RESOURCE REPORT NO. 10
ALTERNATIVES

Resource Report No. 10

Alternatives

Northern Lights 2023 Expansion Project

FERC Docket No. CP22- -000

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RESOURCE REPORT 10 – GENERAL PROJECT DESCRIPTION SUMMARY OF FILING INFORMATION

		Found in Section
1.	Address the "no action" alternative – Title 18 CFR § 380.12(1)(1)	Section 10.1
2.	For large projects, address the effect of energy conservation or energy alternatives to the project -- 18 CFR § 380.12(1)(1)	Sections 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 – 18 CFR § 380.12(1)(1)	Section 10.2
	Discuss the costs and benefits associated with each alternative.	Section 10.2.1 and 10.2.2
4.	Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (*e.g.*, wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route – 18 CFR § 380.12(1)(2)(ii)	Section 10.3
	For onshore projects near to offshore areas, be sure to address alternatives using offshore routings.	Not applicable
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. 18 CFR § 380.12(1)(2)(ii)	Section 10.4

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Abbreviations and Acronyms

ACEEE	American Council for an Energy-Efficient Economy
CFR	Code of Federal Regulations
Dth/day	dekatherms per day
EERE	Energy Efficiency and Renewable Energy (Office of) (U.S. Department of Energy)
EIA	Energy Information Administration
FERC	Federal Energy Regulatory Commission
HDD	Horizontal directional drill
MAOP	maximum allowable operating pressure
MDOC	Minnesota Department of Commerce
MP	milepost
NRDC	Natural Resources Defense Council
Northern	Northern Natural Gas
Project	Northern Lights 2023 Expansion Project
ROW	right of way
WOEI	Wisconsin Office of Energy Innovation

10.0 ALTERNATIVES

Resource Report 10 describes the alternatives evaluated for Northern's proposed Project. The report discusses the potential for reasonable alternatives to meet Project needs, taking into consideration landowners, environmental and cultural impacts, technical feasibility, and schedule. This report also evaluates alternatives utilizing other natural gas transportation companies, existing compression, existing pipeline, existing ROW, and combinations thereof. The four major types of alternatives discussed in this report include the no-action alternative, system alternatives, route alternatives, and aboveground site alternatives.

Northern owns and operates an approximately 14,500-mile-long natural gas transmission pipeline system and associated aboveground facilities, including pipeline and facilities in Minnesota and Wisconsin. Northern is proposing to construct the Project, which will consist of (1) a 2.79-mile extension of its 36-inch-diameter Ventura North E-line; (2) a 1.07-mile loop of its 20-inch-diameter Elk River 1st and 2nd branch lines; (3) a 1.14-mile extension of its 24-inch-diameter Willmar D branch line; (4) a 2.48-mile extension of its 8-inch-diameter Princeton tie-over loop; (5) a 2.01-mile loop of its 3-inch-diameter Paynesville branch line; (6) a 0.34-mile extension of its 8-inch-diameter Tomah branch line loop; and (7) aboveground facilities including a launcher and tie-over valve settings. All Project components are located in various counties in Minnesota and Wisconsin. When placed in service, the proposed facilities will provide for incremental winter peak day firm transportation service of approximately 50,889 Dth/day to serve residential, commercial and industrial customer market growth in Northern's Market Area; this includes 6,667 Dth/day of incremental firm service that will allow a shipper enhanced reliability and flexibility in nominating and scheduling natural gas transportation capacity for electric generation.

10.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, Northern would not construct any component of 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, as well as supplying natural gas for appliance and machinery operation. 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 result in similar or greater environmental impact in another area, but would not eliminate the impact. Part of the incremental capacity created by the Project would enhance the reliability of the nomination process for one of the shippers. The no-action alternative was found not to be a feasible alternative for either purpose.

10.1.1 Energy Conservation

Energy conservation reduces the need for natural gas and other energy resources, allowing existing energy sources to provide the needed energy to fulfill a geographic area's growing energy needs. Energy conservation can decrease the per-user demand for natural gas, allowing a greater number of users' demands to be met with an existing supply. The EERE works with businesses, industries, universities, and others to increase the use of energy efficiency technologies by offering financial assistance opportunities for their development and demonstration (EERE, 2021). EERE also supports state-level energy efficiency programs such as those administered by the MDOC and the WOEI.

The MDOC Division of Energy Resources' Conservation Improvement Program, established in 2008, requires utilities to invest in programs that promote energy-efficient technologies and practices to residential, commercial, industrial, and public energy consumers throughout Minnesota (MDOC, 2020). During both 2017 and 2018, electric utilities exceeded the goal of 1.5% energy savings, and natural gas utilities exceeded the statutory minimum of 1.0% energy savings (MDOC, 2020). The WOEI Focus on Energy program, established in 2001, provides economic support to the people and businesses of Wisconsin to make smart energy decisions. In 2018, Wisconsin reduced the proposed energy savings goals to approximately 0.6% for electricity and natural gas utilities (ACEEE, 2021). Demand side savings goals are not sufficient to meet the future energy needs in the Project area.

Minnesota and Wisconsin also have goals to reduce greenhouse gas emissions from electricity generation. Reduction of greenhouse gases can result in increased generation of electricity from renewable sources; however, in Minnesota and Wisconsin, the focus on reducing coal-fired electricity generation has resulted in a greater demand for both renewable sources as well as natural gas (MDOC, 2020). In Minnesota, coal-fired electrical generation has been reduced from a high of 53% in 2011 to 25% in 2020 (EIA, 2021a). In Wisconsin, coal-fired electrical generation has been reduced from a high 82% in 1997 to 39% in 2020 (EIA, 2021b). Based on the reduction in coal-fired generation, the demand for natural gas has increased in both states. In Minnesota, electricity generated by natural gas has increased from 5% of the total in 2005 to 20% of the total in 2020 (MDOC, 2020). In Wisconsin, utility-scale natural gas usage increased by a factor of four between 2010 and 2020 with natural gas currently providing 35% of electricity generation in the state (EIA, 2021b).

Although greenhouse gas reductions and other demand-side reduction measures infer a long-term solution to energy demands, the programs do not offset the current need identified by Northern's customers. Energy conservation can provide short-term and longer-term alternatives, but conservation methods do not currently provide viable alternatives that can meet the increasing energy demands proposed to be met by the Project. Although individual programs may make a small difference in reducing current and future energy needs in Minnesota and Wisconsin, collectively, they do not provide for the current and future energy needs identified to be served by the proposed Project. The existing energy conservation programs do not offset or delay the current need identified by Northern's customers.

10.1.2 Energy Alternatives

The demand for natural gas to meet the projected energy needs of customers in the Project area continues to increase. Energy alternatives are available and utilized on a utility grid-scale in Minnesota and Wisconsin. Natural gas is a reliable, non-intermittent source of energy that, combined with other traditional and alternative energy sources, provides a safe and secure base for Minnesota's and Wisconsin's energy customer needs. In 2020, approximately 20% of Minnesota's and 35% of Wisconsin's electrical generation was produced using natural gas (MDOC, 2020; EIA, 2021a), and neither Minnesota nor Wisconsin have natural gas production facilities; therefore, infrastructure necessary to transport and manage natural gas within the states is required. Energy alternatives are currently being utilized in Minnesota and Wisconsin; however, they would not meet the needs of the natural gas customers to be served by the Project. Individual alternative and renewable energy sources are discussed in the following sub-sections.

Geothermal

Geothermal energy is obtained by extracting heat from sub-surface, naturally occurring sources, such as hot springs, geysers, volcanoes, or areas near the earth's surface. Because most customers would likely use natural gas for water and space heating, one alternative in the region is existing geothermal

energy. A geothermal unit or system sized for a single building or residence results in the same outcome as a standard forced-air heating, ventilation, and air conditioning system. Geothermal units essentially tap into the earth's constant temperature below the frost line. The constant temperature, around 50 degrees Fahrenheit, is used to heat a water-filled pipe that moves water between the earth and the house. Water cycles through the geothermal unit, which acts as furnace and air conditioner. The units use refrigerant and the water, which is of a constant temperature, to heat or cool air and the air is circulated through ductwork. The system uses excess heat to heat water at no added cost. The system is expensive to install ($7,500 for an average residential system – not including installation and drilling costs) (U.S. Department of Energy, 2011), and cost is dependent on the size of the system. Geothermal systems do not generate electricity, but they do save electricity or natural gas by replacing conventional heating and cooling with more efficient equipment. The investment by the property or building owner to retrofit with a geothermal home unit is high, and the number of owners who would choose geothermal units is likely low.

For the end-user, the installation of a geothermal system would likely be based on cost, payback period and convenience. Although existing geothermal energy systems are promising and have some capability to expand and provide energy to a greater number of end users, the current status of geothermal energy does not, and presumably could not meet, the current and future needs of end users in the next several years. Implementing individual geothermal systems would require costly upgrades and modifications to existing systems and infrastructure. In comparison, the proposed Project can be constructed in several months with short-term, minor, temporary environmental impacts, and can provide the necessary increase in natural gas volume to meet the growth requirements of Northern's existing customers.

Minnesota and Wisconsin do not have practicable access to deep-earth geothermal reservoirs to supply an electric generating facility or provide significant geothermal capacity; therefore, utility-scale geothermal energy is not a feasible alternative to the Project.

Hydropower

Hydroelectric power, or electricity generated from water run through turbines, accounts for 2% of the energy generation in Minnesota and 5% in Wisconsin (EIA, 2021a; 2021b). Additional natural gas capacity from the Project will be used to meet the natural gas supply demands for Northern's customers. Hydropower sources are not available to meet the demand, nor could they be sited, designed, permitted, and constructed within the timeframe feasible to replace the capacity to be provided by the Project. Therefore, hydropower is not a feasible alternative to the Project.

Wind and Solar

Wind provided approximately 22% of Minnesota's electricity generation and 3% of Wisconsin's electricity generation in 2020, while solar energy provided approximately 3% of the electricity generation in Minnesota and only 0.5% in Wisconsin (EIA, 2021a; 2021b). Minnesota and Wisconsin actively promote and support the construction of wind and solar energy in the state; however, natural gas is an additional and alternative energy source necessary for heating, electrical generation and industrial use. Natural gas provides an important source of operational flexibility on the grid, responding quickly to demands for electricity (NRDC, 2012); therefore, it complements the usage of wind and other renewables. But wind and other renewables are not an alternative to the Project because they do not provide the same operational flexibility. Existing renewable energy resources are insufficient to provide the necessary energy requirements as identified by the purpose and need, and new renewable energy resources could not be brought on-line in time to meet the Project schedule. The land requirements for a wind or solar facility that would generate the equivalent

amount of energy as that supplied by the proposed Project would be prohibitive due to the potential environmental impacts. Further, construction of solar or wind energy facilities would require initial research on potentially suitable locations and would take time to develop and install; therefore, solar and wind alternatives would not meet the Project schedule.

Individual or small-scale renewable energy systems would not be available to meet the short-term energy demands to be satisfied by the proposed Project. The number of systems and land requirements of individual or small-scale renewable energy systems needed to achieve the same short-term energy generation as the proposed Project would not meet the Project schedule and would result in greater environmental impacts. The use of renewables does not eliminate construction impacts, and presents its own set of operational impacts, including those associated with new electric transmission lines. Impacts would result from activities related to construction of new infrastructure necessary to harness energy sources such as solar and wind, and conversion and transportation of energy to consumers. Significant investment in infrastructure, including transmission lines, is likely to be required to transport electricity from renewable sources to consumers. Therefore, use of wind and solar energy is not a viable alternative to the proposed Project.

Biomass and Biogas

Biomass resources can produce electricity and heat or steam from wood, wood waste, plant and animal waste, or other organic matter. Both Minnesota and Wisconsin currently utilize biomass resources to provide slightly more than 2% of each state's electric generation (EIA, 2021a; 2021b). The burning of wood or other biomass-based resources generates larger quantities of air pollutants than the combustion of natural gas and may also be subject to use restrictions during periods of degraded air quality. Environmental impacts and use constraints make the large-scale use of wood infeasible for the large majority of potential users.

