergency vehicles in the Project area. The impact on traffic and transportation facilities and public inconvenience at crossings will be minimized by Northern’s traffic control plan, which is found at Appendix M. Northern will coordinate with local highway departments in advance of construction of the pipeline.

Table 1.3-3 summarizes the crossing locations by MP along with the surface type, and anticipated construction crossing methods.

Table 1.3-3 Public Road Crossings

Road Name	MP	Surface Type	Primary Crossing Method	Secondary Crossing Method
C-line extension, Martin County, MN				
85th Street	7.05	Paved	HDD	HDD
County Road 119	7.30	Gravel	Conventional bore	Open cut ⁴
80th Avenue	8.79	Gravel	Conventional bore	Conventional bore
70th Street	9.05	Gravel	Conventional bore	Conventional bore
70th Avenue	10.32	Gravel	HDD	HDD
60th Street	10.39	Gravel	Conventional bore	Conventional bore

As indicated on alignment sheet P3-13, Northern will utilize ETWS 28 for potholing to expose existing utilities along 70th Avenue prior to HDD activities.

⁴ Workspace is depicted on alignment sheet P3-5 between the conventional bore entry and exit points in the event the secondary crossing method is used. Northern will have all necessary permits to open cut County Road 119, if the secondary crossing method is needed.

For a conventional bore, a boring machine is lowered to the bottom of an entry pit that is excavated to a specific depth within the workspace. An auger from the bore rig rotates through a casing, both of which are advanced through the hole as it is drilled. A small pit is excavated on the exit side. Once the pipe and casing reach the exit pit, the borehole pipe is welded to the adjacent pipeline and the casing is removed.

Residential areas

There are no residences located within 25 feet of the project workspace. The nearest residence to a pipeline is located approximately 308 feet southeast of the proposed C-line extension at MP 8.50. The nearest residence to an aboveground facility is located approximately 390 feet southwest of the Columbus branch line tie-over regulator in Dodge County, Nebraska.

Active croplands

Construction in agricultural areas will be conducted in accordance with the Plan and Procedures. To conserve topsoil, Northern will conduct full ROW topsoil removal in all actively cultivated and rotated cropland and improved pasture. A maximum of 12 inches of topsoil will be segregated. Drain tiles are present in the Project area; however, landowners have been unable to provide locations. Previously undocumented drain tile discovered during grading or trenching will be flagged at each ROW edge. Survey data will be collected at the location of the broken tile. If a damaged drain tile is flowing at the time of discovery, temporary repairs will be completed prior to the end of the workday. If a damaged drain tile is not flowing at the time of discovery, the drain tile will be screened and temporarily repaired within 24 hours. Temporary repairs may be removed to accommodate pipe lowering and backfilling.

Permanent drain tile repairs will be made by a qualified drain tile specialist, the landowner or a landowner's representative and will be completed in accordance with the Plan.

Blasting and Burning

Blasting will not be required for the Project. No open burning will be conducted for the Project.

1.4 OPERATION AND MAINTENANCE PROCEDURES

Northern will operate and maintain the proposed facilities in compliance with DOT regulations provided in 49 CFR Part 192, FERC directives in 18 CFR § 380.15, and maintenance requirements in the Plan and Procedures. All Project facilities will be marked and identified in accordance with applicable regulations.

Operational activity on the pipeline will be limited primarily to maintenance of the ROW and inspection, repair and cleaning of the pipeline itself. Periodic aerial and ground inspections by pipeline personnel will identify soil erosion that may expose the pipe; dead vegetation that may indicate a leak in the line; conditions of the vegetative cover and erosion control measures; unauthorized encroachment on the ROW, such as buildings and other substantial structures; and other conditions that could present a safety hazard or require preventative maintenance or repairs.

Pipeline cathodic protection (CP) test leads will be installed along the length of the proposed pipeline during the restoration process. In order to optimally locate the CP system for efficiency and safety, within one year of construction of the pipeline, Northern will conduct an evaluation of and install the CP system, if necessary, for the proposed Project under the appropriate regulatory authority. Northern will install CP systems at optimal locations to help protect the buried pipeline

from corrosion. The pipeline CP systems will be monitored and inspected periodically to ensure proper and adequate corrosion protection. Northern will use public roads to gain access to the ROW for maintenance and inspection activities. Northern will work with landowners to obtain temporary access if such access is required. Appropriate actions to address conditions observed during inspection will be taken as necessary.

Vegetation maintenance is normally not required in agricultural cropland or grazing areas, residential areas, or in herbaceous or farmed wetlands. However, Northern may remove large brush and trees may be periodically removed in accordance with the Plan and Procedures if Northern determines trees or deep-rooted shrubs in the area could damage the pipeline’s protective coating, obscure periodic surveillance, or interfere with potential repairs.

In upland areas, routine vegetation maintenance will be conducted on a 50-foot-wide strip centered over the pipeline with a frequency of not more than once every three years; however, a corridor approximately 10 feet in width and centered over the pipeline will be cleared at a frequency necessary to maintain the 10-foot-wide corridor in an herbaceous state. In addition, trees within 15 feet of the pipeline with roots that will compromise the integrity of the pipeline coating will be selectively removed from the ROW. Northern will not conduct any routine vegetation mowing or clearing in wetlands or riparian environments that are between HDD entry and exit points. Northern will follow the post-construction maintenance procedures described in section VI.D.1 of the Procedures. Routine vegetation maintenance will occur outside the April 15 to August 1 avoidance window for nesting birds and other animals (including pollinators).

1.5 FUTURE PLANS AND ABANDONMENT

Northern has no current plans to expand or abandon the Project facilities described in this report. Northern’s pipeline system comprises an integrated network of transmission facilities in the Midwest. Future expansion will be dependent on additional needs in the general area for natural gas on Northern’s pipeline system.

1.6 PERMITS AND APPROVALS

Northern will obtain all permits and approvals required to construct and operate the proposed facilities for the Project. Table 1.6-1 lists the federal, state and local permits required and the status of each permit. Key agency consultations, including the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), Minnesota State Historic Preservation Office (SHPO), MPCA, Minnesota Department of Natural Resources (MDNR), Nebraska SHPO, Nebraska Game and Parks Commission (NGPC), and the Nebraska Department of Environment and Energy (NDEE). Copies of agency correspondence are divided by resource area (e.g., consultations associated with natural resources and cultural resources) and are provided in appendices E and H.

Northern has completed coordination with local officials to determine if local permits are required, such as permanent access road or road approach permits or conditional use permits. The local permits that will be required are listed in Table 1.6-1. Northern will obtain these permits prior to the start of construction, as required.

Table 1.6-1 Permits, Approvals, and Consultations Required for Construction of the Project

Administering Agency	Permit or Approval	Status
Federal		
FERC	Blanket certificate approval	Prior notice submittal March 2024
USACE, St. Paul District	Section 404, CWA – Dredge and Fill Section 10 Rivers and Harbors Act	Wetland impacts will qualify under the Regional General Permit 3 – Non-Reporting; Notification to USACE completed January 23, 2024. Less than 0.1 acre of wetland impact in Nebraska; temporary impacts covered under NWP 12.
USFWS, Twin Cities Ecological Services Field Office [Minnesota components], Nebraska Ecological Services Field Office [Nebraska component]	Section 7 Endangered Species Act, Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and Easement crossings consultations	Information for Planning and Conservation (IPaC) review complete for Minnesota February 28, 2024. IPaC review complete for Nebraska February 21, 2024. Northern determined no effect on federally listed species, consultation complete.
NRCS	No consultations required due to limited restoration areas and prevalence of agricultural lands.	Utilizing previous recommendations of Minnesota Board of Water and Soil Resources, as needed, and Minnesota and Nebraska DOT seed mixes. Consultation complete.
State - Minnesota		
MPCA	National Pollutant Discharge Elimination System (NPDES) Stormwater Permit	Application will be submitted March 2024. Authorization anticipated April 2024.
	NPDES Trench Water Discharge Permit	Authorization included with stormwater permit
	Section 401 Water Quality	No USACE Preconstruction Notification; therefore, Northern will adhere to the Section 401 provisions of the Utility Regional General Permit. Notification to MPCA completed January 23, 2024. No permit required.
MDNR	Minnesota Water Permitting and Reporting System Water Appropriation Permit for Pit Trench Water	Application will be submitted March 2024. Authorization anticipated April 2024.
	State Protected Species Consultations	Review of stated-listed species completed by MDNR automated Natural Heritage Information System (NHIS) initiated December 11, 2023. Response for further consultation received December 11, 2023. Northern completed follow-up communication in January 2024. On February 29, 2024, MDNR indicated the Project will not negatively affect any

Administering Agency	Permit or Approval	Status
		known occurrences of rare features. Consultation complete.
	License to Cross Public Lands and Waters	Application will be submitted March 2024. Authorization anticipated April 2024.
Minnesota SHPO	Section 106 Consultation, National Historic Preservation Act (NHPA)	Literature review, cultural resource report and Unanticipated Discovery Plan (UDP) submitted for review and concurrence November 16, 2023; concurrence received January 2, 2024. Consultation complete.
Nebraska		
NDEE	NPDES; On-line submittal of Construction Stormwater Permit for Construction Sites (NER160000)	Application will be submitted March 2024. Authorization anticipated April 2024.
	NPDES, Email submittal of Trench Dewatering Discharges Permit (NEG671000)	Application will be submitted March 2024. Authorization anticipated April 2024.
	Section 401 Water Quality Certification	None required; temporary wetland impacts will be covered under non-reporting NWP 12. There are no waterbodies in Project footprint in Nebraska.
Nebraska SHPO	Section 106 Consultation, NHPA	Literature review, cultural resource report and UDP submitted for review and concurrence February 19, 2024; concurrence received March 1, 2024. Consultation complete.
NGPC	On-line review request of Conservation and Environmental Review Tool (CERT); state threatened and endangered (T&E) species	Request submitted February 21, 2024. Determination of no impact to state-listed species. Consultation complete.
Local Permits		
Martin County, MN	Conditional Use Permit and Temporary Access Permits	TBD
Martin Soil and Water Conservation District	Wetland Conservation Act consultation with Local Government Unit	Project notification and Application for Activities Affecting Water Resources in Minnesota submitted January 23, 2024. Project qualifies as “no-loss”; therefore, no permit is required. LGU confirmed the no-loss determination February 20, 2023. Consultation complete.
City of North Bend Planning and Zoning	Floodplain Development Permit	TBD
City of North Bend	Building permit	TBD

1.7 AFFECTED LANDOWNERS

Northern will comply with the landowner notification requirements set forth in 18 CFR § 157.203(d)(2). A list of the affected landowners is provided in Appendix C, which is included separately in Volume III and marked “Contains Privileged Information – Do Not Release” (CUI//PRIV). Northern has established an Environmental Complaint Resolution Procedure that provides landowners whose properties will be crossed by the Project with clear and simple directions for identifying and resolving their environmental mitigation problems or concerns. The Environmental Complaint Resolution Procedure also provides Northern’s Operations Communication Center (OCC) telephone number, which is available 24/7, 365 days per year. In addition, Northern established a project website (https://www.northernnaturalgas.com/expansionprojects/Pages/West_Leg_2024.aspx), which is available to the public. The website address will be noted in the landowner mailing. The information on the website includes a description of the scope of the Project; Project maps; Project contact information and regulatory developments and announcements. A copy of Northern’s Environmental Complaint Resolution Procedure as well as a sample cover letter which will accompany the procedure is included in Appendix K.

1.8 NON-JURISDICTIONAL FACILITIES

No non-jurisdictional facilities will be installed for the Project.

1.9 CUMULATIVE IMPACTS

Cumulative impacts may result when the environmental effects associated with a project are added to or interact with other effects within a particular location or timeframe. Both temporary (construction-related) and permanent (operation-related) impacts were considered by Northern to determine if the cumulative effects of multiple projects over time may result in a significant impact. The cumulative impacts analysis is based on the guidance set forth by the Council on Environmental Quality (January 1997) and the U.S. Environmental Protection Agency (EPA, 1999).

In order to evaluate the potential for cumulative impacts, Northern evaluated projects being developed internally and by its customers. Additionally, Northern contacted the Martin County Planning and Zoning office, Martin County Highway Department, Dodge County Planning and Zoning and Highways, and Dodge County Inspection and Stormwater. In addition, Northern reviewed the 2022 to 2031 10-Year Capital Highway Investment Plan produced by the Minnesota DOT, and the Nebraska DOT website to identify highway projects proposed for construction within or adjacent to the Project area during 2024 or 2025. Records of communication are provided in Appendix B.

There were several nearby actions proposed by others in 2024 and 2025. Northern’s proposed Project components along with the other actions are shown in Figure 1-9. The Hydrologic Unit Code (HUC)-12 watersheds also are shown on Figure 1-9. The proposed actions include the following:

- Martin County, Minnesota – Northern completed construction on the West Leg 2023 Expansion Project including restoration efforts; however, restoration monitoring is ongoing and will overlap with the Project. Specifically, workspaces in the vicinity of the MNB87501 Sherburn TBS #2 take-off overlap between the two projects. Approximately 2.80 acres of

land overlap between the two projects, a combination of agricultural land and industrial/commercial road ROW.

- Martin County, Minnesota – Minnesota DOT has a construction project that is slated for 2024 and will be located approximately 5.5 miles north of the Project. The DOT construction project will not create any cumulative impacts as it located in a different HUC-12.
- There were no related actions identified in the vicinity of the Project component in Dodge County, Nebraska within the shared HUC-12.
- The City of North Bend does not have any permit applications for future developments in the vicinity of the Columbus branch line tie over regulator station.

Soils, Geology and Agriculture

Northern's West Leg 2023 Expansion Project and this Project share construction workspace. Northern has completed construction and restoration of the West Leg 2023 Project. As a majority of the overlapping workspace is agricultural land; the work remaining consists of monitoring restoration progress until the site reaches 70% cover. Due to the depth of bedrock in this area, geology will not be impacted by either action.

Vegetation and Wildlife Resources

Northern's West Leg 2023 Expansion Project and this Project share construction workspace. Northern has completed construction and restoration of the West Leg 2023 Project. As a majority of the overlapping workspace is agricultural land; the work remaining consists of monitoring restoration progress until the site reaches 70% cover. Neither of Northern's actions will impact federal or state-listed T&E species nor any areas of high-quality vegetation. Following construction of the proposed Project, Northern will reseed areas that are not actively farmed so vegetation will typically return within one growing season. There will be minimal cumulative impact between Northern's actions in Martin County, Minnesota.

Construction of Northern's Project has the potential to impact birds protected under the MBTA. Northern plans to begin construction May 2024, within the primary nesting season; therefore, Northern will have a biologist conduct a pre-construction nest survey for breeding birds within the Project workspaces. Nest surveys for migratory bird surveys will be conducted prior to any clearing or construction activity. Northern will identify and avoid active nests until fledging occurs as described in Section 3.3 below; therefore, Northern's Project will have no effect to nesting migratory birds of concern.

As discussed in Resource Report 3, no raptor, bald eagle or golden eagle nests were observed during field surveys for the Project. If nests are observed during pre-construction surveys, Northern will contact the USFWS to determine any necessary avoidance or mitigation measures.

Land Use

As part of this Project, Northern will relocate the Welcome south receiver and MAOP regulator that is currently located in the overlapping workspace to the south end of the Project. As such, approximately 0.93 acre of land will be restored to agricultural land and returned to the landowner. The existing gravel lot and fence will be removed and only a 0.01 acre gravel and guardrail facility will remain. Northern will utilize the same acres in 2024 as were used in 2023. Northern will abide by FERC's Plan for both projects, which will minimize cumulative impacts from restoration activities.

Traffic/Safety

The ongoing restoration monitoring of the West Leg 2023 Expansion Project will be conducted by the EI assigned to the Project once construction of the proposed Project begins. This will minimize any additional traffic or personnel required to monitor the restoration progress of the West Leg 2023 Expansion Project while construction of the current Project is ongoing.

Additional discussion on cumulative impacts for air and noise are included in Section 9.3.

2 RESOURCE REPORT 2 – WATER USE AND QUALITY

2.1 GROUNDWATER RESOURCES

Surficial aquifers are located within the unconsolidated materials above the bedrock surface and are subdivided into alluvial, buried-channel and glacial-drift aquifers. Underlying the Project area is a buried-channel aquifer, which is composed of unconsolidated material deposited by ancient streams in valleys eroded prior to or between glacial advances. Aquifers under the Project areas in Minnesota are located within discontinuous bedrock composed of shale and sandstone approximately 120 to 180 feet deep.

The youngest bedrock aquifer underlying the Project area in Minnesota is the St. Peter Aquifer, which is underlain by the successively older, Prairie du Chien-Jordan, Franconia-Ironton-Galesville, and Mount Simon-Hinckley-Fond du Lac aquifers (USGS, n.d).

The primary aquifer under the Columbus branch line tie-over regulator station is located in alluvium, typically consisting of sand and gravel within the Platte River Valley. Depths to groundwater are characterized by shallow regional water tables <50 feet that produce comparatively large yields. The closest bedrock aquifer under the Columbus branch line tie-over regulator station is located within the Cretaceous Dakota Formation (Divine, 1998).

2.1.1 Sole Source Aquifers

The EPA defines a sole source aquifer or principal source aquifer area as one that supplies at least 50% of the drinking water consumed in the area overlying the aquifer, where contamination of the aquifer could create a significant hazard to public health and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer. There are currently no EPA-designated sole source aquifers crossed by the Project (EPA, 2023a).

2.1.2 Wells and Springs

Public water supply wells are regulated by each respective state and their local health departments. Public water supply wells are registered, documented and monitored. The MDH Minnesota Well Index database contains the most complete record of wells in Minnesota and is maintained by the MDNR. In Nebraska, the Registered Well Inventory is the most complete record of well construction and location information. The Registered Well Inventory is updated and maintained by the NDNR.

Based on the U.S. Geological Survey (USGS) Karst database map, the C-line extension and the Columbus branch line tie-over regulator station are not located within a karst formation (USGS, 2023). As such, the Minnesota Well Index and the NDNR Registered Well Inventory were queried for private wells within 150 feet and public wells within 400 feet of the respective Project components.

No private wells were located within 150 feet of the C-Line extension or Columbus branch line tie-over regulator station and no public wells were located within 400 feet of the C-Line extension or Columbus branch line tie-over regulator station, (MDH, 2023a), NDNR, 2023a; Additionally, no wells were identified within the C-Line extension and Columbus branch line tie-over regulator station during the October 10 and 11, 2023, and February 13, 2024, field surveys, respectively. Well information is provided below in Table 2.1-1.

Table 2.1-1 Water Supply Wells Surrounding the Project

MP	Supply Type	Well Use	Well Depth (Feet)	Feet from Project Boundary and Direction	Feet from Center Line and Direction	Adjacent Pipeline Construction Method
C-line extension, Martin County, MN						
No private wells present within 150 feet and no public wells present within 400 feet.						
Columbus branch line tie-over regulator station, Dodge County, NE						
No private wells present within 150 feet and no public wells present within 400 feet.						

The Minnesota Spring Inventory (MSI) is the most complete record of springs and spring locations in Minnesota and is updated and maintained by the MDNR. The MSI did not identify springs within 1,000 feet of the Project (MDNR, 2023a).

The Lower Platte North Natural Resource District (NRD) stated Nebraska does not maintain an inventory or database of spring locations and stated no known springs were located within 150 feet of the Project area in Nebraska. The record of communications with the Lower Platte North NRD is included in Appendix E.

While conducting biological field surveys, no springs or seeps were identified within the Project ESB. The ESB includes the Project workspaces along with an associated buffer. Additionally, during Project walkdowns, landowners did not provide any additional information to Northern regarding springs or seeps. Northern will notify FERC if any springs are discovered during construction.

2.1.3 Wellhead Protection Areas

Under the Safe Drinking Water Act, each state is required to develop and implement a Wellhead Protection Program in order to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. A Wellhead Protection Area (WHPA) encompasses the area around a drinking water well where contaminants could enter and pollute the well.

In Minnesota, wellhead protection is administered by the MDH Source Water Protection Program, which maintains a database of Source Water Protection Areas (SWPA) via an interactive map (MDH, 2023b). Results of a search in this database indicated that no SWPA is crossed by the C-line extension and therefore, Northern does not anticipate any potential affects to public drinking waters and no additional measures will be required beyond those in the Plan and Procedures.

The NDEE maintains the most complete database of WHPAs in Nebraska; a review of the database indicated no WHPAs are located within the Columbus branch line tie-over regulator station (NDEE, 2023a). The closest WHPA is located approximately 0.36 mile southwest of the Project area for the City of North Bend, Nebraska (NE ID: NE3105305). Due to no WHPAs within the Project area, Northern does not anticipate any potential affects to public drinking waters and no additional

measures will be required beyond those in the Plan and Procedures. Should Project changes occur that could result in affects within the WHPA for the City of North Bend, Northern will coordinate with the appropriate city officials at that time, prior to work being conducted within the WHPA, as appropriate.

2.1.4 Potential Sources of Groundwater Contamination

Northern conducted a database search using publicly available databases to identify facilities with potential and/or actual sources of contamination that could impact nearby groundwater within one mile of the Project workspaces. The EPA’s Facility Registry System map service (EPA, 2023b), the NDEE’s Leaking Underground Storage Tanks and Surface Spills inventory (NDEE, 2023b) and the MPCA’s What’s in My Neighborhood map (MPCA, 2023) were queried. There were no hazardous or solid waste sites recorded in Martin County, Minnesota, in proximity to the Project.

In Nebraska, there are two RCRA hazardous waste sites located with the City of North Bend. Dolezal Trucking Company, registered at 1020 West 7th Street, North Bend, Nebraska, which is located 4,450 feet southwest of Northern’s facility; and Frontier Coop located at 641 West 6th Street, North Bend, Nebraska, which is located approximately 4,200 feet southwest of Northern’s facility. Both of these sites will have groundwater flow direction to the south, toward the Platte River. No NDEE Leaking Underground Storage Tanks and Surface Spills sites were within one mile of the Project. Northern does not anticipate any concerns for construction or dewatering. Additionally, the Project will not impact any brownfield sites (NDEE, 2023b). There are no known contamination issues that will be impacted by construction or operation of the facilities.

2.1.5 Groundwater Construction and Operation Impacts and Mitigation

Activities associated with the construction of the Project have potential to affect groundwater in different ways. Surface drainage and groundwater recharge patterns can be temporarily altered by clearing, grading and soil stockpiling activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. Additionally, soil compaction caused by heavy construction vehicles can reduce infiltration and increase surface runoff and ponding.

Construction of pipeline via the open-cut method is typically confined to depths of no greater than 6 feet, which is above the bedrock aquifers underlying the Project area at a depth of more than 100 feet below ground surface and is generally expected to be above the water table in surficial aquifers. Shallow surficial aquifers are typically contained within relatively permeable alluvial sands and gravels that rapidly respond to changes in water level elevations or groundwater flow. If excavation occurs below the water table, the resulting changes in water levels and/or turbidity in these aquifers are expected to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside.

The introduction of contaminants into groundwater due to accidental release of construction-related chemicals, fuels, or hydraulic fluid during construction could have an adverse effect to groundwater quality, most notably near shallow water wells. No private wells were located within 150 feet of the Project and no public wells were located within 400 feet of the Project (MDH, 2023a and NDNR, 2023a).

The Project workspaces for the C-Line and Columbus branch line tie-over regulator station are not within any Drinking Water Supply Management Area (DWSMAs); therefore, no setbacks or associated mitigating controls are required.

Spill-related impacts from Project construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. To avoid spill-related impacts, Northern developed a Spill Prevention, Control and Countermeasures Plan (SPCC Plan) that outlines measures that will be implemented to prevent accidental releases of fuels and other hazardous substances, and describes response, containment, and cleanup procedures. By implementing the protective measures set forth in the SPCC Plan, long-term contamination due to construction activities is not anticipated. In the unlikely event that undocumented sites with contaminated soils or groundwater are encountered, the soil or water will be handled and disposed of in accordance with applicable regulations. Northern's SPCC plan is included as an appendix in its SWPPP, located in Appendix L.

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

During HDD, the possibility exists for drilling mud to reach the surface or encounter a void or fissure. In the event of the inadvertent release of drilling mud, Northern will implement measures in its HDD Plan. Specifically, Northern's contractor will attempt to seal the void using materials such as wood fibers, cotton seed husks, ground nut shells or other natural, environmentally inert materials. Special polymers that swell to several times their size when wet may be used. Grout or concrete plugs also may be used to fill subsurface voids or fissures. Concrete grout will typically harden quickly and have limited impact on groundwater flow or quality. As discussed further in Section 6 of the HDD Plan, Northern designed its HDDs to avoid bedrock and anticipates that based on the local geology and results of the geotechnical investigation, only unconsolidated formations will be encountered during the HDDs.

During construction, proper management of surface water will limit impacts of sedimentation on shallow groundwater resources and will lessen the potential for sinkhole dropouts. Mitigation of surface runoff will be performed by silt fence, silt traps, sediment basins, and lined ditches where appropriate. Northern's EI staff will assist with on-site determinations regarding dewatering locations and directing the discharge flow directions.

2.2 SURFACE WATER AND WETLAND RESOURCES

The watersheds and river basins crossed by Project components are identified in Table 2.2-1, below.

Table 2.2-1 Watershed and River Basins Crossed by the Project

Watershed		River Basin
C-line extension, Martin County, MN		
MP 5.89 to 9.03	County Ditch Number Eleven	Minnesota River
MP 9.03 to 10.42	Fourmile Creek-East Fork Des Moines River	Lower Mississippi River

Watershed	River Basin
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE	
Rawhide Creek-Platte River	Platte River

Watershed and River Basins obtained from (MDNR, 2023b and NDNR, 2024).

Applying the definition of public waters in Minnesota Statute Section 103G.005, Subdivision 15, the Project will not impact any known watershed protection areas or public water supply reservoirs.

Northern confirmed with the Lower Platte NRD that the Columbus branch line tie-over regulator station is not located within an active watershed management area or NRD project area. The record of communication is included in Appendix B.

The Project areas were reviewed for the presence of waters designated as National Wild and Scenic Rivers, waters designated under Section 10 of the Rivers and Harbors Act of 1899, waters classified under Section 303(d) of the CWA, and potable surface waters. Additionally, field surveys were conducted for the Project between October 10 and 11, 2023, and February 13, 2024, for 100% of the property within the ESB to delineate waterbodies identified by the presence of an ordinary high-water mark. During the field surveys, two perennial waterbody features were identified for the Project within the ESBs. The proposed C-line extension will cross two perennial waterbodies via HDD as well as a travel lane will be constructed over the top of both waterbodies in Minnesota. No waterbodies are located within the ESB for the Project component in Nebraska. The field-delineated waterbodies are depicted on Figure 2-1 and summarized in Table 2.2-2.

Table 2.2-2 Waterbodies Crossed by the Project

MP	Waterbody	Waterbody Type	Crossing Width (feet)	State Water Quality Use Designations ¹	Fishery Type	Crossing Method (Contingency)
C-line extension, Martin County, MN						
6.79	S02 (County Ditch Eleven)	Perennial	61.82	7, 3C, 4A, 4B, 5, 6	7	HDD (Re-drill)
10.26	S01 (East Fork Des Moines River)	Perennial	103.15	2Bg, 3C, 4A, 4B, 5, 6	2Bg	HDD (Re-drill)
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE						
	No waterbodies present					

¹ State Water Classification: Class 2 = Aquatic Life and Recreation; A = cold water, B = warm water, g = applies for general warm water streams. Class 3 = Industrial Consumption; A – D refers to chloride standards. Class 4 = Agriculture and Wildlife; A = applies to irrigation purposes, B = applies to use by livestock and wildlife. Class 5 = Aesthetic Enjoyment and Navigation. Class 6 = Other Uses and Protection of Border Waters.

Both of these waterbodies are mapped as public waters or ditches in the MDNR protected waters and wetlands inventory. The MDNR hydrography identification number for the East Fork Des Moines River is 101916; County Ditch Eleven is 101932.

Based on a review of Minnesota Rules 6264.0050, Subpart 4, which provides a list of designated trout streams in Minnesota, the waterbodies crossed by the Project are not designated as trout streams (MDNR, 2023c). The waterbodies crossed by the Project are not included in the National Wild and Scenic Rivers System (National Wild and Scenic River System, n.d.). In Minnesota, waterbody S01 (East Fork Des Moines River) is listed impaired water (MPCA, 2023b) with an EPA impaired category of 5 for its aquatic life use and 4A for its aquatic recreation use (TDML ID: PRJ00015-001) and is crossed by the Project at MP 10.26. No waterbodies are crossed by the Nebraska

component. The nearest impaired waterbody to the Nebraska component is the Platte River and is located approximately 7,175 feet south of the Project area (NDEE 2023d). No waterbodies crossed by the Project are designated an outstanding resource value water (MPCA, 2023c).

The Official Floodplain Zoning District Map for Martin County, Minnesota, dated May 20, 1977, indicated the C-line extension will cross a mapped floodplain hazard Zone A between MP 10.18 and MP 10.28. The floodplain is associated with the East Fork Des Moines River, which will be crossed via HDD. Northern designed the Project so all Minnesota Project workspaces and facilities are located outside the mapped floodplain. Based on a review of Martin County Floodplain Management Ordinance, Northern has determined a Martin County Floodplain Development Permit will not be required for the C-line extension.

Per a review of the Nebraska Department of Natural Resources Floodplain Management Interactive Map, the Columbus branch line tie-over regulator is located in a flood hazard zone AE of the mapped floodplain of the Platte River (NDNR, 2023b). Northern will not modify the existing graveled area and will maintain the contours of the existing TBS; Northern will construct a new regulator building that will be equipped with flood vents. Due to the proposed work within the mapped floodplain, Northern is required to obtain a development permit from the Dodge County Planning and Zoning Department. Northern is currently completing the floodplain development permit.

Hydrostatic testing will be conducted in accordance with DOT regulations, Title 49 CFR Part 192, to verify the integrity of the pipe and the piping components before being placed into service. For the execution of pressure testing, Northern will obtain water, if used for the pressure test, from off-site municipal sources. Hydrostatic test water will be brought to the Project in compliance with state regulations and existing water rights. No chemical additives will be mixed with the hydrostatic test water. Following testing, Northern will haul the hydrostatic test water off site for disposal at approved facilities near each Project component.

Wetlands that meet the Waters of the United States requirements are subject to regulation by the USACE under the CWA and the jurisdictional regulatory authority lies with the USACE. The MDNR has regulatory authority over certain wetlands, navigable waters and adjacent lands under Minnesota Statute Chapter 103G and Rule 6115.0250. All wetlands in Minnesota are protected under the Wetland Conservation Act Rules, Minn. Stat. Chapter 8420, and are administered by an LGU. The LGU for the C-line extension is the Martin Soil and Watershed District. The NDEE have state regulatory authority over wetlands, navigable waters and adjacent lands in Nebraska; however, coordination is not required since no waterways are present within the Project area in Nebraska.

Northern performed a desktop review of the Project area using National Wetland Inventory (NWI) data, USGS data, National Hydrology Dataset data, NRCS soils information, and aerial orthophotography to identify potential wetlands or wet signatures. Additionally, Northern completed a review of historical aerial imagery for agricultural areas as wetlands are often problematic to locate in farmed areas. Multiple years of aerial imagery were reviewed in areas of known poorly drained or somewhat poorly drained soils. The aerial imagery was reviewed for the appearance of wet signatures. A wet signature is field evidence, recorded by a photograph, of ponding, flooding, or impacts of saturation for sufficient duration, which meets wetland hydrology and possibly wetland vegetation criteria. Areas with wet signatures were investigated in the field and wetland boundaries were verified. The NWI data are shown on Figure 2-1.

Field surveys included a survey for wetlands conducted in accordance with the methodologies established in the USACE Wetlands Delineation Manual and The Regional Supplement to the

USACE Wetland Delineation Manual: Midwest Region (Version 2.0, USACE, 2010). Northern completed the wetland and waterbody field surveys between October 10 and 11, 2023, and February 13, 2024, for 100% of the property within the Project ESB. Three palustrine emergent wetlands and one palustrine forested wetland were identified within the Project ESB in Minnesota and one emergent wetland confined to a roadside ditch was identified within the Project ESB in Nebraska. However, only one emergent wetland will be crossed by the Project in Minnesota; the wetland will be crossed via HDD. One wetland in Nebraska will be temporarily impacted by ETWS and installation of two TARs. Northern will minimize wetland impacts by installing a temporary bridge over the wetland within the TARs; thereby limiting filling and grading activities within the wetland. The wetlands are depicted on Figure 2-1. Table 2.2-3 identifies the characteristics of the wetlands crossed by the Project. Copies of the wetland delineation reports are included in Appendix E.

Table 2.2-3 Wetland Crossed by the Project

Unique Wetland Identifier	MP		Wetland Classification ¹	Length of Crossing (feet) ²	Wetland Crossing Method	Area Affected by Construction (acres)	Area Affected by Operation (acres) ³
	From	To					
C-line extension, Martin County, MN							
W01	10.26	10.26	PEMIC	3.71	HDD and travel lane	0.00 ⁵	0.00 ⁴
C-line extension Total						0.00	0.00
Columbus branch line tie-over regulator, Dodge County, NE							
NB-W01	N/A	N/A	PEM1A	14.33	TAR09 (bridge) and ETWS	0.03 ⁶	0.00 ⁶
NB-W01	N/A	N/A	PEM1A	12.64	TAR10 (bridge) and ETWS	0.03 ⁶	0.00 ⁶
Columbus branch line tie-over regulator Total						0.06	0.00
Project Total						0.06	0.00

¹ Wetland Classification based on Cowardin, Classification of Wetlands and Deepwater Habitats: PEMIC - Palustrine Emergent – persistent - seasonally flooded (Shallow Marsh), PEM1A – Palustrine Emergent – persistent – temporarily flooded (Seasonally Flooded Basin) – The listed classification represents the wetland community at the crossing location.

² Wetland crossing along the length of pipeline.

³ No maintenance will occur in wetland areas between HDD entry and exit points.

⁴ Wetland crossed by the Project via HDD. Northern will not conduct maintenance between the entry and exit pits; therefore, no operational impacts on the wetland will occur.

⁵ Temporary impacts will be limited to foot traffic within a six-foot-wide travel lane or two 3-foot-wide travel lanes between the HDD entry and exit points totaling 0.0005 acre of temporary impacts.

⁶ Temporary impacts will be limited to bridges or like crossing structures. Temporary structures will be removed at the completion of the Project.

Wetland W01 consists of shallow marsh community that is located along the point bar of East Fork Des Moines River (S01). The shallow marsh community was dominated by rice cut grass (*Leersia oryzoides*), with seasonally inundated soils consisting of fluvial deposits mostly of sand. Redox features within the sand deposits were visible, and subsurface moisture was present indicating periodic inundation that occurs when the stream rises during rain events. Wetland NB-W01 consists of seasonally flooded basin community and is considered a ditch. The seasonally flooded basin community was dominated by hybrid cattail (*Typha x glauca*), with seasonally inundated soils

consisting of overwash deposits of silt, sand and clay. The wetland ditch is assumed to be occasionally maintained within the road ROW, to allow proper drainage.

The Project will result in a total of 0.06 acre of temporary impacts to wetlands; no permanent wetland fill or conversion will be required. Temporary wetland impacts will occur from foot traffic during HDD operation to locate and guide the drill and inspect for inadvertent releases, and from two temporary access roads that will utilize bridges or like structures. No excavation or grading will occur in the wetlands. Following construction, the travel lanes will be allowed to revegetate naturally and temporary structures will be removed. Since all wetland impacts that will result from the Project are associated with foot traffic within the HDD travel lanes or temporary crossing structures (i.e., bridges), a wetland specific restoration plan is not necessary.

Pursuant to the Minnesota Wetland Conservation Act, Minn. Stat. Chapter 8420, a replacement plan for temporary wetland impacts will not be required for the installation of pipeline. Additionally, wetland mitigation credits are not required under the Minnesota Wetland Conservation Act for temporary wetland impacts. The Project meets criteria for coverage under the Utilities Regional General Permit from the USACE-St. Paul District without the need for preconstruction notification. Northern submitted a Project notification email to the USACE, WCA LGU, and MPCA January 23, 2024, notifying these agencies of the proposed Project construction and schedule. On February 20, 2024, the Martin Soil and Water Conservation District responded to the project notification and provided a decision of no loss for wetlands. Submittal and response information is included in Appendix E.

The NDEE has state regulatory authority over wetlands, navigable waters and adjacent lands in Nebraska; however, the temporary wetland impact in Nebraska complies with the non-reporting Pre-Construction Notification requirements in Nationwide Permit 12; no coordination with the USACE or NDEE is required.

2.2.2 Construction and Operation Impacts and Mitigation

As part of Northern's temporary erosion and sediment control measures, Northern will construct or install sediment barriers, stormwater diversions, trench breakers, mulch or functional equivalents, and seed to establish ground cover, as necessary, to protect wetlands and waterbodies where land disturbing activities occur within the Project area. Permanent erosion control will be executed in the temporary workspace by restoration of contours as near as practicable to pre-construction conditions and revegetation using approved seed mixes. The temporary and permanent erosion and sediment control measures will be installed as specified in the Plan.

Trench dewatering activities will occur in accordance with the applicable state's requirements and the Plan and Procedures. Hydrostatic test water will be transported offsite for disposal at public treatment facilities. There will be no impacts to surface water resources from dewatering or hydrostatic testing.

As proposed, the Project will not cause permanent impacts on surface waters. Construction practices will follow the Plan and Procedures, which contain BMPs intended to reduce ground disturbance, minimize erosion and sediment run off and promote revegetation within the construction area. Northern's EIs will document that all construction workspace along with the waterbody boundaries are staked by a civil survey firm prior to the start of construction. The refueling setback at the waterbodies also will be demarcated with signage placed by Northern's EIs.

One waterbody (S01) is over 100 feet in length; FERC’s requirements to file major waterbody crossing plans does not apply to prior notice filings. However, Northern’s HDD plan and profile depicts the requirements for a waterbody crossing plan. In order to prevent the introduction of fuels and/or hazardous materials into surface water resources, Northern developed an SPCC Plan to prevent, contain and clean up spills and address necessary precautions during material storage. The SPCC Plan also provides restrictions and mitigation measures to minimize potential impacts associated with the release of fuels, lubricants or other potentially toxic materials used during routine construction. Refueling and storing of hazardous materials will be prohibited within 100 feet of a waterbody during construction. Based on these measures, the potential for fuel or hazardous materials to be released into a wetland or waterbody, or flow to a wetland or waterbody, is minimized to the extent practicable.

The Project component workspaces for the C-Line and Columbus branch line tie-over regulator are not within any DWSMAs; therefore, no setbacks or associated mitigating controls are required.

Northern has avoided and minimized wetland impacts to the maximum extent practicable. Five wetlands were identified within the ESB. Northern designed the Project to avoid three wetlands. One wetland in Minnesota will be crossed via HDD and a temporary travel lane. The wetland in Nebraska will be crossed via two TARs and ETWS. Northern will minimize wetland impacts in Nebraska by installing a temporary bridge over the wetland within the TARs; thereby limiting filling and grading activities. Additionally, Northern will implement the Project SWPPP (located in Appendix L), which contains BMPs intended to reduce ground disturbance, minimize erosion and sediment run off and promote revegetation within the construction area.

Permanent erosion control devices will be installed during restoration and may include slope breakers, interceptor diversion devices, and/or vegetation cover in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of surface water diversion devices to prevent erosion off the ROW into wetlands and other surface waters.

3 RESOURCE REPORT 3 – FISHERIES, VEGETATION, AND WILDLIFE

3.1 FISHERIES

The ESB was assessed for the presence of special waters including springs, National Wild and Scenic Rivers, Outstanding Resource Value Waters (ORVWs), Public Water Inventory, trout streams and other special state and local waterbody designations as described in Section 2.2.

Minnesota

No MDNR-managed state fisheries are located within the Project area (MDNR, 2023d). There is no essential fish habitat in the Project area. Sensitive fish distribution data were obtained from the USFWS IPaC system and the MDNR NHIS database. Determinations for potential impacts were made based on field observations and a review of available literature. A review of the USFWS IPaC system and the MDNR NHIS database indicated that no federally listed or state-listed T&E or special concern fish species are known to occur within the Project area or its vicinity and no coldwater fisheries or trout streams will be crossed by the Project components in Minnesota.

Nebraska

Sensitive fish distribution data were obtained from the USFWS IPaC system and the NGPC database. Determinations for potential impacts were made based on field observations and review of available literature. A review of the databases revealed that no federally listed or state-listed threatened or endangered or special concern fish species are known to occur within the ESB; the ESB did not contain waterways. No fisheries will be crossed by the Project component in Nebraska.

Construction and Operations Impacts and Mitigation

Riparian vegetation contributes to the shading of rivers and their tributaries. The vegetation controls the amount of solar radiation that reaches the water surface, which in turn controls the input of heat into stream systems. Northern will use an HDD to cross the waterbodies, East Fork Des Moines River and County Ditch Eleven. No vegetation removal will occur at the waterbody crossings; therefore, an increase in water temperature or adverse impacts on fish habitat are not expected to occur as a result of construction of the Project.

In addition to using HDD to cross the waterbodies, Northern will follow the Plan and Procedures, which include BMPs intended to reduce ground disturbance, minimize erosion and sediment run off and promote revegetation within the construction area. Construction stormwater will not discharge to streams in or adjacent to the Project area. This will minimize potential sedimentation and turbidity impacts on fisheries.

The primary impact that could occur from HDD activities is an inadvertent release directly or indirectly into a waterbody. Drilling mud from an HDD may leak through previously unidentified fractures in the material underlying the riverbed, in the area of the mud pits, or along the path of the drill, due to unfavorable ground conditions. Although drilling mud consists of naturally occurring nontoxic material, such as bentonite clay, water and other inert additives, in larger quantities, the release of drilling mud into a waterbody could affect fisheries or other aquatic organisms by settling and temporarily inundating the habitats used by these species. Northern will minimize the potential impacts of an inadvertent release of drilling mud by implementing its HDD Plan included in Appendix A. Based on the review of fisheries data, limited fish species may occur in the East Fork Des Moines River and County Ditch Eleven, and no listed or protected aquatic resources are present; therefore, no consultation with MDNR staff regarding HDD and aquatic resources is required.

Prior to the start of construction, Northern will review its HDD Plan with its contractors. During construction, Northern will ensure its contractors have sufficient spill containment material and supplies needed to contain an inadvertent release of drilling mud that occurs near the East Fork Des Moines River or County Ditch Eleven.

Prior to placing the Project into service, the pipeline and piping components for the aboveground facilities will be pressure tested. The Project components that require water for pressure test will obtain the water from off-site sources. Hydrostatic test water will be transported offsite for disposal at public treatment facilities. Refueling or lubricating of vehicles or equipment will be performed in accordance with the Procedures and will occur no closer than 100 feet from a waterbody unless no feasible alternative exists, or a greater setback is stipulated by a permitting agency. Northern anticipates construction and operation of the Project will not cause impacts on fisheries.

3.2 VEGETATION

Vegetative habitats are classified by the presence of the dominant vegetation species. Defining habitats helps to assess the potential presence of wildlife, T&E species and communities, and other ecologically sensitive areas. In turn, these evaluations make it possible to identify areas that require protection or conservation management plans.

Central tallgrass prairie was the predominant native vegetation in the vicinity of the Project prior to European settlement; however, the Project area currently consists primarily of agricultural land, row crops and hay fields. Field surveys conducted for the Project October 10 and 11, 2023, and February 13, 2024, determined the Project site consists primarily of cultivated crop land planted in corn and soybean.

Land use within the Central Iowa and Minnesota Till Prairies is approximately 80% cropland, 5% grassland, 3% forest, 6% urban development, 2% water and 4% other land uses. Where grasslands still occur, they are characterized by little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), and switchgrass (*Panicum virgatum*). In droughty soils, little bluestem, Indiangrass, and needlegrass (*Hesperostipa spartea*) grow. Little bluestem, sideoats grama (*Bouteloua curtipendula*), blue grama (*Bouteloua gracilis*), and scattered bur oak (*Quercus macrocarpa*), juniper (*Juniperus communis*), and sumac (*Rhus typhina*) grow in very shallow soils (USDA, NRCS 2006).

Land use within the Iowa and Minnesota Loess Hills is approximately 84% cropland, 7% grassland, 1% forest, 4% urban development, 1% water, and 3% other land uses. Where grasslands still occur, they are characterized by little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), and wildrye (*Elymus virginicus*). Prairie forbs in this area include fragment false indigo (*Baptisia australis*), showy milkweed (*Asclepias speciosa*), woolly milkweed (*Asclepias vestita*), western prairie fringed orchid (*Platanthera praeclara*), dotted blazing star (*Liatris punctata*), maximilian sunflower (*Helianthus maximiliani*), ground plum (*Astragalus crassicaarpus*), and wild prairie onion (*Allium stellatum*). The wooded areas in this area typically support bur oak (*Quercus macrocarpa*), red oak (*Quercus rubra*), and hackberry (*Celtis occidentalis*). Species in bottom land support slippery elm (*Ulmus rubra*), cottonwood (*Populus fremontii*), willow (*Salix*), and plum (*Prunus*) (USDA, NRCS 2006).

Minnesota

A majority of the ESB consists of actively cultivated agricultural fields. Field surveys were completed between October 10 and 11, 2023. The cultivated crops observed were corn (*Zea mays*) and soybean (*Glycine max*).

Four wetlands were observed in the ESB. The wetlands were classified as Type 1 seasonally flooded, floodplain forested wetland, Type 3 shallow marsh, and Type 1 farmed seasonally flooded wetland. The seasonally flooded floodplain forested wetland vegetation community consisted of black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), reed canary grass (*Phalaris arundinaceus*), Virginia wild-rye (*Elymus virginicus*), and cutleaf coneflower (*Rudbeckia laciniata*), shallow marsh vegetation community was dominated by rice cut grass (*Leersia oryzoides*). The farmed seasonally flooded wetlands consisted of stunted corn, barnyard grass (*Echinochloa crus-galli*), witchgrass (*Panicum capillare*), prostate pigweed (*Amaranthus albus*), and Japanese bristlegrass (*Setaria faberi*).

Other habitats identified within the ESB to a lesser degree consisted of maintained residential communities that consisted of turf species such as Kentucky bluegrass (*Poa pratensis*) and fescues (*Festuca spp.*) with mixes of white clover (*Trifolium repens*), and red clover (*Trifolium pratense*), maintained road ROW consisting mostly of smooth brome (*bromus inurmis*), and riparian habitats consisting of box elder (*Acer negundo*), black willow, green ash, Virginia wild-rye, reed canary grass, Indian hemp (*Apocynum cannabinum*), white grass (*Leersia oryzoides*), common milkweed (*Asclepias syriaca*), stinging nettle (*Urtica dioica*), and smooth brome.

Small segments of open land were observed in the ESB. A majority of the open land is located along road ROW or field edges and was dominated by smooth brome. No large parcel open land was observed within the Project area.

Nebraska

Field surveys were completed February 13, 2024. One emergent wetland was located in the ditch associated with Highway 79. No waterbodies were identified within the ESB. The Project area for the Nebraska component mostly consisted of road ROW containing hybrid cattail (*Typha x glauca*) and yellow foxtail (*setaria pumila*) and actively cropped agricultural land consisting of corn (*Zea mays*). Approximately 0.26 acre of the workspace will occur within an existing Northern facility. There are no trees or shrubs within the ESB.

Project

Based on the field survey data, there are no known unique or sensitive vegetation types affected by the Project. The proposed Project area consists of approximately 76.62 acres of agriculture, 0.05 acre of forested land (in HDD travel lanes only), 0.06 acre of wetland, and 3.98 acres of open land. Temporary and permanent impacts from construction and operation of the Project on vegetation cover types are presented in Table 3.3-2 and discussed below. Project disturbance in commercial/industrial, residential land and open water are not listed in Table 3.3-2, as vegetation is typically not present in these land categories. Wetland impacts in Minnesota, as listed in Table 2.2-3, will be limited to foot traffic within a six-foot-wide travel lane or two 3-foot-wide travel lanes between the HDD entry and exit points totaling <0.01 acre of temporary impacts. Wetland impacts in Nebraska total 0.06 acre and will be limited to ETWS and two TARs that will bridge over a wetland confined to a roadside ditch.