The development of additional biomass and biogas facilities requires significant time and resources to develop. Fuel sources are limited, requiring transportation from source to electric generating facilities, further contributing to greenhouse gas emissions. The Project will be used to meet the natural gas supply demands for Northern's customers; therefore, biomass and biogas are not feasible alternatives to the Project.

Nuclear Energy

Currently two nuclear power plants operate in Minnesota, and one operates in Wisconsin. According to the EIA, nuclear power represented approximately 26% of Minnesota's and 16% of Wisconsin's total electrical generation in 2020 (EIA, 2021a; 2021b). The overall production of energy from nuclear power plants ranks third among all energy sources in Minnesota and Wisconsin. Nuclear power can be produced in large quantities, with minimal air emissions; however, the development of new facilities is capital intensive and requires a long lead time for permitting and construction. In addition, nuclear power presents considerable and unresolved long-term environmental challenges associated with the storage of radioactive spent nuclear fuel. As previously noted, the Project will be used to meet the natural gas supply demands for Northern's customers; therefore, nuclear energy is not a feasible alternative to the Project.

Coal-Based Energy

Coal-based energy supplies 25% of Minnesota's and approximately 40% of Wisconsin's electrical generation (EIA, 2021a; 2021b). Development of coal-based energy would result in a variety of environmental impacts, including impacts associated with drilling, mining, transportation, refinement and distribution. Coal-based energy sources emit more pollutants to the air (e.g., smog

and acid rain, which contain sulfur dioxide and nitrogen oxides) than natural gas (EIA, 2021c). The sulfur dioxide and nitrogen oxides react in the atmosphere with water and return to the earth as acid rain. Nitrogen oxide emissions also react with the atmosphere to create ground-level ozone pollution, or smog. Coal is transported to a plant by rail car, which results in additional adverse impacts, including generation of air emissions from engine exhaust. For the end user, the cost of natural gas for water and space heating is generally lower than the cost of electricity for these same purposes (EIA, 2021d). The EIA's Annual Energy Outlook 2021 projects that shifts in the electricity generation fuel mix continue to reduce national coal-fired generation, which fell from 23% in 2019 to 19% in 2020 (EIA, 2021e). The EIA's document states that growth in electricity demand was met by generation with natural gas and renewable capacity, and that the natural gas share of total electricity generation in the U.S. grew from 38% in 2019 to 40% in 2020 (EIA, 2021e). The shift away from coal-based energy reflects the environmental impacts associated with the use of coal and changing state and federal regulations. Coal-based energy does not provide a significant environmental advantage over natural gas; therefore, is not a reasonable alternative to the proposed Project.

10.2 SYSTEM ALTERNATIVES

System alternatives can include looping or new pipeline along existing ROW, alternative pipe diameters or compression scenarios or alternative placement of pipeline loop that may avoid sensitive resource areas. Northern evaluated several system alternatives that could meet the objectives of the Project but would utilize a different existing natural gas pipeline system or a different configuration of Northern's pipeline facilities including a compression only option.

10.2.1 Pipelines Owned by Others Alternative

There are other interstate natural gas pipelines operating within a reasonable distance of the southern Minnesota area, including Northern Border Pipeline Company and Viking Gas Transmission Company, that were analyzed as possible alternatives to the Project. While Northern cannot definitively speak to the specifics of alternative pipeline transportation companies, because of the widespread delivery points required by the Project, pipelines owned by other companies are not considered to be viable alternatives. The locations of other pipeline systems are much further away from the delivery points than Northern's system. To properly deliver gas to their customers, Northern's system would need to be replicated, resulting in significant financial investment and environmental impacts.

10.2.2 Northern's Compression System Alternative

Northern evaluated adding compression as an alternative to additional pipeline. Northern's evaluation indicated that compression addition is not technically a feasible alternative due to the short pipeline lengths and geographically varied delivery receipt points for the proposed Project. To avoid additional pipeline, Northern determined that additional compressor units would be required at two existing compressor stations in Minnesota and two greenfield compressor stations would be required in Minnesota and Wisconsin. In addition, portions of the system are at the MAOP, which does not facilitate additional natural gas throughput without the addition of more pipeline. Compared to the generally temporary impacts proposed for the Project, construction of additional compressor units would result in greater permanent environmental impacts. In addition, due to the limited nature of the proposed Project, the air and noise impacts related to compressor units were considered unnecessary.

10.3 ROUTE 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. To this end, Northern has completed the following:

- Identified technical requirements
- Developed routing criteria
- Identified potential routing alternatives
- Evaluated the potential environmental impacts of each alternative route
- Evaluated routing alternatives against routing criteria

Paramount in the development of routing criteria is the proximity of the proposed route to existing utility infrastructure. Ground reconnaissance, aerial photography and National Wetland Inventory maps were used to study routing alternatives. The intent of the evaluation is to identify the most environmentally sound and efficient route and the route with the least impact on landowners and the least adverse impact on the environment.

A set of preliminary routes was initially developed and screened with respect to the following parameters.

- Use of existing corridors and minimization of the need to create new corridors
- Potential impacts on cultural and environmental resources
- Land use concerns
- Proximity to residential/congested areas
- Engineering and construction criteria
- Operation and maintenance considerations
- Supporting infrastructure

10.3.1 Major Route Alternatives

Major route alternatives are routes that deviate from the preferred route for an extended distance (e.g., for several miles) or are several miles away from the preferred route. Major route alternatives are primarily considered for new pipeline projects. New geographically different routes create new pipeline corridors and new impacts.

The Project consists of loops and extensions to existing pipelines and will occur adjacent to existing facilities where practicable; therefore, Northern did not consider major route alternatives for any of the pipeline segments.

10.3.2 Minor Route Deviations

Minor route deviations are routes that differ from the originally designed route but are near the originally designed route and are geographically similar. Minor route deviations are those that were considered during the selection of the preferred route because of environmental, economic or technical reasons.

Northern evaluated six minor route deviations for the Project, two for the Ventura North E-line, one for the Elk River 3rd branch line, one for the Willmar D branch line, one for the Princeton tie-over loop, and one for the Paynesville 2nd branch line. A description of the resource issues, comparisons of the environmental characteristics of the alternatives versus the proposed routes, and a clear statement of the overall advantages of the proposed routes are listed below. Northern did not consider

minor route deviations for the Tomah branch line loop since the route is only 0.34 mile long. The Tomah route will include a slight 50-foot shift of the new pipeline away from the existing pipeline for a length of approximately 370 feet to allow for space to conduct a bore and tie-in. Figures 10-1 through 10-6 depict the six minor route alternatives.

Minor Route Deviation 1

Minor route deviation 1 is located on the Ventura North E-line beginning north of 110th Street in Freeborn County, Minnesota. The original design was to complete an open-cut crossing of an agricultural field paralleling the existing pipeline. The original route would have crossed three major agricultural terraces, which would require pre-construction surveys and significant restoration. An open-cut crossing of the three terraces also had the potential to create short-term impacts on the landowner's remaining cropland due to temporary drainage and waterflow changes. Additionally, an extended slope of approximately 4% to 7% was avoided, which would have increased the potential for erosion. Northern designed the proposed route to include open-cut crossing of an agricultural field, avoiding the three agricultural terraces between MP 28.42 and MP 29.10. Table 10.3-1 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-1 depicts the minor route deviation 1 on an aerial photographic overlay.

Table 10.3-1 Comparison of Minor Route Deviation 1 for the Ventura North E-Line

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	3,382	3,642
Adjacent to existing ROW	feet	3,382	0
Construction ROW[1]	acres	7.77	8.36
Permanent ROW[2]	acres	3.88	4.18
Total field delineated wetlands crossed	number	0	0
Total waterbodies crossed	number	0	0
Residences within 50 feet of construction work area	number	0	0
Cultural resources crossed	number	0	0
Land Use	feet	3,382	3,642
Agricultural	feet	1,618	2,922
Agricultural Terraces	feet	1,052	0
Forested	feet	0	0
Open Land	feet	712	714
Industrial/Commercial	feet	0	6
MP range (start and end)	miles	N/A	28.42-29.10

[1] Based on a 100-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW

While the proposed route is slightly longer and is not adjacent to the existing ROW, it has the potential for fewer impacts on the landowner's farming practices (agricultural terraces) while maintaining similar environmental impacts as the original route. Northern selected the proposed route because it presents fewer impacts on the landowner and less potential for erosion.

Minor Route Deviation 2

Minor route deviation 2 is located on the Ventura North E-line between MP 30.42 and MP 30.57 in Freeborn County, Minnesota. Northern designed the proposed route to avoid a high-quality native

prairie identified during environmental field surveys. Table 10.3-2 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-2 depicts the minor route deviation 2 on an aerial photographic overlay.

Table 10.3-2 Comparison of Minor Route Deviation 2 for the Ventura North E-Line

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	735	802
Adjacent to existing ROW	feet	735	0
Construction ROW[1]	acres	1.69	1.84
Permanent ROW[2]	acres	0.84	0.92
Total field delineated wetlands crossed	number	0	0
Total waterbodies crossed	number	0	0
Residences within 50 feet of construction work area	number	0	0
Cultural resources crossed	number	0	0
Land Use	feet	735	802
Agricultural	feet	346	802
Forested	feet	0	0
Open Land[3]	feet	389	0
MP range (start and end)	miles	N/A	30.42-30.57

[1] Based on a 100-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW
[3] Open land is the high-quality native prairie

While the proposed route is slightly longer and is not adjacent to the existing ROW, it avoids impact on a high-quality native prairie and any threatened and endangered species associated with the prairie. The proposed route is located within agricultural fields, which typically can be restored and returned to agricultural land use in a much shorter timeframe than restoration of a native prairie. Northern selected the proposed route because it avoids all impacts to the high-quality native prairie.

Minor Route Deviation 3

Minor route deviation 3 is located on the Elk River 3rd branch line between MP 0.70 and MP 1.07 in Washington County, Minnesota. The original route paralleled the existing pipelines and was designed to allow an HDD under a pond and a residence. Construction of the original route would have resulted in a pipeline underneath a residential garage and home and potentially limited the homeowner use of their driveway during construction. Northern designed the proposed route with an HDD that avoids impacts on the pond and eliminates the HDD under the residence/driveway. Table 10.3-3 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-3 depicts the minor route deviation 3 on an aerial photographic overlay.

Table 10.3-3 Comparison of Minor Route Deviation 3 for the Elk River 3rd Branch Line

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	1,684	1,873
Adjacent to existing ROW	feet	1,684	233
Construction ROW[1]	acres	3.87	4.29
Permanent ROW[2]	acres	1.93	2.15

Environmental Factor	Unit	Original Route	Proposed Route
Total field delineated wetlands crossed	number	0	0
Total waterbodies crossed	number	1	1
Perennial waterbodies	number	1	1
Intermittent waterbodies	number	0	0
Residences within 50 feet of construction work area	number	0	0
Cultural resources crossed	number	0	0
Land Use	feet	1,684	1,873
Agricultural	feet	0	614
Forested	feet	68	84
Open Land	feet	807	309
Residential	feet	374	0
Open Water	feet	435	866
MP range (start and end)	miles	N/A	0.70-1.07

[1] Based on a 100-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW

In the table, both routes appear to impact a waterbody; however, both routes would have avoided the waterbody via an HDD crossing. The HDD for the original route would have been more constrained due to space limitations caused by wetlands and a residence. The proposed route allows Northern to optimize the HDD set-up and avoid workspace around a residence.

Minor Route Deviation 4

Minor route deviation 4 is located on the Willmar D branch line between MP 2.31 and MP 2.53 in Scott County, Minnesota. The original route was designed to parallel the existing pipelines with an HDD. Based on a landowner request during previous work in the area, Northern designed a proposed route that avoided tree removal along the landowner's property line. The proposed route avoids impact on the trees and routes the pipeline further away from houses in the area. Table 10.3-4 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-4 depicts the minor route deviation 4 on an aerial photographic overlay.