Table 3.3-2 Estimated Disturbance of Vegetation Cover Types³

Facility	Agricultural		Forest/ Woodland		Wetland		Open Land	
	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)
C-line extension, Martin County, MN								
Pipeline ROW ^{1,2}	44.53	24.59	0.05	0.00	0.00	0.00	0.92	0.52
ETWS	10.76	0.00	0.00	0.00	0.00	0.00	1.08	0.00
Staging Area	19.68	0.00	0.00	0.00	0.00	0.00	0.63	0.00
Temporary Access Roads	0.91	0.00	0.00	0.00	0.00	0.00	0.83	0.00
MNB87501 Sherburn TBS #2 Take Off, Martin County, MN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MNB87401 Sherburn TBS #1 Take Off	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Facility	Agricultural		Forest/ Woodland		Wetland		Open Land	
	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)	Const (acres)	Oper (acres)
Welcome south receiver and MAOP regulator, Martin County, MN	0.71	0.71	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal	76.59	25.30	0.05	0.00	0.00	0.00	3.46	0.52
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE								
ETWS	0.03	0.00	0.00	0.00	0.04	0.00	0.50	0.00
Columbus Branch Line Tie-Over Regulator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Temporary Access Roads	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00
Subtotal	0.03	0.00	0.00	0.00	0.06	0.00	0.52	0.00
PROJECT TOTAL	76.62	25.30	0.05	0.00	0.06	0.00	3.98	0.52

¹ Construction ROW is based on a 90-foot-wide corridor. Operational ROW is based on a 50-foot-wide corridor.

² Northern also included impacts for a 6-foot-wide or two 3-foot-wide parallel travel lanes between HDD entry and exit points in the pipeline ROW calculations.

³ Residential, industrial/commercial, and open water land use types are excluded from this table as they typically do not contain vegetation.

Lists of potential noxious and invasive weeds were obtained from federal and state agencies. The federal list was obtained from the U.S. Department of Agriculture’s database of Introduced, Invasive and Noxious Plants. State lists are maintained by the Minnesota Department of Agriculture and the Nebraska Department of Agriculture. Northern completed a noxious weed survey of the ESB concurrent with the wetland and waterbody surveys between October 10 and 11, 2023, and February 13, 2024. One noxious weed species, Canada thistle (*Cirsium arvense*), was identified at one location within the ESB: the East Fork Des Moines River riparian area in Martin County, Minnesota. As discussed above, Northern is completing an HDD under this waterbody and the foot-traffic travel lane from the HDD is not located in the identified noxious weed areas.

Northern has developed a Project-specific Noxious Weed Control Plan to prevent the introduction of new noxious weed areas and control the spread of noxious weeds during construction and operation of the proposed facilities (see Appendix D). In addition, Northern will control the introduction and spread of noxious weeds and invasive plants to the Project area through implementation of the Plan. Northern will monitor the construction area in accordance with the Plan and Noxious Weed Control Plan to ensure that the noxious weeds do not spread outside of the areas where they have been identified.

3.3 WILDLIFE

The wildlife species that inhabit the proposed Project area are typical of species found in agricultural areas in the Midwest. Some of the major wildlife species that are common in the Project area are white-tailed deer, gray fox, eastern cottontail rabbit, red squirrel, and chipmunk. Woodchuck, muskrat, and beaver may occasionally be present, and less common animals in the area include otter and mink. House wrens, northern cardinals, American goldfinches, blue jays, song sparrows and common yellowthroats are common in open land areas. Bird species found to nest in agricultural settings include ring-necked pheasant, killdeer, mourning dove, horned lark, American robin, common yellowthroat, bobolink, Eastern and Western meadowlark, red-winged blackbird, brown-headed cowbird, dickcissel, savannah sparrow, grasshopper sparrow, vesper sparrow, and field

sparrow. Raptor species that could be present include sharp-shinned hawk, Cooper’s hawk, broad-winged hawk, and great horned owl.

Species observed during the time of survey included: American crow, American kestrel, American robin, bald eagle, blue jay, European starling, great blue heron, horned lark, house sparrow, killdeer, mourning dove, northern cardinal, northern flicker, red-winged blackbird, ring-necked pheasant, rock pigeon, ruby-crowned kinglet, and song sparrow.

The North American Bird Conservation Initiative (NABCI) maintains a list of Bird Conservation Regions (BCR) (NABCI, 2020). A BCR is an ecologically distinct region in North America with similar bird communities, habitats and resource management issues. Important Bird Areas (IBAs) are discrete sites that provide essential habitat for one or more bird species and include habitat for breeding, wintering, and/or migrating birds (Audubon, 2021). The BCRs and IBAs are discussed by state further below.

The protection of migratory birds is regulated by the MBTA and BGEPA. Any activity, intentional or unintentional, that results in the take of migratory birds is prohibited unless otherwise permitted by the USFWS. Depending on the timing of construction, the Project may potentially affect nests, eggs, and/or young of birds protected under the MBTA.

Minnesota

The C-line extension will be located in the BCR 11 – prairie potholes. The USFWS Birds of Conservation and Concern 2008 report (USFWS, 2021) identifies 33 Birds of Conservation and Concern within BCR 11. The Project component in Minnesota does not cross an IBA. The nearest IBA to the Project is the Des Moines River IBA, located approximately 9.5 miles west of the Project. Based on review of the USFWS IPaC Species list (USFWS, 2023) for Martin County, Minnesota, there are 10 migratory bird species that occur or have the potential to occur within the Project area.

Nebraska

The Columbus branch line tie-over regulator station is located in the BCR 22 – Eastern Tallgrass Prairie. The USFWS Birds of Conservation and Concern 2008 report (USFWS, 2021) identifies 25 Birds of Conservation and Concern within BCR 22. The Project component in Nebraska does not cross an IBA. The nearest IBA to the Columbus branch line tie-over regulator is the Rainwater Basin IBA, located approximately 22 miles southwest of the Project area in Nebraska. Based on review of the USFWS IPaC Species list (USFWS, 2023) for Dodge County, the bald eagle is the only migratory bird species that has the potential to occur within the ESB.

Raptors and MBTA

To assess the potential for impact on raptors, Northern completed field surveys for all Project components between October 10 and 11, 2023, and February 13, 2024; the surveys included a 0.5-mile line-of-site raptor nest survey. No raptor, bald eagle, or golden eagle nests were observed during the surveys. A bald eagle was seen flying across the Project area within the C-line extension ESB along the East Fork Des Moines River riparian corridor.

According to the IPaC, the nesting season for migratory birds in Minnesota and Nebraska is generally from March 1 to August 31. Project construction during this timeframe could result in short-term disturbance of migratory bird habitat, causing birds present in the Project area to relocate temporarily during periods of active construction and human activity. The Project has the potential to temporarily

alter or otherwise affect migratory bird foraging habitat; however, such impacts will be minimal given the number of similar habitats available outside of the construction area.

Northern plans to begin construction May 2024, within the primary nesting season. Construction will continue to November 1, 2024. Northern will attempt to limit removal or impacts on vegetation during the primary nesting season of breeding birds. If construction work cannot be avoided during the peak breeding season, Northern will have a biologist conduct a pre-construction nest survey for breeding birds within the Project workspaces. The nest survey will determine the absence or presence of breeding birds and their nests. Pre-construction nest surveys will be completed for all Project components according to the following procedures.

- No more than seven days before construction activities commence, pre-construction nest surveys for migratory birds will be completed by a qualified avian biologist. The area surveyed will include the proposed workspaces or areas where potentially suitable habitat has been identified.
- If an occupied raptor nest is observed during the survey, construction activities will not be permitted within a 660-foot buffer of the raptor nest site during the breeding season or until the fledglings have left the area. Northern will complete consultation with the USFWS and the MDNR or NGPC if an active raptor nest is observed.
- If a nest, other than a raptor nest, is observed during the survey, construction activities will not be permitted within a 100-foot buffer of the nest until consultation with the MDNR or NGPC and with the USFWS occurs. Northern will implement buffers and practices recommended by the agencies during the consultation.

Upon completion, the survey results will be submitted to the USFWS and the MDNR or NGPC, as appropriate. If breeding birds are not present, construction can proceed with no restrictions. If breeding birds or active nests are present, additional consultation will be conducted. Based on the survey measures listed above, Northern believes the Project will have no effect to migratory birds, birds of conservation concern, raptors, and other species of special concern.

During construction, Northern will minimize light impacts as described below. Northern does not anticipate the routine use of artificial lighting. Artificial lighting only will be utilized, if necessary, to complete potential nighttime activities as described in Section 1.3.3. Lighting would be equipped with shields and aimed downward to minimize impact on nocturnal wildlife or surrounding residences. Lenses for the lighting would be yellow or amber to minimize impacts on residents and wildlife.

3.4 THREATENED AND ENDANGERED SPECIES

The USFWS IPaC Environmental Conservation Online System was accessed to obtain lists of federally listed T&E, proposed and candidate species and federally designated critical habitat that may be present for each Project component. USFWS Determination Keys also were completed for Minnesota and Nebraska. The lists are provided in the Rare, Threatened, and Endangered Species Reports in Appendix E.

Available data describing the life history, critical habitat and conservation measures associated with each species were used to help determine if the Project may have an adverse effect to listed species. Data were retrieved from sources including the USFWS Region 3 website (USFWS, 2021),

NatureServe Explorer Online Encyclopedia of Life (NatureServe, 2023), MDNR T&E species information available online (MDNR, 2023e), NGPC T&E species information available online and NGPC CERT review (NGPC, 2024), and relevant scientific journals and publications referenced below.

Northern conducted field surveys for the presence of suitable habitats concurrent with the wetland delineations between October 10 and 11, 2023, and February 13, 2024. The field surveys consisted of pedestrian inspections to evaluate the presence/absence of suitable habitat and potential presence of listed species within the ESB. Field crews reviewed the list of protected species identified as having the potential to occur within the ESB and within a one-mile buffer of the Project boundary. In addition, the field crews reviewed the applicable fact sheets for specific habitat requirements and identification criteria for the potential species.

Minnesota

Under Stantec’s license agreement (LA-1007), Northern reviewed the MDNR NHIS database in August 2023 for state-listed T&E species with the potential to occur within the Project area. On December 11, 2023, Northern submitted a request for a Natural Heritage Review using the MDNR’s Minnesota Conservation Explorer (MCE) Tool. Informal review of the Project by Northern using the MCE Tool indicated that two records of state-listed species, tuberous Indian-plantain (*Arnoglossum plantagineum*; state threatened) and rattlesnake master (*Eryngium yuccifolium*; state species of special concern) were identified approximately one mile to the east of the Project area within the riparian corridor of the East Fork Des Moines River.

On December 11, 2023, the MDNR responded that further review was needed as a result of state-protected species being in the vicinity of the Project area. On February 29, 2024, MDNR indicated the Project review was complete and the proposed Project will not negatively affect any known occurrences of rare features. Consultation with the MDNR is complete. A copy of the correspondence completed to date is included in Appendix E.

The USFWS IPaC was completed February 28, 2024, and identified one proposed endangered and one candidate species with the potential to occur within or be impacted by construction within the ESB. No critical habitat for these species is currently identified within the ESB. Federally and state-listed species that potentially occur within the vicinity of the Project, their habitat description and anticipated Project impacts are presented in Table 3.4-1 and discussed below.

Nebraska

On February 21, 2024, Northern utilized the Conservation and Environmental Review Tool (CERT) to generate an environmental review report to initiate the consultation process with the NGPC for state-listed species. Once the environmental review report was generated, Northern completed the questions and conservation conditions and determined that conservation measures are not required for the least tern, piping plover, or the northern long eared bat (NLEB). Northern completed the certification and will submit back to the NGPC to complete their consultation.

The USFWS IPaC was completed February 24, 2024, and identified the NLEB, tricolored bat, piping plover, pallid sturgeon, monarch butterfly, and western prairie fringed orchid with the potential to occur within or be impacted by construction within the ESB. No critical habitat for these species is currently identified within the ESB. Federally and state-listed species that potentially

occur within the vicinity of the Project, their habitat description and anticipated Project impacts are presented in Table 3.4-1 and discussed below.

Table 3.4-1 Special Status Species that Potentially Occur in the Vicinity of the Project Area

Common Name	Scientific Name	Federal Status	State Status	County, State	Project Component	Habitat Description	Suitable Habitat Present
Mammals							
NLEB	<i>Myotis septentrionalis</i>	Endangered	Endangered	Dodge, NE	Columbus Branch Line Tie-Over Regulator Station	Winter habitat includes large caves and mines. Summer habitat includes tree cavities and crevices, loose bark of live or dead trees.	<i>Unlikely to occur</i> Project area is within species’ known range, but no suitable habitat was identified within the Project area and no tree clearing is proposed. <i>No effect</i>
Tricolored Bat	<i>Perimyotis subflavus</i>	Proposed Endangered	None	Martin, MN	C-line Extension	Winter habitat includes caves, mines, culverts, tree cavities, and abandoned water wells. Summer habitat includes live and dead deciduous hardwood tree leaf clusters, barns, bridges, roofs, and other concrete structures.	<i>May occur.</i> Potential habitat is present in the Project area. No tree clearing is proposed. <i>Not regulated by the USFWS. Impacts are not anticipated.</i>
				Dodge, NE	Columbus Branch Line Tie-Over Regulator Station		<i>Unlikely to occur</i> Project area is within species’ known range, but no suitable habitat present within the Project area and no tree clearing is proposed. <i>No effect</i>
Birds							
Least Tern	<i>Sternula antillarum athalassos</i>	None	Endangered	Dodge, NE	Columbus Branch Line Tie-Over Regulator Station	Breeding and nesting habitats typically dry riverine sandbars in wide, braided rivers, and along the shores of reservoirs and lakes, or on sand and gravel piles at mining operations near rivers.	<i>Unlikely to occur</i> Project area is within species’ known range, but no suitable habitat was identified within the Project area. <i>No effect</i>
Piping Plover	<i>Charadrius melodus</i>	Threatened	Threatened	Dodge, NE	Columbus Branch Line Tie-Over Regulator Station	Habitat includes open sandy beaches or rocky shores, often in high, dry sections away from water on major river	<i>Unlikely to occur</i> Project area is within species’ known range, but no suitable habitat was identified within the Project area. <i>No effect</i>

Common Name	Scientific Name	Federal Status	State Status	County, State	Project Component	Habitat Description	Suitable Habitat Present
						systems, including the Platte River.	
Plants							
Western Prairie-Fringed Orchid	<i>Platanthera praecleara</i>	Threatened	None	Dodge, NE	Columbus Branch Line Tie-Over Regulator Station	Habitats include mostly tallgrass prairie landscapes, upland prairies and loess soils, wet prairies and meadows, and in the sandy soils of sub-irrigated meadows in the Sandhills.	<i>Unlikely to occur</i> Project area is within species' known range, but no suitable habitat was identified within the Project area. <i>No effect</i>
Tuberous Indian plantain	<i>(Arnoglossum plantagineum)</i>	None	Threatened	Martin, MN	C-line Extension	Habitat includes native, mesic prairie with a few populations occurring on bluff prairies with dry soils.	<i>Unlikely to occur</i> Project area is within species' known range, but no suitable habitat was identified within the Project area. <i>No negative affects</i>
Rattlesnake master	<i>(Eryngium yuccifolium)</i>	None	Special concern	Martin, MN	C-line Extension	Almost exclusively found in prairies in Minnesota. The species is found in glacial till soils, especially deep mesic loam, but it can also be found on well-drained, sand-gravel substrates.	<i>Unlikely to occur</i> Project area is within species' known range, but no suitable habitat was identified within the Project area. <i>No negative affects</i>
Fishes							
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	Endangered	Dodge, NE	Columbus Branch Line Tie-Over Regulator Station	Habitat includes large river systems including the Platte River, with diversity of depths and velocities, turbid, free-flowing, braided channels, sand bars, sand flats and gravel bars..	<i>Does not occur</i> Project area does not include waterways; no suitable habitat present. <i>No effect</i>

Common Name	Scientific Name	Federal Status	State Status	County, State	Project Component	Habitat Description	Suitable Habitat Present
Invertebrates							
Monarch butterfly	<i>Danaus plexippus</i>	Candidate	None	Martin, MN	C-line Extension	Habitat includes roadside ditches and open prairies where milkweed and other flowering plants are present. Milkweed is needed for breeding and flowering plants provide nectar for monarchs to feed on.	<p><i>May occur.</i></p> <p>Limited potential habitat is present in the Project area.</p> <p><i>Not regulated by the USFWS. Impacts are not anticipated as 89% of Project area is actively farmed agricultural land and milkweed was only observed in an HDD area.</i></p>
				Dodge, NE	Columbus Branch Line Tie-Over Regulator Station		<p><i>Unlikely to occur</i></p> <p>Project area is within species' known range, but no suitable habitat was identified within the Project area.</p> <p><i>No effect</i></p>

Detailed information regarding the species listed above, including descriptions of the site conditions of the Project area, species' habitats, and effect determinations are included within the Project Rare, Threatened and Endangered Species Reports found in Appendix E.

Field surveys were conducted between October 10 and 11, 2023, and February 13, 2024, to identify the potential for suitable habitat for federal- and state-listed T&E species. Northern determined that the Project will have no effect to NLEB, least tern, piping plover, western prairie-fringed orchid, tuberous Indian plantain, rattlesnake master, pallid sturgeon, and migratory birds. Based on the no effect determination, further consultation with the USFWS is not required. Northern also determined the Project will have no impact on two species proposed for federal listing, the tricolored bat and Monarch butterfly.

Northern completed determination keys for the species listed in the IPaC reports, where available. For Minnesota, the USFWS determination key concurred with the determination no effect for the tricolored bat and monarch butterfly. For Nebraska, the USFWS determination key concurred with the determination of no effect for the NLEB. According to the USFWS, determination keys are not available for the other species.

Due to a diverse set of habitats used by the monarch butterfly, foraging habitat may potentially be present within the Project area. Given the majority of land use within the Project is used for row crops (approximately 89%) and milkweed was only observed sporadically within a riparian corridor that will not be impacted, impacts on the monarch butterfly are not anticipated. Additionally, the monarch butterfly is currently listed as a candidate species and mitigation measures and consultation are not required; however, Northern is committed to the restoration and preservation of pollinator habitat. On May 28, 2020, Northern became a signatory to the USFWS Nationwide Monarch Butterfly Candidate Conservation Agreement for Energy and Transportation Lands. Northern will offer landowners the option of utilizing pollinator-friendly seed mixtures on privately owned lands within the Project workspaces. As part of this Project, Northern plans to introduce a pollinator-friendly seed mixture at the relocated Welcome South receiver and MAOP regulator, between the fence line and the edge(s) of the facility easement. Northern will use a seed mixture of native grasses and flowers that contains plants for pollinators, including monarch butterflies.

Consultation on federal and state T&E species is complete. Copies of the agency submittals and responses are included in Appendix E.

4 RESOURCE REPORT 4 – CULTURAL RESOURCES

Because the Project will be authorized by FERC, it is subject to Section 106 of the NHPA (16 U.S.C. Part 470 et seq.), as amended. Section 106 requires federal agencies to consider the effects of proposed projects on historic properties listed or eligible for listing in the National Register of Historic Places (NRHP) (including archaeological resources, prehistoric and historic structures, and cultural landscapes).

Regulations for the protection of historic properties (36 CFR Part 800) describe the process for compliance with Section 106, including defining the Area of Potential Effect (APE), steps to identify resources and evaluate effects, and consultation with interested parties, including the Minnesota and Nebraska SHPOs.

Northern, as a non-federal party, is assisting FERC in meeting its obligations under Section 106 of the NHPA, as amended (16 U.S.C. Part 470[f]) and the implementing regulations at 36 CFR Part

800 by following the procedures at 18 CFR § 380.12(f). Section 106 requires FERC to consider the effect of the Project on any historic property.

4.1 CULTURAL RESOURCE SURVEY

4.1.1 MNM80511 C-line extension

A cultural resource survey for the C-line extension, the Welcome south receiver and MAOP regulator, a valve setting and an existing aboveground facility in Martin County, Minnesota, was conducted October 2023⁵. Northern completed an archaeological and architectural survey of approximately 456.31 acres within the ESB. Wetlands, roads, and portions of the ESB that had recently been surveyed for cultural resources were not surveyed as part of this Project. The direct APE is limited to the areas that will physically be affected and subjected to ground disturbance by the proposed construction activities.

Northern will relocate its existing Welcome south receiver and MAOP regulator to a new location at the downstream end of the proposed C-line. The Welcome south receiver and MAOP regulator will include control valves, an overpressure protection valve, and a new 15 foot by 17 foot building with a maximum height of approximately 12 feet. Northern also proposes to add a valve tie-over and an additional valve to an existing facility. The visual indirect APE for the three aboveground pipeline facilities is 500 feet from the limits of the facilities.

The archaeological APE for this portion of the Project is composed of primarily agricultural fields that displayed more than 25% surface visibility and was investigated using pedestrian survey methods at no more than 15-meter intervals. As ground surface visibility exceeded 25%, no shovel testing was conducted. In areas showing evidence of prior earth-moving disturbance, greater than 20-degree slope, or waterlogged wetland area, pedestrian survey was augmented with photographic documentation. No archaeological sites were identified as a result of this survey (RCG&A, 2023).

One historic drainage ditch, County Ditch No. Eleven (MR-MAY-010), was identified within the ESB. This drainage ditch is included in the APE; however, Northern will avoid the ditch by utilizing an HDD. The portion of MR-MAY-010 in the APE was recommended not eligible for listing in the NRHP. No standing structures older than 45 years are located in the direct APE (RCG&A, 2023).

Boundaries of two historical farmsteads, containing buildings that are more than 45 years old, are partially in the APE. Parcel ID 110010150 is a 1920 single-family dwelling, a front-gable auxiliary building, a curved roof auxiliary building a small shed, and a cluster of connected grain silos. Parcel ID 110120300 is a 1967 single-family dwelling, three front-gabled auxiliary buildings, and a cluster of circular grain silos. Project views from both parcels are obscured by trees. The proposed Welcome South Receiver and MAOP Regulator facility will not substantively alter the viewshed of any properties in the indirect APE and temporary visual impacts to these parcels during construction will not adversely impact the aspects of integrity of these parcels.

Based on the results of the cultural resources investigation, construction of the Project components in Martin County, Minnesota, will not have direct or indirect effects on NRHP-listed properties or currently identified archaeological or other cultural resources that appear to be eligible for inclusion

⁵ The cultural survey report prepared as a result of this cultural field survey discusses a modification to an existing facility in Colfax County, Nebraska. Northern has since removed this facility from its scope and changed the location of the tie-over MAOP regulators to Dodge County, Nebraska. The facility alternatives are further discussed in Section 10.3.

on the NRHP. No further archaeological or other cultural resource investigations are recommended. A finding of no historic properties affect is recommended (RCG&A, 2023).

4.1.2 Columbus Branch Line Tie-over Regulator Station

A cultural resource survey for the proposed installation to the existing infrastructure at the Columbus branch tie-over regulator station in Dodge County, Nebraska, was conducted February 9, 2024. The proposed installation consist of the addition of a tie-over regulator that will be installed inside of an existing TBS. The tie-over regulator will include the construction of one building, two control valves and a relief valve. The building will be approximately 8 feet by 13 feet with a maximum height of 11 feet. The ESB is 2.07 acres, and the direct APE, the areas that will physically be affected and subjected to ground disturbance by the proposed construction activities, is 0.93 acre. The visual indirect APE for the proposed aboveground facility is 500 feet from the limits of the tie-over regulator station.

Survey methods consisted of intensive pedestrian inspection. The crew conducted a 30-meter interval pedestrian survey along north-south transects. Vegetation in the ESB consisted of corn chaff in the agricultural field surrounding the Project area; short weeds and grasses were noted in the drainage system along the western fence line. Due to disturbances, ground surface visibility averaged 40% across the ESB. As ground surface visibility exceeded 25%, no shovel testing was conducted. No archaeological or other cultural materials were observed in this portion of the Project's APE and ESB.

Two previously recorded built resources were identified in the indirect APE. One historic one-story house (NB-01) built in 1972 is located 277 feet to the southwest of the ESB. The other structure (NB-02) is a metal utility shed located within Northern's TBS within the ESB. Visual impacts to NB-01 will be minimally intrusive. NB-02 is exempt from review under 36 CFR Part 800. No further archaeological or other cultural resource investigations are recommended. A finding of no historic properties affect is recommended for the Project in Dodge County, Nebraska (RCG&A, 2024).