Table 10.3-4 Comparison of Minor Route Deviation 4 for the Willmar D Branch Line

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	917	1,197
Adjacent to existing ROW	feet	917	0
Construction ROW[1]	acres	2.11	2.73
Permanent ROW[2]	acres	1.05	1.37
Total field delineated wetlands crossed	number	1	1
Forested wetlands	number	0	0
Emergent wetlands	number	1	1
Total waterbodies crossed	number	0	0
Residences within 50 feet of construction work area	number	0	0
Cultural resources crossed	number	0	0

Environmental Factor	Unit	Original Route	Proposed Route
Land Use	feet	917	1,197
Forested	feet	354	424
Open Land	feet	129	593
Residential	feet	146	29
Wetland	feet	288	151
Industrial/Commercial	feet	0	0
Open Water	feet	0	0
MP range (start and end)	miles	N/A	2.31-2.53

[1] Based on a 100-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW

Both routes have similar environmental impacts. While the proposed route is slightly longer, it avoids impact on a landowner's large trees and routes the pipeline further away from houses in the area. Northern selected the proposed route because it results in fewer impacts on landowners.

Minor Route Deviation 5

Minor route deviation 5 is located on the Princeton tie-over loop between MP 9.63 and MP 9.74 in Sherburne County, Minnesota. The original route was designed to parallel the existing pipeline. The construction footprint resulting from the original route would have placed the bore and pipeline workspace in a landowner's driveway, preventing access to the residence during construction. Northern designed a proposed route with an angled bore crossing 273rd Avenue Northwest and open-cut construction to avoid impacts on the driveway and landowner's landscaping. Table 10.3-5 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-5 depicts the minor route deviation 5 on an aerial photographic overlay.

Table 10.3-5 Comparison of Minor Route Deviation 5 for the Princeton Tie-over Loop

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	618	655
Adjacent to existing ROW	feet	618	0
Construction ROW[1]	acres	1.07	1.13
Permanent ROW[2]	acres	0.71	0.75
Total field delineated wetlands crossed	number	0	0
Total waterbodies crossed	number	0	0
Residences within 50 feet of construction work area	number	0	1
Cultural resources crossed	number	0	0
Land Use	feet	618	655
Open Land	feet	192	297
Residential	feet	399	326
Industrial/Commercial	feet	27	32
MP range (start and end)	miles	N/A	9.63-9.74

[1] Based on a 75-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW

Both routes have similar environmental impacts. While the proposed route is slightly longer, it avoids impact on a landowner's driveway allowing them to access the residence during construction. Northern selected the proposed route as it reduces impact on the landowner.

Minor Route Deviation 6

Minor route deviation 6 is located on the Paynesville 2nd branch line between MP 0.00 and MP 1.10 in Stearns County, Minnesota. The original route was designed with an HDD crossing under County Road 123 and a wetland complex that parallels the existing pipeline. Geotechnical data collected indicated that the HDD was not feasible due to existing soil conditions. To avoid an HDD or an open-cut crossing of a major wetland complex, Northern designed the proposed route to maximize open-cut construction methods. The proposed route parallels County Road 123 for approximately 1,100 feet using open-cut construction, a conventional bore under County Road 123, followed by additional open-cut until the proposed pipeline parallels the existing branch line. The proposed route provides a safe, feasible alternative to the HDD. Table 10.3-6 provides a quantitative comparison of the environmental characteristics of the minor route deviation. Figure 10-6 depicts the minor route deviation 6 on an aerial photographic overlay.

Table 10.3-6 Comparison of Minor Route Deviation 6 for the Paynesville 2nd Branch Line

Environmental Factor	Unit	Original Route	Proposed Route
Total Length	feet	4,772	5,740
Adjacent to existing ROW	feet	4,772	1,100[3]
Construction ROW[1]	acres	8.22	9.88
Permanent ROW[2]	acres	5.48	6.59
Total field delineated wetlands crossed	number	1	0
Forested wetlands	number	0	0
Emergent wetlands	number	1	0
Total waterbodies crossed	number	0	0
Residences within 50 feet of construction work area	number	0	0
Cultural resources crossed	number	0	0
Land Use	feet	4,772	5,740
Agricultural	feet	2,912	4,249
Forested	feet	0	304
Open Land	feet	946	1,117
Wetland	feet	884	0
Industrial/Commercial	feet	30	70
MP range (start and end)	miles	N/A	0-1.10

[1] Based on a 75-foot-wide construction ROW
[2] Based on a 50-foot-wide permanent ROW
[3] Adjacent to road ROW

The proposed route is longer but has no impacts on wetlands and provides a safe, feasible alternative to the HDD. Due to subsurface soil conditions, the HDD for the original route was not feasible and open-cut construction methods along the HDD route would have resulted in significant wetland impacts.

10.4 ABOVEGROUND SITE ALTERNATIVES

Aboveground site alternatives were not considered for the proposed pipeline appurtenant facilities. The proposed facilities are either located within or adjacent to existing aboveground facilities or are located within the pipeline construction footprint, as is required for pipeline tie-ins.

REFERENCES

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Figures

Figure 10-1

Minor Route Deviation 1 - Ventura North E-Line

Figure No.

10-1

Title

Minor Deviation 1

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Ventura North E-Line

Project Location
Freeborn Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

N

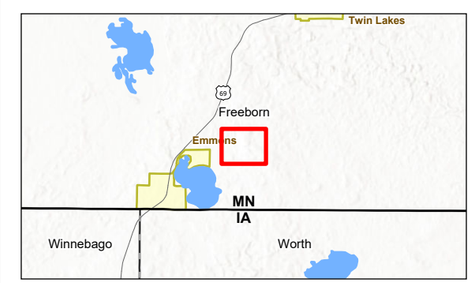
0 200 400 Feet
(At original document size of 11x17)
1:4,800

Legend

- Milepost
- HDD Entry/Exit
- Bore Entry/Exit
- Original Route
- Proposed Centerline
- Existing Centerline
- Approaches
- Existing Driveway
- Environmental Survey Boundary
- Existing Facility
- Extra Temporary Workspace
- Proposed Driveway
- Proposed Lot
- Staging Area
- Temporary Access Road
- Temporary Workspace
- Field Delineated Waterway Line
- Field Delineated Waterway Area
- Field Delineated Open Water Area
- Field Delineated Wetland Area

National Hydrography Dataset

- Perennial Stream
- Intermittent Stream
- Waterbody



Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

Figure 10-2

Minor Route Deviation 2 - Ventura North E-Line

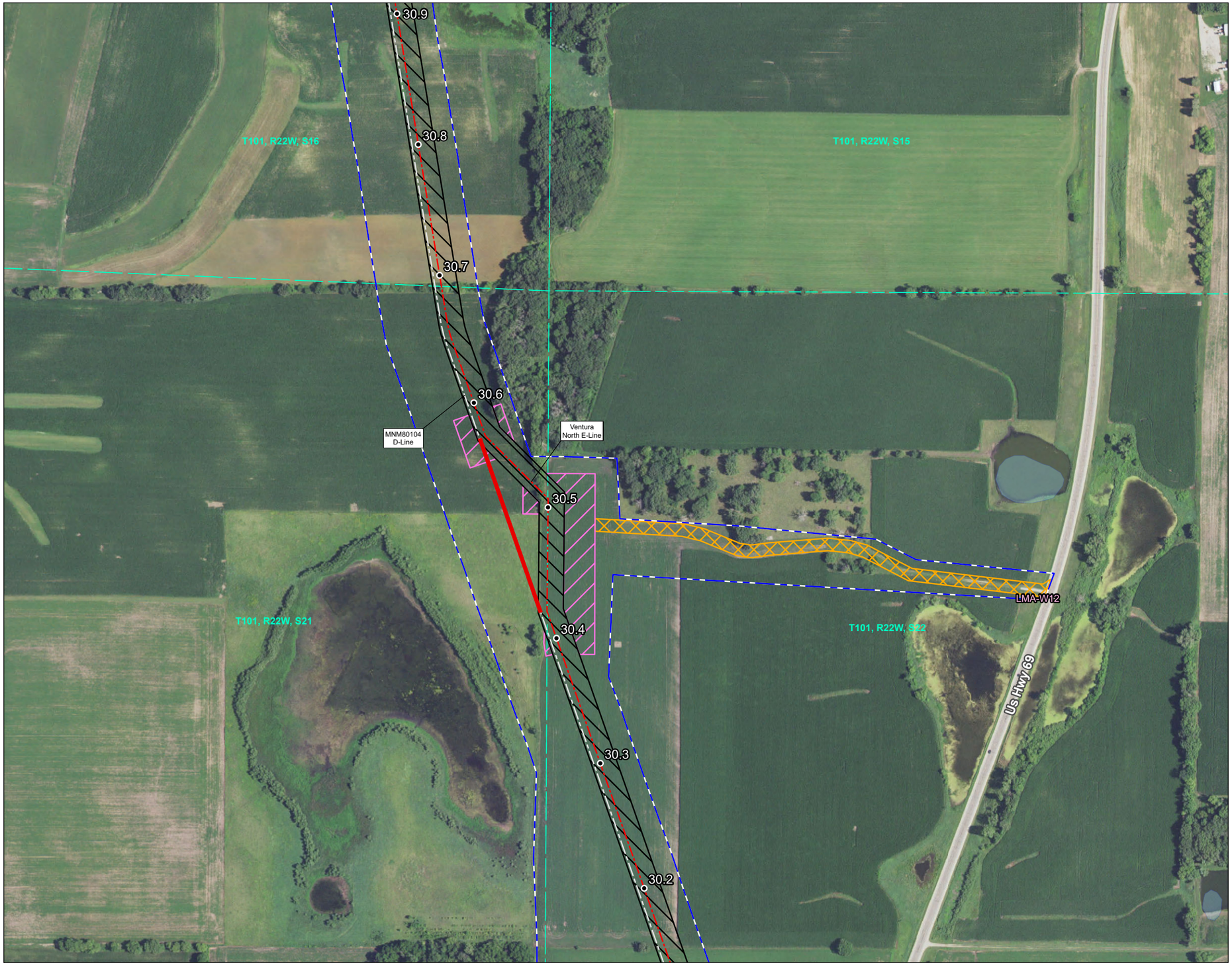


Figure No.

10-2

Title

Minor Deviation 2

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Ventura North E-Line

Project Location
Freeborn Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

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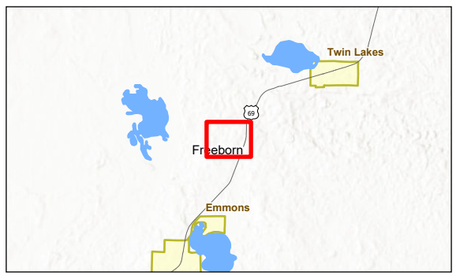