4.2 STATUS OF THE STATE HISTORIC PRESERVATION OFFICE CONSULTATIONS

On November 13, 2023, Northern submitted the report documenting the results of the cultural resources investigations and architectural evaluations of the Project in Minnesota along with a UDP to the Minnesota SHPO. On January 2, 2024, the Minnesota SHPO concurred with Northern's recommendation that no historic properties will be affected by the proposed Project. The Minnesota SHPO further commented on a farm burial plot inside the ESB; no evidence of the burial was located during the field efforts. The Minnesota SHPO also stated the investigation would have been improved by shovel testing in mollisols; however, based on a review of other recent nearby survey efforts, the Minnesota SHPO has determined that the pedestrian survey method was an appropriate identification level of effort for this proposed Project. Northern will comply with the Minnesota SHPO's request on future projects. The Minnesota SHPO did not require any updates to Northern's UDP.

On February 19, 2024, Northern submitted the cultural report documenting the results of the cultural resources investigation and architectural evaluation of the Columbus branch line tie-over regulation station along with a UDP to the Nebraska SHPO. On March 1, 2024, the Nebraska SHPO provided concurrence with the determination that no historic properties will be affected by the Project. The

Nebraska SHPO requested clarification on the UDP regarding the storage location of cultural resources not associated with human remains. In March 2024, Northern will schedule a meeting with the Nebraska SHPO to discuss their request for clarification.

The cultural resource reports are included in Appendix F (labelled CUI/PRIV – DO NOT RELEASE). The UDPs are included in Appendix G, and the consultation letters and SHPO responses are included in Appendix H.

5 RESOURCE REPORT 5 – SOCIOECONOMICS

The construction and operation of the Project and its associated aboveground facilities are not expected to cause significant permanent population increases in the Project area. Construction of the Project will require approximately 125 construction personnel over the estimated six-month construction period. Northern will attempt to hire locally to the extent practicable, but a portion of the workforce may temporarily relocate to the Project area. No additional permanent staff will be required.

5.1 LOCAL SETTING

Impacts on the population in the areas affected by the Project are expected to be temporary and relatively minor. The estimated number of construction workers, up to 125, may bring family members with them to the Project areas; however, due to the short duration of construction and the relatively small percentage of people this represents compared to the existing populations, Northern does not anticipate any significant impacts on the local populations.

Northern collected information about housing, and public services and infrastructure from publicly available online sources for the areas impacted by the Project. Per the 2018-2022 U.S. Census Bureau American Community Survey 5-Year Estimates, the number of housing units in the two county Project area varies between a low of 9,797 in Martin County, Minnesota, to a high of 16,348 in Dodge County, Nebraska. The rental vacancy percentage varies between 8.9% in Martin County, Minnesota, to 10.6% in Dodge County, Nebraska. The number of vacant seasonal, recreational, or occasional housing units includes 176 units in Martin County, Minnesota, and 337 units in Dodge County, Nebraska. An online review through Yellowbook indicates that hotels and motels, as well as campgrounds, are available in each Project county and may provide temporary housing options for the anticipated construction workforce. Given the estimated number of construction workers and the construction duration, the Project will not have a significant or permanent impact on local housing.

Numerous public services are available in the counties affected by the Project. Each Project county has public schools offering classes from kindergarten to high school. Each county in the Project area has at least one sheriff's department/police department and multiple fire and rescue departments. Hospitals are available within both the Project counties. Roads in the Project counties include federal and state highways, county and township roads and city streets. Martin County, Minnesota, also includes U.S. Interstate 90. Given the limited construction area, the estimated number of construction workers, and the short construction duration, the Project will not have an impact on public services.

Construction will have a positive impact on employment, income and tax revenues in the areas directly affected by the Project and in other nearby communities. The impact will result from wages paid to workers, income taxes paid on worker compensation, the buying of local materials and

products, and the sales and other taxes paid by the workers and companies associated with the Project. The consumption of services, including utility services, fuel, lodging, and food will benefit the local economies and the local and state tax bases. During the operational phase of the Project, additional property tax revenues will accrue to the jurisdictions where the facilities are located.

5.2 SOCIOECONOMIC DATA

The latest socioeconomic data produced by the 2018-2022 U.S. Census Bureau American Community Survey 5-Year Estimates were used to assess the existing socioeconomic data for the Project area and the two counties affected by the proposed Project: Martin County in Minnesota and Dodge County in Nebraska.

Table 5.2-1 provides the population characteristics for the Project area based on 2018-2022 U.S. Census Bureau American Community Survey 5-Year Estimates. The total population and population characteristics are presented for the three U.S. Census Block Groups. Population characteristics for the two counties affected by the Project are provided for comparative purposes. The population of the Project area varies between a low of 591 (Census Tract [CT] 9637 Block Group 3 within Dodge County, Nebraska, population of 37,175) and a high of 1,085 (CT 9030, Block Group 1 within a Martin County, Minnesota, population of 19,960). The minority population percentage within the Project area varies between a low of 3.8% (CT 9030 Block Group 1 compared to a Martin County, Minnesota, minority percentage of 9.1%) and a high of 8.6% (CT 9637, Block Group 3 compared to a Dodge County, Nebraska, minority percentage of 19.6%).

Table 5.2-1 provides percentage of households with income in the last 12 months below the poverty level for the Project area based on the U.S. Census Bureau Table B17017. The percentage of households with income in the last 12 months below the poverty level are presented for the three U.S. Census Block Groups. The percentage of households with income in the last 12 months below the poverty level for the two counties affected by the Project are provided for comparative purposes. The percentage of households below the poverty level within the Project area varies between a low of 2.9% (for CT 9637 Block Group 3 compared to 10.5% in Dodge County, Nebraska) and a high of 5.5% (CT 9040 Block Group 2 compared to 11.9% in Martin County, Minnesota).

Linguistically isolated populations are households with limited English-speaking capability. Table 5.2-2 provides the linguistically isolated population percentages for the Project area based on 2018-2022 U.S. Census Bureau American Community Survey 5-Year Estimates. Linguistically isolated population data are unavailable at a Census Block Group level, so the data presented are at a Census Tract level. Linguistically isolated population data for the two counties affected by the Project are provided for comparative purposes. The linguistically isolated population percentage within the Project area varies between a low of 0.2% (CT 9040 compared to 1.7% for Martin County, Minnesota) and a high of 0.6% (CT 9637 compared to 5.7% for Dodge County, Nebraska). This data is depicted on Figure 5-1.

Table 5.2-1 Minority Populations by Races and Ethnicity and Low-Income Populations in the Project Area ^{1,3,5}

Area ²	Race and Ethnicity										People in Poverty ⁶ (%)
	Total Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Some other race (%)	Two or more races (%)	Hispanic or Latino (Any race) (%)	Total Minority (%) ⁴	
Martin County, MN	19,960	90.9	0.6	0.1	0.5	0.0	0.8	1.7	5.4	9.1	11.9
CT 9030 Block Group 1	1,085	96.2	0.0	1.4	0.6	0	0.6	0.5	0.8	3.8	5.4
CT 9040 Block Group 2	855	93.0	2.6	0	0	0.2	0.9	1.6	0.4	7.0	5.5
Dodge County, NE	37,175	80.4	0.6	0.2	0.5	0.1	0.8	5.8	15.0	19.6	10.5
CT 9637, Block Group 3	591	91.4	0	1.2	4.7	0	0	1.9	1.2	8.6	2.9

¹U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates.

²All counties impacted by the Project are located in Minnesota or Nebraska.

³Race documentation is based on self-identification on census forms.

⁴“Minority” refers to people who reported their ethnicity and race as something other than non-Hispanic white. Totals may not equal the sum of individual percentages due to rounding.

⁵0 means none of the population reported that race or ethnicity category. 0.0 means that the race or ethnicity category is rounded-off to zero.

⁶Data from US. Census Bureau Table B17017.

Table 5.2-2 Linguistically Isolated Population in the Project Area¹

Area ²	Linguistically Isolated Population (%) ³
Martin County, MN	1.7
CT 9030	0.5
CT 9040	0.2
Dodge County, NE	5.7
CT 9637	0.6

¹ U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates, Limited English-Speaking Households.

² All counties impacted by the Project are located in Minnesota or Nebraska.

³ Limited English-speaking households

5.3 ENVIRONMENTAL JUSTICE COMMUNITIES

EO 12898 requires each federal agency to make environmental justice part of its mission. Agencies identify and address disproportionately high adverse human health or environmental effects of its activities on minority populations and low-income populations. Minority populations are defined as individuals who are members of the following population groups: American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Black or African American, two or more races, or Hispanic. Low-income is defined as a median household income at or below the Department of Health and Human Services' poverty guidelines.

For purposes of EO 12898, a population is identified as minority in an area if “either (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis” (CEQ, 1997). A minority population exists “if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds” (CEQ, 1997). Based on this definition, no environmental justice communities for minorities are within the Project area.

For purposes of EO 12898, a linguistically isolated population exists if the “percentage of limited English-speaking households of the affected area is meaningfully greater than the percentage of limited English-speaking households in the general population or other appropriate unit of geographic analysis” (CEQ, 1997). Based on this definition, no linguistically isolated populations are within the Project area.

Low-income populations are those that fall below the poverty levels from the U.S. Department of Commerce, Bureau of the Census Population Reports. If the percentage of the low-income population in an identified Census Block Group is equal to or greater than that of the county or if the median household income in an identified block group is equal to or greater than that of the county, then an environmental justice community is present. None of the Census Block Groups had percentages of households with income in the last 12 months that were below the poverty level for the Project area greater than their respective county. Based on this definition, no low-income environmental justice communities are within the Project area.

No environmental justice communities are present in the Project area. Northern will construct and operate the Project consistent with the goals described in EO 12898, and no environmental justice issues are expected to result. Project construction and operation will have positive socioeconomic

effects on the general local population by generating new construction jobs, promoting economic activity, and providing tax revenue.

Construction of the proposed Project will not have disproportionately high or adverse human health, socioeconomic, or other environmental effects on minority or low-income communities.

5.4 COMMUNITY ENGAGEMENT

In accordance with 18 CFR §157.203(d)(2), Northern will engage with affected landowners as further described in Section 1.7.

6 RESOURCE REPORT 6 – GEOLOGICAL RESOURCES

Geology and Physiography

The Project components in Martin County, Minnesota, are within the Central Iowa and Minnesota Till Prairies Major Land Resource Area. Physiography of this area is a result of glaciation by the Des Moines Lobe of the Wisconsin-age ice sheet. The Project area is nearly level to gently rolling glaciated till plain with moraines and glacial lake plains in some areas. Relief is mainly less than 10 to 30 feet. Glacial till, outwash and glacial lake deposits overlie the region and is 300 to 400 feet in thickness. River valleys are recent alluvium consisting of clay, silt, sand, and gravel. Loosely consolidated Cretaceous bedrock sediments, primarily shale, sandstone, and sandy shale, underlie the glacial deposits in the area and are typically less than 25 feet thick. Below the Cretaceous sediments, the uppermost bedrock formation underlying the Project area is the Middle and Upper Cambrian Mt. Simon Sandstone, consisting of sandstone, siltstone, and shale with a thickness of up to 110 feet (Mankato State University [MSU], 1991; Minnesota Geological Survey [MGS], 2011).

The Project component in Dodge County, Nebraska, is located within the Loess Uplands region and encompasses a landscape dominated by rolling hills. Physiography in this area is a result of thick wind-blown sediment redeposited as loess over a wide area during the Wisconsin glaciation. The process was repeated over thousands of years, creating a thick loess landscape. The loess was initially deposited in a more uniform and flatter terrain, but over time, erosion dissected the loess to create the rolling hills seen in present day. The Project area is located within the floodplain of the Platte River and the underlying geology consists of silty to sandy alluvium over coarser-grained sand and gravel at depth. The thickness of the alluvium ranges from ten to 100 feet thick (USGS, 1994). Karst and bedrock geology for the Project area is depicted on Figure 6-1.

Mineral Resources

The MDNR website does not include mineral resource data for Martin County, Minnesota. Minnesota lacks the deposits suitable to be source beds for petroleum, and sedimentary deposits were never buried to the depths necessary to produce crude oil. While some oil and gas exploration has occurred in Minnesota, no commercially viable oil and gas extraction has occurred. Minnesota has no coal reserves or production (MGS, 1984).

Nebraska's crude oil reserves account for approximately 0.03% of the nation's total. Production wells are located in the western and southwestern part of the state and are declining in production over time. Nebraska does not have significant natural gas reserves, and production in the state is declining. Nebraska does not have any significant coal reserves and has no coal production (IEA, 2023).

No evidence of surface mining was observed via desktop review of the proposed Project area. There are no mining or quarrying operations in the vicinity of the Project; however, several abandoned and reclaimed sand and gravel quarries are located adjacent to the Platte River approximately one mile south of the Columbus branch line tie-over regulator. Additionally, there are no oil or natural gas extraction wells or coal mines operating in Minnesota. Limited extraction of crude oil and natural gas occurs over 100 miles southwest of the Columbus branch line tie-over regulator station in Nebraska. Based on the above information, construction and operation of the Project will have no impacts on mineral resources.

Geologic Hazards

There is minimal potential for karst development in the area, given the thick horizon of glacial drift that overlies the area and the lack of carbonate bedrock (MSU, 1991; MGS, 2011). According to the USGS, the Project components in Minnesota and Nebraska are not in mapped karst areas (Weary and Doctor, 2014).

There is low potential for seismically induced ground movements in the Project area. For the Minnesota component, the USGS estimates there is a two% probability for an earthquake to occur over the next 50 years that would result in a peak ground acceleration of 0.026 gravity (g). For the Nebraska component, the USGS also estimates there is a two% probability for an earthquake to occur over the next 50 years that would result in a PGA of 0.046 g. Therefore, there is little risk of earthquake-related impacts on the Project facilities (USGS, 2018).

According to the USGS, the Project components are located in an area of low landslide incidence and low landslide susceptibility (Radbruch-Hall et al., 1982). The USGS Landslide Inventory did not indicate the presence of landslides within the Project area (USGS, 2021).

Northern completed a slope analysis along the proposed pipeline centerline using on-site topographic data to identify steep slopes present in the Project area. Steep slopes are depicted with the beginning and ending MP, the length of the slope, and % slope in Table 6.1-1 below.

Table 6.1-1 Steep Slopes Along the Project Centerline¹

Begin MP	End MP	% Slope	Length of Slope
C-line extension			
6.78	6.79	5-15	78.1*
6.85	6.86	5-15	50.2
6.87	6.87	5-15	12.4
8.13	8.14	5-15	37.0
10.25	10.27	15-30	43.1*
10.27	10.27	15-30	10.8*

¹Slopes were obtained from civil survey data.

*Area is within a drill or bore.

There are no steep slopes associated within the aboveground facility components. To mitigate for steep slopes along the pipeline, Northern will install temporary trench plugs and temporary slope breakers during construction on slopes greater than 5% in accordance with the Plan. The temporary slope breakers will channel water off the ROW through a J-hook or other baffling device to limit water flow down long steep slopes. Temporary trench plugs will reduce the velocity of water flowing along the trench and volume of water that collects at the bottoms of slopes. In accordance with the

Plan, Northern will install permanent trench breakers and permanent slope breakers in areas of steep slopes. Trench breakers are designed to prevent preferential water flow along the pipeline trench by diverting subsurface water flow to the land surface. Groundwater discharging to the land surface is then redirected off the ROW by slope breakers. Used in combination, these structures prevent subsurface piping of soils that can lead to slope instability and failure.

Floodplains along the Project are identified and discussed in Section 2.2. In summary, the C-line extension in Martin County, Minnesota, will cross a floodplain located between MP 10.18 and MP 10.28, which is associated with the East Fork Des Moines River. Northern is crossing the East Fork Des Moines River via HDD and all Project workspaces and facilities are located outside the mapped floodplain. Northern will cross under the East Fork Des Moines River, at more than 32 feet below the bed of the waterway to reduce scour potential.

The Columbus branch line tie-over regulator in Dodge County, Nebraska, is located in a flood hazard zone AE of the mapped floodplain of the Platte River (NDNR, 2023b). Northern will not modify the existing graveled area and will maintain the contours of the existing TBS; Northern will construct a new regulator building with flood vents. Due to the proposed work within the mapped floodplain, Northern is required to obtain a floodplain development permit from the City of North Bend Planning and Zoning. Northern is currently completing the permit application. Floodplains are depicted on Figure 6-2.

The Project components are located in areas with very low geologic hazard potential. The overall effects of construction and operation of the Project on topography and geology will be minor. Northern will minimize impacts by returning contours to preconstruction conditions to the maximum extent practicable with the exception of the aboveground facilities, where grading and filling will be required to create a safe and stable land surface, and to support facility drainage.

Paleontology

Bedrock is generally at least 81 feet or deeper within the Project area; therefore, there is little chance of a paleontological discovery as Northern's construction will not extend into bedrock surfaces. Northern's EIs will be instructed to watch for paleontological materials that may be encountered during clearing, grading, or trenching operations. Northern will notify FERC and/or other appropriate parties if fossil materials are encountered.

Geotechnical Investigation

Northern has completed a geotechnical investigation for the Project. Specifically, Northern completed 11 geotechnical borings in the vicinity of the proposed HDDs on the C-line extension at depths between 41 and 81 feet below ground. Boreholes BH-04 through BH-07 and BH-11 have since been changed to conventional bores of roads. The most prevalent soil type encountered was sandy lean clay and silty sand. Some of the boreholes contained sand lenses between 30 and 61 feet. Water was observed between 4.5 and 30 feet below grade while drilling. Bedrock was not encountered in any of the borings. The geotechnical report is included in Attachment 2 of Northern's HDD Plan (Appendix A).

Northern evaluated HDDs along the Project. The MPs, depth to bedrock, where encountered, and the maximum depth of the HDD for each HDD location are listed in Table 6.8-1. The following geotechnical testing results were determined during the geotechnical investigation.

Table 6.8-1 Geotechnical Testing Results

Crossing Drawing Number	Related Geotechnical Borings	Maximum Depth of Crossing (feet)	Approximate Depth to Bedrock (feet)	Begin MP	End MP	Crossing Method
C-line extension, Martin County, MN						
P4-1	BH-01, BH-02	46	>61	6.70	6.85	HDD
P4-2	BH-03	14	>41	7.03	7.09	HDD
P4-3	BH-08, BH-09, BH-10	58	>81	10.16	10.35	HDD

Based on the results above, the HDDs will not encounter bedrock; therefore, Northern designed the HDDs to meet the parameters of the unconsolidated materials along the profiles.

7 RESOURCE REPORT 7 – SOILS

7.1 EXISTING SOIL RESOURCES

Mapped soil series within the Project area were identified from the NRCS soil survey from the counties each Project component resides (Martin County, Minnesota, and Dodge County, Nebraska), and the Soil Survey Geographic Database (SSURGO) (SCS, 1989). The Project is predominantly within the Canisteo-Glencoe complex map unit in Martin County, Minnesota, and are clay loam over loam endoaquolls formed in calcareous loamy till (Canisteo), and loamy sediments from till (Glencoe). The Project area in Dodge County, Nebraska, is entirely within the Zook silt loam. Zook soils are alluvial, very deep, very poorly drained endoaquolls found on floodplains, stream terraces, and drainageways on uplands. The soil map unit present in the Dodge County Project area is influenced by water and/or flooding. Table 7.1-1 summarizes the percentage of each soil type potentially affected by the Project. A soils map is included as Figure 7-1.

Table 7.1-1 Soil Associations Within the Project Area

Map Unit	Map Unit Name	MPs	Temporary Impact (Acres) ¹	Percent of Project Area
MNM80511 C-line extension, Martin County, MN				
86	Canisteo clay loam, 0 to 2 percent slopes	10.40-10.40 10.41-10.42	1.16	1.37
247	Linder loam	6.64-6.75 9.75-9.82	1.93	2.29
392	Biscay clay loam, 0 to 2 percent slopes	6.54-6.59 6.75-6.82	0.66	0.78
664	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	9.86-9.96	1.16	1.37
886	Nicollet-Crippin complex	6.51-6.54 7.04-7.08 9.06-9.10	3.37	3.99
1833	Coland clay loam, 0 to 2 percent slopes, occasionally flooded	9.82-9.86 9.96-10.21	9.02	10.68
1834	Coland clay loam, 0 to 2 percent slopes, frequently flooded	10.20-10.27	0.44	0.52
102B	Clarion loam, 2 to 6 percent slopes	7.14-7.25	1.41	1.67

Map Unit	Map Unit Name	MPs	Temporary Impact (Acres) ¹	Percent of Project Area
887B	Clarion-Swanlake complex, 2 to 6 percent slopes	6.82-6.92 7.43-7.53 7.65-7.69 7.80-7.88 8.07-8.14 8.51-8.59 8.79-8.84 8.87-8.90 9.16-9.24 9.39-9.48	10.47	12.40
920B	Clarion-Estherville complex, 2 to 6 complex slopes	5.89-5.94	3.82	4.52
L107A	Canisteo-Glencoe complex, 0 to 2 percent slopes	5.94-6.21 6.25-6.51 6.92-7.04 7.25-7.43 7.88-8.07 8.14-8.17 8.30-8.35 8.59-8.79 9.10-9.16 9.24-9.39 9.48-9.75	35.77	42.36
L83A	Webster clay loam, 0 to 2 percent slopes	7.08-7.14 7.53-7.65 8.35-8.40 8.84-8.87 8.90-9.06 10.27-10.4 10.40-10.41	9.27	10.98
L84A	Glencoe clay loam, 0 to 1 percent slopes	6.21-6.25 8.17-8.30	1.95	2.31
L85A	Nicollet clay loam, 1 to 3 percent slopes	6.59-6.64 7.69-7.80 8.40-8.51	3.09	3.66
Subtotal			83.52	98.90
Columbus Branch Line Tie-over Regulator Station, Dodge County, NE				
7891	Zook silt loam, overwash, 0 to 2 percent slopes, occasionally flooded	NA	0.93	1.10
Subtotal			0.93	1.10
Total Acres			84.45	100

¹ Temporary impact area includes the permanent aboveground facilities plus temporary workspace.

7.2 EXISTING SOIL LIMITATIONS

The following subsections discuss the existing soil classifications, which include prime farmland, farmland of statewide importance and hydric soils, and potential construction-related limitations including compaction and rutting, corrosion, and revegetation concerns. Soils within the Project construction footprint may have more than one limitation associated with each map unit. Soil limitations and their acreage within the Project area are listed in Table 7.2-1 below.

Table 7.2-1 Soil Limitations Within the Project Area

Project Component	Total Acres (Ac)	Prime Farmland ¹		Farmland of Statewide Importance		Water “Kw” Erodible ²		Wind Erodible ³		Hydric ⁴		Highly Compaction Prone ⁵		Highly Corrosive to Steel		Shallow to Bedrock ⁶		Revegetation Concerns ⁷	
		Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%	Ac	%
MNM80511 C-line extension	83.52	77.39	92.59	5.75	6.88	63.86	76.41	0.00	0.00	59.50	71.19	67.9	81.24	83.52	100.0	0.00	0.00	67.90	81.24
Columbus Branch Line Tie-Over Regulator Station	0.93	0.93	100.00	0.00	0.00	0.93	100.00	0.00	0.00	0.93	100.00	0.93	100.00	0.93	100.00	0.00	0.00	0.93	100.00
Total Acres	84.45	78.32	92.74	5.75	6.81	64.79	76.72	0.00	0.00	60.43	71.56	68.83	81.50	84.45	100	0.00	0.00	68.83	81.50

¹ Includes all areas rated as “Prime Farmland,” “Prime Farmland if Drained,” and “Prime Farmland if protected from flooding.” Prime farmland is based on NRCS soil classifications and may not match actual agricultural land use.

² Erosion Factor Kw indicates the susceptibility of a whole soil to sheet and rill erosion by water, and is a function of percent silt, sand, organic matter, soil structure, and hydraulic conductivity (Ksat). Values range from 0.02 and 0.69. A rating of 0.0-0.24 is Low, a rating of 0.25-0.40 is Moderate, and a rating of 0.40-0.69 is High.

³ Includes soils that have Wind Erodible Group rating of 1 or 2.

⁴ Includes soils that have a hydric rating of Hydric or Predominantly Hydric.

⁵ Includes soils that have a Compaction Potential rating of High.

⁶ Includes soils that have a depth to bedrock of greater than 78 inches.

⁷ Revegetation is based on potential for seedling mortality rate class. Areas of high seedling mortality are included. A rating of high seedling mortality can occur because of one or more soil properties and that overcoming the unfavorable properties require special design, extra maintenance, and costly alteration (e.g., drainage tile).

7.2.1 Prime Farmland

The Project will temporarily and permanently impact land classified as prime farmland or farmland of statewide importance. Prime farmland is a special classification of highly productive cropland that is recognized and described by the NRCS and receives special protection under the federal Surface Mining Control and Reclamation Act of 1977. Prime farmland soils are defined by the USDA as those best suited for growing food, feed, forage, fiber, and oilseed crops (USDA NRCS, 2020). Farmland of statewide importance generally include areas where soils nearly meet the requirements for prime farmland and economically produce high yields of crops when treated and managed according to acceptable farming methods.

The Project will be located primarily within active cropland in Martin County, Minnesota; the Project area in Dodge County, Nebraska, is not actively farmed. Construction of the Project will temporarily impact approximately 78.32 acres (92.74% of the Project land impacts) of prime farmland. This total includes 77.39 acres (92.59%) of the C-line extension in Martin County, Minnesota, and 0.93 acres (100.00%) of the Columbus branch line tie-over regulator in Dodge County, Nebraska. Following construction, actively farmed prime farmland areas other than those permanently affected (approximately 0.76 acre) will be returned to agricultural production or other current use.

The Project area also contains approximately 5.75 acres (6.88% of total Project footprint) of farmland of statewide importance and is entirely within the C-line extension in Martin County, Minnesota. No other Project components are located in farmland of statewide importance and there are no permanent impacts proposed in areas designated as Farmland of Statewide Importance. Following construction, farmed areas will be returned to agricultural production or other current use.

7.2.2 Water and Wind Erosion Hazard

Water and wind erodible soils were identified by analyzing the SSURGO database for soils that have a Water Erodibility Group rating of 0.4 to 0.69 or are classified as highly water erodible. The analysis also identified soils with a Wind Erodibility Group rating of 1 or 2 or that are classified as highly wind erodible. Based on the analysis, no soils were identified as highly water erodible; however, most soils in the Project area contained a moderate water erodibility rating (64.79 acres, 76.72%). Construction of the C-line extension will be in 63.86 acres (76.41%) of soils rated as highly water erodible, and 0.93 acre (100.00%) of highly water erodible soil in the Columbus branch line tie-over regulator station.

The Project construction will not impact any acres of soil designated as highly wind erodible.

7.2.3 Drainage Classification and Hydric Soils

Drainage class refers to the rate at which water percolates through the soil. Soils classified as somewhat excessively drained and excessively drained may be difficult to re-vegetate due to low organic content and low moisture retention. Soils classified as moderately well-drained and well-drained remove water readily but not rapidly. The principal water source is direct precipitation. Very poorly, poorly, and somewhat poorly drained soils remain saturated for a portion of the growing season. These drainage classes are considered hydric, predominately hydric or partially hydric soils and often support wetlands requiring special consideration, such as construction mitigation. Hydric

soils are defined as soils that are saturated, flooded or ponded long enough during the growing seasons to develop anaerobic conditions in the upper part of the soil column.

Based on the analysis, approximately 60.43 acres (71.56%) of the Project area is classified as containing predominantly hydric soils. This includes 59.50 acres (71.19%) of hydric soil within the MNM80511 C-line extension in Martin County, Minnesota, and 0.93 acre (100.00%) of hydric soil within the Columbus branch line tie-over regulator station.

7.2.4 Compaction and Rutting Potential

Soils with a high potential for compaction will be affected during construction activities by the repeated movement of machinery across the soil surface. Soils with high shrink-swell potential and poor drainage characteristics tend to be susceptible to compaction, particularly when wet. These soils tend to have high clay content composed of platy particles with water in interstitial spaces. Clay particles will become compacted through repeated stress. Soils with a high silt or sand content tend to be composed of sub-rounded to rounded particles and are less susceptible to compaction. Although surface “crusts” may form on these types of soils when subjected to repeated traffic, upon drying, the compacted particles are often readily separated.

Restricted infiltration results in excessive ponding and runoff, erosion, nutrient loss, and potential water-quality degradation. Compaction restricts penetration by plant roots and inhibits plant growth. Compaction-prone soils were identified by analyzing the SSURGO database for soil series that either a surface texture of sandy clay loam or finer or a drainage class of somewhat poorly, poorly or very poorly drained. Based on the analysis, approximately 68.83 acres (81.50%) of the construction workspace has soils that are highly compaction prone. This total includes 67.90 acres (81.24%) of the C-line extension in Martin County, Minnesota, and 0.93 acre (100.00%) of the Columbus branch line tie-over regulator station in Dodge County, Nebraska.

Rutting can occur when equipment is operated on soils that are moist or saturated. Evaluation of soil rutting potential as noted in the SSURGO databases indicates that all land within the construction workspace area has moderate to severe rutting potential.

7.2.5 Corrosion Potential

Corrosion potential is based on the corrosion of steel rating class. The risk of corrosion for uncoated steel is expressed as low, moderate or high and is based on soil drainage class, total acidity, electrical resistivity, near field capacity, and electrical conductivity of the saturation extract. Based on the analysis, approximately 84.45 acres (100.00%) of the construction workspace has soils that are highly corrosive to steel. This means all of the C-line extension and Columbus branch line tie-over regulator station contain soil with high corrosion potential.

7.2.6 Shallow Bedrock

Shallow soils are determined where lithic contact occurs within 78 inches or less of the soil surface. Based on the analysis, none of the Project components have soils that are shallow to bedrock.

7.2.7 Revegetation Concerns

Revegetation is based on potential for seedling mortality rating class. A rating of low indicates the soil has properties that will decrease the potential for successful revegetation (USDA NRCS, 2020). Based on the analysis, approximately 68.83 acres (81.50%) of both construction workspaces have soil that may be difficult to revegetate due to moderate or high seedling mortality. This total includes 59.51 acres (87.64%) of soil of the C-line extension that has a “High” seedling mortality designation and 8.39 acres (12.36%) that has a “Moderate” seedling mortality designation.

The entirety of the Columbus branch line tie-over regulator station (0.93 acre) is designated as having a “High” seedling mortality rate.

7.3 GENERAL CONSTRUCTION/OPERATION IMPACT MITIGATION

Mitigation measures to protect soil resources will be implemented during and after construction. In general, Northern will implement the measures in the Plan to avoid, minimize or mitigate potential effects of Project construction and operation on soils. The Plan identifies and specifies BMPs that will be used to protect soil productivity and water quality by controlling soil erosion and the loss of topsoil and surface organic matter.

To conserve topsoil, Northern will conduct full ROW and/or disturbance area topsoil removal in all actively cultivated and rotated cropland and improved pasture. A maximum of 12 inches or the actual depth of the existing topsoil horizon, whichever is less, will be segregated. The topsoil and subsoil will be stored in separate windrows on the construction ROW and will not be allowed to mix. Where the existing topsoil is less than 12 inches, the actual depth of the topsoil will be removed and segregated. Implementation of proper topsoil segregation will ensure post-construction revegetation success, thereby minimizing the potential for long-term erosion due to lack of vegetation.

Topsoil and subsoil will be tested for compaction following construction in all agricultural areas. Northern will de-compact subsoil in accordance with the soil compaction mitigation procedures described in the Plan. These include using appropriate deep-tillage equipment such as a paraplow or chisel plow. Compaction testing will be conducted on the subsoil to verify compaction is relieved to a level equal to or better than adjacent undisturbed areas. Once decompaction of the subsoil is complete, the segregated topsoil will be returned to the ROW. Decompaction will be completed on the restored topsoil using shallow-ripping tools. Per the Plan, Northern will remove excess rock from the top 12 inches of soil in all cultivated cropland, pastures and hayfields. The final surface will be examined to verify that native rock visible on the surface is similar in size, density and distribution to that in undisturbed areas adjacent to the ROW.

To minimize potential for soil erosion from water and wind, Northern will install temporary erosion control devices as specified in the Plan and Northern’s SWPPP for Minnesota. The workspace in Dodge County, Nebraska, is less than one acre; therefore, a SWPPP is not required. Northern will implement the following BMPs to minimize the potential for soil erosion from wind and water:

- Minimizing the quantity and duration of soil exposure
- Limiting the amount of open trench for the C-line extension to 5,280 feet at any one time
- Installing mulch, temporary seeding, or other protection measures on topsoil and subsoil piles to prevent water erosion
- Installing silt fence around topsoil and subsoil stockpiles pursuant to MPCA and NDEE permit requirements

- Implementing dust mitigation practices
- Reducing the velocity of run-off water and redirecting run off, as appropriate
- Installing and maintaining erosion and sediment control measures during construction
- Installing redundant sedimentation controls within 50 feet of wetlands and waterbodies
- Establishing vegetation following final grading
- Inspecting the ROW and maintaining erosion and sediment control as needed until Permit Termination Conditions have been achieved

Temporary erosion control measures, including interceptor diversions (e.g., slope breakers) and sediment filter devices (e.g., straw bales, silt fence, sediment basins), will be installed immediately following initial ground disturbance. As required, temporary trench breakers will be installed immediately following ditch excavation to reduce runoff velocities in the trench during construction. Mulch or other wildlife-suitable erosion control matting may be used on steep slopes to prevent erosion during construction. Mulch products will not contain synthetic (plastic) fiber additives in areas that drain to Minnesota public waters. Erosion control matting will be limited to bio-netting or natural netting and will conform to Category 3N or 4N in the 2016 and 2018 Minnesota DOT standard specifications for construction. The temporary erosion control devices will be inspected every seven days and after each rainfall event of 0.5 inch or greater, to ensure controls function properly.

The effectiveness of temporary erosion control devices will be inspected and monitored daily by Northern's EI(s). Any deficiencies will be noted in the inspector's daily reports to Northern. Northern's construction contractor is required to make repairs within 24 hours per the stormwater permit to ensure effective controls.

Northern will stabilize access roads using gravel or equipment mats to minimize rutting. If rutting to a depth of six inches or greater occurs during construction, Northern will 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 will require its construction contractor(s) to provide maintenance equipment to repair the ruts to pre-construction conditions or better as soon as ground conditions permit. With implementation of these mitigation measures, the Project will not have an impact on soils due to construction activities under wet conditions. Northern will de-compact soils within the Project workspaces, as necessary, upon conclusion of construction to ensure vegetation can be re-established.

To mitigate corrosion potential, Northern will use a fusion-bond epoxy coating on its pipeline; further, corrosion will be controlled through the use of a pipeline cathodic protection impressed current system. The cathodic protection system will be maintained through bimonthly rectifier inspection readings and annual cathodic potential readings to ensure that proper cathodic protection levels are maintained. Northern will complete modifications or additions, as needed, to the current cathodic protection system to include the pipeline and aboveground facilities.

Agricultural areas will be restored to agricultural production (where not permanently impacted) after construction is complete. The Plan includes restoration and revegetation measures that include seedbed preparation, fertilization and seeding to actively promote revegetation in non-agricultural areas. Northern will monitor revegetation after the first and second growing seasons. In agricultural areas, revegetation will be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

Following construction, the construction workspace that is not permanently developed or returned to agricultural production will be seeded, mulched, and permanent erosion controls will be installed as needed. Northern will use the Minnesota Agronomy Technical Note #31 ver. 1.7 (USDA, NRCS, 2021) recommended species, planting densities, and fertilization rates for all areas not returned to agricultural production in Martin County, Minnesota. If desired species are not available, substitute species may be determined from the Minnesota Board of Water Soil Resources Seed Substitutions guideline (MNBWSR, 2017). Northern will use the Nebraska Herbaceous Vegetation Establishment Guidance Document (USDA NRCS, 2022b) recommended seed species, planting densities, and fertilization rates for all areas not returned to agricultural production in Dodge County, Nebraska. Northern will implement the Minnesota DOT and the Nebraska DOT specifications for erosion control practices. Additionally, Northern will require agronomic nutrient soil testing of all areas to be seeded and require the contractor to follow the nutrient application rates. Erosion control devices will be maintained until the construction area is successfully re-vegetated or stabilized. Following successful revegetation or stabilization of construction areas, erosion control devices will be removed.

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

Northern has adopted the FERC Plan and Procedures. No modifications are being requested or have been identified as necessary.

8 RESOURCE REPORT 8 – LAND USE, RECREATION, AND AESTHETICS

8.1 LAND REQUIREMENTS

Table 8.1-1 lists miles and percent crossed by the proposed pipeline for each land use category impacted. Table 8.1-2 is a summary of land use acreages affected by construction and operation of the proposed pipeline and aboveground facilities. Table 8.1-2 summarizes the status of existing or new easement requirements by land use category.

Table 8.1-1 Land Crossed by the Project Pipeline

Agriculture		Forested		Wetlands		Open Land		Residential		Industrial/ Commercial		Open Water		Other		Total Mile(s)	Total %
Mile(s)	%	Mile(s)	%	Mile(s)	%	Mile(s)	%	Mile(s)	%	Mile(s)	%	Mile(s)	%	Mile(s)	%		
C-line extension, Martin County, MN																	
4.24	93.6	0.06	1.3	0.00	0.0	0.06	1.3	0.03	0.7	0.12	2.7	0.02	0.4	0.00	0.0	4.53	100.0

Table 8.1-2 Acreage Affected by Construction and Operation of the Project

Facility	Agricultural		Forest/ Woodland		Wetland		Open Land		Residential		Industrial/ Commercial		Open Water		Total	
	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper
C-line extension, Martin County, MN																
Pipeline ROW ^{1,2}	44.53	24.59	0.05	0.00	0.00	0.00	0.92	0.52	0.00	0.00	0.95	0.53	0.01	0.00	46.46	25.64
<i>Within Existing Easement</i>	14.75	12.28	0.00	0.00	0.00	0.00	0.32	0.27	0.00	0.00	0.31	0.25	0.00	0.00	15.38	12.80
<i>Outside of Existing Easement</i>	29.78	12.31	0.05	0.00	0.00	0.00	0.60	0.25	0.00	0.00	0.64	0.28	0.01	0.00	31.08	12.84
ETWS	10.76	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00	1.13	0.00	0.00	0.00	12.97	0.00
<i>Within Existing Easement</i>	2.44	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.18	0.00	0.00	0.00	2.79	0.00
<i>Outside of Existing Easement</i>	8.32	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.95	0.00	0.00	0.00	10.18	0.00
Staging Area	19.68	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.03	0.00	0.00	0.00	21.34	0.00
<i>Within Existing Easement</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Outside of Existing Easement</i>	19.68	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.03	0.00	0.00	0.00	21.34	0.00
Temporary Access Roads ³	0.91	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.25	0.00	0.00	0.00	1.99	0.00
Existing Aboveground Facility ^{4, 5}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Aboveground Facility	0.71	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.76	0.76
<i>Within Existing Easement</i>	0.24	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.24
<i>Outside of Existing Easement</i>	0.47	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.52	0.52
Subtotal	76.59	25.30	0.05	0.00	0.00	0.00	3.46	0.52	0.00	0.00	3.41	0.58	0.01	0.00	83.52	26.40
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE																
ETWS ³	0.03	0.00	0.00	0.00	0.04	0.00	0.50	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.63	0.00
Existing Aboveground Facility ⁴	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.26	0.26
Temporary Access Roads ³	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
Subtotal	0.03	0.00	0.00	0.00	0.06	0.00	0.52	0.00	0.00	0.00	0.32	0.26	0.00	0.00	0.93	0.26
Project Within Existing Easement	17.43	12.52	0.00	0.00	0.00	0.00	0.49	0.27	0.00	0.00	0.49	0.25	0.00	0.00	18.41	13.04
Project Outside of Existing Easement	59.19	12.78	0.05	0.00	0.06	0.00	3.49	0.25	0.00	0.00	3.24	0.59	0.01	0.00	66.04	13.62
PROJECT TOTAL	76.62	25.30	0.05	0.00	0.06	0.00	3.98	0.52	0.00	0.00	3.73	0.84	0.01	0.00	84.45	26.66

¹ Construction ROW is based on a 90-foot-wide corridor. Operational ROW is based on a 50-foot-wide corridor.

² Northern also included impacts for a single 6-foot-wide or two 3-foot-wide parallel travel lanes between HDD entry and exit points in the pipeline ROW calculations.

³ Outside existing easement.

⁴ Within existing easement.

⁵ Includes acres of existing facility at both north and central portions of pipeline.

Construction and Permanent ROW

The C-line extension will be installed within a 90-foot-wide nominal construction corridor. Northern will utilize ETWS, staging areas and temporary access roads during construction.

Existing ROW

The entirety of the proposed pipeline will be installed parallel to other Northern pipelines. Table 8.1-3 summarizes the location of the existing ROW, the position of the proposed pipeline to existing ROW, the width of the ROW, and the widths that will be used for temporary and permanent ROW of the Project.

Table 8.1-3 Existing Right of Way Paralleled by the Project

MP		Type of ROW	Position of Proposed Pipeline to Existing ROW	Width of Existing ROW (feet) ¹	Width Used for Construction ROW (feet)	Width Used for Permanent ROW (feet)
From	To					
C-line extension, Martin County, MN						
5.89	5.90	Natural gas	East to West (Under existing pipeline)	50	50	25-50
5.90	10.16	Natural gas	Northwest	50	30-50	25
10.32	10.42	Natural gas	Northwest	50	30	25

¹ Existing pipeline ROW is based on 50-foot permanent ROW data.

Extra Temporary Workspaces, Staging Areas, Access Roads, and Permanent Access Roads

ETWS of varying widths will be required adjacent to the TWS in certain locations that require additional workspace for storage and in certain areas that require specialized construction methods such as HDD crossings; wetland and waterbody crossings; the beginning and end of the pipeline segments; aboveground facility construction and road crossings. ETWS for the Project totals 13.60 acres. Northern has identified four staging areas that will be used for construction and will primarily impact agricultural land. The staging areas are adjacent to the TWS and ETWS and will be utilized by the contractor(s) for pipe and equipment storage, staging of crews and equipment parking. Staging areas total 21.34 acres for construction. Details of land use acreage impacts for ETWS and staging areas required for construction can be found in Table 8.1-4; acreage impacts for the access roads and permanent access roads are included in Table 8.1-5.

Table 8.1-4 Extra Temporary Workspace and Staging Areas

ID	Approx MP	Dimensions (feet)	Type	Existing Land Use and Acres	Total Area (acres)	Justification
C-line extension, Martin County, MN						
ETWS01	5.88	200'x200'	ETWS	Agricultural 0.81	0.91	Facility
				Industrial/Commercial 0.10		
ETWS02	5.89	475'x390'x410' x60'x90'x100'x95'x150'x200'	ETWS	Agricultural 1.24	2.16	Facility
				Industrial/Commercial 0.03		
				Open Land 0.89		
ETWS03	6.67	250'x15'	ETWS	Agricultural 0.09	0.09	HDD

ID	Approx MP	Dimensions (feet)	Type	Existing Land Use and Acres	Total Area (acres)	Justification
ETWS04	6.67	250'x45'	ETWS	Agricultural 0.25	0.25	HDD
ETWS05	6.84	250'x15'	ETWS	Agricultural 0.09	0.09	HDD
ETWS06	6.84	250'x45'	ETWS	Agricultural 0.25	0.25	HDD
ETWS07	7.00	345'x15'x330'x25'	ETWS	Agricultural 0.11	0.11	HDD
ETWS08	7.00	200'x65'x245'x45'	ETWS	Agricultural 0.22	0.22	HDD
ETWS09	7.06	265'x75'x110'x390'x30'	ETWS	Agricultural 0.23	0.29	HDD & facility
				Industrial/Commercial 0.06		
ETWS10	7.05	265'x45'x475'x15'x110'x110'x50'	ETWS	Agricultural 0.30	0.41	HDD & facility
				Industrial/Commercial 0.01		
				Open Land 0.10		
ETWS11	7.23	240'x15'x255'x25'	ETWS	Agricultural 0.07	0.08	Conventional bore
				Industrial/Commercial 0.01		
ETWS12	7.23	395'x65'x350'x45'	ETWS	Agricultural 0.35	0.38	Conventional bore
				Industrial/Commercial 0.03		
ETWS13	7.28	375'x25'x360'x20'	ETWS	Agricultural 0.12	0.13	Conventional bore
				Industrial/Commercial 0.01		
ETWS14	7.30	270'x70'x55'x225'x435'	ETWS	Agricultural 0.91	1.03	Conventional bore
				Industrial/Commercial 0.12		
ETWS15	8.49	385'x15'x375'x20'	ETWS	Agricultural 0.12	0.13	Open cut private driveway
				Industrial/Commercial 0.01		
ETWS16	8.49	255'x60'x295'x45'	ETWS	Agricultural 0.26	0.28	Open cut private driveway
				Open Land 0.02		
ETWS17	8.57		ETWS	Agricultural 0.07	0.09	

ID	Approx MP	Dimensions (feet)	Type	Existing Land Use and Acres	Total Area (acres)	Justification
		265'x20'x275'x15'		Industrial/Commercial 0.02		Open cut private driveway
ETWS18	8.54	395'x45'x355'x60'	ETWS	Agricultural 0.30	0.37	Open cut private driveway
				Open Land 0.07		
ETWS19	8.73	25'x205'x15'x225'	ETWS	Agricultural 0.06	0.07	Conventional bore
				Industrial/Commercial 0.01		
ETWS20	8.73	375'x70'x325'x45'	ETWS	Agricultural 0.33	0.36	Conventional bore
				Industrial/Commercial 0.03		
ETWS21	8.78	380'x25'x360'x15'	ETWS	Agricultural 0.13	0.13	Conventional bore
ETWS22	8.80	225'x140'x45'x260'	ETWS	Agricultural 0.49	0.49	Conventional bore
ETWS23	9.00	335'x15'x320'x20'	ETWS	Agricultural 0.11	0.11	Conventional bore
ETWS24	9.00	205'x60'x240'x45'	ETWS	Agricultural 0.22	0.22	Conventional bore
ETWS25	9.06	340'x510'x385'	ETWS	Agricultural 1.35	1.52	Conventional bore
				Industrial/Commercial 0.17		
ETWS26	9.04	320'x45'x280'x60'	ETWS	Agricultural 0.28	0.31	Conventional bore
				Industrial/Commercial 0.03		
ETWS27	10.10	275'x145'x375'x110'	ETWS	Agricultural 0.79	0.79	HDD
ETWS28	10.30	50'x55'	ETWS	Agricultural 0.03	0.07	Daylighting/pot holing during HDD
				Industrial/Commercial 0.04		
ETWS29	10.31	505'x15'x200'x285'x25'	ETWS	Agricultural 0.19	0.22	HDD & conventional bore
				Industrial/Commercial 0.03		
ETWS30	10.33	135'x45'x35'x60'x120'x175'x115'	ETWS	Agricultural 0.17	0.42	HDD & conventional bore
				Industrial/Commercial 0.25		
ETWS31	10.42	310'x235'x185'x35'x60'x30'x1	ETWS	Agricultural 0.82	0.99	

ID	Approx MP	Dimensions (feet)	Type	Existing Land Use and Acres	Total Area (acres)	Justification
		5'x170'x115'x170'x140'		Industrial/Commercial 0.17		Conventional bore
SA01	5.99	500'x895'x685'x410'	Staging Area	Agricultural 7.19	7.46	Construction equipment
				Industrial/Commercial 0.11		
				Open Land 0.16		
SA02	8.57	805'x715'x245'x15'x620'x15'x205'	Staging Area	Agricultural 5.91	6.78	Construction equipment
				Industrial/Commercial 0.40		
				Open Land 0.47		
SA03	10.07	145'x10'x95'x460'x610'x675'x200'x210'	Staging Area	Agricultural 5.62	5.84	Construction equipment
				Industrial/Commercial 0.22		
SA04	10.36	265'x140'x170'x90'x50'x215'	Staging Area	Agricultural 0.96	1.26	Construction equipment
				Industrial/Commercial 0.30		
Subtotal					34.31	
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE						
ETWS32	NA	200'x200'	ETWS	Industrial/Commercial 0.06	0.63	Facility installation inside existing TBS footprint
				Open Land 0.50		
				Wetland 0.04		
				Agricultural 0.03		
Subtotal					0.63	
Project Total					34.94	

Access to the Project’s construction workspaces will be primarily from public roads. Northern will build temporary road approaches, also referred to as construction entrances, from existing public and private roads to gain access to construction workspaces. Two permanent access roads totaling 0.02 acre will be constructed to provide access to the proposed Welcome south receiver and MAOP regulator. The permanent access roads will be constructed with a gravel surface. In addition, Northern will utilize three existing roads for temporary access, expand one existing road and construct six new temporary access roads, which will result in approximately 2.03 acres of temporary impact on agricultural or industrial/commercial lands. Additional details of the planned access roads and permanent access roads can be found in Table 8.1-5.