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

Figure 10-3

Minor Route Deviation 3 - Elk River Branch Line

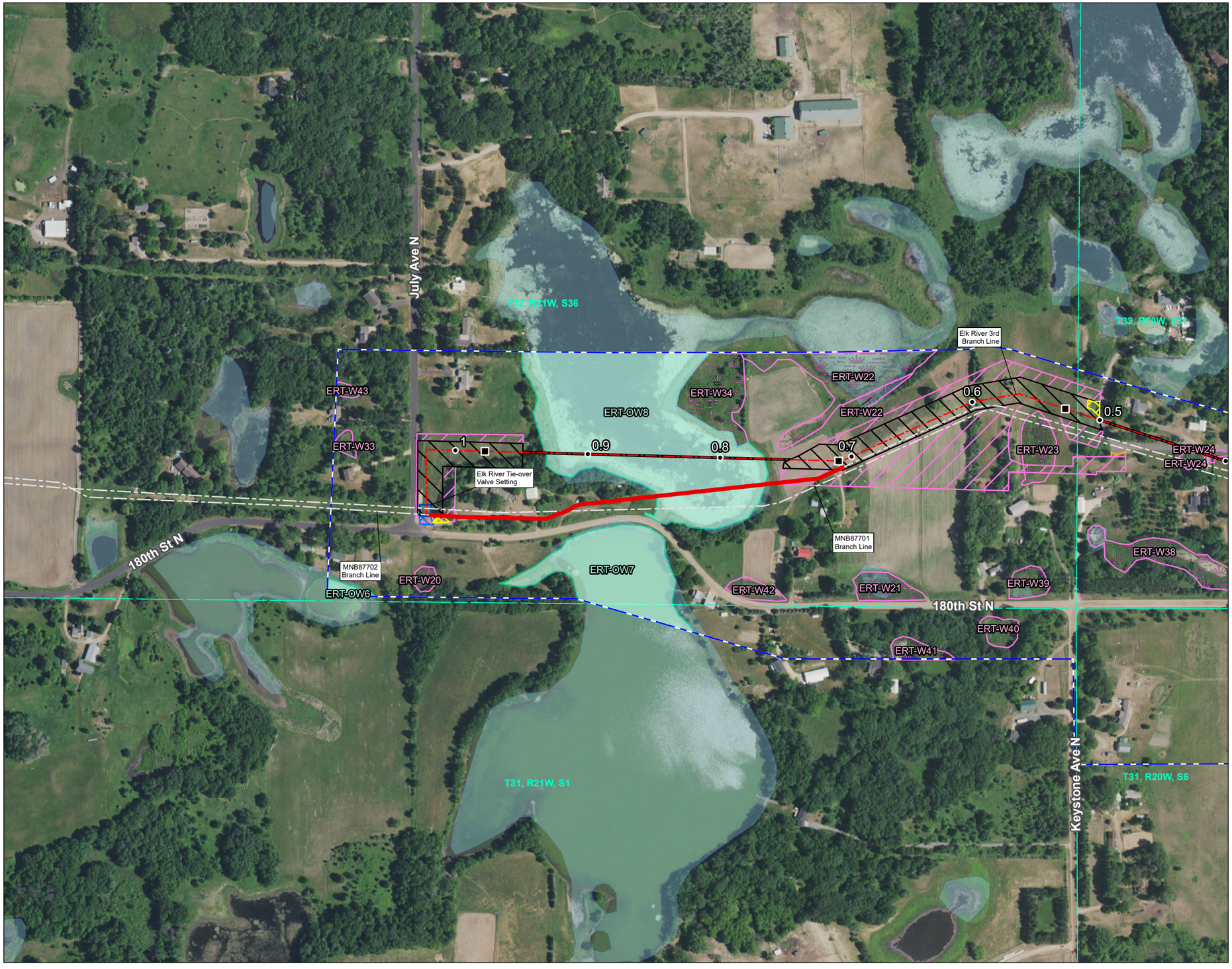

Figure No.

10-3

Title

Minor Deviation 3

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Elk River 3rd Branch Line

Project Location
Washington Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

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(At original document size of 11x17)
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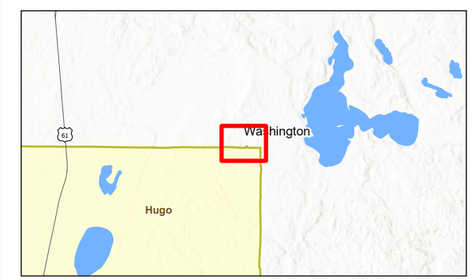

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

Figure 10-4

Minor Route Deviation 4 - Willmar D Branch Line

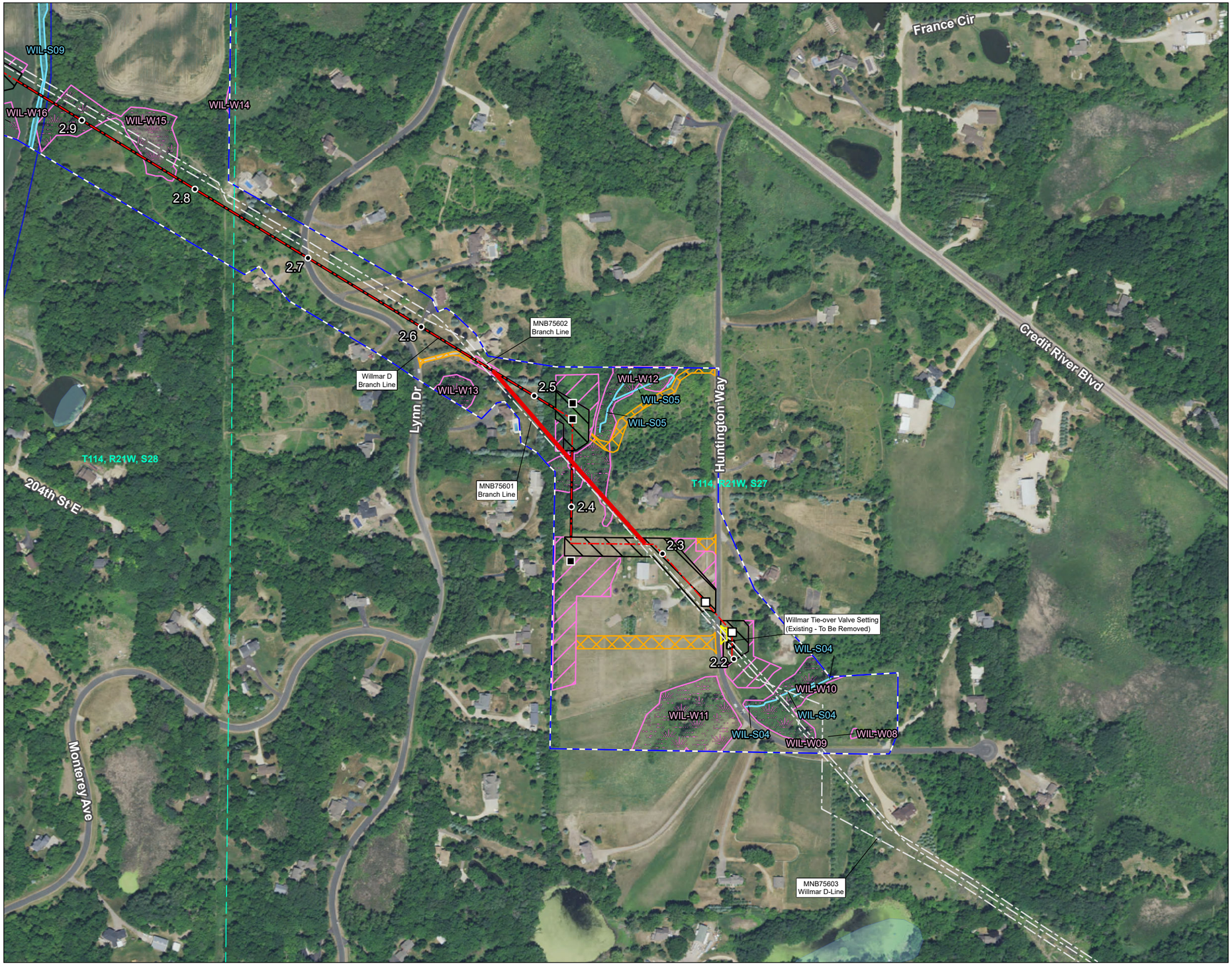

Figure No.

10-4

Title

Minor Deviation 4

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Willmar D Branch Line

Project Location
Scott Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

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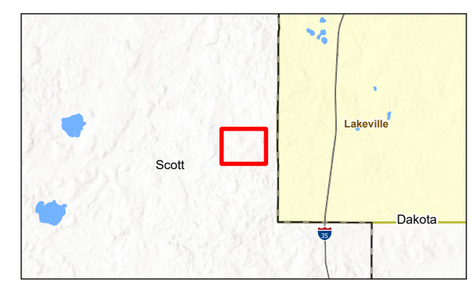

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

Figure 10-5

Minor Route Deviation 5 - Princeton Branch Line Loop

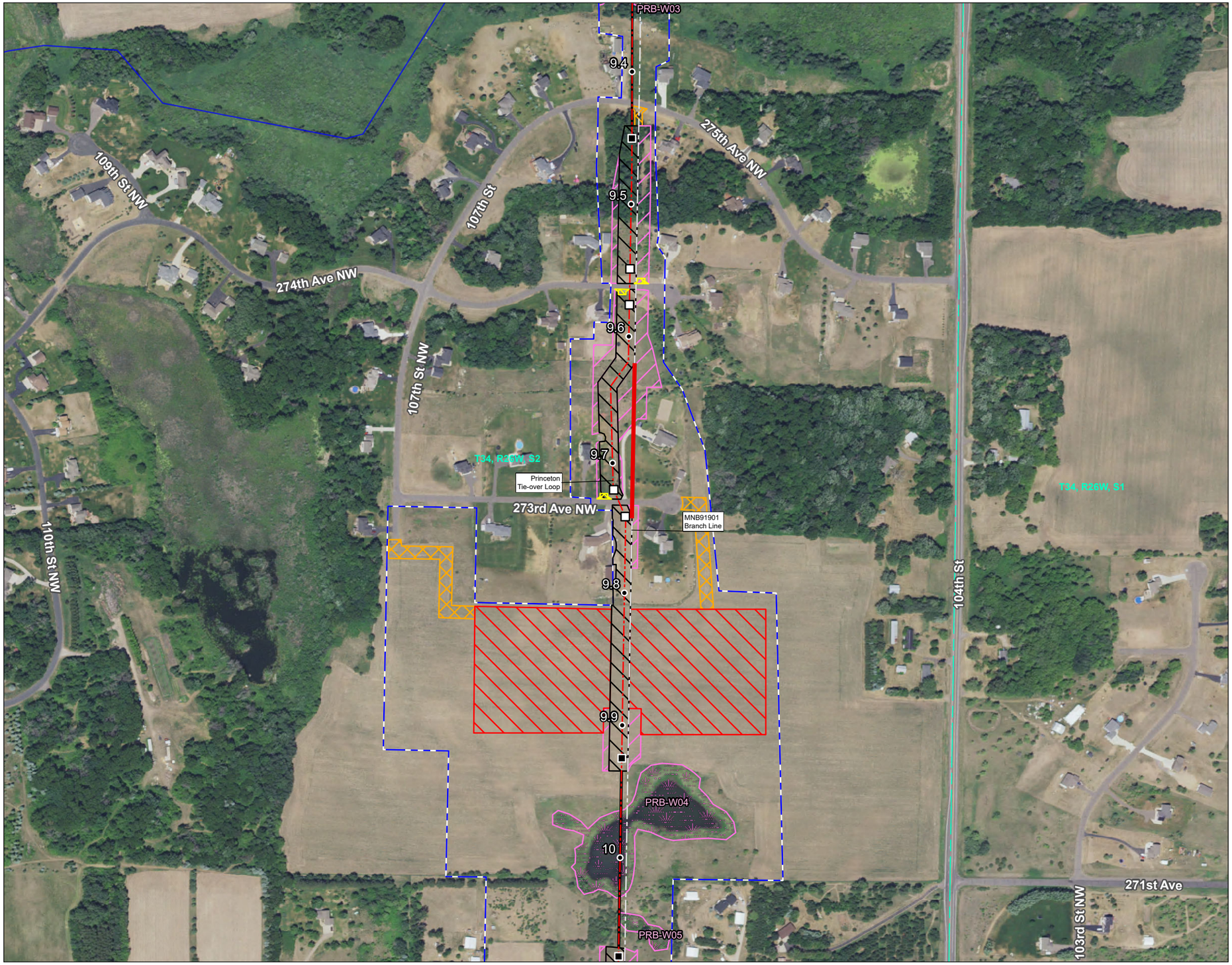

Figure No.