Temporary road approaches will be underlain with a geotextile fabric. Prior to construction activities, existing roads and access roads that will be used to access the pipeline construction

ROW may require modifications for heavy equipment access. Following construction, Northern will remove the gravel and geotextile fabric from any temporary access roads or construction entrances that required placement of new gravel. Soil may be decompacted in agricultural land and contours will be restored to preconstruction conditions.

Temporary access roads will vary in width depending on the footprint of existing roads, if present, and the proposed construction equipment used (HDD rigs and stringing trucks generally need wider roads). TAR04 and TAR07 are wider than Northern’s typical maximum width of 50 feet due to the presence of steep road ditches and potential construction personnel walking through the ditches.

Table 8.1-5 Temporary and Permanent Access Roads

ID	Approx MP	Description	Length (feet)	Width (feet)	Type	Existing Land Use and Acres	Total Area (acres)	New or existing
C-line extension, Martin County, MN								
TAR01	5.89	From 100th Avenue into Sherburn TBS #2 Take Off & ETWS02	33	20	Temporary	Agricultural 0.01	0.02	Existing
						Industrial/Commercial 0.01		
TAR02	5.89	From 100th Avenue to workspace & SA01	407	15	Temporary	Open Land 0.16	0.16	New
TAR03	7.05	From 85th Street to Private Driveway	40	25	Temporary	Industrial Commercial 0.02	0.02	Existing
TAR04	7.30	From County Road 119 to ETWS12	278	75	Temporary	Agricultural 0.31	0.42	New
						Industrial/Commercial 0.11		
TAR05	7.30	From County Road 119 to ETWS14	69	42	Temporary	Agricultural 0.06	0.08	New
						Industrial/Commercial 0.02		
TAR06	8.55	From 80th Avenue to Private Driveway	750	42	Temporary	Industrial/Commercial 0.03	0.70	Expand existing
						Open Land 0.67		
TAR07	9.05	From 80th Street to ETWS23	346	80	Temporary	Agricultural 0.53	0.57	New
						Industrial/Commercial 0.04		

ID	Approx MP	Description	Length (feet)	Width (feet)	Type	Existing Land Use and Acres	Total Area (acres)	New or existing
TAR08	10.19	From 70th Avenue to SA03	40	20	Temporary	Industrial/Commercial	0.02	Existing
PAR01	10.40	From 60th Street to Welcome South Loop Regulator & Receiver Site	35	20	Permanent	Industrial/Commercial	0.01	New
PAR02	10.40	From 60th Street to Welcome South Loop Regulator & Receiver Site	37	20	Permanent	Industrial/Commercial	0.01	New
Subtotal							2.01	
Columbus Branch Line Tie-Over Regulator Station, Dodge County, NE								
TAR09	NA	Highway 79	28	20	Temporary	Open Land 0.01	0.02	New
						Wetland 0.01		
TAR10	NA	Highway 79	28	20	Temporary	Open Land 0.01	0.02	New
						Wetland 0.01		
Subtotal							0.04	
Project Total							2.05	

Aboveground Facilities

For the C-line extension, Northern will relocate a receiver and MAOP regulator from MNB87501 Sherburn TBS #2 Take Off (renamed facility⁶) at the Project take-off to its new Welcome South MAOP regulator and receiver site at the terminus of the pipeline extension. An existing take off valve will remain at the renamed MNB87501 Sherburn TBS #2 take off. Northern will install a tie-over valve and associated piping within the existing MNB87401 Sherburn TBS# 1 take off. The relocated Welcome south receiver and MAOP regulator will consist of receiver, MAOP regulators and associated piping and tie-in valves and a building to protect the control valves.

Northern will install the proposed Columbus branch line tie-over regulator station, within an existing TBS. The new regulator station will consist of two MAOP regulators with associated electrical equipment, a relief valve, and a building to protect the control valves. Additional details of the planned aboveground facilities can be found in Table 8.1-6.

⁶ As described in Resource Report 1, the Welcome South MAOP regulator and receiver currently located at the beginning of the C-line extension, will be relocated to the terminus of the C-line extension. Only a take-off valve will remain at this location, which will be re-named the MNB87501 Sherburn TBS #2 take off.

Table 8.1-6 Aboveground Facilities

Project Component	Proposed Activity	Existing Land Use (acres)	Total Area (acres)	Facility Total Area (acres)
C-line extension, Martin County, MN				
MNB87501 Sherburn TBS #2 Take Off (renamed facility)	Removal of existing equipment that is to be relocated to Welcome South Loop MAOP regulator & receiver site. The existing take off valve will remain.	Industrial/ Commercial 0.00	0.00 ²	0.00 ²
		Open Land 0.00		
MNB87401 Sherburn TBS #1 Take Off	Tie-over piping and tie-over valve assembly	Agricultural 0.00	0.00 ²	0.00 ²
Welcome South MAOP regulator and receiver	Relocated receiver, MAOP regulators and associated electrical equipment, an overpressure protection valve and a building to protect the control valves	Agricultural 0.71	0.74	0.76 ¹
		Industrial/ Commercial 0.03		
Columbus Branch Line Tie-Over Regulator, Dodge County, NE				
Columbus Branch Line Tie-Over Regulator Station (within existing TBS)	New MAOP regulators and associated electrical equipment, a relief valve and a building to protect the control valves	Industrial/ Commercial 0.26	0.26	0.26
Project Total				0.85

¹ Includes permanent access roads(s)

² Included in ETWS as existing facilities

8.2 LAND USE IMPACTS AND MITIGATION MEASURES

Land uses are characterized into seven classifications based on vegetative cover or predominant land use within the Project area: agricultural, forest/woodland (upland), wetlands, open land, residential, industrial/commercial and open water. Land use classifications were assigned using field observations made during the 2023 field surveys and interpretation of 2022 and 2023 aerial imagery. Land use categories are defined below.

- Agricultural – active farmed cropland and specialty crop production
- Forest/woodland (upland) – mixed hardwood forests, mixed evergreen and hardwood forests
- Wetlands – emergent wetlands, scrub-shrub wetlands and forested wetlands
- Open land – upland land including non-forested rangeland, scrub-shrub land, non-agricultural fields, prairie, and open land in the early stages of succession
- Residential – rural and developed residential property
- Industrial/commercial – manufacturing or industrial plants, mines, commercial facilities, roads, railroads, and electric or gas utility stations
- Open water – lakes, ponds and water crossings greater than 100 feet

Total acreage for temporary construction activities is approximately 84.45 acres. Total permanent operational acreage for the pipeline combined with the aboveground facilities is 26.66 acres. The

land use type that will be predominantly disturbed during construction and operation of the Project is agricultural.

8.2.1 Land Use

Agricultural Land

Agriculture is the dominant land use impacted by the Project. Approximately 76.59 acres of agricultural land will be impacted by construction of the proposed Project, including TWS, ETWS, staging areas, access roads, and aboveground facilities. Approximately 25.30 acres of agricultural land will be affected by operation and maintenance of the Project facilities.

The cropland crossed by the Project is used for a variety of crops including corn and soybeans. The primary impacts on agricultural land during construction will include temporary reductions in agricultural production in areas of cultivated cropland and potential reduced yields of future crops. Agricultural land in the construction area generally will be taken out of production for one growing season. Depending on construction progress and the specific crop being grown, potential impacts on cultivated cropland will occur only if construction occurs on those lands during the growing season, as defined by the NRCS Water and Climate Center Wetlands Determination Table.

Agricultural lands will be restored to their former use following construction; therefore, the pipeline construction and operation will not result in a long-term impact on farmland with the exception of the 0.71 acre required for the proposed aboveground facilities. Impacts on prime farmland are discussed in more detail in Resource Report 7. Landowners will be compensated for crop loss resulting from construction, and crops may be planted on top of the new pipeline once land utilized for construction is restored. To avoid or minimize soil impacts, Northern will employ the erosion and sedimentation control and restoration procedures described in the Plan and Procedures and the Project SWPPP. The procedures employed ensure that soil productivity is not diminished in agricultural lands by using topsoil segregation measures and alleviating compaction.

No specialty crops, including nurseries, vineyards, orchards, citrus groves, dairies, aquaculture or tree farms were identified near Project facilities. Specialty crops were reviewed through aerial images, field surveys, and landowner consultation. Noxious weeds were not identified inside Project workspaces.

Forested/Woodland

No forested/woodland land will be impacted by the construction or operation of the Project, including aboveground facilities. There is a small forested floodplain area at S01 (East Fork Des Moines River) that consists of the following dominant species: boxelder, green ash, sandbar willow, black willow, blue violet, stinging nettle, giant goldenrod, and American germander. The forest land is within an HDD travel lane for P4-3 and with the exception of foot traffic and occasional clearing of branches for safety, will not be impacted. The foot-traffic travel lane in the small forested riparian area is represented by the 0.05 acre of impact in Table 8.1-2. No tree clearing will be required for the Project. There will be no operational impact on forested land.

Wetlands

Approximately 0.06 acre of emergent/shallow marsh wetland will be temporarily utilized by the Project. Less than 0.01 acre of shallow marsh wetland is located in the HDD travel lane for P4-3 in Martin County, Minnesota. With the exception of foot traffic, the wetland area will not be impacted.

Restoration of foot traffic impacts through a shallow marsh will not be required as the vegetation will regenerate naturally as the seed bank will not be impacted. Northern will not mow their operational ROW where the pipeline was installed via HDD in wetland or riverine areas.

One emergent wetland confined to a roadside ditch was identified within the Project ESB in Nebraska. The wetland in Nebraska will be temporarily impacted by ETWS and installation of two TARs for a total of 0.06 acre. Northern will minimize wetland impacts by installing temporary bridges over the wetland within the TARs; thereby limiting filling and grading activities. Construction in the wetland area will be conducted in accordance with the Plan and Procedures.

Wetlands are discussed in detail in Section 2.2, Resource Report 2. Northern's SPCC Plan provides restrictions and mitigation measures to minimize potential impacts associated with the release of fuels, lubricants or other potentially toxic materials used during routine construction. Refueling and storage of hazardous materials will be prohibited within 100 feet of wetlands during construction. The refueling buffers will be shown on the construction SWPPP figure.

Open Land

Approximately 3.98 acres of open land, including fallow land, or former cropland and/or other disturbed areas, will be temporarily impacted during construction of the Project. Open land also includes mowed areas of mixed weeds and grass along roadsides and existing access roads. Temporary impacts on open lands are expected along the proposed construction corridor due to grading and trenching activities during pipeline installation. The temporary construction corridor and ETWS will be allowed to revert to open land use after completion of construction. The operational impact on open land by the Project is approximately 0.52 acre.

Residential

No residential land will be impacted by the construction or operation of the Project facilities, including aboveground facilities.

Industrial/Commercial

Industrial/commercial land crossed by the Project is limited to existing Northern facilities and public road ROWs. Approximately 3.73 acres of industrial/commercial land will be temporarily impacted by construction of the Project. The operational impact on industrial/commercial land by the Project is 0.84 acre.

Open Water

Approximately 0.01 acre of open water will be temporarily utilized by the HDD travel lane for P4-3. With the exception of foot or boat traffic, the open water area will not be impacted. There will be no operational impact on the open water area and restoration will not be required.

8.2.2 Public Land, Recreation, and Other Designated Areas

Northern reviewed a one-mile-radius study area around the Project site for public lands, recreational areas and other designated or special use areas, including:

- Lands administered by federal, state, county, or local agencies, or private conservation organizations
- Lands and trails used for designated recreational purposes
- Local historical or culturally significant lands

- National and state scenic rivers, and designated scenic areas or roads
- Coastal Zone Management Areas
- Cemeteries, churches, or schools
- Landfills, hazardous waste sites, quarries, mines, and other special uses

To assess the Project area for these resources, Northern reviewed USGS topographic maps, aerial photographs, agency databases, and publicly available sources for public lands, recreational sites, and other special-use areas in the Project area. Based on this review, the Project will not be located on publicly owned recreational or other special-use lands; cross any federal or county lands; nor will it cross or be located within 0.25 mile of any state or national forests, state or local wildlife management areas, national trails, National Park Service Wilderness Areas, National Wild and Scenic Rivers, parks, or golf courses. No local historically or culturally significant areas will be affected by the Project; therefore, no impacts will occur on these areas and no specific land use mitigation is required.

The Project is located within the interior of the continental U.S. and is not located in a designated coastal zone management area; therefore, a coastal zone management consistency determination is not necessary or included in this report. A review of the USGS topographic maps and aerial photographs indicated there are no cemeteries, churches, or schools within 0.25 mile of the Project area. In Minnesota, there are no registered hazardous waste sites within one mile of the Project area in Martin County, and the Project will not impact any brownfield sites (MDH, 2023c).

In Nebraska, there are two RCRA hazardous waste sites located within the City of North Bend. Dolezal Trucking Company, registered at 1020 West 7th Street, North Bend, Nebraska, which is located 4,450 feet southwest of Northern's facility; and Frontier Coop located at 641 West 6th Street, North Bend, Nebraska, which is located approximately 4,200 feet southwest of Northern's facility. Both of these sites will have groundwater flow direction to the south, toward the Platte River. No NDEE Leaking Underground Storage Tanks and Surface Spills sites were within one mile of the Project. Northern does not anticipate any concerns for construction or dewatering. Additionally, the Project will not impact any brownfield sites (NDEE, 2023b). There are no known contamination issues that will be impacted by construction or operation of the facilities.

8.2.3 Planned Residential and Commercial Areas

No planned residential or commercial areas were identified within 0.25 mile of the Project. Records of correspondence with county and city officials are included in Appendix B.

Minnesota

The Martin County Minnesota Zoning Map identifies the Project area as primarily zoned for agriculture, with a small portion designated as industrial/commercial (Martin County, 2023b). The Martin County Comprehensive Land Use Plan also indicates the Project is an area zoned for agricultural and other commercial/residential land uses (Martin County, 2023a). According to the Martin County Zoning Office, no known construction is planned in the vicinity of the Project. The Project will not impact known future residential or commercial areas.

Nebraska

The Dodge County Nebraska Zoning Map does not include zoning for the Columbus branch line tie-over regulator station as it is identified within the City of North Bend extraterritorial jurisdiction;

however, the surrounding area to the Project is zoned as A-3: Agricultural - transitional (Dodge County, 2024). According to the Dodge County website, there is no comprehensive plan available. The Project will not impact known future residential or commercial areas.

8.2.4 Existing Residences and Buildings

The Project in Martin County, Minnesota, is located within a rural area with scattered residences and industrial buildings. In Dodge County, Nebraska, the Project area consists of public road ROW an existing TBS lot, agricultural land and wetland land. There are no residences located within 25 feet of the Project workspace. The nearest residence to a pipeline is located approximately 308 feet southeast of the proposed C-line extension at MP 8.50. The nearest residence to an aboveground facility workspace is located approximately 390 feet southwest of the Columbus branch line tie-over regulator station in Dodge County, Nebraska.

Additionally, there are no residences or buildings within 50 feet of the proposed construction workspaces. Since no residences or buildings exist within 25 feet of a construction work area, site-specific residential construction plans are not required. Additional details on the closest buildings is included in Section 1.3.5, Resource Report 1.

8.3 VISUAL RESOURCES IMPACTS AND MITIGATION MEASURES

Lands within the Project area are relatively flat with the majority of the land used for agricultural production. The Project will be located on private land; therefore, federal and state visual management standards do not apply. No special or unique features, designated scenic areas, or viewsheds are located in or near the Project area. Visual impacts pertaining to cultural resources such as historic architecture are discussed in Section 4.1.

Based on the small visual footprint of the proposed pipeline facilities, minimal impacts will occur in the vicinity of the Project. Remaining visual impacts from the Project will be limited to construction activities and minimal clearing will be required for construction of the pipeline.

9 RESOURCE REPORT 9 – AIR AND NOISE

9.1 AIR QUALITY

9.1.1 Existing Conditions

9.1.1.1 Climate

The climate in the Project area is primarily continental in character and is characterized by marked seasonal variations. Meteorological data for Sioux City, Iowa, were selected as representative for the Project given its centralized location. Normal annual precipitation for the Project averages 29.3 inches (National Oceanic and Atmospheric Administration, n-d). Winters are cold and summers are mild-to-hot in the region. January is the coldest month, with an average low temperature of 10 degrees Fahrenheit (°F) while July is the warmest month with average high temperatures of approximately 85°F. Southern Minnesota and eastern Nebraska (the Project area) experiences a wide range of weather events, including floods, drought, blizzards, thunderstorms, and tornadoes.

9.1.1.2 National Ambient Air Quality Standards

The Clean Air Act (CAA) of 1970, 42 U.S. Code Part 7401 et seq., amended in 1977 and 1990, is the basic federal statute governing air quality. The provisions of the CAA that are potentially relevant to construction and operation emission sources include the following: National Ambient Air Quality Standards (NAAQS), Prevention of Significant Deterioration (PSD), nonattainment area New Source Review, New Source Performance Standard, National Emission Standards for Hazardous Air Pollutants, and Title V Operating Permits.

Section 109(b) of the CAA requires that the EPA establish NAAQS “requisite to protect” public health and public welfare (40 CFR Part 50). The CAA identifies two class types of NAAQS: primary standards and secondary standards. Primary standards are limits set to protect the public health of the most sensitive populations, such as asthmatics, children and the elderly. Secondary standards are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife and structures. The CAA requires the EPA to periodically review and, if new data indicate, update the NAAQS.

The EPA has promulgated NAAQS for six criteria pollutants: ozone, particulate matter (PM), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and lead. Standards for PM are categorized on the size of the PM based on diameters of particulate matter with a diameter ≤ 10 microns (PM₁₀) and particulate matter with a diameter ≤ 2.5 microns (PM_{2.5}). The NAAQS are summarized in Table 9.1-1.

Table 9.1-1 National Ambient Air Quality Standards

Pollutant	Averaging Period	Standards	
		Primary	Secondary
SO ₂	Annual ^a	0.03 ppm	0.02 ppm
	24-hour ^b	0.14 ppm	same as primary
	3-hour ^b	--	0.5 ppm
	1-hour ^c	75 ppb	--
PM	Annual	75 µg/m ³	60 µg/m ³
	24-hour	260 µg/m ³	150 µg/m ³
PM ₁₀	24-hour ^f	150 µg/m ³	same as primary
	Annual ^d	50 µg/m ³	
PM _{2.5}	24-hour ^e	35 µg/m ³	same as primary
	Annual ^f	12 µg/m ³	15 µg/m ³
NO ₂	Annual ^g	53 ppb	same as primary
	1-hour ^b	100 ppb	--
CO	8-hour ^b	9 ppm	--
	1-hour ^b	35 ppm	--
Ozone	8-hour ⁱ	0.07 ppm	same as primary
Lead	Rolling 3 Month Average ^a	0.15 µg/m ³	same as primary

^a Not to be exceeded.

^b Not to be exceeded more than once per year.

^c Compliance based on 3-year average of 99th percentile of the daily maximum one-hour average

^d Not to be exceeded more than once per year on average over 3 years

^e Compliance based on 3-year average of 98th percentile of 24-hour concentrations

^f Compliance based on annual mean, averaged over three years

^g Annual mean

^h Compliance based on 3-year average of the 98th percentile of the daily maximum one-hour average

ⁱ Compliance based on 3-year average of the 98th percentile of the daily maximum one-hour average

ppm = parts per million by volume

ppb = parts per billion by volume

µg/m³ = micrograms per cubic meter

The EPA compares ambient air criteria pollutant measurements to NAAQS to assess the status of the air quality of regions within the U.S. The regions are generally defined on a county level basis. Based on these comparisons, regions are designated as being in one of the following categories for the criteria air pollutants:

- **Attainment.** A region is designated as in “attainment” if monitoring shows that ambient concentrations of a specific pollutant are less than or equal to NAAQS. An attainment area for a NAAQS that has been redesignated from nonattainment is classified as a “maintenance area” for a 10-year period to ensure that the air quality improvements are sustained.
- **Nonattainment.** If the NAAQS are exceeded for a pollutant, then the region is designated as in “nonattainment” for that pollutant. Nonattainment areas can be further classified based on the severity of the exceedance of the relevant standard.
- **Unclassifiable.** An area is designated as “unclassifiable” if the ambient air monitoring data are incomplete and do not support a designation of attainment or nonattainment.

Martin County, Minnesota, and Dodge County, Nebraska, will be affected by air emissions from the construction of the proposed Project. Both of the affected counties are designated “attainment” for each of the NAAQS pollutants.

9.1.1.3 Air Quality Control Regions

A useful way to characterize existing air quality in a given area is to identify the attainment status of the air quality control region (AQCR) in which it is located. An AQCR, as defined in Section 107 of the Clean Air Act, is a federally designated area in which NAAQS must be met. An implementation plan is developed for each AQCR describing how ambient air quality standards will be achieved and maintained.

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

The attainment status designations appear in 40 CFR Part 81. The attainment status of a region, in conjunction with projected emission rates or emissions increases, determines the regulatory review process for a new project. The Project will be located in an area designated as in attainment with the NAAQS (EPA, 2016).

9.1.2 Anticipated Air Quality Impacts and Mitigation

9.1.2.1 Construction Emissions

Construction of the Project will result in intermittent and temporary emissions of criteria pollutants over the six-month construction period. These emissions generally include dust (PM₁₀ and PM_{2.5})

generated from soil disturbing activities such as earthmoving, wind erosion of disturbed areas, and vehicle traffic during construction. The amount of dust generated during construction will be a function of vehicle numbers and types, vehicle speeds, roadway characteristics, and precipitation events. Dust emissions will be greater during dry periods and in areas of fine-textured soils. The Project, as planned, will require no blasting. In addition, Northern will not complete any open burning.

Fugitive Dust Emissions

In accordance with Rule 7011.0150 of the Minnesota Administrative Code, and Rule 15.129.003.02 of the Nebraska Administrative Code, a person shall take reasonable precautions to prevent PM from becoming airborne in quantities sufficient to cause a nuisance. The Code states PM should not remain visible beyond the property where it originates. Each agency may require reasonable measures including, but not limited to, use of water for control of dusts in construction operations; the grading of roads or the clearing of land; application of suitable materials such as asphalt, oil, water, or chemicals on unpaved roads, material stockpiles, and other surfaces which can give rise to airborne dusts; installation and use of containment or control equipment to enclose or otherwise limit the emissions resulting from the handling and transfer of dusty materials; covering, at all times when in motion, open-bodied vehicles transporting materials likely to give rise to airborne dusts; prompt removal of earth or other material from paved streets or to which earth or other material has been transported by trucking or earth-moving equipment; and reducing the speed of vehicles traveling over on-property surfaces as necessary to minimize the generation of airborne dusts.

Construction of the Project will generally take place during daytime hours. This schedule will allow equipment operators to assess the presence of fugitive emissions and dust and to implement abatement measures, as needed. Northern will employ dust control measures, such as watering access roads, storage piles and disturbed surfaces, during construction and restoration. The addition of construction stone to unpaved areas also will mitigate dust emissions. Additional measures that may be employed include imposing vehicle speed restrictions on unpaved areas, using gravel tracking pads at egress points to remove dirt from tires and tracks and restoring disturbed areas following construction per the Plan and Procedures.

Northern will implement the following BMPs to control fugitive dust emissions.

- Stabilization of open storage piles and disturbed areas will be managed in accordance with applicable state and local regulations. Water from a municipal source or temporary seed and mulch will be the primary methods of dust control.
- Due to the relatively short length of the pipeline, requirements for phase-grading operations are not practicable. Northern will comply with the MPCA's requirement to allow only 5,280 feet of open trench per project segment at any one time. Due to the relatively short construction schedule for the pipeline segment, installation of a wind fence is not practicable. Northern will apply water or seed and mulch to stabilize dirt surfaces or temporary soil stockpiles.
- Northern will enforce a 15-mile-per-hour speed limit for all vehicles and construction equipment on the construction right of way and temporary access roads.