10-5

Title

Minor Deviation 5

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Princeton Tie-over Loop

Project Location
Sherburne Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

N

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(At original document size of 11x17)
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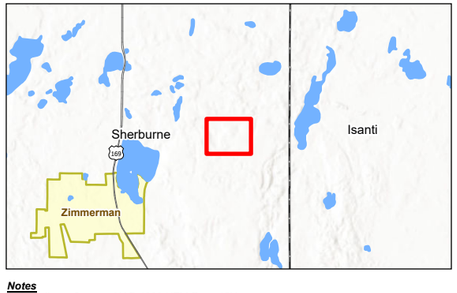

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

Figure 10-6

Minor Route Deviation 6 - Paynesville Branch Line

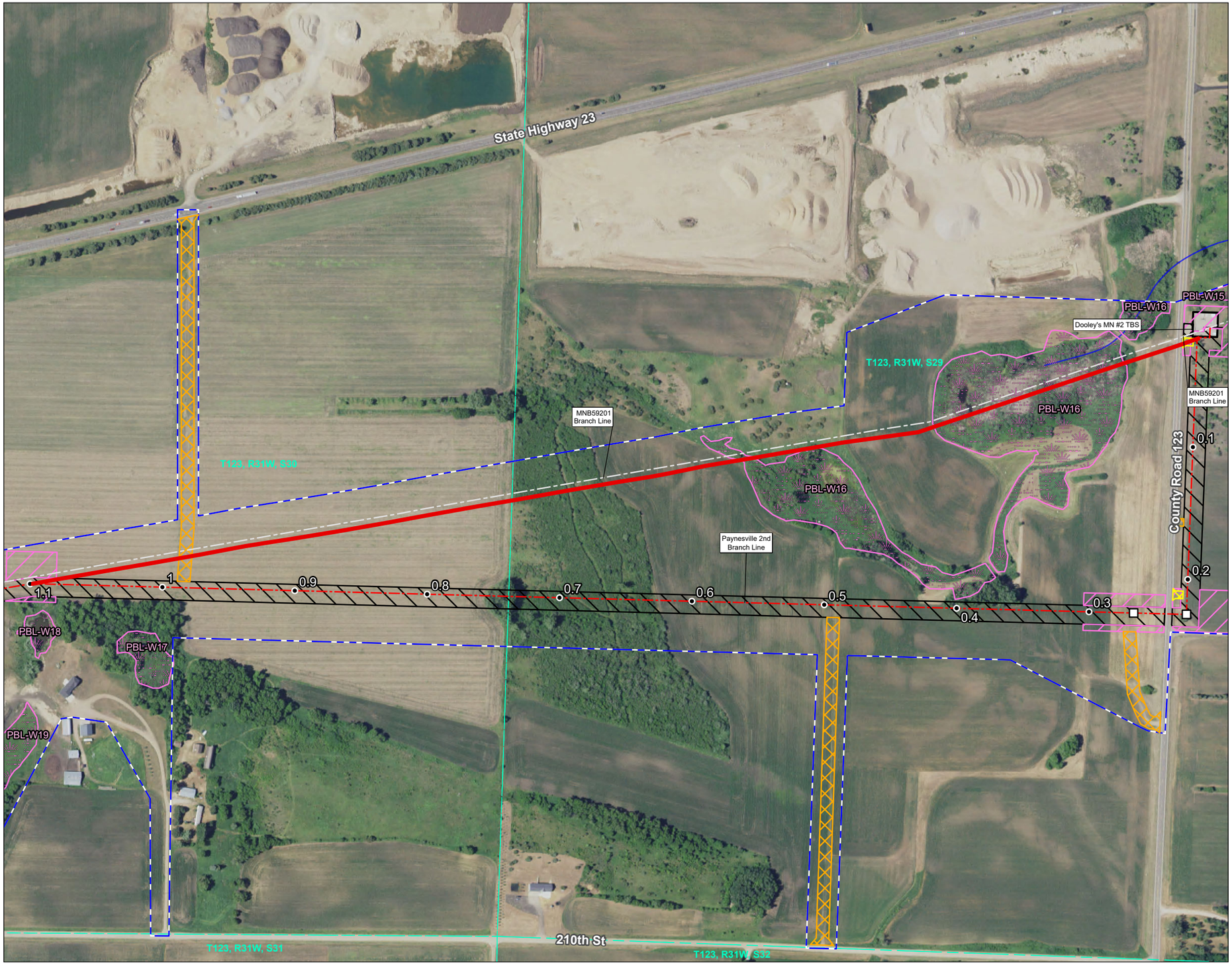

Figure No.

10-6

Title

Minor Deviation 6

Client/Project 172607730

Northern Natural Gas
Northern Lights 2023 - Paynesville 2nd Branch Line

Project Location
Stearns Co., MN

Prepared by JM on 2021-12-14
TR by SF on 2021-12-15
IR by BM on 2022-02-22

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(At original document size of 11x17)
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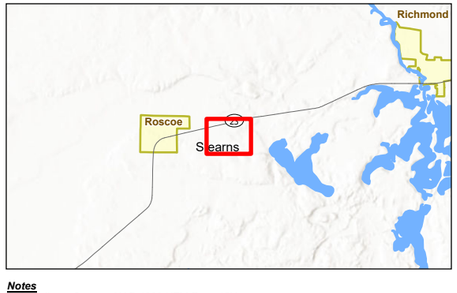

Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Data Sources: Stantec, NNG, NADS, USGS
3. Background: 2021 NAIP

Stantec

RESOURCE REPORT NO. 11
RELIABILITY AND SAFETY

Resource Report No. 11

Reliability and Safety

Northern Lights 2023 Expansion Project

FERC Docket No. CP22- -000

February 2022

RESOURCE REPORT 11 – RELIABILITY AND SAFETY SUMMARY OF FILING INFORMATION

	Found in Section
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 – Title 18 Code of Federal Regulations § 380.12(m)	Sections 11.3, 11.4, 11.5, 11.6, 11.7, 11.8 and 11.9
Additional Information Often Missing and Resulting in Data Requests	
• Identify by milepost and in table form, all U.S. Department of Transportation class locations and areas of concern (for example, high consequence areas) as defined in Title 49 of the Code of Federal Regulations § 192.903 for the proposed route, alternative routes, and compressor stations and explain the basis for high consequence area identification.	Section 11.3.1 and 11.3.2. Table 11.3-1
• Discuss the outcome of the consultations with local fire departments and emergency response agencies relative to whether additional equipment, training, and support are needed in the project area.	Section 11.7.5

Contents

List of Tables

Abbreviations and Acronyms

API	American Petroleum Institute
CFR	Code of Federal Regulations
CP	Cathodic protection
DOT	Department of Transportation
FERC	Federal Energy Regulatory Commission
HCA	High consequence area
HDD	Horizontal directional drill
LEPC	Local emergency planning committees
MCA	Moderate consequence area
MP	milepost
Northern	Northern Natural Gas
OCC	Northern's Operations Communication Center
OQP	Operator Qualification Plan
OSHA	Occupational Health and Safety Administration
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIR	Potential impact radius
Project	Northern Lights 2023 Expansion Project
ROW	right of way
SCADA	Supervisory control and data acquisition

11.0 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.

Northern owns and operates an approximately 14,500-mile-long natural gas transmission pipeline system and associated aboveground facilities, including pipeline and facilities in Minnesota and Wisconsin. Northern is proposing to construct the Project, which will consist of (1) a 2.79-mile extension of its 36-inch-diameter Ventura North E-line; (2) a 1.07-mile loop of its 20-inch-diameter Elk River 1st and 2nd branch lines; (3) a 1.14-mile extension of its 24-inch-diameter Willmar D branch line; (4) a 2.48-mile extension of its 8-inch-diameter Princeton tie-over loop; (5) a 2.01-mile loop of its 3-inch-diameter Paynesville branch line; (6) a 0.34-mile extension of its 8-inch-diameter Tomah branch line loop; and (7) aboveground facilities including a launcher and tie-over valve settings. All Project components are located in various counties in Minnesota and Wisconsin.

11.1 HAZARDS

The transportation of natural gas by pipeline generates minimal risk to the public in the event of an incident and subsequent release of gas. Historically, impacts on public safety from pipeline transportation of natural gas have been directly related to leaks or line breaks, 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 digging near buried pipeline sections; or equipment malfunctions (DOT PHMSA, 2021a).

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 Fahrenheit (Northern Material Safety Data Sheet, 2021).

11.2 PIPELINE ACCIDENT DATA

Since 1970, PHMSA has collected pipeline incident reports and combined them to provide 20-year-trend data to the public. Natural gas pipeline operators have been required to report incidents that involve fatalities, property damage of more than $50,000, injury requiring in-patient hospitalization, release of gas, or those considered significant by the operator. A total of 549 natural gas pipeline onshore transmission incidents meeting these criteria were reported from 2016 through 2020 (DOT PHMSA, 2010a).

PHMSA breaks down this trend data by the primary causes of common incidents. Table 11.2-1 presents the primary causes of incidents, along with the percentage distribution compared to the total number of incidents for the time period from 2016 to 2020 (DOT PHMSA, 2021a). Natural force damage and other outside force damage may be caused by earth movements due to subsurface soil settlement, washouts or other geological hazards; weather effects such as winds, heavy rains/flooding and lightning; accidental vehicular traffic; and willful damage.

Table 11.2-1 Natural Gas Transmission Incidents by Cause (2016-2020)

Cause	Number of Incidents – Onshore Transmission[1]	Percentage of Total
Corrosion	79	14.4
Excavation damage	62	11.3
Incorrect operation	43	7.8
Material/Weld/Equipment Failure	281	51.2
Natural force damage	38	6.9
Other outside force damage	31	5.7
All other causes	15	2.7
Total	**549**	**100**

[1] DOT PHMSA Pipeline Incidents, Onshore transmission from 2016-2020.

The most common pipeline incidents are caused by material/weld/equipment failure, corrosion, and third-party excavation damage. Historically, excavation damage was the most common incident; however, since April 1982, operators and contractors have been required to participate in One Call public utility locate programs. The locate programs have reduced unauthorized excavation activities near pipelines and subsequently minimized pipeline incidents caused by excavation damage.

Corrosion remains a major concern for gas transmission pipelines. However, the use of both an external protective coating and a CP system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe.

Northern has a recorded total of 24 incidents on its pipeline system between 2016 and 2020, none of which resulted in injuries (DOT PHMSA, 2022). The majority of the reported incidents were caused by material/weld/equipment failures. The second greatest number of incidents on Northern's system was caused by third-party excavation damage.

11.3 SAFETY STANDARDS FOR PIPELINES

The proposed pipeline facilities will be designed, constructed, operated, and maintained in accordance with the DOT PHMSA CFR Part 192. The DOT regulations in 49 CFR Part 192 specify material selection and qualification, minimum design requirements, operating and maintenance schedules and protection from internal, external and atmospheric corrosion. These federal safety standards, together with pipeline integrity management programs and recent advances in pipeline manufacturing, construction and inspection techniques, minimize the potential for pipeline failure.

11.3.1 DOT Class Locations

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. The four area classifications are defined as follows.

- Class 1: Location with 10 or fewer buildings intended for human occupancy
- Class 2: Location with more than 10 but fewer than 46 buildings intended for human occupancy
- Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of either a building, or small, well-defined outside area (e.g., playground, recreational area, outdoor theater, or place of public assembly) that is occupied by 20 or more people at least five days a week for 10 weeks in any 12-month period
- Class 4: Location ends 220 yards from the nearest building with four or more stories above ground or when a cluster of buildings intended for human occupancy requires a Class 2 or 3 location, the class location ends 220 yards from the nearest building in the cluster

Class locations representing more populated areas require higher safety factors in pipeline design, testing and operation. Pipelines constructed within a Class 1 location must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3 and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. Class locations also specify the maximum distance between block valves (e.g., 10.0 miles in Class 1; 7.5 miles in Class 2; 4.0 miles in Class 3; and 2.5 miles in Class 4). Table 11.3-1 summarizes the existing class locations and design Class locations crossed by the Project pipeline facilities.

Table 11.3-1 Class Locations for the Project Pipeline Facilities

Beginning MP	Ending MP	Existing Class for Proposed Facilities	Design Class for Proposed Facilities
Ventura North E-line			
28.42	31.21	Class 1	Class 2 for Open Cut Class 3 for Trenchless
Elk River 3rd branch line			
0.00	0.11	Class 1	Class 2 for Open Cut Class 3 for Trenchless
0.11	0.65	Class 2	Class 2 for Open Cut Class 3 for Trenchless
0.65	0.82	Class 1	Class 2 for Open Cut Class 3 for Trenchless
0.82	1.07	Class 2	Class 2 for Open Cut Class 3 for Trenchless
Willmar D branch line			
2.20	2.87	Class 2	Class 3
2.87	3.34	Class 1	Class 3
Princeton tie-over loop			
8.78	8.95	Class 2	Class 3
8.95	9.28	Class 1	Class 3
9.28	9.89	Class 2	Class 3
9.89	9.40	Class 1	Class 3
9.40	11.17	Class 2	Class 3
11.17	11.26	Class 1	Class 3
Paynesville 2nd branch line			
0.00	2.01	Class 1	Class 3

Beginning MP	Ending MP	Existing Class for Proposed Facilities	Design Class for Proposed Facilities
Tomah branch line loop			
1.92	2.12	Class 1	Class 3
2.12	2.26	Class 2	Class 3

Pipe design regulations for steel pipe are contained in 49 CFR Part 192, Subpart C. Section 192.105 specifies a formula for the pipeline's design pressure. Sections 192.107 through 192.115 contain the components of the design formula, including yield strength, wall thickness, design factor, longitudinal joint factor and temperature derating factor. Component design will be adjusted based on specific conditions of the Project.

11.3.2 HCAs and Integrity Management Planning

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. This rule requires that an integrity management plan be developed to document procedures under which pipeline integrity will be monitored and maintained for those areas where the pipeline traverses lands or facilities that are considered HCAs.

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.

Potential impact circles that contain 20 or more structures intended for human occupancy; buildings housing populations of limited mobility; buildings that would be hard to evacuate (e.g., nursing homes or schools); or buildings and outside areas occupied by more than 20 persons on a specified minimum number of days each year, are defined as HCAs (DOT PHMSA, 2011).

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. Northern also determined there are three MCAs present within the Project. Two MCAs are located on the Elk River 3rd branch line between MP 0.05 - 0.62 and MP 0.81 - 1.03; one is located on the Willmar D branch line between MP 2.21 and 2.81. Northern will manage the MCAs per its pipeline safety standards and procedures.

11.3.3 Pipeline Markers

In accordance with PHMSA regulations in 49 CFR § 192.707, Northern will clearly and frequently mark its pipeline along the ROW, including at intersections with roadways, railroads and other utilities; waterbody crossings; MPs and other important areas. These markers will alert the public to the general location of the pipeline to help prevent encroachment and potential damage caused by third-party excavation. Markers are typically offset from the physical pipe centerline. Northern participates in state One Call systems to help ensure the safety of anyone excavating near existing pipelines.

Northern will install markers for newly installed pipeline and aboveground pipeline appurtenances.

11.3.4 Operations, Maintenance and Emergency Planning

Pipeline operating regulations contained in 49 CFR § 192.615, Subpart L requires each pipeline operator to establish an operation and maintenance plan and an emergency plan that includes procedures to minimize hazards in a natural gas pipeline emergency. Key elements of the plans include the procedures listed below.

- Responding to and managing an emergency incident (i.e., gas leakages, fires, explosions and natural disasters)
- Establishing and maintaining communication, as well as notifying local fire, police and public officials of incidents and coordinating emergency response
- Promptly and effectively responding to emergencies
- Ensuring Northern personnel are properly trained and supplied with the appropriate equipment, tools and materials for dealing with an emergency
- Protecting and securing life over property when dealing with hazards
- Performing an emergency shutdown of the system when necessary and safely restoring service following outages

Northern will design the pipelines with a 0.5 or 0.6 design factor to protect against future class location changes. Changes in population density near the proposed facilities will be monitored to document that the new facilities meet the appropriate design criteria and safety standards where class locations change. When changes in population density occur, Northern may replace sections of pipe, reduce the operating pressure in the line or take other similar safety measures to achieve the required measure of safety. The new class location also may require an increase in the frequency of inspection.

Northern's emergency response program and other pipeline safety monitoring program aspects are summarized in Sections 11.4 and 11.6.

11.4 SAFETY STANDARDS FOR ABOVEGROUND FACILITIES

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

Northern's emergency response personnel are trained in first aid and proper equipment use as specified under 29 CFR Part 1910. Fire-fighting equipment, consisting primarily of hand-held dry chemical fire extinguishers, are located in company vehicles.

11.5 VALVE ISOLATION SAFETY

Northern will install and operate a number of valves for the Project to allow for isolation of facilities and segments of pipelines for maintenance or in case of an emergency. Valves at pipeline appurtenances will be manual, with the exception of one automated valve at the Elk River 3rd branch line (inside the Hugo compressor station). Additional information on valves associated with each Project component is provided in Resource Report 1, Section 1.1.2.

11.6 SAFETY STANDARDS FOR CONSTRUCTION

During construction, the applicable requirements of OSHA will be followed. All applicable requirements for construction set forth under 49 CFR Part 192 and 29 CFR Parts 1910 and 1926 will

be emphasized by Northern to all employees and contractors as part of general practices. Additional safety standards requiring training during construction are further outlined below.

11.6.1 Traffic Control

With the exception of two gravel-covered public roads on the Ventura North E-line that will be open cut, Northern will cross the public roads and most private driveways by HDD or conventional bore, which will not restrict access for residential owners and general public and eliminate the need for any detours as normal traffic flow can be maintained. Northern's construction contractor will provide traffic warning signs along road crossings as recommended by the Minnesota and Wisconsin Manual of Uniform Traffic Control Devices (Minnesota DOT, 2019 and Wisconsin DOT, 2017) and required by local and/or state road encroachment permits.

Two gravel public roads are proposed with open-cut crossing methods. The Ventura North E-line 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 road crossing plans. Northern will coordinate with local highway departments in advance of construction of each Project component and develop and post detours in advance of the open-cut crossings. Due to the residential areas being crossed and open-cut roadway crossings, Northern has developed a traffic control plan for the Project. A traffic control plan is included in Resource Report 1, Appendix 1G.

Northern will utilize tanker trucks to transport water for hydrostatic testing. The hydrostatic testing is a limited-time construction activity and the impacts are expected to be temporary and of short duration. Northern expects the truck driver will have a commercial driver's license, and the truck will have normal safety features for a vehicle of its size.

Further, Northern will coordinate with local authorities, as required by local and/or state road permits, before construction begins to ensure that both Northern and representatives of the local authorities have appropriate contact information.

11.6.2 Affected Residences and Schools

Construction activities in residential areas will be temporary and limited to the time required to safely install the pipeline and restore the ROW. Northern will install safety fence along its workspace as needed and where there is potential for public access. Nine residences are located within 50 feet of the Project, located on the Elk River 3rd branch line, Willmar D branch line, and Princeton tie-over loop. Four of the nine residences are located within 25 feet of the edge of the Project's temporary workspaces. The locations of these residences are provided in Resource Report 8, Table 8.2-1, and additional descriptions of potential impacts and mitigation on these residences are provided in Resource Report 1, Section 1.3.4 and in Resource Report 8, Section 8.2.2 of Resource Report 8. There are no schools in proximity to the Project.

11.6.3 Working over Existing In-service Pipelines

Northern avoids construction activities over existing operating pipelines whenever possible, but is capable of safely doing so when subsurface conditions allow. Northern will cross in-service pipelines on the Project via both open cut and trenchless methods. Northern's engineers will assess the potential stresses imposed by equipment and materials traveling over existing pipelines and make recommendations as necessary (e.g., additional soil cover, timber mats, minimal separation distance) for protecting the in-service pipeline and public from potential hazards. Northern also will use hydrovac excavation or mechanical methods to expose the existing pipeline at the cross-over

locations. Northern has included ETWS workspace in the Project where these crossovers occur along HDDs. Northern also employs spotters for large equipment. As part of Northern's damage prevention procedure, the contractor will hydro-excavate a pothole or excavate a small trench to locate the existing pipeline and then install a poly-vinyl chloride pipe in the ground recording depth, MP and other relevant information on the pipe.

11.6.4 Minimum Distances between Pipelines

Northern will maintain a 25-foot offset between the existing pipeline and the new pipelines except for areas with deviations due to landowner requests and/or environmental and engineering constraints. These are further discussed in Resource Reports 8 and 10.

11.6.5 Public Access

Northern will restrict the public from easily accessible workspaces (e.g., road crossings) by installing temporary safety fencing and barriers around areas of active construction.

11.6.6 Utility Crossovers

Crossing over or under existing pipelines or other utility infrastructure is common for all types of utilities and will be completed in a safe manner. Northern and its contractors will avoid unnecessary crossings of foreign lines when possible and will follow existing safety procedures in areas where crossovers are unavoidable.

Typically, crossovers are installed under existing pipelines. Some crossovers require deeper excavation, additional workspace and exposure of the crossed utility. All of these factors increase impacts on the surrounding land and require extra care during installation of the new pipeline. Before a crossover is allowed, Northern will work with the utility owner to agree upon a crossing method that satisfies both companies' policies and public safety codes. Northern's construction inspectors and pipeline construction contractors have extensive experience and knowledge of the proper means and methods for safely installing pipeline crossovers.

The Project, as designed, will cross foreign in-service pipelines, utilities and other Northern pipelines. Northern's engineers will assess the potential stresses imposed by equipment and materials on the existing pipeline and make recommendations as necessary (e.g., additional soil cover, timber mats) for protecting the in-service pipelines and public from potential hazards.

11.6.7 Welding

Northern's policy is that only company-approved and certified welders are permitted to work on its 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 American Society of Mechanical Engineers Boiler and Pressure Vessel Code § IX, API 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.

11.6.8 Blasting

Northern does not anticipate blasting will be required for the Project.

11.7 PIPELINE SAFETY MONITORING PROGRAM

11.7.1 Material Construction

Safety begins at the pipe mill or manufacturer where the piping and other facility components are manufactured. Northern representatives inspect the piping, coating and other components to document that it meets quality control standards and specifications. During construction, the integrity of pipeline coatings (which are designed to protect the pipeline against corrosion) are inspected, examined, or repaired if necessary and are verified on-site by qualified inspectors. Pipe girth welds will be non-destructively tested in accordance with DOT requirements before installation is considered complete. In addition, proposed piping will be pressure tested to a pressure 1.25 to 1.5 times higher than its maximum allowable operating pressure according to class locations and before being placed in service.

11.7.2 Observations and Inspections

Once the Project is installed, Northern will implement a number of routine monitoring measures, including the following:

- Monitoring CP periodically
- Testing relief valves
- Observing surface conditions on and near the property for indications of leaks, construction activity or any other factors that may affect safety and operation
- Inspecting valve settings and observing area construction activities
- Conducting leak surveys at least once every calendar year or as required by regulations

During inspections of the Northern system, Northern employees look for signs of unusual activity on the ROW. Upon discovery of an unusual activity, Northern personnel will respond immediately to assess the nature of the activity and remedy with prescribed corrective action. Additional tests may be conducted using analyzers to verify the effectiveness of the CP system. Any missing or damaged pipeline markers used to identify the location of the pipeline will be promptly replaced or repaired.

11.7.3 SCADA Monitoring

In addition to the monitoring listed above, Northern will monitor the pipeline systems using a SCADA system. SCADA systems are used to monitor and control facilities or equipment in industries such as telecommunications, water and waste control, energy, oil and gas refining, and transportation. A SCADA system gathers information year-round, 24 hours per day, and transfers the information back to Northern's OCC, described in Section 11.7.5 below. The system alerts Northern personnel that a leak may have occurred and carries out the necessary analysis and control.

Northern's pipeline system is monitored by a gas control department located in Omaha, Nebraska. The Project facilities will be monitored for flow and pressure with data communicated to the gas control department. Alarms, which include high- and low-pressure indicators, also are monitored by the system and activated at the gas control department.

11.7.4 Employee Qualification Program

Pursuant to the requirements of 49 Part CFR 192, Subpart N, Northern also maintains and follows a written employee qualification program. This program includes training to ensure that Northern employees have the necessary knowledge and skills to perform their tasks in a manner that ensures

the safe operation of pipeline facilities. The program also includes an OQP to ensure that individuals who perform covered tasks on the system are qualified in accordance with 49 CFR Part 192, Subpart N. The OQP requires all individuals who perform covered tasks on the system, including contractors, be qualified to perform the covered tasks and be able to recognize and react to abnormal operating conditions. Elements of the OQP include the following:

- Identification of the covered tasks
- Evaluation and qualifications of individuals
- Definition of non-qualified individuals
- Performance contributing to an incident
- Reasonable cause to verify qualification
- Communication of change
- Subsequent qualification intervals
- Record keeping
- Training requirements
- Regulatory agency notification

11.7.5 Emergency Response

Northern has designated the OCC to manage its 24-hour emergency response capabilities. The OCC's toll-free number (1-888-367-6671) will be included in all communications with property owners and other identified stakeholders, posted on all pipeline markers and provided to local emergency agencies in the vicinity of the pipeline and aboveground facilities. The OCC is staffed year-round, 24 hours per day. When a call is received regarding the Project, trained OCC personnel will record the information and notify the Project manager via email, who will either address the concern or contact the appropriate company subject matter expert to provide a timely response.