Construction Engine Emissions

Construction also results in combustion emissions from diesel and gasoline-fueled vehicles used in various construction activities. Combustion-related emissions will include NO_x, CO, volatile organic compounds (VOCs), SO₂, PM, and small amounts of hazardous air pollutants (HAPs). The EPA requires manufacturers of on- and off-road engines to certify their products to engine emission standards based on the year of manufacture. On-road equipment, like automobiles and pick-up trucks, have had a series of standards imposed since the 1970s.

Large construction equipment, such as a grader or a front-end loader, are generally powered by diesel engines. For diesel engines, the emission standards have been phased in over the past two decades in four steps, referred to as Tier 1 to Tier 4. The engine must comply with the emission standards in place based on the size of the engine for the year the engine was built and must comply with the appropriate standard throughout its useful life. The engine manufacturers must certify the engine emissions to the EPA. In 2010, the EPA required the sulfur concentration in diesel fuels be lowered from a historical concentration of 500 ppm to 15 ppm (ultra-low sulfur diesel fuel), which allows diesel engines to meet current Tier 4 emission requirements. Proper maintenance of construction equipment and use of ultra-low-sulfur diesel fuel will minimize engine emissions during Project construction. To reduce emissions from internal combustion engines, idling of construction vehicles will be minimized.

Northern has reviewed the US EPA Construction Emission Control Checklist and has adopted the following controls and best practices, including the following for mobile and stationary-source diesel controls.

- For on-highway vehicles, Northern verified that its primary construction contractors have programs in place to replace their on-highway vehicles within 10 years of purchase. The primary contractors do not generally own or maintain vehicles from 2010 or older.
- For non-road vehicles and equipment, Northern's general contractors have indicated most of the construction equipment, excluding specialty equipment (e.g., side booms), operated by the companies are less than 10 years old and equipped to comply with Tier 4 exhaust emissions standards.
- The remaining stationary-source vehicles (locomotives and marine vessels) noted by the EPA are not applicable to the Project.

Regarding the best practices applied through the construction contracting or oversight process, Northern verified with its contractors that many have already adopted the following BMPs.

- Limiting construction equipment idling time to 15 to 30 minutes between usages, dependent on the construction task
- Encouraging the use of electric starting aids, such as block heaters, where applicable
- Maintaining diesel engines per the manufacturer's recommended maintenance schedule and procedures

Additionally, Northern will encourage contractors to retrofit older-tier or Tier 0 nonroad engines with exhaust filtration devices before they enter the construction site. Northern's contractors have indicated most of their equipment is not older-tier or Tier 0 and already meets a higher level of exhaust emissions standards. Northern verified that its primary construction contractors have already

implemented fleet replacement programs. The primary contractors generally do not own or maintain vehicles from 2010 or older. Given the current alternative energy vehicle technology and the remote locations of the project components, use of hybrid or battery-electric vehicles is not feasible.

The fugitive dust volumes from the construction activities and engine emissions from the construction equipment for the Project are summarized in Table 9.1-2. In this analysis, Northern assumed that the construction equipment engines, on average, would comply with Tier 2 standards. For the C-line extension in Martin County, Minnesota, Northern will utilize a hot tap to blow down approximately 120 feet of 6-inch-diameter pipeline to complete the tie-ins. Northern will not require venting at the Columbus branch line tie-over regulator station as the tie-ins will occur aboveground on the existing valves. Detailed calculations, including assumed quantities of equipment type for the Project, are provided in Appendix I.

Table 9.1-2 Emissions from Construction Equipment

Description and County	Emissions (tons)								
	Criteria Pollutants						CO _{2e}	Formaldehyde	Total for All HAPS
	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}			
Engine Emissions									
Martin County, MN	48.5	9.7	2.8	0.02	1.6	1.5	2,249	0.30	0.55
Dodge County, NE	5.4	1.1	0.3	0.00	0.2	0.2	250	0.04	0.06
Unpaved Roads^{1,2}									
Martin County, MN	-	-	-	-	9.6	1.0	-	-	-
Dodge County, NE	-	-	-	-	1.1	0.1	-	-	-
Earthmoving^{1,2}									
Martin County, MN	-	-	-	-	2.2	0.2	-	-	-
Dodge County, NE	-	-	-	-	0.2	0.03	-	-	-
Venting for Tie-ins²									
Martin County, MN	-	-	0.01	-	-	-	15	-	-
Dodge County, NE	-	-	-	-	-	-	-	-	-
Total emissions									
Martin County, MN	48.5	9.7	2.8	0.02	13.4	2.9	2,265	0.30	0.55
Dodge County, NE	5.4	1.1	0.3	0.00	1.5	0.2	250	0.04	0.06
Project Total³	53.9	10.8	3.1	0.02	14.9	3.1	2,515	0.34	0.60

¹ Unpaved roads and earthmoving are a source of fugitive dust emissions from these operations, engine emissions from the equipment are included in engine emissions

² (-) means that pollutant does not apply

³ Values may vary due to rounding.

The Project construction schedule will determine the period of time during which construction-related emissions will occur and also the total quantity of emissions. Construction is scheduled to begin May 2024 and be completed by November 1, 2024; however, restoration and demobilization activities may extend through December 31, 2024, and into spring/summer 2025, if required.

9.1.2.2 Operational Emissions

After the pipeline is in service, emissions from the pipeline and the related aboveground appurtenant facilities will be low. Northern has calculated the loss of methane, which is a greenhouse gas (GHG), from the operation of the newly installed receiver, regulators, and valve settings, which include fugitive equipment leaks from valves, flanges, etc., which are included in the Project. Operational emissions do not include emissions from existing equipment nor equipment that is being replaced in-kind. Operational GHG emissions associated with the Project are summarized in Table 9.1-3. Receiver emissions assume one pipeline inspection gauge run consisting of one launch per event once every seven years.

Table 9.1-3 Operational Emissions Summary

Fugitive Emissions	Emissions (tpy)	
	Methane (CH ₄)	CO _{2e}
Martin County, MN	0.6	15.4
Dodge County, NE	0.2	5.4
Project Total	0.8	20.8

The Project will not be subject to major source permitting requirements; therefore, a PSD ambient air quality analysis is not required.

9.1.3 Air Quality Mitigation Measures

Fugitive dust emissions during construction will be mitigated, as necessary, by following the work practices listed below.

- Cover or treat surfaces disturbed by construction activities with a dust suppressant until completion of activities at each site of disturbance
- Stabilize on-site unpaved roads and off-site unpaved access roads (e.g., using water or chemical stabilizer/suppressant)
- Restrict on-road vehicle speeds on unpaved roadways to 15 miles per hour
- Add construction stone to unpaved areas or pave workspaces. Use gravel tracking pads at egress points to remove dirt from tires and tracks
- Restore disturbed areas following construction
- Sweep paved roads

Through the implementation of the work practices described above, and the short duration of the construction activities, the temporary emissions during construction of the Project will be minimal and the impact of these emissions will be localized.

In addition, construction equipment will be properly tuned and operated only on an as-needed basis to minimize the combustion emissions from diesel and gasoline engines. Therefore, it is anticipated that these emissions will not have a significant impact on air quality.

9.1.4 Climate Change

Northern understands the value of discussing a project's GHG emissions as the FERC balances the benefits of a project, i.e., its demonstrated need and necessity against possible environmental impacts. Simply put, Northern believes responsible environmental management is good business; it benefits customers and improves the quality of the environment in which we live. Northern has programs to reduce methane, a contributor to greenhouse gas emissions. Appendix I contains a detailed discussion of the Project's GHG emissions and a summary of that discussion is below.

In 2016, Northern entered into a partnership agreement to participate in the Environmental Protection Agency's voluntary Natural Gas STAR Methane Challenge Program as founding partners. In doing so, Northern committed to maximize blow-down gas recovery and/or emission reductions through identified best practices and new technology. Northern reduced methane emissions from non-emergency blow downs by at least 50% from total potential emissions beginning in 2017.

On September 15, 2016, Northern submitted the Methane Challenge Program Implementation Plan to the Environmental Protection Agency, which outlined how Northern will meet this commitment. In 2018, Northern reported that the commitment had been achieved in the first full year of participation and methane emissions from non-emergency blow downs were reduced by 76.7% in 2017. In 2019, Northern reported methane emissions from non-emergency blow downs were reduced by 67.8% in 2018. In 2020, Northern reported methane emissions from non-emergency blow downs were reduced by 76.7% in 2019. In 2021, Northern reported methane emissions from non-emergency blow downs were reduced by 72.5% in 2020. In 2022, Northern reported methane emissions from non-emergency blow downs were reduced by 67.3% in 2021. In 2023, Northern reported methane emissions from non-emergency blow downs were reduced by 87.8% in 2022.

In August 2018, BHE Pipeline Group became a member of ONE Future, a national industry group committed to reducing methane emissions by sharing best practices and new technologies. In 2017, Northern began reporting a methane emissions rate based on the One Future Methane Emissions Estimation Protocol, August 2016, to inform shareholders of the strides Northern has made in reducing methane emissions compared to the transmission and storage sector. In 2018, 2019, 2020, 2021 and 2022, Northern achieved a methane emissions rate of 0.079%, 0.060%, 0.065%, 0.078% and 0.044% respectively, which is an improvement over the 2016 methane emissions rate of 0.090%. Northern is forecasting a year-end rate of 0.051% for 2023. The transmission and storage industry average is 0.26%.

Northern has adopted maintenance and engineering measures to minimize venting of natural gas, reducing methane emissions. The use of third-party portable compression to draw down line pressure resulted in a savings of 223.78 MMscf, of natural gas emitted in 2021; this equates to approximately 112,440 tons CO₂e. The use of hot taps reduces the length of a line that has to be blown down during maintenance. A line stop is inserted in the pipeline; a shorter length of pipe is blown down. Northern estimates this procedure resulted in the avoidance of 124.7 MMscf of natural gas released to the atmosphere; this equates to approximately 62,650 tons CO₂e. During normal pipeline operations, pipeline equipment, such as regulating stations, compressor stations, and town border stations, are utilized to draw down line pressure when needed, avoiding the venting of 65.2 MMscf or approximately 32,750 tons CO₂e of natural gas. Northern also uses

flaring of gas as an alternative to venting natural gas, resulting in an estimated 15.4 MMscf, or approximately 7,740 tons CO₂e, of natural gas vented.

All told, in 2021, through operational best practices alone Northern achieved a 94.4% in methane reduction savings through flaring (95.5 MMscf of gas saved v. 5.6 MMscf of gas released; 89.75% of methane savings through capped blowdowns (26.1 MMscf of gas saved v. 3.0 MMscf of gas released); 65.0% of methane savings through pipeline operations (38.5 MMscf of gas saved v. 20.7 MMscf of gas released; and 100% methane savings through the use of vapor recovery units (1.2 MMscf of gas saved v. 0 MMscf of gas released).

In 2022, Northern replaced a total of seven antiquated compressor units, one unit at the Brownfield, Texas, station, two units at the Spraberry, Texas, station, and four units at the Ogden, Iowa, station. In 2023, Northern started construction to replace four units at the North Branch, Minnesota, station. In 2023, Northern installed a compressor blowdown system at the Sunray, Texas, compressor station to route natural gas that would otherwise be vented to the atmosphere to the station fuel header during blowdown activities. In 2024, Northern plans to install two vapor recovery systems, one at the Spraberry, Texas, compressor station and one at the Paullina, Iowa, compressor station. These vapor recovery systems will capture natural gas packing leak emissions from multiple reciprocating compressors and compress the gas to the station fuel system. The compressors at these facilities are newly installed units which have operating conditions that permit the packing recovery system to be implemented Northern uses advanced technology, such as LiDAR (light detection and ranging) optimal Gas Imaging (OGI), and a HiFlow Sampler™ technology, to identify the source of fugitive leaks. Northern then assigns a priority to leaks in order to respond to the sources with the greatest level of fugitive gas.

In developing its Project, Northern considered the potential environmental impacts, including GHG emission impacts from downstream sources. Specifically, for GHG emissions impact, Northern analyzed additional end-user consumption, in addition to the construction and operational impacts. Table 9.1-4 below outlines GHG impacts from the Project. Northern analyzed potential GHG emission impacts using three separate scenarios: initial load factor, average load factor (seasonal), and 100% utilization. This 100% utilization analysis overstates the emissions associated with end-use consumption of natural gas because it does not reflect the reality of ambient temperature-dependent space heating (homes, schools, hospitals and businesses, etc.) that rely on natural gas for the health and safety of the occupants. The descriptions and support for each of the scenarios is described in detail in Appendix I.

Table 9.1-4 Potential GHG Emissions Impacts

Activity	CO ₂ e (metric tons) ¹
Construction Emissions	2,282
Operational Emissions	20.1
Downstream Impacts - Initial Load Factor	2,513
Downstream Impacts - Average Load Factor (Seasonal)	125,902
Downstream Impacts – 100% Utilization	251,254

¹ All CO₂e calculations are annualized except for construction emissions, which will only occur during construction of the Project.

9.2 NOISE

9.2.1 Applicable Noise Guidelines

Sound is caused by vibrations that generate waves of pressure fluctuations in the surrounding medium. Sound levels are typically measured using a logarithmic decibel (dB) scale as pressure fluctuations caused by sound sources can vary by several orders of magnitude. The logarithmic dB scale facilitates the comparison of different sound levels. Unwanted sound or sound that causes disturbance or annoyance is often called noise. The terms sound and noise are used interchangeably in this report.

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 hertz (Hz) and is least sensitive to sound frequencies below 400 Hz or above 12,500 Hz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to noise levels. The decibel in the dB(A) is the most widely used for this purpose.

The L_{eq} is the steady sound energy level recorded and averaged over a specific period of interest such as hourly ($L_{eq,1hr}$), daytime ($L_{eq,day}$), nighttime ($L_{eq,night}$), or a 24-hour period. FERC defines daytime hours as the hours between 7 a.m. and 7 p.m. and nighttime hours as the hours between 7 p.m. and 7 a.m.

FERC regulations also refer to the day-night sound level (L_{dn}) to evaluate the noise impact of operation and construction activities on nearby NSAs. The L_{dn} is the L_{eq} plus 10 decibels added to nighttime levels to account for greater human sensitivity to noise during nighttime hours.

The L_{dn} is calculated according to the following formula:

$$L_{dn} = 10 \times \text{Log}_{10} \left(\frac{15}{24} \times 10^{(L_{eq(day)}/10)} + \frac{9}{24} \times 10^{((L_{eq(night)}+10)/10)} \right)$$

FERC regulations at 18 CFR § 380.12(k)(2) require that any applicable state or local noise regulations be identified. Regulations further require, at 18 CFR § 380.12 (k)(4)(v), that an operator specify how the proposed Project will meet the regulations. In the absence of any applicable state or local noise regulation, FERC requires that noise attributable to any new compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed an L_{dn} of 55 dB(A) at any pre-existing NSA. Northern will not be adding any compression as part of this Project; however, Northern will apply the noise standards to its HDDs.

FERC guidance states that construction activities that could or may occur during nighttime hours should be performed with the goal that the activity contribute noise levels at or below 55 dB(A) L_{dn} and 48.6 $L_{eq-24hr}$, or no more than 10 dB(A) over background if ambient noise levels are above 55 dB(A) L_{dn} . The human ear's threshold of perception for noise change is considered to be 3 dB(A); 6 dB(A) is clearly noticeable to the human ear; and 10 dB(A) is perceived as a doubling of noise.

A review of applicable state noise regulations identified Minnesota Rules Chapter 7030, which provides the Minnesota standards for noise. No applicable noise regulations were identified for the state of Nebraska.

The Minnesota Rules Chapter 7030 describe the limiting levels of sound established on the basis of present knowledge for the preservation of health and welfare. These standards are designed to be

consistent with sleep, speech, annoyance, and hearing conservation requirements for receivers within areas grouped according to land use activities. The Minnesota standards are as follows:

Table 9.2-1 MPCA State Noise Standards

Land Use	Noise Area Classification	Day (7 a.m. – 7 p.m.) dBA		Night (7 p.m. – 7 a.m.) dBA	
		L ₁₀ of	L ₅₀ of	L ₁₀ of	L ₅₀ of
Residential	NAC-1	L ₁₀ of 65	L ₅₀ of 60	L ₁₀ of 55	L ₅₀ of 50
Commercial	NAC-2	L ₁₀ of 70	L ₅₀ of 65	L ₁₀ of 70	L ₅₀ of 65
Industrial	NAC-3	L ₁₀ of 80	L ₅₀ of 75	L ₁₀ of 80	L ₅₀ of 75

Notes:

NAC-1 includes household units, transient lodging and hotels, educational, religious, cultural entertainment, camping, and picnicking land uses.

NAC-2 includes retail and restaurants, transportation terminals, professional offices, parks, recreational, and amusement land uses.

NAC-3 includes industrial, manufacturing, transportation facilities (except terminals), and utilities land uses.

From MPCA, Minn. Rules § 7030.0040

L₁₀ means the sound level that is exceeded for 10% of the time for a one-hour survey period. L₅₀ means the sound level that is exceeded 50% of the time for a one-hour survey period.

No applicable local noise regulations were found for Martin County, Minnesota, or Dodge County, Nebraska.

Northern will conduct construction and operating activities within the standards set forth by the MPCA as outlined in Table 9.2-1 above and pursuant to FERC guidance.

9.2.2 Existing Noise Levels

Construction activities related to the Project are expected to have a noise impact on the ambient environment and nearby NSAs. The noise impact of the operation of the Project once completed is expected to be insignificant relative to existing ambient sound levels. The construction noise impacts will be associated with HDD activities along the pipeline centerline in Martin County, Minnesota, and installation at an existing facility in Dodge County, Nebraska.

An assessment of the noise impact of the construction activities requires that existing baseline noise levels be quantified in the Project area. The applicable FERC guideline recommends that noise levels be representative of the existing conditions at NSAs affected by HDDs or new stationary noise sources. The applicable FERC guideline requires Northern to quantitatively describe existing noise levels at NSAs. Northern measured ambient noise levels at four locations representative of NSAs along the Project route. The Project route includes a rural and agricultural area in Martin County, Minnesota. In Dodge County, the Project area consists of an existing facility, an adjacent highway, and agricultural land.

Ambient noise measurements consisting of short-term 20-minute sound level measurements were collected between November 14, 2023, and November 15, 2023, in Minnesota and between February 13, 2024, and February 14, 2024, in Nebraska. Measurements were collected in accordance with ANSI SC1.100-2014 “*Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas*” where possible.

One Type 1 Larson Davis Model LXT (serial number 6992) sound level meter was used to collect the measurements. The instrument was calibrated before and after the site visit using a Larson Davis CAL200 calibrator set to 114 dB at 1000 Hz. Simultaneous measurements of 1/1 and 1/3 octave bands and LA_{eq} sound levels were collected in one second increments at each location at a

height of approximately five feet above the ground. The sound level meter (SLM) was set to collect measurements applying an A-weighting with the sound level meter in slow response. Tenth, 50th, and 90th percentiles also were calculated by the SLM for each measurement. Measurements were digitally recorded and exported into a spreadsheet for analysis using the Larson Davis G4 proprietary software.

Field observations were used to evaluate the potential impact of weather on sound level measurements. Measurements were taken during periods where wind induced sound was ten dB below measured sounds levels, relative humidity was below 90%, and temperature was within the operating range of the sound level meter. Measurements were not taken during periods of precipitation.

ANSI S12.100-2014 defines residual sound as the all-encompassing sound, being usually a composite of sound from many sources from many directions, near and far, remaining at a given position in a given situation when all uniquely identifiable discrete sound sources are eliminated, rendered insignificant, or otherwise not included. Residual sound may be approximated at the LA₉₀ or the sound level exceeded during 90% of the measurement period. Measurement locations ML-07 and ML-10 were collected by HDDs in Martin County, Minnesota. Measurement locations ML01 through ML04 were collected at the Columbus branch line tie-over regulator station and are not included on the table below; ML05 and ML06 noise readings were collected north and south of the station near NSAs, respectively. Northern has conservatively used the LA₉₀ to calculate the L_{dn} at measurement locations in Table 9.2-2.

Table 9.2-2 Background Ambient Sound Pressure Levels for the Monitoring Locations

Facility/HDD	Measurement Location	Measured (LA ₉₀)		Calculated L _{DN}
		Day (dBA)	Night (dBA)	(dBA)
P4-1	ML-07	36	37	43
P4-2	ML-07	36	37	43
P4-3	ML-10	42	37	44
Columbus Branch Line Tie-Over Regulator Station	ML06	34	30	37
	ML05	35	32	39

9.2.3 Construction Noise Impacts

Construction of the Project is expected to create noise impacts. Construction activities will represent an intermittent, temporary noise source. Three HDDs are planned for the construction of the Project. The entrance and exit pits of an HDD represent a continuous, localized noise source during the HDD. The installation of a single HDD may require several days to two weeks of work depending on the length and complexity of the HDD. Work will be scheduled to occur during the daytime hours of 7 a.m. to 7 p.m. NSAs within 0.5 mile of the entrance and exit pits of the HDDs were identified. Aerial imagery, land ownership records, and field surveys were reviewed to identify potential NSAs located near the potential HDD sites.

Table 9.2-3 summarizes the NSA locations nearest each HDD location for the Project. The noise impact analysis for each HDD was conservatively performed assuming the HDD pit nearest each individual NSA was an entry pit and the furthest HDD pit was the exit pit. The entrance pit has a

higher sound power level than the exit pit given the presence of the drill rig and additional supporting equipment. This assumption allows for the worst-case noise impact at each NSA to be modelled. Should field conditions require the HDD to be drilled in the opposite direction than currently being shown in the design drawings, no change in the noise analysis is required.

People at nearby residences and buildings will hear the construction noise but the overall impact will be short-term. The EI will monitor daytime noise levels during HDD activities; Northern will include this information in the weekly reports. A map showing the locations of NSAs in the vicinity of the Project is included as Figure 9-1.

Table 9.2-3 Summary of Identified HDD NSA Locations

NSA ID and Type	Latitude (of NSA)	Longitude (of NSA)	Distance and Direction to NSA	Duration of HDD
P4-1				
NSA01 (Residence)	43.6194	-94.6890	2,469 feet north	7 days
NSA02 (Residence)	43.6120	-94.6762	2,613 feet east	
NSA03 (Residence)	43.6143	-94.6916	1,409 feet northwest	
NSA04 (Residence)	43.6083	-94.6786	2,587 feet southeast	
NSA05 (Residence)	43.6074	-94.6903	1,630 feet southwest	
NSA06 (Residence)	43.6134	-94.6954	2,104 feet west	

NSA ID and Type	Latitude (of NSA)	Longitude (of NSA)	Distance and Direction to NSA	Duration of HDD
P4-2				
NSA01 (Residence)	43.6194	-94.6890	3,561 feet north	4 days
NSA02 (Residence)	43.6120	-94.6762	3,862 feet northeast	
NSA03 (Residence)	43.6143	-94.6916	1,720 feet north	
NSA04 (Residence)	43.6083	-94.6786	3,179 feet east	
NSA05 (Residence)	43.6074	-94.6903	658 feet south	
NSA06 (Residence)	43.6134	-94.6954	1,912 feet northwest	
P4-3				
NSA07 (Residence)	43.5746	-94.7367	561 feet west	10 days
NSA08 (Residence)	43.5717	-94.7351	822 feet south	

Construction of a pipeline typically involves installation of access roads, clearing and grubbing, delivery of materials, site grading and trenching, pipeline installation, HDD crossings, and restoration. The level of construction noise will vary over the entire construction period and will be highly dependent on the type of construction equipment being used at any given time. While construction is planned to occur over a six-month period, concentrated construction activities will occur only at periodic intervals.

Tie-ins, pressure testing, testing and commissioning, electrical work, inspections, and other time-sensitive construction activities may extend into nighttime hours past 7 p.m. and may include Sunday work. Artificial lighting only will be utilized, if necessary, to complete potential nighttime activities as described above. Lighting would be equipped with shields and aimed downward to minimize

impact on nocturnal wildlife or surrounding residences. Lenses for the lighting would be yellow or amber to minimize impacts on residents and wildlife.

Northern will complete HDD activities between 7 a.m. and 7 p.m.; no HDD nighttime drilling will occur. Based on site-specific conditions, Northern may elect to reverse the entry and exit points for an HDD. Northern will minimize light impacts as described below. Northern does not anticipate the routine use of artificial lighting.

Northern obtained sound power ratings for HDD rigs and supporting equipment (mud pumps, bentonite mixing systems and excavators) from equipment manufacturer specification sheets. For equipment where manufacturer sound power ratings were unavailable, sound power ratings for comparable equipment from the Federal Highway Administration construction noise model were used. A summary of the sound power ratings for equipment at the entry pit is summarized in Table 9.2-4.

Table 9.2-4 Combined Equipment Sound Power at HDD Entry Pit

Equipment	Assumed Quantity Operating Simultaneously	Maximum Sound Power Level of Equipment (dBA)
HDD Drilling Rig ¹	1	104
Mud Pump Engines ¹	1	112
Mud Cleaner	1	102
Shaker	1	108
Bentonite Mixer ¹	1	92
Excavator ²	1	110
	Total Sound Modelled Sound Power Level	116

¹Vendor specifications for HDD equipment from American Augers

² Federal Highway Administration, Federal Highway Administration Highway Construction Noise Handbook. U.S. Department of Transportation. July 5, 2011, http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm

A summary of the sound power ratings for equipment at the exit pit is summarized in Table 9.2-5.

Table 9.2-5 Combined Equipment Sound Power at HDD Exit Pit

Equipment	Assumed Quantity Operating Simultaneously	Maximum Sound Power Level of Equipment (dBA)
HDD Drilling Rig ¹	1	104
Mud Pump	1	98
Bentonite Mixer ¹	1	92
Excavator ²	1	110
	Total Sound Modelled Sound Power Level	111

¹Vendor specifications for HDD equipment from American Augers

² Federal Highway Administration, Federal Highway Administration Highway Construction Noise Handbook. U.S. Department of Transportation. July 5, 2011, http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm

Note 2: Federal Highway Administration, Federal Highway Administration Highway Construction Noise Handbook. U.S. Department of Transportation. July 5, 2011, http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm

Northern determined the distance between the entry and exit pits for the proposed HDDs to the nearest NSAs. The cumulative acoustical impact of the HDD operations at the pit entry and exit was evaluated at each of the identified NSAs, assuming the nearest pit to each NSA will be the entry pit and that a large HDD rig will be used for each HDD. These assumptions establish the

worst-case condition for each HDD in the Project. The cumulative acoustical impact of HDD operations on identified representative NSAs was calculated using CADNA/A acoustic modelling software (Version 2021 MR2), published by Datakustik GmbH, configured to implement ISO-9613-2 environmental noise propagation algorithms.

The cumulative noise impacts for daytime-only HDD construction activities are detailed in Table 9.2-6. The cumulative noise impacts for stationary noise is detailed in Table 9.2-7. Northern will monitor the actual sound impact levels at the HDD locations during HDD drilling activities to verify the sound assumptions utilized in this modelling. The selection and size of the HDD equipment during the construction of the Project has not been made, so the actual equipment to be utilized may have substantially lower sound impacts if a smaller or more modern piece of equipment is selected.

Table 9.2-6 HDD Noise Impact Summary Table

Location	Latitude of NSA	Longitude of NSA	Distance and Direction to NSA	Existing Ambient L _{dn} (dBA)	Estimated L _{dn} due to Project Construction (dBA)	Estimated L ₁₀ due to Project Construction (dBA)	Mitigation Required for Daytime Only HDDs	L _{dn} of Construction plus Ambient L _{dn} (dBA)	Potential Increase Above Ambient (dB)
P4-1¹									
NSA01 (Residence)	43.6194	-94.6890	2,469 feet north	43	51	48	N/A	52	9
NSA02 (Residence)	43.6120	-94.6762	2,613 feet east	43	50	47	N/A	51	8
NSA03 (Residence)	43.6143	-94.6916	1,409 feet northwest	43	58	54	N/A	58	15
NSA04 (Residence)	43.6083	-94.6786	2,587 feet southeast	43	51	48	N/A	52	9
NSA05 (Residence)	43.6074	-94.6903	1,630 feet southwest	43	56	52	N/A	56	13
NSA06 (Residence)	43.6134	-94.6954	2,104 feet west	43	53	50	N/A	54	11
P4-2¹									
NSA01 (Residence)	43.6194	-94.6890	3,561 feet north	43	48	44	N/A	49	6
NSA02 (Residence)	43.6120	-94.6762	3,862 feet northeast	43	47	43	N/A	48	5
NSA03 (Residence)	43.6143	-94.6916	1,720 feet north	43	56	52	N/A	56	13
NSA04 (Residence)	43.6083	-94.6786	3,179 feet east	43	49	46	N/A	50	7
NSA05 (Residence)	43.6074	-94.6903	658 feet south	43	64	60	N/A	64	21
NSA06 (Residence)	43.6134	-94.6954	1,912 feet northwest	43	55	51	N/A	55	12

Location	Latitude of NSA	Longitude of NSA	Distance and Direction to NSA	Existing Ambient L _{dn} (dBA)	Estimated L _{dn} due to Project Construction (dBA)	Estimated L ₁₀ due to Project Construction (dBA)	Mitigation Required for Daytime Only HDDs	L _{dn} of Construction plus Ambient L _{dn} (dBA)	Potential Increase Above Ambient (dB)
P4-3¹									
NSA07 (Residence)	43.6384	-94.6409	561 feet west	44	66	62	N/A	66	22
NSA08 (Residence)	43.6446	-94.6520	822 feet south	44	62	59	N/A	62	18

¹ HDDs will occur during daytime hours only

The noise impact for HDDs is not anticipated to exceed the MPCA daytime criteria; as such, no noise mitigation measures are required for daytime drilling. Northern will not conduct HDD operations past 7 p.m.; therefore, nighttime noise mitigation is not required.

9.2.4 Operational Noise Impacts

The operation of the pipeline component is not expected to create new operational noise impacts upon completion of construction activities.

The operation of the Columbus branch line tie-over regulator station in Dodge County, Nebraska, is predicted to have on-going noise impacts upon completion of construction activities. Table 9.2-7 summarizes the NSA locations nearest the Columbus branch line tie-over regulator station (nearest the fenceline). Other aboveground appurtenances installed as part of the Project are expected to have an insignificant noise impact at nearby NSAs.

Table 9.2-7 Summary of Identified Operational NSA Locations

NSA ID and Type	Latitude (of NSA)	Longitude (of NSA)	Distance and Direction to NSA
Columbus Branch Line Tie-Over Regulator Station			
NSA01 (Residence)	41.4711	-90.7808	449 Southwest
NSA02 (Residence)	41.4741	-90.7799	673 North

Northern obtained sound power ratings for the proposed Columbus branch line tie-over regulator station as summarized in Table 9.2-8. Sound power values for the proposed valves include noise mitigation measures (building and acoustical pipe wrap).

Table 9.2-8 Sound Power of Proposed Columbus Branch Line Tie-Over Regulator Station

Equipment	Assumed Quantity Operating Simultaneously	Sound Power Level of Equipment (dBA)
Existing North Bend NE #1 TBS	1	73
Columbus proposed valves ¹	2	104
	Total Sound Modelled Sound Power Level	107

¹ Manufacturer sound level specification with “building and acoustical pipe wrap” noise mitigation measures implemented.

The cumulative acoustical impact of operational noise on identified representative NSAs was calculated using CADNA/A acoustic modelling software (Version 2021 MR2), published by Datakustik GmbH, configured to implement ISO-9613-2 environmental noise propagation algorithms. The cumulative noise impact is summarized in Table 9.2-9.

Table 9.2-9 Operational Noise Impact Summary Table

Location	Latitude of NSA	Longitude of NSA	Distance and Direction to NSA	Existing Ambient L_{dn} (dBA)	Estimated L_{dn} due to Project Operation without Mitigation (dBA)¹	Estimated L_{dn} due to Project Operation with Mitigation (dBA)	L_{dn} of Stationary plus Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
NSA01 (Residence)	41.4711	-90.7808	449 Southwest	37	49	N/A - Below Applicable Criteria	49	12
NSA02 (Residence)	41.4741	-90.7799	673 North	39	46	N/A - Below Applicable Criteria	47	8

¹ Estimated unmitigated sound power level includes the implementation of manufacturer supplied “building and acoustical pipe wrap”

The cumulative noise impact of the existing North Bend NE #1 TBS, proposed Columbus branch line tie-over regulator station, and existing ambient sound level is below the applicable FERC 55 dBA L_{dn} criteria. No additional mitigation beyond the inclusion of a building and acoustical pipe wrap is required to mitigate the aboveground piping and valve noise at the Columbus branch line tie-over regulator. Acoustical pipe wrap will have a minimum surface density of 4 lbs/ft³ to effectively mitigate noise emissions from aboveground valves and piping. All new exterior aboveground valves and piping for the proposed Columbus branch line tie-over regulator station will be wrapped using acoustic pipe wrap.

9.2.5 Noise Mitigation Measures

Construction will occur primarily during daytime hours, which will mitigate the perceived noise impacts on nearby NSAs. Nighttime operations (7 p.m. to 7 a.m.) are possible as noted in section 9.2.3.

Northern will take steps to minimize engine idling and other non-essential noise generating activities. Northern will ensure that all combustion engine-driven machinery is equipped with mufflers. Northern will inform nearby residents of the Project and the upcoming construction activities and will respond to and investigate concerns.

Results of modeling indicate the use of a building and acoustical pipe wrap will sufficiently mitigate noise from the Columbus branch line tie-over regulator station.

9.3 CUMULATIVE IMPACTS

9.3.1 Cumulative Air Quality Impacts

There will be no cumulative air quality impacts associated with the Project.

9.3.2 Cumulative Noise Impacts

There will be no significant cumulative noise impacts associated with the operation of the Project.

10 RESOURCE REPORT 10 – ALTERNATIVES

Northern considered a variety of alternatives to the proposed Project to meet the Project need, which is to provide incremental firm natural gas transportation service on Northern's West Leg system. The Project need was evaluated considering a variety of criteria including reliability, safety, and potential alternatives, including no-action, energy conservation, alternative energy, system alternatives, and site alternatives. The primary objective in evaluating alternatives was to avoid, minimize, and mitigate landowner and environmental impacts while meeting customers' needs in balance with land use, engineering considerations, technological parameters, and economic benefits.

10.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, Northern would not construct the Project and consequently would be unable to meet the natural gas requirements of its customers. The customers, however, would still require additional natural gas transportation capacity to meet residential, commercial, and industrial growth demands. This includes the delivery of natural gas to heat homes and businesses, supplying

natural gas for appliance and machinery operation, and supplying gas to industrial plant operations. The Project is designed to optimize the placement of facilities to meet customer needs.

If no action is taken by Northern, other natural gas transmission companies would most likely be required to construct new facilities to meet the requirements for additional capacity. This action would likely result in greater environmental impacts in other areas and would not eliminate the cumulative impacts in the long term.

If the Project is not constructed, the local impacts directly associated with construction activities (e.g., disturbance of soils, wildlife habitat, and clearing of vegetation) would be avoided. However, the need for additional natural gas transportation capacity for the customer would likely result in construction occurring elsewhere. As a result, the no-action alternative was not found to be a feasible alternative because it would not satisfy the purpose and need for the Project.

10.1.1 Energy Conservation

In Minnesota, the Minnesota Department of Commerce, Division of Energy Resources and the Minnesota Public Utilities Commission implement programs, in accordance with Minnesota Statute Section 216B.2401 and Section 216C.05, that promote energy efficiency in both the electricity and natural gas industries (DER, 2023). In Nebraska, the NDEE administers the State Energy Program which includes energy efficiency in both industry and at the residential level (NDEE, 2023).

Energy conservation is not considered a viable alternative to the proposed Project because the entire volume of the natural gas product delivered as a result of the Project is subscribed by Northern's customers to meet residential, commercial, and industrial growth demands, in spite of ongoing conservation efforts.

10.1.2 Energy Alternatives

Because the Project is intended to transport natural gas based on customer demand, energy derived from renewable sources, such as geothermal, hydropower, wind, nuclear power, solar energy, and cogeneration; and from petroleum and coal-based fuels are not viable alternatives. These alternative energy sources cannot supply the natural gas supply demands of Northern's customers. Additionally, the costs of building these systems versus the minor natural gas expansion project makes them infeasible. Therefore, Northern does not view energy alternatives as a viable alternative to the transportation of natural gas.

10.2 SYSTEM ALTERNATIVES

System alternatives considered by Northern include pipeline systems owned by others and installation of compression on Northern's system in lieu of the proposed pipeline facilities. Northern eliminated compression as it would still require additional modifications on other branch lines and therefore would have been more impactful compared to the proposed plan. There are other interstate natural gas pipelines operating within the southern Minnesota area, including Northern Border Pipeline Company and Tallgrass Interstate Gas Transmission, that were analyzed as possible alternatives to the Project. While Northern cannot definitively speak to the specifics of alternative pipeline transportation companies, pipelines owned by other companies are not considered to be viable alternatives because of the widespread delivery points required by the Project. The locations of other pipeline systems are further away from the delivery points than Northern's system, which

would result in significant financial investment and environmental impacts compared to the proposed Project.

The proposed Project uses a combination of the installation of the C-line extension as well as the installation of the Columbus branch line tie-over station at an existing TBS to increase mainline capacity. Northern evaluated one system alternative to the proposed Project. System Alternative A included the installation of an approximately 2.1-mile loop extension of the 24-inch-diameter Fremont North line and an approximately 3.8-mile loop extension of the 24-inch-diameter Palmyra North line. The system alternative does not include modifications to aboveground facilities. The system alternative is depicted on Figure 10-1. Table 10.2-1 provides a comparison of environmental and engineering factors for the alternative and proposed Project.

Table 10.2-1 Comparison of System Alternatives

Factor	Unit	Proposed Project	System Alternative A
Length	miles	4.5	5.9
Pipeline diameter			
16-inch-diameter	miles	4.5	N/A
24-inch-diameter	miles	N/A	5.9
Nominal construction right-of-way width ^{1,2}	feet	90	100
Construction right-of-way ^{1,2}	acres	55	71
Permanent right-of-way ³	acres	27.5	35.5
Construction impact on forest ⁴	acres	0	1.06
Operation impact on forest ⁴	acres	0	0.53
Construction impact on non-forest wetlands ⁵	acres	1.3	0.6
Operation impact on non-forest wetlands ⁵	acres	0.63	0.26
Construction impact on forested wetlands ⁵	acres	0.11	0.14
Operation impact on forested wetlands ⁵	acres	0.06	0.06
Waterbody crossings ⁶			
Major	number	0	0
Intermediate	number	2	4
Minor	number	0	1
Critical habitat crossed ⁷	miles	0	0
Recreation and special interest areas crossed ⁸	number/miles	0/0	0/0
Residential areas within 50 feet of the centerline ⁴	acres	0	1.38
Road crossings ⁹	number	6	7
Railroad crossings ¹⁰	number	0	0

¹ Based on a 90-foot-wide construction ROW Proposed Project

² Based on a 100-foot-wide construction ROW System Alternative A

³ Based on a 50-foot-wide permanent ROW

⁴ National Land Cover Dataset (NLCD 2019)

⁵ National Wetland Inventory Database (USFWS 2022a)

⁶ National Hydrologic Dataset (USGS 2022b)

⁷ Federally Designated Critical Habitat (USFWS 2022b)

⁸ PAD-US (USGS 2022a)

⁹ North American Detailed Streets (ESRI 2022)

¹⁰ U.S. Rails Database (US Census Bureau 2019)

System Alternative A would have a larger construction and operations footprint with more impact on forest and forested wetlands. System Alternative A would require more waterbody and road crossings and has more residential areas near the pipeline.

Compared to the system alternative, the proposed Project was determined to be the least impactful option to meet customer demand. While the proposed Project impacts more non-forested wetlands, it impacts fewer forested wetlands and no forested uplands. The proposed Project crosses fewer waterbodies and roads and does not impact any residential areas. Northern can utilize smaller workspaces as the pipeline diameter for the proposed Project is smaller than the system alternative.

10.3 ROUTE AND ABOVEGROUND FACILITY ALTERNATIVES

The goal of the route selection analysis is to identify a Project alignment that represents a minimal and acceptable level of environmental impact coupled with attainment of the Project goals. Route alternatives include alignments that differ from those of the originally designed Project.

Northern's proposed Project includes only pipeline that will be constructed in parallel to existing pipelines; therefore, no route alternatives were evaluated. Limited alternatives for aboveground facilities exist for the proposed Project. Aboveground facilities associated with the C-line extension are located at existing facilities or at the take off and terminus of the proposed pipeline. There are no environmental resources impacted by the facilities, as proposed.

Northern evaluated three potential locations for the aboveground facility in Nebraska. The three locations were at existing Northern facilities: the Schuyler tie-over regulator in Colfax County; a block valve setting near Rogers, Nebraska, in Colfax County; and the Columbus branch line tie-over regulator station. The Schuyler tie-over regulator was eliminated as the location was in a regulated floodway that was prone to flooding from the Platte River. The block valve setting near Rogers was eliminated as the site would require expansion of an existing facility in a floodplain. The Columbus branch line tie-over regulator station within the North Bend NE #1 TBS was selected as the preferred location as it was in a mapped floodplain and not floodway and the location provides the requested customer capacity without expanding the existing facility footprint.

11 RESOURCE REPORT 11 – RELIABILITY AND SAFETY

Resource Report 11 describes the reliability and safety aspects of Northern's proposed Project. The report addresses the potential hazard to the public from failure of facility components resulting from accidents or natural catastrophes, how these events may affect reliability and what procedures and design features have been used to reduce potential hazards.

11.1 HAZARDS

The transportation of natural gas by pipeline potentially generates some risk to the public in the event of an incident and subsequent release of gas. Impacts on public safety from pipeline transportation of natural gas have historically been directly related to leaks or line breaks that are most often due to

corrosion; leaks or line breaks due to external forces not associated with pipeline operations, including seismic forces and/or damage from third-party excavation near buried pipeline sections; or equipment malfunctions (DOT PHMSA, 2013).

The primary component of the natural gas transported in interstate transmission pipelines is methane, a colorless, odorless, and tasteless gas. While not chemically toxic, methane is classified as an asphyxiant with a slight inhalation hazard. Exposure to high concentrations can result in serious injury or death due to oxygen deficiency. The specific gravity of methane is 0.55, which is lighter than air. This means methane tends to rise at normal atmospheric temperatures and disperses rapidly in the atmosphere. In general, unconfined mixtures of methane in air are not flammable or explosive because of the dilution of the methane by air. However, mixtures of methane in air are flammable at concentrations between 5.0% and 15.0% methane by volume. Methane has an ignition temperature above 1,000 degrees F (Northern Material Safety Data Sheet).

11.2 SAFETY STANDARDS

Separate subparts to 49 CFR Part 192 address the design of additional pipeline components, including but not limited to launchers and receivers, service lines, customer meters, valves, etc. The proposed Project's aboveground facilities will be designed, constructed, and operated to meet or exceed applicable specifications.

PHMSA promulgated a rule for pipeline integrity management in HCAs for gas transmission pipelines that has been incorporated into 49 CFR Part 192, Subpart O. DOT regulations in 49 CFR § 192.903 identify a formula that is utilized to estimate the distance from a potential explosion at which death, injury or significant property damage may occur adjacent to natural gas transmission pipelines and associated facilities. This distance is known as the PIR and is defined as the radius of a circle within which potential failure of a pipeline could have significant impact on people or property. Northern has calculated the PIR for all points along the Project to determine the presence of HCAs. Northern has determined the Project will not affect any HCAs or MCAs.

DOT regulations in 49 CFR § 192.5 define area classifications based on population density near the pipeline. Areas of higher population face more stringent requirements. A "class location unit" is defined as an area that extends 220 yards (660 feet) on either side of the centerline of any continuous one-mile length of pipeline. Class locations representing more populated areas require higher safety factors in pipeline design, testing and operation. The existing and design class locations for the pipeline on the Project will be Class 1.

Northern's emergency response personnel are trained in first aid and proper equipment use as specified under OSHA 29 CFR Part 1910.

During construction, the applicable requirements of OSHA will be followed. All applicable requirements for construction set forth under 49 CFR Part 192 and OSHA regulations at 29 CFR Parts 1910 and 1926 will be emphasized by Northern to all employees and contractors as part of general practice. Additional safety standards requiring training during construction are further outlined below.

11.2.1 Traffic Control

Potential traffic interruptions at all public roads crossed by the Project are not expected due to installation of the pipeline via the HDD or conventional bore method but could occur when

delivering materials and equipment to the construction site. Flagmen will be utilized to stop traffic, as necessary, during these short delays. Northern will coordinate with local officials to avoid traffic interruptions and ensure the safety of pedestrians, motorists and emergency vehicles in the Project area.

No public roads are proposed to be crossed via open cut as the primary construction method. In the unlikely event that the conventional bore under County Road 119 is unsuccessful, Northern may elect to open cut the road, pending receipt of required permits. One private driveway will be crossed via HDD while the second will be crossed via open-cut methods. The C-line extension is located in rural areas with typically low traffic flow patterns. In general, the impact on traffic and transportation facilities and public inconvenience at crossings will be minimized by Northern's traffic control plan. Northern will coordinate with local highway departments in advance of construction of the pipeline. Northern has developed a traffic control plan for the Project, which is included in Appendix M.

11.2.2 Public Access

Open access to the construction work areas near areas that are easily accessible to the public, such as road crossings, will be restricted by the installation of temporary safety fences around open excavations.

11.2.3 Welding

Northern's policy is that only company-approved and certified welders are permitted to work on Northern pipeline facilities. All welding activities are carried out under the supervision of a Northern welding inspector and follow Northern's welding procedures. Additionally, all qualified welders meet the standards of the ASME BPVC Section IX, American Petroleum Institute 1104 and 49 CFR Part 192. All contract welders also will be required to comply with applicable OSHA rules specified under 29 CFR Parts 1910 and 1926.

11.3 VALVE ISOLATION SAFETY

Associated tie-in valves are manual shut-off.

11.4 PUBLIC EDUCATION PROGRAM

Northern complies with American Petroleum Institute 1162 for its Public Awareness Program. Following this guidance, Northern identifies the target audiences (e.g., general public, libraries, affected landowners, local public officials, emergency responders, local emergency planning committees, media, and One Call centers) that should receive correspondence and provides information, as appropriate, to ensure adequate reporting to Northern or the appropriate emergency response organization.

11.5 SECURITY AND TERRORISM

Safety and security concerns have changed the way pipeline operators and regulators must consider terrorism, both in approving new projects and in operating existing facilities. The Office of Homeland Security is tasked with the mission of coordinating the efforts of all executive departments

and agencies to prevent, prepare for, protect against, respond to and recover from terrorist attacks within the U.S. FERC, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies, is working to improve pipeline security practices, strengthen communications within the industry and extend public outreach in an ongoing effort to secure pipeline infrastructure.

The likelihood of future acts of terrorism or sabotage occurring on the proposed Project is unpredictable given the disparate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such acts. Northern is committed to cooperating with FERC, along with other federal, state, and local agencies to protect its energy facilities, employees and the neighboring public.

12 RESOURCE REPORT 12 – PCB CONTAMINATION

Resource Report 12 is required for filings involving the replacement, abandonment by removal or abandonment in place of pipeline facilities determined to have polychlorinated biphenyl (PCBs) in excess of 50 ppm in pipeline liquids. As part of the Project, approximately 130 feet of piping in Minnesota and approximately 40 feet of piping in Nebraska will be removed. Recent testing results show PCB concentrations in the vicinity of the Project between no detect and 2.5 ppm.

Northern may encounter liquids in the pipeline and facilities during the proposed below-ground tie-ins. Since much of Northern’s pipeline system was installed prior to the 1980s, there is a potential of having PCBs in excess of 50 ppm in pipeline liquids associated with facilities (e.g., lubricants and sealants). Given the small diameter of the pipeline and piping, the potential for PCB wipe sampling is limited; therefore, Northern will assume any liquids from small diameter pipe contains PCB concentrations over 50 ppm.

As applicable, Northern’s inspection team will oversee the PCB sampling to determine if liquids are found in the existing pipeline system. The sampling for and disposal of PCB-contaminated facilities will be conducted in accordance with Northern’s PCB Disposal Requirements (Northern environmental procedure 410.301) and Sampling for PCBs during Pipeline Removal (environmental procedure 410.405), both provided in Appendix J.

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