Northern has a Public Awareness and Damage Prevention Program that calls for communication with emergency responders on an annual basis. Communication revolves around pipeline safety: how to identify a pipeline marker, what a pipeline ROW is and looks like, who to call in case of an emergency, physical properties of natural gas and what is expected of first responders during an emergency.

Northern employs an emergency management response team to respond to pipeline leaks and other emergencies. Team members conduct regular mock and table-top drills. In the event of a leak or emergency, a "call burst" is sent to team members. Response to the situation is conducted using a command-and-control system and is directed from a state-of-the-art command center in Northern's Omaha, Nebraska, headquarters building. Northern has established an alternate command center in south Omaha, Nebraska.

Northern has developed emergency response plans for its entire system. Operating personnel attend training for emergency response procedures and plans, pursuant to OSHA 29 CFR Part 1910. Northern will review, revise and develop new emergency response plans as necessary before placing the new facilities in operation. Northern operations staff will meet with LEPCs, including fire departments and police departments, to review their plans. Northern will work with these LEPCs to communicate the specifics about the pipeline facilities in the area and the need for emergency response. Northern also will meet periodically with these entities to review and revise their plans when necessary. LEPC personnel will be involved in any operator-simulated emergency exercises and post-exercise critiques, if conducted. Northern will use all available, reasonable and relevant means to support the pipeline and facilities if an emergency occurs.

No special fire-fighting apparatus is required to fight a high-pressure natural gas fire at the proposed facilities. The most effective and immediate way to begin to address a high-pressure gas pipeline rupture is to shut off the gas source. Northern has valves spaced along the pipeline that can be used to isolate each pipeline segment. Any gas remaining in the pipe segment is then allowed to burn off.

11.8 INTEGRITY MANAGEMENT PROGRAM

Northern has developed a pipeline integrity management program to improve pipeline safety along its entire pipeline system. This program was implemented to comply with the prescriptively based requirements of 49 CFR Part 192, Subpart O. Northern implements the program through the following:

- Assessing the integrity of pipelines in HCAs, MCAs and other areas
- Improving integrity management data systems within the company
- Increasing the integrity and reliability of the pipeline system

The proposed new pipelines and aboveground pipeline appurtenances will be incorporated into Northern's integrity management program. The information that Northern gathers about its system is incorporated into the integrity management program. Northern decides where and when to internally inspect the pipeline based on accumulated data. Risk assessment of the pipeline system determines what inspection criteria are required. This may include in-line inspection tools (e.g., smart pigs) that are designed to provide specific integrity information about the condition of the pipe, as well as inspection tools and practices that Northern has determined will be the most effective.

11.8.1 Pressure Testing

Pressure tests are an integral part of Northern's pipeline integrity management program. Pipelines are designed to operate at certain pressures based on the pipe metal's yield strength, diameter and wall thickness. Hydrostatic pressure testing or pneumatic pressure testing will be conducted in accordance with 49 CFR Part 192 Subpart J to verify the integrity of pipelines and aboveground pipeline appurtenances before being placed into service. The components installed for the Project will be tested between one and eight hours. Any significant loss of pressure will indicate that a leak may have occurred and warrant further inspection and, where necessary, repair. Additional information on hydrostatic or pneumatic pressure testing is located in Resource Report 1, Section 1.3.3 and Table 1.3-1.

11.8.2 Periodic Inspections

As part of regular operation and maintenance practices, Northern will periodically inspect its pipelines for leaks and safety hazards by walking, driving, flying or other appropriate means of traversing the ROW. Northern also will inspect its CP anode beds to verify adequate corrosion protection. Inspectors will access the ROW using public roads and acquire permission from affected landowners before entering their properties.

11.8.3 Cathodic Protection

All new underground structures that are used to transport natural gas are required by the DOT regulations at 49 CFR Part 192 Subpart I to have an external protective coating (Section 192.461) and must have a CP system (Section 192.463) designed to work with the coating to protect the underground structures from corrosion. Following construction and installation of the facilities required for the Project, Northern will install low voltage CP systems at optimal locations to help

protect buried pipelines from corrosion. Northern intends to install its CP systems within one year of the Project being placed in service. All rectifiers and electrical equipment will be enclosed inside locked metal boxes. Additional mitigation systems will be installed to protect the piping, and associated aboveground facilities from corrosion caused by induced alternating current. Aboveground structures will be coated to prevent atmospheric exposure and corrosion.

Northern is required by DOT to assess the actual pipe-to-soil potentials of newly installed below-ground structures. Based on this data, Northern will design and install CP systems, as needed, within one year of the in-service date in accordance with DOT regulations at 49 CFR Part 192 Subpart I Section 192.455.

Northern also is required by DOT regulations at 49 CFR Part 192, Subpart I, Section 192.465, to constantly monitor the effectiveness of the CP systems and promptly correct any deficiencies found. Following the modification and balancing of the CP systems, Northern personnel will routinely check the voltage and amperage of the rectifiers as well as the pipe-to-soil potentials. Adjustments will be made as conditions change. In addition to maintenance activities, annual CP surveys will be completed to determine pipe-to-soil potentials. Close-interval surveys also will be conducted on a periodic basis.

11.9 PUBLIC EDUCATION PROGRAM

Northern complies with API 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, LEPC, 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.

Northern will minimize the possibility of excavation-related damage to the pipeline by adhering to the following damage prevention requirements listed below.

- General notification of the public near the pipeline, in addition to notification of individuals or companies engaged in excavation activities, to make them aware of how to determine the general location of underground pipelines before excavation activities begin.
- Participation in One Call systems and maintaining responsibility to mark and prevent damage to pipelines for excavation activities by:
  - Temporarily marking the buried pipeline in the excavation area prior to any work being done
  - Inspecting the pipeline during and after excavation activities to verify the integrity of the pipeline; Northern will have personnel observe all excavations that occur on the ROW to document that no damage occurs during excavations

Northern may perform a targeted mail program to communicate public awareness and damage prevention information to residences, businesses and places of congregation. Northern will mail the information if any of the following situations exist.

- The area is located in what has been designated as an HCA
- Conditions exist that elevate the potential for third-party damage
- Specific local conditions warrant more frequent communication

11.10 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 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.

REFERENCES

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29 CFR 1910 Occupational Safety and Health Standards.

29 CFR 1926 Safety and Health Regulations for Construction.

49 CFR Part 192 Transportation of Natural and other Gas by Pipeline: Minimum Federal Safety Standards.

RESOURCE REPORT NO. 12
PCB CONTAMINATION

Resource Report No. 12

PCB Contamination

Northern Lights 2023 Expansion Project

FERC Docket No. CP22- -000

February 2022

RESOURCE REPORT 12 – PCB CONTAMINATION
SUMMARY OF FILING INFORMATION

	Found in Section
1. For projects involving the replacement or abandonment of facilities determined to have polychlorinated biphenyls (PCBs), provide a statement that activities would comply with an approved U.S. Environmental Protection Agency disposal permit or with the requirements of the Toxic Substances Control Act – Title 18 Code of Federal Regulations (CFR) § 380.12(n)(1)	Not applicable
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 – 18 CFR § 380.12(n)(2)	Not applicable

Contents

List of Appendices

Abbreviations and Acronyms

EPA	Environmental Protection Agency
Northern	Northern Natural Gas
PCB	Polychlorinated biphenyl
ppm	parts per million
Project	Northern Lights 2023 Expansion Project
TSCA	Toxic Substances Control Act

12.0 PCB CONTAMINATION

Resource Report 12 describes on-site PCB contamination for Northern's proposed Project. The EPA regulations address PCBs in natural gas pipeline systems and PCB-contaminated pipeline abandonment procedures and requirements. Resource Report 12 is required for filings involving the replacement, abandonment by removal, or abandonment in place of pipeline facilities determined to have PCBs in excess of 50 ppm in pipeline liquids. Resource Report 12 also is required for compressor station modification on sites that have been determined to have PCB-contaminated soil at concentrations in excess of 50 ppm.

Northern owns and operates an approximately 14,500-mile-long natural gas transmission pipeline system and associated aboveground facilities, including pipeline and facilities in Minnesota and Wisconsin. Northern is proposing to construct the Project, which will consist of (1) a 2.79-mile extension of its 36-inch-diameter Ventura North E-line; (2) a 1.07-mile loop of its 20-inch-diameter Elk River 1st and 2nd branch lines; (3) a 1.14-mile extension of its 24-inch-diameter Willmar D branch line; (4) a 2.48-mile extension of its 8-inch-diameter Princeton tie-over loop; (5) a 2.01-mile loop of its 3-inch-diameter Paynesville branch line; (6) a 0.34-mile extension of its 8-inch-diameter Tomah branch line loop; and (7) aboveground facilities including a launcher and tie-over valve settings. All Project components are located in various counties in Minnesota and Wisconsin.

The new pipe required for the proposed Project will not contain PCBs. Construction of the pipeline facilities associated with the Project will require the removal of pipe to accommodate tie-ins to Northern's existing system. The proposed Project will interconnect with Northern's existing pipeline system at the take-off and tie-ins for the six pipeline components described above. Minimal amounts of piping may be removed to complete the tie-ins at each end of the six components.

Northern reviewed wipe samples from its existing pipelines in proximity to the Project. A wipe sample collected from the Ventura North D-line contained a PCB concentration of 31 ppm, which is classified as non-toxic according to TSCA (40 CFR part 761) and the Minnesota Pollution Control Agency. Samples collected from the other five pipeline components did not contain detectable levels of PCB concentrations. Based on the PCB sampling results for the pipelines, Northern does not anticipate encountering hazardous levels of PCBs during Project construction; however, Northern will implement its PCB protocols discussed below.

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 (e.g., lubricants and sealants) associated with facilities being removed. As applicable, Northern's inspection team will oversee the PCB sampling if liquids are found in the existing pipeline system during the tie-ins. The sampling for and disposal of PCB-contaminated facilities will be in accordance with Northern's PCB Disposal Requirements (environmental procedure 410.301) and Sampling for PCBs during Pipeline Removal (environmental procedure 410.405) provided as Appendix 12A.

Appendices
RR12

Appendix 12A
Northern's PCB Disposal Requirements and Sampling for PCBs during Pipeline Removal

1 PURPOSE:

The purpose of this procedure is to ensure all portions of the Northern system, subject to the PCB Mega Rule, comply with the regulations when pipe is removed from the system for reuse or disposal.

2 RESPONSIBILITY FOR ADMINISTRATION:

Team Leader, Environmental Skilled Person, DES, Project Manager and Construction Coordinator

3 GENERAL:

None

4 RELATED PROCEDURES:

EA 410.401	Sampling for PCBs
EA 410.403	PCB Mega Rule Marking Requirements
EA 410.101	Storage an On-Site Handling
EA 410.408	Storage for Reuse
EA 470.101	Sale and Purchase of Used Material

5 PROCEDURE:

5.1 Prior to removal of pipe, characterization of the pipe to determine PCB contamination may be required. All coal tar based coatings must be sampled for the presence of PCBs prior to removal or disposal. Follow environmental procedure 410.401, Sampling for PCBs.

5.2 If pipe is less than 4-inches in diameter, no sampling is required if the pipe is to be reused within the system or destined for disposal. If the pipe is to be used in another manner (e.g., sold) refer to environmental procedure 470.101, Sale and Purchase of Used Materials.

5.3 If the pipe is greater than 4-inches in diameter and still in service, collect liquid samples in accordance with environmental procedure 410.401, Sampling for PCBs from all condensate collection points along the portion of the pipeline to be abandoned. Collection points include compressors, filters, scrubbers, drips and tanks. Sampling must occur within 72 hours of the last transmission of gas. If no liquid samples can be collected due to lack of liquids in that portion of the system or sampling did not occur within 72 hours of the last transmission of gas, the wipe samples must be collected at the time of removal. If liquids are present, the line must be characterized based on collection of liquid samples.

5.4 Results should be evaluated by reviewing one upstream sample point to the next downstream sample point. The PCB concentration of the entire pipeline system between those two sampling points is assumed to be the concentration of the upstream sample point. For example, as to points A, B, and C below the results should be interpreted as follows:

⊕----------⊕----------⊕

A	B	C
Greater than 50 ppm	Less than 50 ppm	Greater than 50 ppm

5.5 The segment between A and B is contaminated at levels greater than 50 ppm PCBs.

5.6 The segment between B and C is contaminated at levels less than 50 ppm PCBs.

5.7 If only one sample is collected, the entire segment to be removed must be characterized based on the results of that sample.

5.8 If liquid samples cannot be collected, then the pipeline section to be removed must be wipe sampled as per environmental procedure 410.401, Sampling for PCBs.

5.9 Wipe samples must be collected as follows (joint = 40 ft. of pipe):

5.9.1 If fewer than seven joints are removed, every joint shall be sampled.

5.9.2 If seven joints or more are to be removed, sample sites shall be selected depending on the total length of pipeline to be removed. If the total contiguous length (L) of the pipeline to be removed:

5.9.2.1 If less than 3 miles (15,840 ft.), take one sample at the first upstream end joint and one sample at the last joint removed then select five more samples as follows. Assign a unique number to each joint, including the first and last joint. Divide the total number of joints by 6 (Total number/6 = S). Round result to the nearest whole number. In addition to sampling the first segment and last segment, also collect samples at segments 1+S, 1+2S, 1+3S, 1+4S, and 1+ 5S. See the attached example.

5.9.2.2 If greater 3 miles (15840 ft.), then take first sample from upstream end of first joint and then collect samples from every 1/2 mile of pipe until entire length of pipe is sampled. See the attached example.

5.10 Mark joints removed for reuse or disposal in accordance with environmental procedure, 410.403 - PCB Mega Rule Marking Requirements.

5.11 Store joints destined for disposal or reuse within the system in accordance with environmental procedure 410.202, Storage and On-site Handling.

5.12 Pipe that is less than 4 inches in diameter can be reused within the system or disposed of in a municipal landfill, industrial non hazardous waste landfill, hazardous waste landfill, or other TSCA disposal facility only after discussion with the DES. The material can also be sent to an authorized scrap metal smelter, refer to environmental procedure 470.101, Sale and Purchase of Used Materials. All free-flowing liquids must be removed.

5.13 Pipe that is greater than 4-inches in diameter and contaminated at levels less than 500 ppm PCBs or 100 ug/cm^2 can be reused within the system or disposed of in a municipal landfill, industrial non hazardous waste landfill, hazardous waste landfill, or other TSCA disposal facility. The material can also be sent to an authorized scrap metal smelter, refer to environmental procedure 470.101, Sale and Purchase of Used Materials. All free-flowing liquids must be removed.

5.14 Pipe that is greater than 4-inches in diameter and contaminated at levels greater than 500 ppm or 100 ug/cm^2 PCBs, must be decontaminated before it can be reused within the system or disposed in a municipal or industrial landfill. Contact the DES for options.

5.15 All coal tar based coatings contaminated at levels greater than 50 ppm must be removed before the pipe can be reused within the system. When the sale of used equipment is contemplated refer to environmental procedure 470.101, Sale and Purchase of Used Materials.

6 RECORDS:

6.1 Documentation of the abandonment process will be kept with the project file.

7 CHANGE MANAGEMENT:

Responsibility for Procedure:

Address all questions on this procedure to the Senior Director of Environmental Affairs, Pipeline Safety and Right of Way.

Revision History:

Rev. 3 02/28/04
Rev. 4 01/01/06
Rev. 5 02/28/08

1 PURPOSE:

The purpose of this procedure is to provide regulatory guidance for transportation and disposal of polychlorinated biphenyl (PCB) wastes off-site in accordance with Environmental Protection Agency (EPA) regulations under the Toxic Substance Control Act (TSCA), 40 CFR Part 761.

2 RESPONSIBILITY FOR ADMINISTRATION:

Operations Manager, Environmental Skill Employees, Division Environmental Specialist (DES) or Project Manager

3 GENERAL:

3.1 The following are the disposal methods available for PCB wastes:

3.1.1 Liquid PCB waste (50 ppm PCBs or greater) must be incinerated at an incinerator approved to accept PCB wastes. Organic liquid PCB waste (e.g., condensate and diesel fuel) that is between 2 and 50 ppm PCBs must be managed as used oil.

3.1.2 PCB contaminated articles, such as pipe and equipment can be disposed of at a municipal landfill, non-hazardous industrial landfill, or scrap metal smelter if it is contaminated at levels less than 500 ppm or 100ug/100cm^2 PCBs. If pipe is less than 4-inches in diameter *and a wipe sample cannot be obtained, the pipe is considered PCB-contaminated at a level of 50 to 500 ppm and disposed of accordingly.* If pipe is 4-inches or greater in diameter and contaminated at levels 500 ppm or greater or 100ug/100cm^2 or greater, the material must be decontaminated before it can be disposed of at a municipal landfill, industrial landfill, or scrap smelter. It can be disposed of at a chemical waste landfill if drained of all free flowing liquids without decontamination. (Per environmental procedure 410.401, *Sampling and Recordkeeping for PCBs*, a wipe template is 10cm x 10cm, which equals 100cm^2.)

4 RELATED PROCEDURES:

OP 110.420	Motor Carrier Safety
EA 390.106	Manifesting and Other Transport Requirements for Off-Site Disposal
EA 410.101	PCB Storage and On-site Handling
EA 410.202	Marking Requirements
*EA 410.401	Sampling and Recordkeeping for PCBs*

5 PROCEDURE:

5.1 Package PCB wastes or material in a secure, non-leaking, Department of Transportation (DOT) approved containers or in a manner approved under the DOT regulations. See environmental procedure 410.101, Storage and On-site Handling, for packaging requirements and/or consult with the safety department.

5.2 Determine the type of facility at which the PCB waste will be disposed using the information in the General section above. Contact the DES for guidance and information on available disposal facilities.

5.3 For PCB wastes that fill more than ½ of a gondola, contact the DES directly to determine arrangements for disposal.

5.4 Prior to offering the PCB waste for transport to a disposal facility, prepare a hazardous waste manifest in accordance with the instructions located in section 9 of this manual and include the additional information set out below:

5.4.1 For each bulk load of PCBs: The identity of the PCB waste, the earliest date of removal from service for disposal, and the weight in kilograms of the PCB waste.

5.4.2 For each PCB article container or PCB container: The unique identifying number of the container, the type of waste (e.g., soil, debris, small capacitors), the earliest date of removal from service for disposal, and the weight in kilograms of the PCB waste. (Note: Each PCB article within a PCB article container does not require a unique identifying number.)

5.4.3 For each PCB article not in a PCB container or PCB article container: The serial number, if available, or other method of unique identification, the date of removal from service for disposal, and the weight in kilograms of the PCB waste in each PCB Article.

5.5 Label each container to be shipped offsite in accordance with DOT and TSCA requirements as follows:

5.5.1 DOT substance or waste by name and UN or NA identification number, (e.g., Polychlorinated Biphenyls UN2315).

5.5.2 TSCA PCB sticker. Refer to environmental procedure 410.202, Marking Requirements.

5.6 If the Northern Natural Gas (Northern) facility uses an independent transporter to transport the PCB waste to a commercial storer or disposer, the facility shall confirm by telephone, or by other means of confirmation agreed to by both parties, that the commercial storer or disposer actually received the manifested waste in the following manner:

5.6.1 The Northern facility shall confirm receipt of the waste by close of business the day after it receives the manifest hand-signed by the commercial storer or disposer.

5.6.2 If the Northern facility has not received the hand-signed manifest within 35 days after the independent transporter accepted the PCB waste, the facility shall telephone, or communicate with by some other agreed-upon means, the disposer or commercial storer to determine whether the PCB waste was actually received. If the PCB waste was not received, the facility shall contact the independent transporter to determine the disposition of the PCB waste.

5.6.3 If the Northern facility does not receive a hand-signed manifest from an EPA-approved facility within 10 days from the date of the telephone call or other agreed upon means of communication, to the independent transporter, the facility must submit an “exception report” to the EPA. See environmental procedure 390.106, Manifesting and Other Transport Requirements for Off-Site Disposal.

5.6.4 If the Northern facility is required to keep an Annual Document Log, all telephone conversations must be recorded in that document. See environmental procedure 410.101, PCB Storage and On-site Handling.

5.7 PCBs must be disposed of within 1 year of the date that they were removed from service and placed in a storage area. Always ship PCB waste to an off-site disposal location at least 90 days before the 1 year time period will elapse.

5.8 If an independent transporter is used, contact the commercial facility by telephone when the signed copy of the manifest is received to confirm the waste material was received by the commercial facility. If the waste was not received by the commercial facility, contact the DES.

5.9 The disposal facility is required to prepare and submit to the generating facility a "Certificate of Disposal" within 30 days of disposal so that the facility can verify that the waste was disposed within the 1 year time limit. Contact the disposal facility if the Certificate of Disposal is not received in a timely manner.

6 RECORDS:

6.1 Submit shipping manifests and Certificates of Disposal to the company's records management system. Use the category, PCB DISPOSAL on the Document Submittal Form. These records will be kept for the life of the facility.

7 CHANGE MANAGEMENT:

Responsibility for Procedure:

Address all questions on this procedure to the *director of environmental affairs*.

Revision History:

Rev. 3	02/28/04	
Rev. 4	01/01/06	
Rev. 5	10/13/11	Corrected denominators in section 3.1.2. Added section 5.3 to contact the DES for disposal options if PCB wastes fill more than ½ of a gondola.
Rev. 6	07/31/12	Updated the Related Procedures section and added detail stating that if the pipe is less than 4-inches in diameter and a wipe sample cannot be obtained, the pipe is considered PCB-contaminated at a level of 50 to 500 ppm and disposed of accordingly.

RESOURCE REPORT NO. 13
ADDITIONAL INFORMATION RELATED TO LNG PLANTS

Resource Report No. 13

Additional Information Related to LNG Plants

Northern Lights 2023 Expansion Project

FERC Docket No. CP22- -000

February 2022

RESOURCE REPORT 13 – ADDITIONAL INFORMATION RELATED TO LNG PLANTS SUMMARY OF FILING INFORMATION

	Found in Section
Provide all the listed detailed engineering materials. (18 CFR § 380.12(o))	Not applicable

Contents

Abbreviations and Acronyms

CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
LNG	Liquefied natural gas
Northern	Northern Natural Gas
Project	Northern Lights 2023 Expansion Project

13.0 ADDITIONAL INFORMATION RELATED TO LNG PLANTS

Resource Report 13 is required when a project includes the construction of new or recommissioning of existing LNG facilities.

Northern owns and operates an approximately 14,500-mile-long natural gas transmission pipeline system and associated aboveground facilities, including pipeline and facilities in Minnesota and Wisconsin. Northern is proposing to construct the Project, which will consist of (1) a 2.79-mile extension of its 36-inch-diameter Ventura North E-line; (2) a 1.07-mile loop of its 20-inch-diameter Elk River 1st and 2nd branch lines; (3) a 1.14-mile extension of its 24-inch-diameter Willmar D branch line; (4) a 2.48-mile extension of its 8-inch-diameter Princeton tie-over loop; (5) a 2.01-mile loop of its 3-inch-diameter Paynesville branch line; (6) a 0.34-mile extension of its 8-inch-diameter Tomah branch line loop; and (7) aboveground facilities including a launcher and tie-over valve settings. All Project components are located in various counties in Minnesota and Wisconsin.

Northern's proposed Project does not include any LNG facilities; therefore, according to the FERC regulations provided in 18 CFR § 380.12(o), Resource Report 13 is not required to construct or operate Northern's Project as proposed.